

It is to be noted that, whereas the test borings are drilled and sampled by experienced drillers, it is sometimes difficult to record changes in stratification within narrow limits. In the absence of foreign substances, it is also difficult to distinguish between discolored soils and clean soil fill.

Soil Conditions

Boring B-1 - The subsurface soil conditions consist of an upper stratum of fine sand, an intermediate stratum of clayey sand, and a deeper stratum of silty clay.

From the mudline to an approximate depth of six (6) feet, an upper stratum of medium sand with shells was encountered. Standard penetration values (N) obtained within these soils ranged from one (1) to four (4) blows per foot. These soils are non-plastic and contain between 12 and 23 percent silt and clay size particles as indicated by minus #200 sieve tests.

From six (6) feet below the mudline, to a depth of 7.5 feet, an intermediate stratum of clayey sand was encountered. A standard penetration value (N) obtained within these soils was two (2) blows per foot. These soils contain approximately 42 percent silt and clay size particles as indicated by minus #200 sieve tests.

From 7.5 feet below the mudline and extending to a depth of nine (9) feet, a stratum of silty clay was encountered. A standard penetration value (N) obtained within these soils was four (4) blows per foot. These soils are high in plasticity as indicated by an Atterberg limit test. The tested liquid limit was 53 percent and plasticity index (PI) was 31. These soils contain approximately 22 percent sand size particles as indicated by a minus #200 sieve test.

Boring B-2 - The subsurface soil conditions consist of an upper stratum of fine sand, intermediate strata of clayey sand and silty clay, and a deeper stratum of sandy clay.

From the mudline to an approximate depth of six (6) feet, an upper stratum of fine sand was encountered. Standard penetration values (N) obtained within these soils ranged from zero (0) to one (1) blow per foot. These soils are non-plastic and contain between five (5) and 14 percent silt and clay size particles as indicated by minus #200 sieve tests.

From six (6) feet below the mudline, to a depth of 10.5 feet, intermediate strata of clayey sand and silty clay were encountered. Standard penetration values (N) obtained within these soils ranged from one (1) to 11 blows per foot. These soils are low in plasticity as indicated by Atterberg limit tests. Liquid limits ranged from 24 to 27 percent and plasticity indices (PI) ranged from seven (7) to 12.

From 10.5 feet below the mudline and extending to a depth of 13.5 feet, a stratum of sandy clay was encountered. Standard penetration values (N) obtained within these soils averaged 10 blows per foot. These soils are low in plasticity as indicated by Atterberg limit test. The tested liquid limit was 34 percent and plasticity index (PI) was 13. These soils contain approximately 50 percent sand size particles as indicated by a minus #200 sieve test.

Boring B-3 - The subsurface soil conditions consist of a stratum of silty clay.

From the mudline to an approximate depth of 10.5 feet, an upper stratum of silty clay was encountered. Standard penetration values (N) obtained within these soils ranged from zero (0) to 11 blows per foot. These soils are high in plasticity as indicated by Atterberg limit tests. Liquid limits averaged 68 percent and plasticity indices (PI) averaged 29. These soils contain between one (1) and eight (8) percent sand size particles as indicated by minus #200 sieve tests.

Boring B-4 - The subsurface soil conditions consist of an upper stratum of clayey sand and fine sand and a deeper stratum of silty clay.

From the mudline to an approximate depth of six (6) feet, an upper stratum of clayey sand and fine sand was encountered. Standard penetration values (N) obtained within these soils ranged from zero (0) to three (3) blows per foot. These soils are generally non-plastic and contain between one (1) and 34 silt and clay size particles as indicated by minus #200 sieve tests.

From six (6) feet below the mudline and extending, a stratum of silty clay was encountered. Standard penetration values (N) obtained within these soils ranged from seven (7) to 12 blows per foot. These soils are high in plasticity as indicated by an Atterberg limit test. The tested liquid limit was 77 percent and plasticity index (PI) was 34. These soils contain approximately five (5) percent sand size particles as indicated by minus #200 sieve tests.

CONTAMINATION ASSESSMENT

Analytical test results indicate concentrations of Total Petroleum Hydrocarbons (TPH) in the four (4) composite soil samples collected from soil boring locations B-1, B-2, B-3, and B-4. The levels of TPH concentration encountered in the soil samples from soil boring locations B-1 and B-2 are those typically associated with the biodegradation of naturally occurring organic matter and do not represent an adverse environmental concern.

PROFESSIONAL SERVICE INDUSTRIES, INC.

RECORD OF SUBSURFACE EXPLORATION

Boring: B-2

Object Name: 1995 Marina Dredging Project Date of Boring: November 16, 1995

Site: T-Heads - Corpus Christi, Texas Project No.: 326-55415

DESCRIPTION	DEPTH	SAMPLE	N	Qu	Qp	Mc	REMARKS
SURFACE							
Water							
Mudline = 5 feet below water surface	5						
FINE/MEDIUM SAND, tanish gray, wet, very loose.		SS-1	WH			26.6	-#200=5%
		SS-2	WR			25.2	-#200=7%
Same as above, some clay.		SS-3	WH			23.5	-#200=14%
FINE/MEDIUM SAND, gray, wet, very loose.	10	SS-4	1			24.9	-#200=10%
CLAYEY SAND, gray, very moist, very loose, (SC).		SS-5	1		0.5	37.3	LL=27% PI=12
SILTY CLAY, with sand, gray, very moist, stiff.		SS-6	11		1.0	33.1	
CLAYEY SAND, gray, very moist, loose, (SC).	15	SS-7	8		0.25	19.4	-#200=37% LL=24% PI=7
SANDY CLAY, grayish tan, moist, stiff.		SS-8	10		2.25	21.5	
Same as above, (CL).		SS-9	10		2.5	20.7	-#200=50% LL=34% PI=13
Total Depth of Boring = 18.5 ft below water surface	20						
WH = Weight of Hammer WR = Weight of Rod							

LAL #: 11160-02
Client ID: B-2 Comp.

BASE/NEUTRAL AND ACID EXTRACTABLES BY GC/MS

Matrix: Soil

Analyte	Results	Units	Method	MDL/DF
<u>BASE NEUTRAL EXTRACTABLES</u>				
N-Nitrosodimethylamine	<330	ug/kg	SW 8270	330/1
Bis (2-chloroethyl) ether	<330	ug/kg	SW 8270	330/1
1,3-Dichlorobenzene	<330	ug/kg	SW 8270	330/1
1,4-Dichlorobenzene	<330	ug/kg	SW 8270	330/1
Benzyl alcohol	<330	ug/kg	SW 8270	330/1
1,2-Dichlorobenzene	<330	ug/kg	SW 8270	330/1
Bis (2-chloroisopropyl) ether	<330	ug/kg	SW 8270	330/1
N-Nitroso di-n-propyl amine	<330	ug/kg	SW 8270	330/1
Hexachloroethane	<330	ug/kg	SW 8270	330/1
Nitrobenzene	<330	ug/kg	SW 8270	330/1
Isophorone	<330	ug/kg	SW 8270	330/1
Bis (2-chloroethoxy) methane	<330	ug/kg	SW 8270	330/1
1,2,4-Trichlorobenzene	<330	ug/kg	SW 8270	330/1
Naphthalene	<330	ug/kg	SW 8270	330/1
4-Chloroaniline	<330	ug/kg	SW 8270	330/1
Hexachlorobutadiene	<330	ug/kg	SW 8270	330/1
2-Methylnaphthalene	<330	ug/kg	SW 8270	330/1
Hexachlorocyclopentadiene	<330	ug/kg	SW 8270	330/1
1-Chloronaphthalene	<800	ug/kg	SW 8270	800/1
2-Nitroaniline	<330	ug/kg	SW 8270	330/1
Dimethylphthalate	<330	ug/kg	SW 8270	330/1
2,4-Dinitrotoluene	<330	ug/kg	SW 8270	330/1
Acenaphthylene	<330	ug/kg	SW 8270	330/1
3-Nitroaniline	<800	ug/kg	SW 8270	800/1
Acenaphthene	<330	ug/kg	SW 8270	330/1
Dibenzofuran	<330	ug/kg	SW 8270	330/1
2,6-Dinitrotoluene	<330	ug/kg	SW 8270	330/1
Fluorene	<330	ug/kg	SW 8270	330/1
4-Chloro phenyl phenyl ether	<330	ug/kg	SW 8270	330/1
4-Nitroaniline	<800	ug/kg	SW 8270	800/1
Diethyl phthalate	<330	ug/kg	SW 8270	330/1
Di-n-Butylphthalate	<330	ug/kg	SW 8270	330/1
N-Nitrosodiphenylamine	<330	ug/kg	SW 8270	330/1
4-Bromo phenyl phenyl ether	<330	ug/kg	SW 8270	330/1
Hexachlorobenzene	<330	ug/kg	SW 8270	330/1
Phenanthrene	<330	ug/kg	SW 8270	330/1
Anthracene	<330	ug/kg	SW 8270	330/1
Fluoranthene	<330	ug/kg	SW 8270	330/1
Pyrene	<330	ug/kg	SW 8270	330/1
Butylbenzyl phthalate	<330	ug/kg	SW 8270	330/1
Benzo (a) anthracene	<330	ug/kg	SW 8270	330/1
Chrysene	<330	ug/kg	SW 8270	330/1
Bis (2-ethylhexyl) phthalate	<330	ug/kg	SW 8270	330/1
1,3'-Dichlorobenzidine	<330	ug/kg	SW 8270	330/1
n-Octylphthalate	<330	ug/kg	SW 8270	330/1
Benzo- (b) fluoranthene	<330	ug/kg	SW 8270	330/1

Extraction Date:
11/20/95
Analysis Date:
11/22/95
Analyst: SP

(continued)



LAB #: 11160-02
Client ID: B-2 Comp.

BASE/NEUTRAL AND ACID EXTRACTABLES BY GC/MS (cont.)

Matrix: Soil

Analyte	Results	Units	Method	MDL/DF
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BASE NEUTRAL EXTRACTABLES

Benzo (k) fluoranthene	<330	ug/kg	SW 8270	330/1
Benzo- (a) pyrene	<330	ug/kg	SW 8270	330/1
Indo (1,2,3-cd) pyrene	<330	ug/kg	SW 8270	330/1
Dibenzo (a,h) anthracene	<330	ug/kg	SW 8270	330/1
Benzo (g,h,i) perylene	<330	ug/kg	SW 8270	330/1

ACID EXTRACTABLES

Phenol	<330	ug/kg	SW 8270	330/1
2-Chlorophenol	<330	ug/kg	SW 8270	330/1
2-Methylphenol	<330	ug/kg	SW 8270	330/1
4-Methylphenol	<330	ug/kg	SW 8270	330/1
2-Nitrophenol	<330	ug/kg	SW 8270	330/1
2,4-Dimethylphenol	<330	ug/kg	SW 8270	330/1
Benzoic acid	<330	ug/kg	SW 8270	330/1
2,4-Dichlorophenol	<330	ug/kg	SW 8270	330/1
4-Chloro-3-methylphenol	<330	ug/kg	SW 8270	330/1
6-Trichlorophenol	<330	ug/kg	SW 8270	330/1
2,4,5-Trichlorophenol	<330	ug/kg	SW 8270	330/1
2,4-Dinitrophenol	<800	ug/kg	SW 8270	800/1
4-Nitrophenol	<800	ug/kg	SW 8270	800/1
4,6-Dinitro-2-methyl phenol	<800	ug/kg	SW 8270	800/1
Pentachlorophenol	<800	ug/kg	SW 8270	800/1

PESTICIDES

Alpha-BHC	<330	ug/kg	SW 8270	330/1
Beta-BHC	<330	ug/kg	SW 8270	330/1
Gamma-BHC	<330	ug/kg	SW 8270	330/1
Delta-BHC	<330	ug/kg	SW 8270	330/1
Heptachlor	<330	ug/kg	SW 8270	330/1
Aldrin	<330	ug/kg	SW 8270	330/1
Heptachlor epoxide	<330	ug/kg	SW 8270	330/1
Endosulfan I	<330	ug/kg	SW 8270	330/1
Dieldrin	<330	ug/kg	SW 8270	330/1
4,4'-DDE	<330	ug/kg	SW 8270	330/1
Endrin	<330	ug/kg	SW 8270	330/1
Endosulfan II	<330	ug/kg	SW 8270	330/1
4,4'-DDD	<330	ug/kg	SW 8270	330/1
Endrin aldehyde	<330	ug/kg	SW 8270	330/1
Endosulfan sulfate	<330	ug/kg	SW 8270	330/1
4,4'-DDT	<330	ug/kg	SW 8270	330/1
Endrin Ketone	<330	ug/kg	SW 8270	330/1
Permethrin	<330	ug/kg	SW 8270	330/1



LA 11160-02
Client ID: B-2 Comp.

PURGEABLE AROMATICS

Matrix: Soil
LOW LEVEL

<u>Analyte</u>	<u>Results</u>	<u>Units</u>	<u>Method</u>	<u>MDL/DF</u>
Benzene	<10	ug/kg	SW 8020	10/1
Toluene	<10	ug/kg	SW 8020	10/1
Ethylbenzene	<10	ug/kg	SW 8020	10/1
Total Xylenes	<10	ug/kg	SW 8020	10/1
Total VOAs	<10	ug/kg	SW 8020	-/-
MTBE	<10	ug/kg	SW 8020	10/1

Extraction Date:

NA

Analysis Date:

11/28/95

Analyst: WH

<u>Analyte</u>	<u>Results</u>	<u>Units</u>	<u>Method</u>	<u>Analysis Date</u>	<u>Analyst</u>	<u>MDL</u>
Total Recoverable Petroleum Hydrocarbons	16.0	mg/kg	EPA 418.1	11/20/95	RM	10.0

METALS ANALYSIS

<u>Analyte</u>	<u>Results</u>	<u>Units</u>	<u>Method</u>	<u>Analysis Date</u>	<u>Analyst</u>
Total Arsenic	<0.6	mg/kg	SW 7060	11/22/95	MC
Total Barium	12	mg/kg	SW 7080	11/27/95	JS
Total Cadmium	<0.6	mg/kg	SW 7130	11/20/95	JS
Total Chromium	1.9	mg/kg	SW 7190	11/20/95	JS
Total Lead	5.00	mg/kg	SW 7420	11/21/95	JS
Total Mercury	<0.02	mg/kg	SW 7471	11/27/95	JS
Total Selenium	<0.6	mg/kg	SW 7740	11/22/95	MC
Total Silver	<1.00	mg/kg	SW 7760	11/22/95	JS



PROFESSIONAL SERVICE INDUSTRIES, INC.

RECORD OF SUBSURFACE EXPLORATION

Boring: B-2

Project Name: 1995 Marina Dredging Project Date of Boring: November 16, 1995

Site: T-Heads - Corpus Christi, Texas Project No.: 326-55415

DESCRIPTION	DEPTH	SAMPLE	N	Qu	Qp	Mc	REMARKS
<u>SURFACE</u>							
Water							
Mudline = 5 feet below water surface	5						
FINE/MEDIUM SAND, tanish gray, wet, very loose.		SS-1	WH			26.6	-#200=5%
		SS-2	WR			25.2	-#200=7%
Same as above, some clay.		SS-3	WH			23.5	-#200=14%
FINE/MEDIUM SAND, gray, wet, very loose.	10	SS-4	1			24.9	-#200=10%
CLAYEY SAND, gray, very moist, very loose, (SC).		SS-5	1		0.5	37.3	LL=27% PI=12
SILTY CLAY, with sand, gray, very moist, stiff.		SS-6	11		1.0	33.1	
CLAYEY SAND, gray, very moist, loose, (SC).	15	SS-7	8		0.25	19.4	-#200=37% LL=24% PI=7
SANDY CLAY, grayish tan, moist, stiff.		SS-8	10		2.25	21.5	
Same as above, (CL).		SS-9	10		2.5	20.7	-#200=50% LL=34% PI=13
Total Depth of Boring = 18.5 ft below water surface	20						
WH = Weight of Hammer WR = Weight of Rod							

LAL #: 11160-02
Client ID: B-2 Comp.

BASE/NEUTRAL AND ACID EXTRACTABLES BY GC/MS

Matrix: Soil

Analyte	Results	Units	Method	MDL/DF
<u>BASE NEUTRAL EXTRACTABLES</u>				
N-Nitrosodimethylamine	<330	ug/kg	SW 8270	330/1
Bis (2-chloroethyl) ether	<330	ug/kg	SW 8270	330/1
1,3-Dichlorobenzene	<330	ug/kg	SW 8270	330/1
1,4-Dichlorobenzene	<330	ug/kg	SW 8270	330/1
Benzyl alcohol	<330	ug/kg	SW 8270	330/1
1,2-Dichlorobenzene	<330	ug/kg	SW 8270	330/1
Bis (2-chloroisopropyl) ether	<330	ug/kg	SW 8270	330/1
N-Nitroso di-n-propyl amine	<330	ug/kg	SW 8270	330/1
Hexachloroethane	<330	ug/kg	SW 8270	330/1
Nitrobenzene	<330	ug/kg	SW 8270	330/1
Isophorone	<330	ug/kg	SW 8270	330/1
Bis (2-chloroethoxy) methane	<330	ug/kg	SW 8270	330/1
1,2,4-Trichlorobenzene	<330	ug/kg	SW 8270	330/1
Naphthalene	<330	ug/kg	SW 8270	330/1
4-Chloroaniline	<330	ug/kg	SW 8270	330/1
Hexachlorobutadiene	<330	ug/kg	SW 8270	330/1
2-Methylnaphthalene	<330	ug/kg	SW 8270	330/1
Hexachlorocyclopentadiene	<330	ug/kg	SW 8270	330/1
1-Chloronaphthalene	<800	ug/kg	SW 8270	800/1
2-Nitroaniline	<330	ug/kg	SW 8270	330/1
Dimethylphthalate	<330	ug/kg	SW 8270	330/1
2,4-Dinitrotoluene	<330	ug/kg	SW 8270	330/1
Acenaphthylene	<330	ug/kg	SW 8270	330/1
3-Nitroaniline	<800	ug/kg	SW 8270	800/1
Acenaphthene	<330	ug/kg	SW 8270	330/1
Dibenzofuran	<330	ug/kg	SW 8270	330/1
2,6-Dinitrotoluene	<330	ug/kg	SW 8270	330/1
Fluorene	<330	ug/kg	SW 8270	330/1
4-Chloro phenyl phenyl ether	<330	ug/kg	SW 8270	330/1
4-Nitroaniline	<800	ug/kg	SW 8270	800/1
Diethyl phthalate	<330	ug/kg	SW 8270	330/1
Di-n-Butylphthalate	<330	ug/kg	SW 8270	330/1
N-Nitrosodiphenylamine	<330	ug/kg	SW 8270	330/1
4-Bromo phenyl phenyl ether	<330	ug/kg	SW 8270	330/1
Hexachlorobenzene	<330	ug/kg	SW 8270	330/1
Phenanthrene	<330	ug/kg	SW 8270	330/1
Anthracene	<330	ug/kg	SW 8270	330/1
Fluoranthene	<330	ug/kg	SW 8270	330/1
Pyrene	<330	ug/kg	SW 8270	330/1
Butylbenzyl phthalate	<330	ug/kg	SW 8270	330/1
Benzo (a) anthracene	<330	ug/kg	SW 8270	330/1
Chrysene	<330	ug/kg	SW 8270	330/1
Bis (2-ethylhexyl) phthalate	<330	ug/kg	SW 8270	330/1
1,3'-Dichlorobenzidine	<330	ug/kg	SW 8270	330/1
n-Octylphthalate	<330	ug/kg	SW 8270	330/1
Benzo- (b) fluoranthene	<330	ug/kg	SW 8270	330/1

Extraction Date:
11/20/95
Analysis Date:
11/22/95
Analyst: SP

(continued)



LAB #: 11160-02
Client ID: B-2 Comp.

BASE/NEUTRAL AND ACID EXTRACTABLES BY GC/MS (cont.)

Matrix: Soil

Analyte	Results	Units	Method	MDL/DF
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BASE NEUTRAL EXTRACTABLES

Benzo (k) fluoranthene	<330	ug/kg	SW 8270	330/1
Benzo- (a) pyrene	<330	ug/kg	SW 8270	330/1
Indo (1,2,3-cd) pyrene	<330	ug/kg	SW 8270	330/1
Dibenzo (a,h) anthracene	<330	ug/kg	SW 8270	330/1
Benzo (g,h,i) perylene	<330	ug/kg	SW 8270	330/1

ACID EXTRACTABLES

Phenol	<330	ug/kg	SW 8270	330/1
2-Chlorophenol	<330	ug/kg	SW 8270	330/1
2-Methylphenol	<330	ug/kg	SW 8270	330/1
4-Methylphenol	<330	ug/kg	SW 8270	330/1
2-Nitrophenol	<330	ug/kg	SW 8270	330/1
2,4-Dimethylphenol	<330	ug/kg	SW 8270	330/1
Benzoic acid	<330	ug/kg	SW 8270	330/1
2,4-Dichlorophenol	<330	ug/kg	SW 8270	330/1
4-Chloro-3-methylphenol	<330	ug/kg	SW 8270	330/1
6-Trichlorophenol	<330	ug/kg	SW 8270	330/1
2,4,5-Trichlorophenol	<330	ug/kg	SW 8270	330/1
2,4-Dinitrophenol	<800	ug/kg	SW 8270	800/1
4-Nitrophenol	<800	ug/kg	SW 8270	800/1
4,6-Dinitro-2-methyl phenol	<800	ug/kg	SW 8270	800/1
Pentachlorophenol	<800	ug/kg	SW 8270	800/1

PESTICIDES

Alpha-BHC	<330	ug/kg	SW 8270	330/1
Beta-BHC	<330	ug/kg	SW 8270	330/1
Gamma-BHC	<330	ug/kg	SW 8270	330/1
Delta-BHC	<330	ug/kg	SW 8270	330/1
Heptachlor	<330	ug/kg	SW 8270	330/1
Aldrin	<330	ug/kg	SW 8270	330/1
Heptachlor epoxide	<330	ug/kg	SW 8270	330/1
Endosulfan I	<330	ug/kg	SW 8270	330/1
Dieldrin	<330	ug/kg	SW 8270	330/1
4,4'-DDE	<330	ug/kg	SW 8270	330/1
Endrin	<330	ug/kg	SW 8270	330/1
Endosulfan II	<330	ug/kg	SW 8270	330/1
4,4'-DDD	<330	ug/kg	SW 8270	330/1
Endrin aldehyde	<330	ug/kg	SW 8270	330/1
Endosulfan sulfate	<330	ug/kg	SW 8270	330/1
4,4'-DDT	<330	ug/kg	SW 8270	330/1
Endrin Ketone	<330	ug/kg	SW 8270	330/1
Permethrin	<330	ug/kg	SW 8270	330/1



LA 11160-02
Client ID: B-2 Comp.

PURGEABLE AROMATICS

Matrix: Soil
LOW LEVEL

<u>Analyte</u>	<u>Results</u>	<u>Units</u>	<u>Method</u>	<u>MDL/DF</u>
Benzene	<10	ug/kg	SW 8020	10/1
Toluene	<10	ug/kg	SW 8020	10/1
Ethylbenzene	<10	ug/kg	SW 8020	10/1
Total Xylenes	<10	ug/kg	SW 8020	10/1
Total VOAs	<10	ug/kg	SW 8020	-/-
MTBE	<10	ug/kg	SW 8020	10/1

Extraction Date:

NA

Analysis Date:

11/28/95

Analyst: WH

<u>Analyte</u>	<u>Results</u>	<u>Units</u>	<u>Method</u>	<u>Analysis Date</u>	<u>Analyst</u>	<u>MDL</u>
Total Recoverable Petroleum Hydrocarbons	16.0	mg/kg	EPA 418.1	11/20/95	RM	10.0

METALS ANALYSIS

<u>Analyte</u>	<u>Results</u>	<u>Units</u>	<u>Method</u>	<u>Analysis Date</u>	<u>Analyst</u>
Total Arsenic	<0.6	mg/kg	SW 7060	11/22/95	MC
Total Barium	12	mg/kg	SW 7080	11/27/95	JS
Total Cadmium	<0.6	mg/kg	SW 7130	11/20/95	JS
Total Chromium	1.9	mg/kg	SW 7190	11/20/95	JS
Total Lead	5.00	mg/kg	SW 7420	11/21/95	JS
Total Mercury	<0.02	mg/kg	SW 7471	11/27/95	JS
Total Selenium	<0.6	mg/kg	SW 7740	11/22/95	MC
Total Silver	<1.00	mg/kg	SW 7760	11/22/95	JS

