

HALLIBURTON

iCem[®] Service

WHITING OIL & GAS CORP - EBUS

1700 Broadwat
Denver, CO 80290

For:

Date: Tuesday, March 24, 2015

WHITING RAZOR 11 H-0215A LINER

WHITING RAZOR 11 H-0215A LINER
Job Date: Sunday, March 22, 2015

Sincerely,
Sebastian Estenssoro

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1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Razor 11H-0215A** cement **Production Liner** casing job. A pre-job safety meeting was held before the job where details of the job were discussed, potential safety hazards were reviewed, and environmental compliance procedures were outlined.

Halliburton maintains a continuous quality improvement process and appreciates any comments or suggestions that you may have. Halliburton again thanks you for the opportunity to perform service work on this well. We hope to be your solutions provider for future projects.

Respectfully,

Halliburton Brighton

Job Times

	Date	Time
Requested Time On Location:		
Called Out Time:	3/21/2015	1500
Arrived On Location At:		2030
Job Started At:	3/22/2015	0600
Job Completed At:		1200
Departed Location At:		1300

1.2 Planned Pumping Schedule

Event	Pressure (psi)	Rate (bpm)	Volume (bbl)	Sacks	Density (ppg)	Yield (ft ³ /sk)	WR (gal/sk)
START JOB							
FILL LINES			2		8.33		
PRESSURE TEST	6612						

TUNED SPACER		2	20		12	3.13	19.8
CEMENT		4	149.87115	510	13.8	1.65	7.53
DROP DART							
MMCR Displacement			10				
Clay-Web Displacement		5	140		8.33		
SLOW RATE THROUGH TOOL		2					
SLOW RATE TO BUMP PLUG		4					
BUMP PLUG	2614						
PRESSURE UP	5860						

CHECK FLOATS			2 bbl back				
CIRCULATE OFF LINER TOP		7					
END JOB							

MAX PRESSURE							
MIX WATER NEEDED							

SPACER TO SURFACE			trace				
CEMENT TO SURFACE							

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Cementing Job Summary

The Road to Excellence Starts with Safety

Sold To #: 366960		Ship To #: 3272088		Quote #: 0022016722		Sales Order #: 0902238877				
Customer: WHITING OIL & GAS CORP - EBUS				Customer Rep:						
Well Name: RAZOR		Well #: 11 H-0215A		API/UWI #: 05-123-38598-00						
Field: WILDCAT		City (SAP): RAYMER		County/Parish: WELD		State: COLORADO				
Legal Description: SE NE-11-10N-58W-2180FNL-368FEL										
Contractor: FRONTIER DRLG				Rig/Platform Name/Num: FRONTIER 26						
Job BOM: 7525										
Well Type: HORIZONTAL OIL										
Sales Person: HALAMERICA/HX41066				Srv Supervisor: Joseph Fantasia						
Job										
Formation Name										
Formation Depth (MD)		Top		Bottom						
Form Type				BHST						
Job depth MD		12751ft		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		4	3.34	14			0	5186	0	0
Casing		7	6.184	29	LTC	L-80	0	6297	0	0
Casing		4.5	4	11.6	LTC	L-80	5186	12751	0	5847
Open Hole Section			6.125				6297	12751	0	5847
Tools and Accessories										
Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make	
Guide Shoe	4.5			12751		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	12 lb/gal Tuned Spacer III	Tuned Spacer III		20	bbl	12	3.13	19.8	4	
35.30 gal/bbl		FRESH WATER								
178.42 lbm/bbl		BARITE, BULK (100003681)								

last updated on 3/22/2015 11:48:36 AM

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Cementing Job Summary

Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
2	Lead Cement	ECONOCEM (TM) SYSTEM	510	sack	13.8	1.65	7.53	5	7.53
7.53 Gal		FRESH WATER							
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
3	Displacement	Displacement	150	bbl	8.33			4	
Cement Left In Pipe		Amount	ft	Reason				Shoe Joint	
Mix Water: pH ##		Mix Water: ## ppm			Mix Water Temperature: ## °F °C				
		Chloride: ##							
Cement Temperature: ## °F °C		Plug Displaced by: ## lb/gal kg/m ³ XXXX				Disp. Temperature: ## °F °C			
Plug Bumped? Yes/No		Bump Pressure: #### psi MPa				Floats Held? Yes/No			
Cement Returns: ## bbl m ³		Returns Density: ## lb/gal kg/m ³				Returns Temperature: ## °F °C			
Comment									

1.3 Job Overview

		Units	Description
1	Surface temperature at time of job	°F	40
2	Mud type (OBM, WBM, SBM, Water, Brine)	-	WBM
3	Actual mud density	lb/gal	10.8
7	Time circulated before job	HH:MM	01:00
8	Mud volume circulated	bbls	240
9	Rate at which well was circulated	bpm	4
10	Pipe movement during hole circulation	Y/N	N
11	Rig pressure while circulating	psi	800
12	Time from end mud circulation to start of job	HH:MM	00:30
13	Pipe movement during cementing	Y/N	N
14	Calculated displacement	bbls	154
15	Job displaced by	Rig/HES	HES
16	Annular flow before job	Y/N	N
17	Annular flow after job	Y/N	N
18	Length of rat hole	ft	1
19	Units of gas detected while circulating	units	0
20	Was lost circulation experienced at any time?	Y/N	PARTIAL LOSSES DURING DISP. NOT FORMALLY RECORDED

1.4 Lost Circulation Details

Lost Circulation Details
Returns slowed twice during displacement at 80bbl away and 120bbl away

1.5 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	0	ppm	3000 ppm	Can shorten thickening time of cement
Sulfates	<200	ppm	1500 ppm	Will greatly decrease the strength of cement
Total Hardness	12	ppm	500 mg/L	High concentrations will accelerate the set of the cement
Iron	0	ppm	300 ppm	High concentrations will accelerate the set of the cement
Temperature	50	°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	Comb Pump Rate (bbl/min)	DH Density (ppg)	PS Pump Press (psi)	Comments
Event	1	Arrive at Location from Service Center	Arrive at Location from Service Center	3/21/2015	20:30:00	USER				ARRIVE AT LOCATION. RIG RUNNING IN LINER. PERFORM PRE RIG UP SAFETY MEETING AND SITE ASSESSMENT WITH CREW.
Event	2	Casing on Bottom	Casing on Bottom	3/22/2015	06:00:00	USER				CASING ON BOTTOM
Event	3	Start Job	Start Job	3/22/2015	07:00:00	COM4	0.00	0.03	-21.00	HELD PRE JOB SAFETY MEETING WITH ALL PRESENT PERSONNEL PRIOR TO JOB.
Event	4	Test Lines	Test Lines	3/22/2015	07:44:40	COM4	0.00	8.61	6612.00	PRESSURE TEST LINES TO 6500 PSI.
Event	5	Pump Spacer 1	Pump Spacer 1	3/22/2015	07:51:22	COM4	2.50	11.99	758.00	PUMP 20 BBLS TUNED SPACER MIXED AT 12 PPG USING SUPPLIED WATER. DENSITY VERIFIED BY SCALE
Event	6	Pump Cement	Pump Cement	3/22/2015	08:02:48	COM4	2.10	13.92	633.00	PUMP 149 BBLS (510 SKS) ECONOCHEM MIXED AT 13.8 PPG USING SUPPLIED WATER. DENSITY VERIFIED BY SCALE.
Event	7	Shutdown	Shutdown	3/22/2015	08:45:40	USER	1.80	13.93	52.00	
Event	8	Clean Lines	Clean Lines	3/22/2015	08:46:34	USER	0.60	8.11	-5.00	
Event	9	Pump Displacement	Pump Displacement	3/22/2015	08:47:23	COM4	2.50	8.00	-9.00	DISPLACE 150 BBLS FRESH WATER. 5 GAL MMCR ADDED TO FIRST 10 BBLS AND 10 GAL CLAYWEB ADDED THROUGHOUT THE REMAINING DISPLACEMENT. RETURNS SLOWED TWICE DURING DISPLACEMENT. 80 BBLS AWAY. AND 120 BBLS AWAY
Event	10	Bump Plug	Bump Plug	3/22/2015	09:24:31	COM4	0.40	7.96	2614.00	PLUG LANDED AT 2614 PSI. PRESSURE BROUGHT TO 3100 PSI AND HELD 2 MIN.
Event	11	Check Floats	Check Floats	3/22/2015	09:26:04	USER	0.00	7.97	3055.00	FLOATS HELD. 2 BBLS BACK.
Event	12	Set Tool	Set Tool	3/22/2015	09:34:58	USER	0.00	8.03	5866.00	PRESSURE UP TO 5860 PSI TO SET HANGER/PACKER.
Event	13	Pressure Test	Pressure Test	3/22/2015	09:47:18	USER	0.00	7.96	1935.00	PRESSURE UP ON ANNULUS USING RIG PUMPS. BACKSIDE PRESSURE TEST PERFORMED AND RECORDED BY RIG.
Event	14	Sting out	Sting out	3/22/2015	09:52:12	USER	0.00	7.90	567.00	RIG STINGS OUT OF HANGER.

Event	15	Circulate Well	Circulate Well	3/22/2015	09:57:27	USER	0.00	7.90	536.00	CIRCULATE ON LINER TOP UNTIL CLEAN. PUMP 160 BBLS FRESH WATER. TRACES OF SPACER TO SURFACE BUT NOTHING SOLID ENOUGH TO CALL SPACER TO SURFACE.
Event	16	End Job	End Job	3/22/2015	10:52:18	COM4	0.00	-0.34	-10.00	HOLD PRE RIG DOWN SAFETY MEETING WITH CREW PRIOR TO RIGGING DOWN EQUIPMENT.

3.0 Attachments

3.1 WHITING RAZOR 11 H-0215A LINER-Custom Results.png



