From: Jesse Gagliano
Sent: Thu Jun 11 17:37:38 2009
To: Morel, Brian P; Hafle, Mark E
Subject: Macondo BoD
Importance: Normal
Attachments: MC 252_Macondo BoD_v1_CustomerCopy.pdf

Brian / Mark,

Attached is the Macondo BoD. For the 16" I current have a 13.5 ppg lead and 16.4 ppg tail slurry to trying and get cement lift. It appears even going with the lighter lead we will not get cement lift due to the restriction. Also this BoD does not have a recommendation for 9 7/8" contingency. Once the 9 7/8" plan in finalized I can work something up and get it to you. If you have any questions let me know. Thanks!!

Jesse Gagliano
Halliburton Energy Services
Account Representative - Cementing
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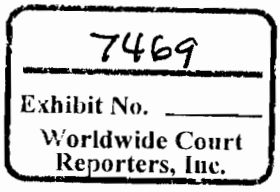

Bp America Prod Co-sorac/gom Ebiz
PO Box 22024
Tulsa, Oklahoma 74121-2024

Macondo Prospect 1

United States of America

Macondo BoD

Prepared for: Mark Hafle

Version: 1

Submitted by:
Jesse Gagliano
Halliburton
10200 Bellaire Blvd
Houston, Texas 77072-5299

HALLIBURTON

Halliburton appreciates the opportunity to present this proposal and looks forward to being of service to you.

Foreword

Enclosed is our recommended procedure for cementing the casing strings in the referenced well. The information in this proposal includes well data, calculations, materials requirements, and cost estimates. This proposal is based on information from our field personnel and previous cementing services in the area.

Halliburton Energy Services recognizes the importance of meeting society's needs for health, safety, and protection of the environment. It is our intention to proactively work with employees, customers, the public, governments, and others to use natural resources in an environmentally sound manner while protecting the health, safety, and environmental processes while supplying high quality products and services to our customers.

We appreciate the opportunity to present this proposal for your consideration and we look forward to being of service to you. Our Services for your well will be coordinated through the Service Center listed below. If you require any additional information or additional designs, please feel free to contact myself or our field representative listed below.

Prepared and Submitted by: _____

Jesse Gagliano
Technical Advisor

SERVICE CENTER:	Lafayette, La
SERVICE COORDINATOR:	Danny Mooney
OPER. ENGINEER:	Veronica Rodriquez-Rivera
PHONE NUMBER:	1-800-444-7830

Job Information — 28" Conductor Casing

Well Name: Macondo Prospect	Well #: 1
36" Drive Pipe	5081 - 5361 ft (MD)
Outer Diameter	36.000 in
Inner Diameter	33.000 in
Linear Weight	552.69 lbm/ft
28" Casing	5081 - 6275 ft (MD)
Outer Diameter	28.000 in
Inner Diameter	26.500 in
Linear Weight	218.27 lbm/ft
32 1/2" Open Hole	5361 - 6275 ft (MD)
Inner Diameter	32.500 in
Job Excess	200 %
Landing String	0 - 5081 ft (MD)
Outer Diameter	6.625 in
Inner Diameter	5.375 in
28" Innerstring	5081 - 6125 ft (MD)
Outer Diameter	5.500 in
Inner Diameter	4.778 in
Linear Weight	21.90 lbm/ft
Water Depth	4992 feet
Air Gap	89 feet
Mud Type	Water Based Mud
Mud Weight	12.50 lbm/gal
BHST	65 degF
BHCT	65 degF

Spacer:

Total Spacer	= 842.19 ft^3
	= 150.00 bbl

Cement : (694.00 ft fill)

280.00 ft * 1.6635 ft^3/ft * 0 %	= 465.78 ft^3
414.00 ft * 1.4849 ft^3/ft * 200 %	= 1844.24 ft^3
Total Foamed Lead Cement	= 2310.02 ft^3
	= 411.43 bbl
Sacks of Cement	= 1772 sks

Cement : (450.00 ft fill)

350.00 ft * 1.4849 ft^3/ft * 200 %	= 1559.14 ft^3
100.00 ft * 1.4849 ft^3/ft * 200 %	= 445.47 ft^3
Total Foamed Tail Cement	= 2004.61 ft^3
	= 357.03 bbl
Sacks of Cement	= 1554 sks

Cement : (50.00 ft fill)

50.00 ft * 1.4849 ft^3/ft * 200 %	= 222.73 ft^3
Tail Cement	= 222.73 ft^3
	= 39.67 bbl

Shoe Joint Volume: (100.00 ft fill)

100.00 ft * 3.8302 ft^3/ft	= 383.02 ft^3
	= 68.22 bbl
Tail plus shoe joint	= 605.75 ft^3
	= 107.89 bbl
Total Tail	= 569 sks

Total Pipe Capacity:

5081.00 ft * 0.1576 ft^3/ft	= 800.63 ft^3
1044.00 ft * 0.1245 ft^3/ft	= 129.99 ft^3
150.00 ft * 3.8302 ft^3/ft	= 574.53 ft^3
	= 268.08 bbl

Displacement Volume to Shoe Joint:

Capacity of Pipe - Shoe Joint	= 268.08 bbl - 68.22 bbl
	= 199.86 bbl

Fluid Instructions

Fluid 1: Water Based Spacer

TUNED SPACER III
1.5 lbm/bbl BLACK DYE

Fluid Density:	13 lbm/gal
Fluid Volume:	150 bbl

Fluid 2: Foamed Lead Cement – **Foamed to average density of 13.5 ppg**

Standard Cement
0.07 % Halliburton EZ-FLO (Bulk Flow Enhancer)
0.07 Gal/sk Zonesealant 2000 (Foamer)
1.88 lbm/sk KCL (Additive Material)

Fluid Weight	16.74 lbm/gal
Slurry Yield:	1.05 ft^3/sk
Total Mixing Fluid:	4.19 Gal/sk
Top of Fluid:	5081 ft
Calculated Fill:	694 ft
Volume:	411.43 bbl
Calculated Sacks:	1771.64 sks
Proposed Sacks:	1780 sks

Fluid 3: Foamed Tail Cement – **Foamed to average density of 14.5 ppg**

Standard Cement
94 lbm/sk Premium Cement (Cement)
0.07 % Halliburton EZ-FLO (Bulk Flow Enhancer)
0.07 Gal/sk Zonesealant 2000 (Foamer)
1.88 lbm/sk KCL (Additive Material)
0.26 Gal/sk Calcium Chloride Liquid (Accelerator)

Fluid Weight	16.74 lbm/gal
Slurry Yield:	1.07 ft^3/sk
Total Mixing Fluid:	4.28 Gal/sk
Top of Fluid:	5775 ft
Calculated Fill:	450 ft
Volume:	357.03 bbl
Calculated Sacks:	1554.12 sks
Proposed Sacks:	1560 sks

Fluid 4: Tail Cement – **Un-foamed**

Standard Cement
0.07 % Halliburton EZ-FLO (Bulk Flow Enhancer)
0.07 Gal/sk Zonesealant 2000 (Foamer)
0.26 Gal/sk Calcium Chloride Liquid (Accelerator)
1.88 lbm/sk KCL (Additive Material)

Fluid Weight	16.74 lbm/gal
Slurry Yield:	1.07 ft^3/sk
Total Mixing Fluid:	4.28 Gal/sk
Top of Fluid:	6225 ft
Calculated Fill:	50 ft
Volume:	107.89 bbl
Calculated Sacks:	568.77 sks
Proposed Sacks:	570 sks

Fluid 5: Mud

Sea Water

Fluid Density:	8.60 lbm/gal
Fluid Volume	199.86 bbl

Detailed Pumping Schedule

Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Estimated Avg Rate bbl/min	Downhole Volume
1	Spacer	TUNED SPACER III	13.0		150 bbl
2	Cement	Foamed Lead Cement	16.7		1780 sks
3	Cement	Foamed Tail Cement	16.7		1560 sks
4	Cement	Un-foamed Tail	16.7		570 sks
5	Mud	Sea Water	8.6		199.86 bbl

Foam Output Parameter Summary:

Fluid #	Fluid Name	Unfoamed Liquid Volume	Beginning Density lbm/gal	Ending Density lbm/gal	Beginning Rate scf/bbl	Ending Rate scf/bbl
Stage 1						
2	Foamed Lead Cement	332.3 bbl	13.5	14.0	225.2	225.2
3	Foamed Tail Cement	294.8 bbl	14.0	14.3	225.2	225.2

Foam Design Specifications:

Foam Calculation Method: Constant Gas Flow
Backpressure: 2216.85 psig
Bottom Hole Circulating Temp: 65 degF
Mud Outlet Temperature: 60 degF

Calculated Gas = 141225.5 scf
Additional Gas = 50000 scf
Total Gas = 191225.5 scf

SAP Quote # 0

Mtrl Nbr	Description	Qty	U/M	Unit Price	Net Amt
14161	CMT CONDUCTOR CASING BOM	1	JOB		0.00
	Personnel				
130443	ZONESEAL CERTIFIED SPECIALIST H/DAY/MO TOTAL NUMBER HR/DAY/WEEK/MTH/YEAR/JOB/RUN	1 96 HR	H	145.24	13,943.04
576784	CMT, Offshore Engineer, per hr HOURS	1 96	EA	134.32	12,894.72
	Equipment				
583768	CMT,Foam Cmt Base Rate(3-day)-SORAC	1	EA	24,295.68	24,295.68
583769	CMT,Addl Day Foam Cmt Day Rate-SORAC	1	DAY	3,100.45	3,100.45
	Spacer Material				
483826	TUNED SPACER III	150	BBL	122.28	18,342.00
101673327	HALLIBURTON INDICATOR BLACK, 25 LB PAIL	225	LB	55.00	12,375.00
	Cement Material				
100003687	PREMIUM CEMENT	3910	SK	14.71	57,516.10
101002314	EZ-FLO	258	LB	10.57	2,727.06
101207218	ZONESEALANT 2000	274	GAL	77.25	21,166.50
100001585	KCL POTASSIUM CHLORIDE	7351	LB	0.55	4,043.05
100005054	CALCIUM CHLORIDE - LIQUID -	554	GAL	8.09	4,481.86
	Total	**USD**			**174,885.46**

SAP Quote # 0

Mtrl Nbr	Description	Qty	U/M	Unit Price	Net Amt
342210	N2 BOM-Foam Cementing w/o CT	1	JOB		0.00
13459	Nitrogen Charge	191226	SCF	1.35	0.00
	Personnel				
576758	CMT, Equipment Optr, per hr HOURS	2 96	EA	46.62	8,951.04
	Services				
583772	CMT,N2 Base Rate(3day)Foam Cmt Job-SORAC	1	EA	31,745.54	31,745.54
583773	CMT,Addl N2 Day Rate Foam Cmt Job-SORAC	1	DAY	8,056.40	8,056.40
583837	CMT,Addl 100ft N2 Iron, ZI Foamed-SORAC	4	DAY	300.00	1,200.00
	Total	**USD**			**49,952.98**

Job Information — 22" Surface Casing

Well Name: Macondo Prospect	Well #: 1
28" Casing	5081 - 6275 ft (MD)
Outer Diameter	28.000 in
Inner Diameter	26.500 in
Linear Weight	218.27 lbm/ft
22" Casing	5081 - 8000 ft (MD)
Outer Diameter	22.000 in
Inner Diameter	19.500 in
Linear Weight	277.01 lbm/ft
26" Open Hole	6275 - 8000 ft (MD)
Inner Diameter	26.000 in
Job Excess	150 %
Landing String	0 - 5081 ft (MD)
Outer Diameter	6.625 in
Inner Diameter	5.375 in
22" Innerstring	5081 - 7850 ft (MD)
Outer Diameter	5.500 in
Inner Diameter	4.778 in
Linear Weight	21.90 lbm/ft
Water Depth	4992 feet
Air Gap	89 feet
Mud Type	Water Based Mud
Mud Weight	12.50 lbm/gal
BHST	94 degF
BHCT	94 degF

Calculations — 22" Surface Casing

Spacer:

Total Spacer	= 1122.92 ft^3
	= 200.00 bbl

Cement : (1419.00 ft fill)

1194.00 ft * 1.1904 ft^3/ft * 0 %	= 1421.30 ft^3
225.00 ft * 1.0472 ft^3/ft * 150 %	= 589.05 ft^3
Total Foamed Lead Cement	= 2010.35 ft^3
	= 358.06 bbl
Sacks of Cement	= 1461 sks

Cement : (1000.00 ft fill)

1000.00 ft * 1.0472 ft^3/ft * 150 %	= 2617.99 ft^3
Total Foamed Lead Cement	= 2617.99 ft^3
	= 466.28 bbl
Sacks of Cement	= 1991 sks

Cement : (450.00 ft fill)

350.00 ft * 1.0472 ft^3/ft * 150 %	= 916.30 ft^3
100.00 ft * 1.0472 ft^3/ft * 150 %	= 261.80 ft^3
Total Foamed Tail Cement	= 1178.10 ft^3
	= 209.83 bbl
Sacks of Cement	= 904 sks

Cement : (50.00 ft fill)

50.00 ft * 1.0472 ft^3/ft * 150 %	= 130.90 ft^3
Tail Cement	= 130.90 ft^3
	= 23.31 bbl

Shoe Joint Volume: (100.00 ft fill)

100.00 ft * 2.0739 ft^3/ft	= 207.39 ft^3
	= 36.94 bbl
Tail plus shoe joint	= 338.29 ft^3
	= 60.25 bbl
Total Tail	= 319 sks

Total Pipe Capacity:

5081.00 ft * 0.1576 ft^3/ft	= 800.63 ft^3
2769.00 ft * 0.1245 ft^3/ft	= 344.78 ft^3
150.00 ft * 2.0739 ft^3/ft	= 311.09 ft^3
	= 259.41 bbl

Displacement Volume to Shoe Joint:

Capacity of Pipe - Shoe Joint	= 259.41 bbl - 36.94 bbl
	= 222.48 bbl

Fluid Instructions
Fluid 1: Water Based Spacer

TUNED SPACER III	Fluid Density:	13 lbm/gal
1.5 lbm/bbl BLACK DYE	Fluid Volume:	200 bbl

Fluid 2: Foamed Lead Cement– **Foamed to average density of 13.5 ppg**

Standard Cement	Fluid Weight	16.74 lbm/gal
94 lbm/sk Premium Cement (Cement)	Slurry Yield:	1.05 ft^3/sk
0.07 % Halliburton EZ-FLO (Bulk Flow Enhancer)	Total Mixing Fluid:	4.20 Gal/sk
0.07 Gal/sk Zonesealant 2000 (Foamer)	Top of Fluid:	5081 ft
0.01 Gal/sk Micro Matrix Retarder (Retarder)	Calculated Fill:	1419 ft
1.88 lbm/sk KCL (Additive Material)	Volume:	358.06 bbl
	Calculated Sacks:	1460.52 sks
	Proposed Sacks:	1470 sks

Fluid 3: Foamed Lead Cement– **Foamed to average density of 13.5 ppg**

Standard Cement	Fluid Weight	16.74 lbm/gal
0.07 % Halliburton EZ-FLO (Bulk Flow Enhancer)	Slurry Yield:	1.05 ft^3/sk
0.07 Gal/sk Zonesealant 2000 (Foamer)	Total Mixing Fluid:	4.19 Gal/sk
1.88 lbm/sk KCL (Additive Material)	Top of Fluid:	6500 ft
	Calculated Fill:	1000 ft
	Volume:	466.28 bbl
	Calculated Sacks:	1990.81 sks
	Proposed Sacks:	2000 sks

Fluid 4: Foamed Tail Cement– **Foamed to average density of 14.5 ppg**

Standard Cement	Fluid Weight	16.74 lbm/gal
0.07 % Halliburton EZ-FLO (Bulk Flow Enhancer)	Slurry Yield:	1.07 ft^3/sk
0.07 Gal/sk Zonesealant 2000 (Foamer)	Total Mixing Fluid:	4.28 Gal/sk
0.26 Gal/sk Calcium Chloride Liquid (Accelerator)	Top of Fluid:	7500 ft
1.88 lbm/sk KCL (Additive Material)	Calculated Fill:	450 ft
	Volume:	209.83 bbl
	Calculated Sacks:	904.16 sks
	Proposed Sacks:	910 sks

Fluid 5: Tail Cement – **Un-foamed**

Standard Cement	Fluid Weight	16.74 lbm/gal
0.07 % Halliburton EZ-FLO (Bulk Flow Enhancer)	Slurry Yield:	1.06 ft^3/sk
0.07 Gal/sk Zonesealant 2000 (Foamer)	Total Mixing Fluid:	4.23 Gal/sk
0.26 Gal/sk Calcium Chloride Liquid (Accelerator)	Top of Fluid:	7950 ft
1.88 lbm/sk Potassium Chloride (Additive Material)	Calculated Fill:	50 ft
	Volume:	60.25 bbl
	Calculated Sacks:	318.84 sks
	Proposed Sacks:	320 sks

Fluid 6: Mud

Sea Water	Fluid Density:	8.60 lbm/gal
	Fluid Volume	222.48 bbl

Detailed Pumping Schedule

Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Estimated Avg Rate bbl/min	Downhole Volume
1	Spacer	TUNED SPACER III	13.0	7.0	200 bbl
2	Cement	Foamed Lead Cement 1	16.7		1470 sks
3	Cement	Foamed Lead Cement 2	16.7		2000 sks
4	Cement	Foamed Tail Cement	16.7		910 sks
5	Cement	Unfoamed Tail	16.7		320 sks
6	Mud	Sea Water	8.6		222.48 bbl

Foam Output Parameter Summary:

Fluid #	Fluid Name	Unfoamed Liquid Volume	Beginning Density lbm/gal	Ending Density lbm/gal	Beginning Rate scf/bbl	Ending Rate scf/bbl
Stage 1						
2	Foamed Lead Cement 1	273.9 bbl	12.6	13.6	299.6	299.6
3	Foamed Lead Cement 2	373.4 bbl	13.6	14.0	299.6	299.6
4	Foamed Tail Cement	171.5 bbl	14.0	14.2	299.6	299.6

Foam Design Specifications:

Foam Calculation Method: Constant Gas Flow
Backpressure: 2216.85 psig
Bottom Hole Circulating Temp: 94 degF
Mud Outlet Temperature: 60 degF

Calculated Gas = 245319.7 scf
Additional Gas = 50000 scf
Total Gas = 295319.7 scf

SAP Quote # 0

Mtrl Nbr	Description	Qty	U/M	Unit Price	Net Amt
14161	CMT CONDUCTOR CASING BOM	1	JOB		0.00
	Personnel				
130443	ZONESEAL CERTIFIED SPECIALIST H/DAY/MO TOTAL NUMBER HR/DAY/WEEK/MTH/YEAR/JOB/RUN	1 96 HR	H	145.24	13,943.04
576784	CMT, Offshore Engineer, per hr HOURS	1 96	EA	134.32	12,894.72
	Equipment				
583769	CMT,Addl Day Foam Cmt Day Rate-SORAC	4	DAY	3,100.45	12,401.80
	Spacer Material				
483826	TUNED SPACER III	200	BBL	122.28	24,456.00
101673327	HALLIBURTON INDICATOR BLACK, 25 LB PAIL	300	LB	55.00	16,500.00
	Cement Material				
100003687	PREMIUM CEMENT	4700	SK	14.71	69,137.00
101002314	EZ-FLO	310	LB	10.57	3,276.70
101207218	ZONESEALANT 2000	329	GAL	77.25	25,415.25
100003780	MICRO MATRIX RETARDER	15	GAL	43.70	655.50
100001585	KCL POTASSIUM CHLORIDE	8235	LB	0.55	4,529.25
100005054	CALCIUM CHLORIDE - LIQUID -	320	GAL	8.09	2,588.80
101163786	KCL-POTASSIUM CHLORIDE	602	LB	0.70	421.40
	Total	**USD**			**186,219.46**

SAP Quote # 0

Mtrl Nbr	Description	Qty	U/M	Unit Price	Net Amt
342210	N2 BOM-Foam Cementing w/o CT	1	JOB		0.00
13459	Nitrogen Charge	295320	SCF	1.35	0.00
	Personnel				
576758	CMT, Equipment Optr, per hr HOURS	2 96	EA	46.62	8,951.04
	Services				
583773	CMT,Addl N2 Day Rate Foam Cmt Job-SORAC	4	DAY	8,056.40	32,225.60
583837	CMT,Addl 100ft N2 Iron, ZI Foamed-SORAC	4	DAY	300.00	1,200.00
	Total	**USD**			**42,376.64**

Job Information — 18" Liner

Well Name: Macondo Prospect	Well #: 1
Riser	0 - 5081 ft (MD)
Outer Diameter	24.000 in
Inner Diameter	19.500 in
22" Casing	5081 - 8000 ft (MD)
Outer Diameter	22.000 in
Inner Diameter	19.500 in
Linear Weight	277.01 lbm/ft
22" Open Hole	8000 - 9900 ft (MD)
Inner Diameter	22.000 in
Job Excess	15 %
Landing String	0 - 5081 ft (MD)
Outer Diameter	6.625 in
Inner Diameter	5.375 in
18" Innerstring	7600 - 9750 ft (MD)
Outer Diameter	5.500 in
Inner Diameter	4.778 in
Linear Weight	21.90 lbm/ft
18" Liner	7600 - 9900 ft (MD)
Outer Diameter	18.000 in
Inner Diameter	16.750 in
Linear Weight	117 lbm/ft
18" Landing String	5081 - 7600 ft (MD)
Outer Diameter	5.500 in
Inner Diameter	4.778 in
Linear Weight	24.37 lbm/ft
Mud Type	Synthetic
Mud Weight	10.60 lbm/gal
BHST	122 degF

Spacer:

839.00 ft * 0.8727 ft^3/ft * 15 %	= 841.99 ft^3
Total Spacer	= 842.19 ft^3
	= 150.00 bbl

Cement : (928.00 ft fill)

778.00 ft * 0.8727 ft^3/ft * 15 %	= 780.77 ft^3
150.00 ft * 0.8727 ft^3/ft * 15 %	= 150.53 ft^3
Lead Cement	= 931.31 ft^3
	= 165.87 bbl

Shoe Joint Volume: (100.00 ft fill)

100.00 ft * 1.5302 ft^3/ft	= 153.02 ft^3
	= 27.25 bbl
Tail plus shoe joint	= 1084.33 ft^3
	= 193.13 bbl
Total Tail	= 1000 sks

Total Pipe Capacity:

5081.00 ft * 0.1576 ft^3/ft	= 800.63 ft^3
2519.00 ft * 0.1245 ft^3/ft	= 313.65 ft^3
2150.00 ft * 0.1245 ft^3/ft	= 267.71 ft^3
150.00 ft * 1.5302 ft^3/ft	= 229.53 ft^3
	= 287.02 bbl

Displacement Volume to Shoe Joint:

Capacity of Pipe - Shoe Joint	= 287.02 bbl - 27.25 bbl
	= 259.77 bbl

Fluid Instructions

Fluid 1: Water Based Spacer

TUNED SPACER III

1.3 gal/bbl SEM-8 (Additive Material)

Fluid Density:	11.10 lbm/gal
Fluid Volume:	150 bbl

Fluid 2: Lead Cement

Premium Cement

94 lbm/sk Premium Cement (Cement)
0.07 % Halliburton EZ-FLO (Bulk Flow Enhancer)
0.25 % D-AIR 3000 (Defoamer)
1.88 lbm/sk KCL (Clay Control)
0.08 Gal/sk Halad(R)-344 EXP (Low Fluid Loss Control)
0.02 Gal/sk HR-6L (Retarder)

Fluid Weight	16.40 lbm/gal
Slurry Yield:	1.08 ft^3/sk
Total Mixing Fluid:	4.41 Gal/sk
Top of Fluid:	8972 ft
Calculated Fill:	928 ft
Volume:	193.07 bbl
Calculated Sacks:	1000 sks
Proposed Sacks:	1000 sks

Fluid 3: Rheologically Enhanced Spacer

TUNED SPACER III

1.3 gal/bbl SEM-8 (Additive Material)

Fluid Density:	11.10 lbm/gal
Fluid Volume:	10 bbl

Fluid 4: Mud

SBM

Fluid Density:	10.60 lbm/gal
Fluid Volume	249.77 bbl

Detailed Pumping Schedule

Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Estimated Avg Rate bbl/min	Downhole Volume
1	Spacer	TUNED SPACER III	11.1		150 bbl
2	Cement	Lead Cement	16.4		1000 sks
3	Spacer	TUNED SPACER III	11.1		10 bbl
4	Mud	SBM	10.6		249.77 bbl

SAP Quote # 0

Mtrl Nbr	Description	Qty	U/M	Unit Price	Net Amt
7524	CMT DRILLING LINER BOM	1	JOB		0.00
483826	TUNED SPACER III	160	BBL	122.28	19,564.80
100003687	PREMIUM CEMENT	1000	SK	14.71	14,710.00
101002314	EZ-FLO	66	LB	10.57	697.62
101249405	HALAD-344 EXP	80	GAL	125.71	10,056.80
100001585	KCL POTASSIUM CHLORIDE	1880	LB	0.55	1,034.00
101235089	SEM-8	208	GAL	47.45	9,869.60
101007446	D-AIR 3000	235	LB	4.31	1,012.85
100005058	HR-6L RETARDER	20	GAL	22.89	457.80
	Total	**USD**			**57,403.47**

Job Information — 16" Liner

Well Name: Macondo Prospect — Well #: 1

Riser	0 - 5081 ft (MD)
Outer Diameter	24.000 in
Inner Diameter	19.500 in
22" Casing	5081 - 8000 ft (MD)
Outer Diameter	22.000 in
Inner Diameter	19.500 in
Linear Weight	277.01 lbm/ft
18" Liner	7600 - 9900 ft (MD)
Outer Diameter	18.000 in
Inner Diameter	16.750 in
Linear Weight	117 lbm/ft
16" Casing	5081 - 12500 ft (MD)
Outer Diameter	16.000 in
Inner Diameter	14.850 in
Landing String	0 - 5081 ft (MD)
Outer Diameter	6.625 in
Inner Diameter	5.375 in
16" Innerstring	5081 - 12350 ft (MD)
Outer Diameter	5.500 in
Inner Diameter	4.778 in
Linear Weight	21.90 lbm/ft
20" Open Hole	9900 - 12500 ft (MD)
Inner Diameter	20.000 in
Job Excess	15 %
Mud Type	Synthetic
Mud Weight	11.80 lbm/gal
BHST	162 degF

Calculations — 16" Liner

Spacer:

322.00 ft * 0.6777 ft^3/ft * 0 %	= 218.21 ft^3
400.00 ft * 0.134 ft^3/ft * 0 %	= 53.59 ft^3
1900.00 ft * 0.134 ft^3/ft * 0 %	= 254.54 ft^3
350.00 ft * 0.7854 ft^3/ft * 15 %	= 316.12 ft^3
Total Spacer	= 842.19 ft^3
	= 150.00 bbl

Cement : (1750.00 ft fill)

1750.00 ft * 0.7854 ft^3/ft * 15 %	= 1580.61 ft^3
Total Lead Cement	= 1580.61 ft^3
	= 281.52 bbl
Sacks of Cement	= 935 sks

Cement : (500.00 ft fill)

350.00 ft * 0.7854 ft^3/ft * 15 %	= 316.12 ft^3
150.00 ft * 0.7854 ft^3/ft * 15 %	= 135.48 ft^3
Tail Cement	= 451.60 ft^3
	= 80.43 bbl

Shoe Joint Volume: (100.00 ft fill)

100.00 ft * 1.2028 ft^3/ft	= 120.28 ft^3
	= 21.42 bbl
Tail plus shoe joint	= 571.88 ft^3
	= 101.86 bbl
Total Tail	= 528 sks

Total Pipe Capacity:

5081.00 ft * 0.1576 ft^3/ft	= 800.63 ft^3
7269.00 ft * 0.1245 ft^3/ft	= 905.10 ft^3
150.00 ft * 1.2028 ft^3/ft	= 180.41 ft^3
	= 335.94 bbl

Displacement Volume to Shoe Joint:

Capacity of Pipe - Shoe Joint	= 335.94 bbl - 21.42 bbl
	= 314.51 bbl

Fluid Instructions

Fluid 1: Water Based Spacer

TUNED SPACER III

1.3 gal/bbl SEM-8 (Additive Material)

Fluid Density:	12.30 lbm/gal
Fluid Volume:	150 bbl

Fluid 2: Lead Cement

Premium Cement

94 lbm/sk Premium Cement (Cement)
0.07 % Halliburton EZ-FLO (Bulk Flow Enhancer)
0.25 % D-AIR 3000 (Defoamer)
1.88 lbm/sk KCL (Clay Control)
0.08 Gal/sk WG-17EXP (Fluid Loss Control)
8.874 Gal/sk Fresh Water (Mixing Fluid)

Fluid Weight	13.50 lbm/gal
Slurry Yield:	1.69 ft^3/sk
Total Mixing Fluid:	8.95 Gal/sk
Top of Fluid:	10250 ft
Calculated Fill:	1750 ft
Volume:	281.52 bbl
Calculated Sacks:	934.72 sks
Proposed Sacks:	940 sks

Fluid 3: Tail Cement

Premium Cement

94 lbm/sk Premium Cement (Cement)
0.07 % Halliburton EZ-FLO (Bulk Flow Enhancer)
0.25 % D-AIR 3000 (Defoamer)
1.88 lbm/sk KCL (Clay Control)
0.08 Gal/sk Halad(R)-344 EXP (Low Fluid Loss Control)
0.02 Gal/sk HR-6L (Retarder)

Fluid Weight	16.40 lbm/gal
Slurry Yield:	1.08 ft^3/sk
Total Mixing Fluid:	4.41 Gal/sk
Top of Fluid:	12000 ft
Calculated Fill:	500 ft
Volume:	101.86 bbl
Calculated Sacks:	527.56 sks
Proposed Sacks:	530 sks

Fluid 4: Rheologically Enhanced Spacer

TUNED SPACER III

1.3 gal/bbl SEM-8 (Additive Material)

Fluid Density:	12.30 lbm/gal
Fluid Volume:	10 bbl

Fluid 5: Mud

SBM

Fluid Density:	11.80 lbm/gal
Fluid Volume	304.51 bbl

Detailed Pumping Schedule

Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Estimated Avg Rate bbl/min	Downhole Volume
1	Spacer	TUNED SPACER III	12.3		150 bbl
2	Cement	Lead Cement	13.5		940 sks
3	Cement	Tail Cement	16.4		530 sks
4	Spacer	TUNED SPACER III	12.3		10 bbl
5	Mud	SBM	11.8		304.51 bbl

SAP Quote # 0

Mtrl Nbr	Description	Qty	U/M	Unit Price	Net Amt
7524	CMT DRILLING LINER BOM	1	JOB		0.00
483826	TUNED SPACER III	160	BBL	122.28	19,564.80
101235089	SEM-8	208	GAL	47.45	9,869.60
100003687	PREMIUM CEMENT	1470	SK	14.71	21,623.70
101283806	WG-17EXP	76	GAL	75.21	5,715.96
101002314	EZ-FLO	97	LB	10.57	1,025.29
100001585	KCL POTASSIUM CHLORIDE	2764	LB	0.55	1,520.20
101249405	HALAD-344 EXP	43	GAL	125.71	5,405.53
101007446	D-AIR 3000	346	LB	4.31	1,491.26
100005058	HR-6L RETARDER	11	GAL	22.89	251.79
	Total	**USD**			**66,468.13**

Job Information — 13-3/8" Liner

Well Name: Macondo Prospect — Well #: 1

Riser	0 - 5081 ft (MD)
Outer Diameter	24.000 in
Inner Diameter	19.500 in
16" Casing	5081 - 12500 ft (MD)
Outer Diameter	16.000 in
Inner Diameter	14.850 in
16" Open Hole	12500 - 15300 ft (MD)
Inner Diameter	16.000 in
Job Excess	15 %
Landing String	0 - 5081 ft (MD)
Outer Diameter	6.625 in
Inner Diameter	5.375 in
13-5/8" Landing String 2	5081 - 12200 ft (MD)
Outer Diameter	5.500 in
Inner Diameter	4.778 in
Linear Weight	21.90 lbm/ft
13-5/8" Liner	12200 - 15300 ft (MD)
Outer Diameter	13.625 in
Inner Diameter	12.375 in
Linear Weight	88.20 lbm/ft
Mud Type	Synthetic
Mud Weight	13.10 lbm/gal
BHST	199 degF

Calculations — *13-3/8" Liner*

Spacer:

251.00 ft * 0.1903 ft^3/ft * 0 %	= 47.75 ft^3
1800.00 ft * 0.3838 ft^3/ft * 15 %	= 794.36 ft^3
Total Spacer	= 842.19 ft^3
	= 150.00 bbl

Cement : (1000.00 ft fill)

1000.00 ft * 0.3838 ft^3/ft * 15 %	= 441.31 ft^3
Tail Cement	= 441.31 ft^3
	= 78.60 bbl

Shoe Joint Volume: (180.00 ft fill)

180.00 ft * 0.8353 ft^3/ft	= 150.35 ft^3
	= 26.78 bbl
Tail plus shoe joint	= 591.66 ft^3
	= 105.38 bbl
Total Tail	= 546 sks

Total Pipe Capacity:

5081.00 ft * 0.1576 ft^3/ft	= 800.63 ft^3
7119.00 ft * 0.1245 ft^3/ft	= 886.42 ft^3
3100.00 ft * 0.8353 ft^3/ft	= 2589.28 ft^3
	= 761.65 bbl

Displacement Volume to Shoe Joint:

Capacity of Pipe - Shoe Joint	= 761.65 bbl - 26.78 bbl
	= 734.87 bbl

Fluid Instructions

Fluid 1: Water Based Spacer

TUNED SPACER III

1.3 gal/bbl SEM-8 (Additive Material)

Fluid Density:	14 lbm/gal
Fluid Volume:	150 bbl

Fluid 2: Tail Cement

Premium Cement

94 lbm/sk Premium Cement (Cement)
0.07 % Halliburton EZ-FLO (Bulk Flow Enhancer)
0.25 % D-AIR 3000 (Defoamer)
1.88 lbm/sk KCL (Clay Control)
0.1 Gal/sk Halad(R)-344 EXP (Low Fluid Loss Control)
0.02 Gal/sk HR-6L (Retarder)
4.294 Gal/sk Fresh Water (Mixing Fluid)

Fluid Weight	16.40 lbm/gal
Slurry Yield:	1.08 ft^3/sk
Total Mixing Fluid:	4.41 Gal/sk
Top of Fluid:	14300 ft
Calculated Fill:	1000 ft
Volume:	105.38 bbl
Calculated Sacks:	545.81 sks
Proposed Sacks:	550 sks

Fluid 3: Rheologically Enhanced Spacer

TUNED SPACER III

1.3 gal/bbl SEM-8 (Additive Material)

Fluid Density:	14 lbm/gal
Fluid Volume:	10 bbl

Fluid 4: Mud

SBM

Fluid Density:	13.10 lbm/gal
Fluid Volume	724.87 bbl

Detailed Pumping Schedule

Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Estimated Avg Rate bbl/min	Downhole Volume
1	Spacer	TUNED SPACER III	14.0		150 bbl
2	Cement	Tail Cement	16.4		550 sks
3	Spacer	TUNED SPACER III	14.0		10 bbl
4	Mud	SBM	13.1		724.87 bbl

SAP Quote # 0

Mtrl Nbr	Description	Qty	U/M	Unit Price	Net Amt
7524	CMT DRILLING LINER BOM	1	JOB		0.00
483826	TUNED SPACER III	160	BBL	122.28	19,564.80
101235089	SEM-8	208	GAL	47.45	9,869.60
100003687	PREMIUM CEMENT	550	SK	14.71	8,090.50
101002314	EZ-FLO	37	LB	10.57	391.09
100001585	KCL POTASSIUM CHLORIDE	1034	LB	0.55	568.70
101249405	HALAD-344 EXP	55	GAL	125.71	6,914.05
100005058	HR-6L RETARDER	11	GAL	22.89	251.79
101007446	D-AIR 3000	130	LB	4.31	560.30
	Total	**USD**			**46,210.83**

Well Name: Macondo Prospect	Well #: 1
Riser	0 - 5081 ft (MD)
Outer Diameter	24.000 in
Inner Diameter	19.500 in
16" Casing	5081 - 12500 ft (MD)
Outer Diameter	16.000 in
Inner Diameter	14.850 in
Landing String	0 - 5081 ft (MD)
Outer Diameter	6.625 in
Inner Diameter	5.375 in
13-5/8" Liner	12200 - 15300 ft (MD)
Outer Diameter	13.625 in
Inner Diameter	12.375 in
Linear Weight	88.20 lbm/ft
11-3/4" Expandable Liner Pre Expansion	13700 - 17000 ft (MD)
Outer Diameter	11.750 in
Inner Diameter	11.000 in
Linear Weight	47 lbm/ft
14" Open Hole	15300 - 17000 ft (MD)
Inner Diameter	14.000 in
Job Excess	15 %
11-3/4" Landing String	5081 - 13700 ft (MD)
Outer Diameter	5.500 in
Inner Diameter	4.778 in
Linear Weight	21.90 lbm/ft
Mud Type	Synthetic
Mud Weight	13.50 lbm/gal
BHST	222 degF

Spacer:

1168.00 ft * 0.6703 ft^3/ft * 0 %	= 782.87 ft^3
725.00 ft * 0.0822 ft^3/ft * 0 %	= 59.62 ft^3
Total Spacer	= 842.19 ft^3
	= 150.00 bbl

Cement : (2275.00 ft fill)

875.00 ft * 0.0822 ft^3/ft * 0 %	= 71.96 ft^3
1400.00 ft * 0.316 ft^3/ft * 15 %	= 508.76 ft^3
Total Primary Cement	= 580.72 ft^3
	= 103.43 bbl
Sacks of Cement	= 352 sks

Cement : (300.00 ft fill)

300.00 ft * 0.316 ft^3/ft * 15 %	= 109.02 ft^3
Tail Cement	= 109.02 ft^3
	= 19.42 bbl

Shoe Joint Volume: (180.00 ft fill)

180.00 ft * 0.66 ft^3/ft	= 118.79 ft^3
	= 21.16 bbl
Tail plus shoe joint	= 227.81 ft^3
	= 40.57 bbl
Total Tail	= 138 sks

Total Pipe Capacity:

5081.00 ft * 0.1576 ft^3/ft	= 800.63 ft^3
8619.00 ft * 0.1245 ft^3/ft	= 1073.19 ft^3
3300.00 ft * 0.66 ft^3/ft	= 2177.84 ft^3
	= 721.63 bbl

Displacement Volume to Shoe Joint:

Capacity of Pipe - Shoe Joint	= 721.63 bbl - 21.16 bbl
	= 700.47 bbl

Fluid Instructions

Fluid 1: Water Based Spacer

TUNED SPACER III

1.3 gal/bbl SEM-8 (Additive Material)

Fluid Density:	14 lbm/gal
Fluid Volume:	150 bbl

Fluid 2: Primary Cement

Premium Cement

50 kg/sk Premium Cement (Cement)
0.07 % Halliburton EZ-FLO (Bulk Flow Enhancer)
0.25 % D-AIR 3000 (Defoamer)
1.88 lbm/sk KCL (Additive Material)
20 % SSA-1 (Additive Material)
15 % Common White-100 Mesh, SSA-2
0.18 Gal/sk Gasstop EXP (Additive Material)
0.18 Gal/sk SCR-100L (Retarder)

Fluid Weight	16.50 lbm/gal
Slurry Yield:	1.65 ft3/sk
Total Mixing Fluid:	6.27 Gal/sk
Top of Fluid:	14425 ft
Calculated Fill:	2275 ft
Volume:	103.43 bbl
Calculated Sacks:	351.95 sks
Proposed Sacks:	360 sks

Fluid 3: Tail Cement

Premium Cement

50 kg/sk Premium Cement (Cement)
0.07 % Halliburton EZ-FLO (Bulk Flow Enhancer)
0.25 % D-AIR 3000 (Defoamer)
1.88 lbm/sk KCL (Additive Material)
20 % SSA-1 (Additive Material)
15 % Common White-100 Mesh, SSA-2
0.18 Gal/sk Gasstop EXP (Additive Material)
0.1 Gal/sk SCR-100L (Retarder)

Fluid Weight	16.50 lbm/gal
Slurry Yield:	1.65 ft3/sk
Total Mixing Fluid:	6.26 Gal/sk
Top of Fluid:	16700 ft
Calculated Fill:	300 ft
Volume:	40.57 bbl
Calculated Sacks:	138.24 sks
Proposed Sacks:	140 sks

Fluid 4: Rheologically Enhanced Spacer

TUNED SPACER III

1.3 gal/bbl SEM-8 (Additive Material)

Fluid Density:	14 lbm/gal
Fluid Volume:	10 bbl

Fluid 5: Mud

SBM

Fluid Density:	11.60 lbm/gal
Fluid Volume	690.47 bbl

Detailed Pumping Schedule

Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Estimated Avg Rate bbl/min	Downhole Volume
1	Spacer	TUNED SPACER III	14.0		150 bbl
2	Cement	Lead Cement	16.5		360 sks
3	Cement	Tail Cement	16.5		140 sks
4	Spacer	TUNED SPACER III	14.0		10 bbl
5	Mud	SBM	11.6		690.47 bbl

Cost Estimate 11-3/4 x 13-5/8" Liner (CONTINGENCY)

SAP Quote # 0

Mtrl Nbr	Description	Qty	U/M	Unit Price	Net Amt
7524	CMT DRILLING LINER BOM	1	JOB		0.00
483826	TUNED SPACER III	160	BBL	122.28	19,564.80
101235089	SEM-8	208	GAL	47.45	9,869.60
100003687	PREMIUM CEMENT	587	SK	14.71	8,634.77
101002314	EZ-FLO	39	LB	10.57	412.23
100012238	SCR-100 L	79	GAL	76.65	6,055.35
100001585	KCL POTASSIUM CHLORIDE	940	LB	0.55	517.00
101007446	D-AIR 3000	138	LB	4.31	594.78
100003691	SAND-200 MESH SILICA FLOUR SSA-1	11024	LB	0.24	2,645.76
100003676	SAND-COMMON WHITE-100 MESH, SSA-2	83	SK	24.28	2,015.24
101280580	GASSTOP EXP	90	GAL	162.26	14,603.40
	Total	**USD**			**64,912.93**

Conditions

NOTE

The cost in this analysis is good for the materials and/or services outlined within. These prices are based on Halliburton being awarded the work on a first call basis. Prices will be reviewed for adjustments if awarded on 2nd or 3rd call basis and/or after 30 days of this written analysis. This is in an effort to schedule our work and maintain a high quality of performance for our customers.

The unit prices stated in the proposal are based on our current published prices. The projected equipment, personnel, and material needs are only estimates based on information about the work presently available to us. At the time the work is actually performed, conditions then existing may require an increase or decrease in the equipment, personnel, and/or material needs. Charges will be based upon unit prices in effect at the time the work is performed and the amount of equipment, personnel, and/or material actually utilized in the work. Taxes, if any, are not included. Applicable taxes, if any, will be added to the actual invoice.

It is understood and agreed between the parties that with the exception of the subject discounts, all services performed and equipment and materials sold are provided subject to Halliburton's General Terms and Conditions contained in our current price list, (which include LIMITATION OF LIABILITY and WARRANTY provisions), and pursuant to the applicable Halliburton Work Order Contract (whether or not executed by you), unless a Master Service and/or Sales Contract applicable to the services, equipment, or materials supplied exists between your company and Halliburton, in which case the negotiated Master Contract shall govern the relationship between the parties. A copy of the latest version of our General Terms and Conditions is available from your Halliburton representative or at: http://www.halliburton.com/hcs/general_terms_conditions.pdf for your convenient review, and we would appreciate receiving any questions you may have about them. Should your company be interested in negotiating a Master Contract with Halliburton, our Law Department would be pleased to work with you to finalize a mutually agreeable contract. In this connection, it is also understood and agreed that Customer will continue to execute Halliburton usual field work orders and/or tickets customarily required by Halliburton in connection with the furnishing of said services, equipment, and materials.
Any terms and conditions contained in purchase orders or other documents issued by the customer shall be of no effect except to confirm the type and quantity of services, equipment, and materials to be supplied to the customer.
If customer does not have an approved open account with Halliburton or a mutually executed written contract with Halliburton, which dictates payment terms different than those set forth in this clause, all sums due are payable in cash at the time of performance of services or delivery of equipment, products, or materials. If customer has an approved open account, invoices are payable on the twentieth day after date of invoice.

Customer agrees to pay interest on any unpaid balance from the date payable until paid at the highest lawful contract rate applicable, but never to exceed 18% per annum. In the event Halliburton employs an attorney for collection of any account, customer agrees to pay attorney fees of 20% of the unpaid account, plus all collection and court costs.