HALLIBURTON

Cementing Job Summary

The Road to Excellence Starts with Safety

Sold To #: 345242	**Ship To #:** 3544187	**Quote #:**	**Sales Order #:** 0902054525
Customer: NOBLE ENERGY INC E-BUSINESS		**Customer Rep:** Noble	
Well Name: MOSES STATE	**Well #:** LD11-78HN		**API/UWI #:** 05-123-39828-00
Field: WILDCAT	**City (SAP):** RAYMER	**County/Parish:** WELD	**State:** COLORADO
Legal Description: SW SW-2-9N-58W-465FSL-1117FWL			
Contractor: H & P DRLG		**Rig/Platform Name/Num:** H & P 273	
Job BOM: 7525			
Well Type: HORIZONTAL OIL			
Sales Person: HALAMERICA\HB21661		**Srvc Supervisor:** Cement Spare Laptop	

Job

Formation Name			
Formation Depth (MD)	**Top**	**Bottom**	
Form Type		**BHST**	240 degF
Job depth MD	9701ft	**Job Depth TVD**	
Water Depth		**Wk Ht Above Floor**	
Perforation Depth (MD)	**From**	**To**	

Well Data

Description	New / Used	Size in	ID in	Weight lbm/ft	Thread	Grade	Top MD ft	Bottom MD ft	Top TVD ft	Bottom TVD ft
Drill Pipe	3	4	3.34	14	BTC	P-110	0	5832	0	5732
Casing	3	7	6.276	26	BTC	P-110	0	6040	0	5939
Casing	3	4.5	4	11.6	BTC	P-110	5832	9701	5732	6496
Open Hole Section			6.125		BTC		6040	9705	5939	6496

Tools and Accessories

Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make
Guide Shoe	4.5			9701		Top Plug	4.5		HES
Float Shoe	4.5					Bottom Plug	4.5		HES
Float Collar	4.5					SSR plug set	4.5		HES
Insert Float	4.5					Plug Container	4.5		HES
Stage Tool	4.5					Centralizers	4.5		HES

Miscellaneous Materials

Gelling Agt		Conc		Surfactant		Conc		Acid Type		Qty		Conc	
Treatment Fld		Conc		Inhibitor		Conc		Sand Type		Size		Qty	

Fluid Data

Stage/Plug #: 1

Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
1	Water Based Mud-10 #/gal		0	bbl	10			6	

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Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
2	11.5 lb/gal Tuned Spacer III	Tuned Spacer III	0	bbl	11.5	3.86	24.8	6	
145.18 lbm/bbl		BARITE, BULK (100003681)							
36 gal/bbl		FRESH WATER							

Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
3	Lead Cement no Super CBL	EXPANDACEM (TM) SYSTEM		sack	13.8	1.65		6	7.57
7.57 Gal		FRESH WATER							

Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
4	Tail with Super CBL	EXPANDACEM (TM) SYSTEM		sack	13.8	1.65		6	7.58
7.58 Gal		FRESH WATER							

Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
5	Water	Water	0	bbl	8.33			6	

Cement Left In Pipe	Amount	49 ft	Reason		Shoe Joint
Mix Water:	pH ##	Mix Water Chloride	## ppm	Mix Water Temperature:	## °F °C
Cement Temperature:	## °F °C	Plug Displaced by:	## lb/gal kg/m3 XXXX	Disp. Temperature:	## °F °C
Plug Bumped?	Yes/No	Bump Pressure:	#### psi MPa	Floats Held?	Yes/No
Cement Returns:	## bbl m3	Returns Density:	## lb/gal kg/m3	Returns Temperature:	## °F °C
Comment					

1.3 Job Overview

		Units	Description
1	Surface temperature at time of job	^{o}F	32
2	Mud type (OBM, WBM, SBM, Water, Brine)	-	Wbm
3	Actual mud density	lb/gal	10.6
4	Actual mud Plastic Viscosity (PV)	cP	
5	Actual mud Yield Point (YP)	$lb_f/100ft^2$	
6	Actual mud 30 min Gel Strength	$lb_f/100ft^2$	
7	Time circulated before job	HH:MM	02:00
8	Mud volume circulated	bbls	
9	Rate at which well was circulated	bpm	6
10	Pipe movement during hole circulation	Y/N	N
11	Rig pressure while circulating	psi	1100
12	Time from end mud circulation to start of job	HH:MM	10min
13	Pipe movement during cementing	Y/N	N
14	Calculated displacement	bbls	132
15	Job displaced by	Rig/HES	Hes
16	Annular flow before job	Y/N	Y
17	Annular flow after job	Y/N	N
18	Length of rat hole	ft	10
19	Units of gas detected while circulating	units	0
20	Was lost circulation experienced at any time?	Y/N	N

1.4 Water Field Test

Item	Recorded Value	Units	Max Acceptable Limit	Potential Problems in Exceeding Limit
pH	7	-	6.0-8.0	Chemicals in the water can cause severe retardation
Chlorides	200	ppm	3000 ppm	Can shorten thickening time of cement
Sulfates	0	ppm	1500 ppm	Will greatly decrease the strength of cement
Total Hardness	0	ppm	500 mg/L	High concentrations will accelerate the set of the cement
Calcium	0	ppm	500 ppm	High concentrations will accelerate the set of the cement
Total Alkalinity	0	ppm	1000 ppm	Cement is greatly retarded to the point where it may not set up at all (typically occurs @ pH ≥ 8.3).
Bicarbonates	0	ppm	1000 ppm	Cement is greatly retarded to the point where it may not set up at all
Potassium	0	ppm	5000 ppm	High concentrations will shorten the pump time of cement (indicates the presence of chlorides, therefore if Potassium levels are measured as high, so should the chlorides)
Iron	0	ppm	300 ppm	High concentrations will accelerate the set of the cement
Temperature	58	°F	50-80 °F	High temps will accelerate; Low temps may risk freezing in cold weather

Submitted Respectfully by:

2.0 Real-Time Job Summary

2.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	Downhole Density (ppg)	Combined Pump Rate (bbl/min)	Pass-Side Pump Pressure (psi)	Comments
Event	1	Call Out	Call Out	1/24/2015	08:00:00	USER				
Event	2	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	1/24/2015	12:00:00	USER				Discussed route and driving safety and hazards.
Event	3	Depart from Service Center or Other Site	Depart from Service Center or Other Site	1/24/2015	12:10:00	USER				
Event	4	Arrive At Loc	Arrive At Loc	1/24/2015	14:30:00	USER				Lin- 4 1/2"- 11.6#- 4949', DP- 5849', TD- 10870', TVD- 5700', Prev Cas- 7"- 26# @ 6069', ST- 45.92', OH- 6 1/8", WF- 10.6# WBM, Hanger @ 5869.5'. Tool is Weatherford. Water- 58 deg, PH- 7, Chlorides- less than 200
Event	5	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	1/24/2015	14:40:00	USER				Did site assessment, discussed safety and hazards.
Event	6	Rig-Up Equipment	Rig-Up Equipment	1/24/2015	14:50:00	USER				Spotted equipment and rigged up.
Event	7	Rig-Up Completed	Rig-Up Completed	1/24/2015	15:30:00	USER				
Event	8	Circulate Well	Circulate Well	1/24/2015	15:31:00	USER				Rig pumping ball down and circulating well @ 4.3 bbls/min 775 psi.
Event	9	Pre-Job Safety Meeting	Pre-Job Safety Meeting	1/24/2015	15:45:00	USER	8.39	0.00	16.00	Discussed job procedures, safety and hazards.
Event	10	Wait on HES Materials to Arrive - End Time	Wait on HES Materials to Arrive - End Time	1/24/2015	18:05:00	USER	8.41	0.00	8.00	HAd to have SCR-742 Hot shotted to location. Was not on call sheet.
Event	11	Start Job	Start Job	1/24/2015	18:14:52	COM4	8.34	0.00	9.00	
Event	12	Test Lines	Test Lines	1/24/2015	18:19:59	COM4	8.33	0.00	163.00	Filled lines with 2.5 bbls fresh water. Shut down. CLosed valve and tested lines to 5000 psi. Had good tests.
Event	13	Pump Spacer 1	Pump Spacer 1	1/24/2015	18:28:28	COM4	8.31	0.00	80.00	Pumped 60 bbls of 11.5# Tune III spacer @ 5 bbls/min, 1115 psi
Event	14	Check Weight	Check weight	1/24/2015	18:32:34	COM4	11.49	5.00	1098.00	13.8#

Event	15	Pump Lead Cement	Pump Lead Cement	1/24/2015	18:44:29	COM4	13.02	1.70	251.00	Pumped 29.39 bbls of 13.8# Lead cement @ 5.5 bbls/min, 1280 psi
Event	16	Check Weight	Check weight	1/24/2015	18:46:17	COM4	13.95	5.60	1215.00	13.8#
Event	17	Pump Tail Cement	Pump Tail Cement	1/24/2015	18:50:03	COM4	13.71	3.20	130.00	Pumped 91.1 bbls of 13.8# Tail cement @ 6 bbls/min, 1140 psi
Event	18	Check Weight	Check weight	1/24/2015	18:53:45	COM4	13.76	6.00	1208.00	13.8#
Event	19	Shutdown	Shutdown	1/24/2015	19:11:28	COM4	13.77	0.00	35.00	
Event	20	Clean Lines	Clean Lines	1/24/2015	19:12:28	COM4	13.55	0.00	16.00	
Event	21	Drop Top Plug	Drop Top Plug	1/24/2015	19:18:53	COM4	-0.36	0.00	9.00	Weatherford tool hand released top plug.
Event	22	Pump Displacement	Pump Displacement	1/24/2015	19:19:00	COM4	-0.36	0.00	9.00	Pumped 127 bbls of fresh water @ 5 bbls/min. Pressure range- 1900 psi to 2300 psi. Calculated displacement was 132 bbls. Had good returns entire job.
Event	23	Bump Plug	Bump Plug	1/24/2015	19:48:11	COM4				Bumped plug @ 127 bbls away. Final circulating pressure was 1600 psi and bumped over to 2300 psi.
Event	24	Check Floats	Check Floats	1/24/2015	19:53:00	USER	8.35	0.00	2368.00	Floats held. got 1 bbl back.
Event	25	End Job	End Job	1/24/2015	19:54:54	COM4				
Event	26	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	1/24/2015	20:05:00	USER	0.01	0.00	6.00	Discussed hazards and safety and assigned rig down duties.
Event	27	Rig-Down Equipment	Rig-Down Equipment	1/24/2015	20:15:00	USER				
Event	28	Rig-Down Completed	Rig-Down Completed	1/24/2015	22:00:00	USER				
Event	29	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	1/24/2015	22:10:00	USER				Discussed route, driving safety and hazards.
Event	30	Depart Location for Service Center or Other Site	Depart Location for Service Center or Other Site	1/24/2015	22:15:00	USER				