

APPENDIX F

SOIL REMEDIATION SUPPORTING DOCUMENTS

**RAW VOLUME SOIL/SEDIMENT EXCEEDING 29B
 STATE OF LOUISIANA AND VERMILION PARISH SCHOOL BOARD V LOUISIANA LAND AND EXPLORATION ET AL; DOCKET NO. 82162, DIV "D"; 15TH JDC
 EAST WHITE LAKE FIELD
 VERMILION PARISH, LOUISIANA
 PREPARED FOR TALBOT, CARMOUCHE, AND MARCELLO**

Impacted Thickness (ft)	Surface Area of Soil Contamination (ft ²)	Volume of Soil Contamination (ft ³)	Volume of Soil Contamination (yd ³)
4	18,044	72,176	2,673
6	4,702	28,212	1,045
2	11,266	22,532	835
8	10,233	81,864	3,032
4	10,233	40,932	1,516
2	4,595	9,190	340
3	15,064	45,192	1,674
1	6,295	6,295	233
13	7,284	94,692	3,507
1.5	15,064	22,596	837
8	98,486	787,888	29,181
4	45,450	181,800	6,733
3	7,543	22,629	838
	254,259	1,415,998	52,444

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1		SOIL CONTAMINATION VOLUMES - 29B EXCEEDANCES														
2		STATE OF LOUISIANA AND VERMILION PARISH SCHOOL BOARD V LOUISIANA LAND AND EXPLORATION ET AL; DOCKET NO. 82162, DIV "D"; 15TH JDC														
3		EAST WHITE LAKE FIELD														
4		VERMILION PARISH, LOUISIANA														
5		PREPARED FOR TALBOT, CARMOUCHE, AND MARCELLO														
6																
7		SOIL/CANAL SEDIMENT														
8		Volume (ft ³)	1,415,998	10,591,665	gal											
9		Volume (yd ³)	52,444													
10			6.61	Conversion Factor, Cubic Yards to BBLs (bbls/yd3) - Engineering Reference												
11		Volume (BBL)	346,657													
12		Excavation Rate for clamshell	8	yd3/min												
13		Time to complete excavation	5	days												
14																
15																
16		DEWATERING PROCESS CALCULATIONS (from DelTank in Scott, LA)														
17		Feed rate	1500	gal/min												
18		Time required to dewater all sediment	5	days												
19																
20		Filter Cake Generation Algorithm														
21																
22		$(\text{slurry feed volume (gal)}) \times (\text{percent solids in slurry}) \times (\text{slurry density}) = \text{volume of filter cake produced}$														
23		$(\text{percent solids in filter cake}) \times (\text{density of filter cake})$														
24																
25		slurry feed volume (gal)	10,591,665	gal												
26		percent solids in slurry	0.2													
27		slurry density	9	lb/gal												
28		percent solids in filter cake	0.4													
29		filter cake density	80	lb/ft ³												
30		Volume of filter cake produced	595,781	ft ³												
31		Volume of filter cake produced	22,066	yd ³												
32		Volume of filter cake produced	145,856	BBL												
33																

Cell: C12

Comment: Wayne Prejean:
average rate from Javeler Construction

Cell: B20

Comment: Wayne Prejean:
From george Vogel at Acension Industries

Cell: C27

Comment: Wayne Prejean:
from George Vogel at Acension Industries

Cell: C28

Comment: Wayne Prejean:
DelTank estimate of solids content of filter cake produced from sand slurry is 75%. Reduced this amount by 25% to allow for indeterminate soil matrix

Cell: C29

Comment: Wayne Prejean:
from George Vogel at Acension Industries

Cell: B30

Comment: Wayne Prejean:
from algorithm above

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	COSTS FOR EXCAVATION/DISPOSAL OF CONTAMINATED SOIL AND SEDIMENT - 29B EXCEEDANCES												
2	STATE OF LOUISIANA AND VERMILION PARISH SCHOOL BOARD V LOUISIANA LAND AND EXPLORATION ET AL; DOCKET NO. 82162, DIV "D"; 15TH JDC												
3	EAST WHITE LAKE FIELD												
4	VERMILION PARISH, LOUISIANA												
5	PREPARED FOR TALBOT, CARMOUCHE, AND MARCELLO												
6													
7		Time by Task				Cost per Unit		Number of Units		Markup		Total (\$)	
8													
9	CANAL/SHALLOW SOIL EXCAVATION AND DEWATERING												
10		Excavation and Dewatering				\$66.00	/yd ³	52,444	yd ³				\$3,461,328
11												SUBTOTAL	\$3,461,328
12	OFFSITE TRANSPORTATION AND DISPOSAL												
13		Barge transport of contaminated sediment				\$1.90	/barrel	145,856	barrels				\$277,127
14		Disposal of contaminated sediment				\$12.50	/barrel	145,856	barrels				\$1,823,201
15												SUBTOTAL	\$2,100,327
16	CONFIRMATION SAMPLING OF SEDIMENT												
17		Power Probe Mobilization/Demobilization				\$1,500.00	/unit	1	unit				\$1,500
18		Power Probe w/crew - Direct push sampling				\$1,900.00	/day	6	days				\$11,400
19		Lab Analysis				\$125.00	/sample	250	samples	\$3,125.00			\$34,375
20		Geologist				\$90.00	/hour	6	days				\$540
21		Power probe Crew Per diem				\$300.00	/day	6	days				\$1,800
22		Geologist Per diem				\$150.00	/day	6	days				\$900
23												SAMPLING TOTAL:	\$50,515
24													
25													
26												EXCAVATION TOTAL:	\$5,612,171

Cell: F10

Comment: Wayne Prejean:
From Javeler Construction

Cell: F13

Comment: Wayne Prejean:
Basis of one tug pushing 2 barges to disposal facility.--i.e., 3,000 BBL per trip; and one tug pushing two empty barges back to site.

Tug - \$2000/day
Fuel - \$400/day
Barge (x2) - \$500/day
Total = \$2900/day x 2 = \$5800/trip

Cost per barrel: $\$5800/3000 \text{ bbl} = \$1.93/\text{bbl}$ ---Rounded to \$1.90/bbl

Calculated from Central Boat rate sheet

Cell: F14

Comment: Wayne Prejean:
Quote from US Liquids

	A	B	C	D	E	F	G	H	I	J	K	L	M	
1	COSTS TO MANAGE CONTAMINATED WATER FROM SEDIMENT DEWATERING PROCESS - 29B EXCEEDANCES													
2	STATE OF LOUISIANA AND VERMILION PARISH SCHOOL BOARD V LOUISIANA LAND AND EXPLORATION ET AL; DOCKET NO. 82162, DIV "D"; 15TH JDC													
3	EAST WHITE LAKE FIELD													
4	VERMILION PARISH, LOUISIANA													
5	PREPARED FOR TALBOT, CARMOUCHE, AND MARCELLO													
6														
7		Time by Task				Cost per Unit		Number of Units		Markup		Total (\$)		
8														
9		VOLUME REDUCTION IN RO SYSTEM AND DISPOSAL OFFSITE				\$1.26	/barrel	200,801	barrels				\$253,010	
10														
11		ONSITE DISPOSAL OF ALL WASTEWATER FROM DEWATERING				\$0.42	/barrel	200,801	barrels				\$84,337	
12														
13														
14														
15		Unit rates derived from cost estimates to remediate contaminated groundwater (see GW remediation cost tables)												

**RAW VOLUME SOIL/SEDIMENT EXCEEDING ECOLOGICAL STANDARDS
STATE OF LOUISIANA AND VERMILION PARISH SCHOOL BOARD V LOUISIANA LAND AND EXPLORATION ET AL; DOCKET NO. 82162, DIV "D"; 15TH JDC
EAST WHITE LAKE FIELD
VERMILION PARISH, LOUISIANA
PREPARED FOR TALBOT, CARMOUCHE, AND MARCELLO**

Impacted Thickness (ft)	Surface Area of Soil Contamination (ft ²)	Volume of Soil Contamination (ft ³)	Volume of Soil Contamination (yd ³)
3	2,203,250	6,609,750	244,806
2	190,452	380,904	14,108
3	106,287	318,861	11,810
3	168,760	506,280	18,751
3	125,548	376,644	13,950
	2,794,297	8,192,439	303,424

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1		SOIL CONTAMINATION VOLUMES - ECOLOGICAL EXCEEDANCES														
2		STATE OF LOUISIANA AND VERMILION PARISH SCHOOL BOARD V LOUISIANA LAND AND EXPLORATION ET AL; DOCKET NO. 82162, DIV "D"; 15TH JDC														
3		EAST WHITE LAKE FIELD														
4		VERMILION PARISH, LOUISIANA														
5		PREPARED FOR TALBOT, CARMOUCHE, AND MARCELLO														
6																
7		SOIL/CANAL SEDIMENT														
8		Volume (ft ³)	8,192,439	61,279,444	gal											
9		Volume (yd ³)	303,424													
10			6.61	Conversion Factor, Cubic Yards to BBLs (bbls/yd3) - Engineering Reference												
11		Volume (BBL)	2,005,630													
12		Excavation Rate for clamshell	8	yd3/min												
13		Time to complete excavation	26	days												
14																
15																
16		DEWATERING PROCESS CALCULATIONS (from DelTank in Scott, LA)														
17		Feed rate	1500	gal/min												
18		Time required to dewater all sediment	28	days												
19																
20		Filter Cake Generation Algorithm														
21																
22		$(\text{slurry feed volume (gal)}) \times (\text{percent solids in slurry}) \times (\text{slurry density}) = \text{volume of filter cake produced}$														
23		$(\text{percent solids in filter cake}) \times (\text{density of filter cake})$														
24																
25		slurry feed volume (gal)	61,279,444	gal												
26		percent solids in slurry	0.2													
27		slurry density	9	lb/gal												
28		percent solids in filter cake	0.4													
29		filter cake density	80	lb/ft ³												
30		Volume of filter cake produced	3,446,969	ft ³												
31		Volume of filter cake produced	127,666	yd ³												
32		Volume of filter cake produced	843,869	BBL												
33																

Cell: C12

Comment: Wayne Prejean:
average rate from Javeler Construction

Cell: B20

Comment: Wayne Prejean:
From george Vogel at Acension Industries

Cell: C27

Comment: Wayne Prejean:
from George Vogel at Acension Industries

Cell: C28

Comment: Wayne Prejean:
DelTank estimate of solids content of filter cake produced from sand slurry is 75%. Reduced this amount by 25% to allow for indeterminate soil matrix

Cell: C29

Comment: Wayne Prejean:
from George Vogel at Acension Industries

Cell: B30

Comment: Wayne Prejean:
from algorithm above

	A	B	C	D	E	F	G	H	I	J	K	L
1	COSTS FOR EXCAVATION/DISPOSAL OF CONTAMINATED SOIL AND SEDIMENT - ECOLOGICAL EXCEEDANCES											
2	STATE OF LOUISIANA AND VERMILION PARISH SCHOOL BOARD V LOUISIANA LAND AND EXPLORATION ET AL; DOCKET NO. 82162, DIV "D"; 15TH JDC											
3	EAST WHITE LAKE FIELD											
4	VERMILION PARISH, LOUISIANA											
5	PREPARED FOR TALBOT, CARMOUCHE, AND MARCELLO											
6												
7	Time by Task				Cost per Unit			Number of Units		Markup		Total (\$)
8												
9	CANAL/SHALLOW SOIL EXCAVATION AND DEWATERING											
10	Excavation and Dewatering				\$66.00 /yd ³			303,424 yd ³				\$20,025,962
11											SUBTOTAL	\$20,025,962
12	OFFSITE TRANSPORTATION AND DISPOSAL											
13	Barge transport of contaminated sediment				\$1.90 /barrel			843,869 barrels				\$1,603,351
14	Disposal of contaminated sediment				\$12.50 /barrel			843,869 barrels				\$10,548,363
15											SUBTOTAL	\$12,151,714
16	CONFIRMATION SAMPLING OF SEDIMENT											
17	Power Probe Mobilization/Demobilization				\$1,500.00 /unit			1 unit				\$1,500
18	Power Probe w/crew - Direct push sampling				\$1,900.00 /day			6 days				\$11,400
19	Lab Analysis				\$125.00 /sample			250 samples		\$3,125.00		\$34,375
20	Geologist				\$90.00 /hour			6 days				\$540
21	Power probe Crew Per diem				\$300.00 /day			6 days				\$1,800
22	Geologist Per diem				\$150.00 /day			6 days				\$900
23											SAMPLING TOTAL:	\$50,515
24												
25												
26											EXCAVATION TOTAL:	\$32,228,191

Cell: F10

Comment: Wayne Prejean:
From Javeler Construction

Cell: F13

Comment: Wayne Prejean:
Basis of one tug pushing 2 barges to disposal facility.--i.e., 3,000 BBL per trip; and one tug pushing two empty barges back to site.

Tug - \$2000/day
Fuel - \$400/day
Barge (x2) - \$500/day
Total = \$2900/day x 2 = \$5800/trip

Cost per barrel: $\$5800/3000 \text{ bbl} = \$1.93/\text{bbl}$ ---Rounded to \$1.90/bbl

Calculated from Central Boat rate sheet

Cell: F14

Comment: Wayne Prejean:
Quote from US Liquids

	A	B	C	D	E	F	G	H
1		GROUT CALCULATIONS FOR ISOLATION OF SALT-SATURATED SOIL						
2		STATE OF LOUISIANA AND VERMILION PARISH SCHOOL BOARD V LOUISIANA LAND AND EXPLORATION ET AL; DOCKET NO. 82162, DIV "D"; 15TH JDC						
3		EAST WHITE LAKE FIELD						
4		VERMILION PARISH, LOUISIANA						
5		PREPARED FOR TALBOT, CARMOUCHE, AND MARCELLO						
6								
7		Grout Injection to 15' BGS (Peat Zone)				Grout Injection to 30' BGS (Chicot Confining Unit)		
8								
9								
10		ROI = 10'				ROI = 10'		
11								
12		Total Area	1,609,114	ft ²		Total Area	311,910	ft ²
13		Radius of Influence (ROI)	10	ft		Radius of Influence (ROI)	10	ft
14		Area of ROI	314	ft ²		Area of ROI	314	ft ²
15		No. of injection points	5,122			No. of injection points	993	
16		Volume of cement for horizontal containment	643,646	ft ³		Volume of cement for horizontal containment	124,764	ft ³
17								
18		1" carbon steel pipe (5' section not threaded)	\$1.01	per ft		1" carbon steel pipe (5' section not threaded)	\$1.01	per ft
19		1" carbon steel pipe (5' section threaded)	\$11.30	per unit		1" carbon steel pipe (5' section threaded)	\$11.30	per unit
20		cement material (12 lb/gal slurry with gel additive)	\$15.00	per ft ³		cement material (12 lb/gal slurry with gel additive)	\$15.00	per ft ³
21		Equipment for injecting cement	\$11.00	per ft ³		Equipment for injecting cement	\$11.00	per ft ³
22		camlock coupling - 1" carbon steel	\$40.60	per unit		camlock coupling - 1" carbon steel	\$40.60	per unit
23		ball valve - 1" carbon steel	\$49.85	per unit		ball valve - 1" carbon steel	\$49.85	per unit
24		Lag bolt	\$1.00	per unit		Lag bolt	\$1.00	per unit
25		spud barge	\$500	per day		spud barge	\$500	per day
26		tugboat	\$2,300	per day		tugboat	\$2,300	per day
27		marsh excavator	\$4,000.00	per day		marsh excavator	\$4,000.00	per day
28		Grout injection rate	100	gal/min		Grout injection rate	100	gal/min
29								
30								
31								
32		1" carbon steel pipe (15' not threaded)	\$15.15			1" carbon steel pipe (30' section not threaded)	\$30.30	
33		1" carbon steel pipe (5' section threaded)	\$11.30			1" carbon steel pipe (5' section threaded)	\$11.30	
34		camlock coupling - 1" carbon steel	\$40.60			camlock coupling - 1" carbon steel	\$40.60	
35		Lag bolt	\$1.00	per unit		Lag bolt	\$1.00	per unit
36		ball valve - 1" carbon steel	\$49.85			ball valve - 1" carbon steel	\$49.85	
37		Cost per injection point:	\$117.90			Cost per injection point:	\$133.05	
38								
39		Total Material Cost for Injection at 15' bgs	\$603,880.14			Total Material Cost for Injection at 30' bgs	\$132,097.41	

Cell: C16

Comment: Wayne Prejean:
Based on 2' thickness of blanket

Cell: G16

Comment: Wayne Prejean:
Based on 2' thickness of blanket

Cell: C18

Comment: Wayne Prejean:
From Steel Ranch, Inc. in New Iberia

Cell: G18

Comment: Wayne Prejean:
From Steel Ranch, Inc. in New Iberia

Cell: C19

Comment: Wayne Prejean:
From Steel Ranch, Inc. in New Iberia

Cell: G19

Comment: Wayne Prejean:
From Steel Ranch, Inc. in New Iberia

Cell: C20

Comment: Wayne Prejean:
From Reliable Production Services

Cell: G20

Comment: Wayne Prejean:
From Reliable Production Services

Cell: C21

Comment: Wayne Prejean:
From Reliable Production Services

Cell: G21

Comment: Wayne Prejean:
From Reliable Production Services

Cell: C22

Comment: Wayne Prejean:
From kthsales.com.

Cell: G22

Comment: Wayne Prejean:
From kthsales.com.

Cell: C23

Comment: Wayne Prejean:
From Apollo Valves

Cell: G23

Comment: Wayne Prejean:
From Apollo Valves

Cell: C25

Comment: Wayne Prejean:
From Broussard Bros. Spud barge size = 140' x 38'

Cell: G25

Comment: Wayne Prejean:
From Broussard Bros. Spud barge size = 140' x 38'

Cell: C26

Comment: Wayne Prejean:
From Broussard Bros. Spud barge size = 140' x 38'. Tugboat = \$1900/day plus \$400/day for fuel.

Cell: G26

Comment: Wayne Prejean:
From Broussard Bros. Spud barge size = 140' x 38'. Tugboat = \$1900/day plus \$400/day for fuel.

Cell: C27

Comment: Wayne Prejean:
From Wilco Marsh Buggies and Draglines in Harvey, LA. Quote is for 330 class swamp excavator.

\$350/hr (10 hr/day minimum)
\$200/day per diem
100 gallons/day diesel consumption
assume diesel at \$3.00/gal

Cell: G27

Comment: Wayne Prejean:
From Wilco Marsh Buggies and Draglines in Harvey, LA. Quote is for 330 class swamp excavator.

\$350/hr (10 hr/day minimum)
\$200/day per diem
100 gallons/day diesel consumption
assume diesel at \$3.00/gal

Cell: B28

Comment: Wayne Prejean:
Pat B. estimation

Cell: F28

Comment: Wayne Prejean:
Pat B. estimation

Cell: H11

Comment: Wayne Prejean:

Conservatively estimated as the perimeter length of impacted soil times the depth of wall (15').

Cell: B12

Comment: Wayne Prejean:

Installation using probe mounted on airboat

Cell: F12

Comment: Wayne Prejean:

Day rate for airboat and crew.

Cell: H12

Comment: Wayne Prejean:

Assumes installation of 20 points per day.

Cell: F13

Comment: Wayne Prejean:

SEE GROUT ISOLATION CALCS worksheet.

Smaller areas of CI impact inside of larger CI areas require injection at 30' bgs (35' of piping). CI impact outside of these requires injection at 15' bgs (20' of piping)

Cell: F14

Comment: Wayne Prejean:

Based on conversations with Reliable Production cementing services division. They actually suggested that quoted cost be quadrupled due to scale of project. Costs were doubled for purposes of this estimate

Cell: F15

Comment: Wayne Prejean:

Broussard Bros.

Cell: H15

Comment: Wayne Prejean:

Assumes injection rate of 100 gals/min (Reliable Prod.) SEE GROUT BLANKET WORKSHEET. Round up to 40 days to account for unforeseen shutdowns.

Cell: F16

Comment: Wayne Prejean:

Broussard Bros.

Cell: H16

Comment: Wayne Prejean:

Assumes injection rate of 100 gals/min (Reliable Prod.) SEE GROUT BLANKET WORKSHEET. Round up to 40 days to account for unforeseen shutdowns.