

HALLIBURTON

iCem[®] Service

PDC ENERGY-EBUS

United States of America, COLORADO

Date: Wednesday, July 11, 2018

J Clark 13N Foam Production

Job Date: Wednesday, July 04, 2018

Sincerely,

Bryce Hinsch

Legal Notice

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1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **J Clark 13N** cement **production** 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.

Approximately 50 bbls of muflush and trace spacer interface were returned to surface.

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 Fort Lupton

The Road to Excellence Starts with Safety

Sold To #: 304535		Ship To #: 3870493		Quote #: 0022461925		Sales Order #: 0904971209					
Customer: PDC ENERGY-EBUS				Customer Rep: Chris McMullen							
Well Name: J CLARK			Well #: 13N		API/UWI #: 05-123-46695-00						
Field: WATTENBERG		City (SAP): GREELEY		County/Parish: WELD		State: COLORADO					
Legal Description: NW NE-14-5N-65W-550FNL-1994FEL											
Contractor: ENSIGN DRLG				Rig/Platform Name/Num: ENSIGN 152							
Job BOM: 14143 14143											
Well Type: HORIZONTAL OIL											
Sales Person: HALAMERICA\HX38199				Srv Supervisor: Nicholas Roles							
Job											
Formation Name											
Formation Depth (MD)		Top		Bottom							
Form Type					BHST						
Job depth MD		12068ft			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	
Casing		9.625	8.921	36	LTC	J-55	0	1670		1670	
Casing		5.5	4.778	20		P-110	0	12068		0	
Open Hole Section			8.5				1670	6431	1670	6431	
Open Hole Section			8.5				6431	12074	6431	6872	
Tools and Accessories											
Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make		
Guide Shoe	5.5			12068		Top Plug	5.5	1	WTF		
Float Shoe	5.5					Bottom Plug	5.5	1	WTF		
Float Collar	5.5					SSR plug set	5.5		HES		
Insert Float	5.5					Plug Container	5.5	1	HES		
Stage Tool	5.5					Centralizers	5.5		HES		
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	Mud Flush III (Powder)	Mud Flush III			50	bbl	8.4			5	
42 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
2	12.5 lb/gal Tuned Spacer III	Tuned Spacer III	100	bbl	12.5	2.69	16.7	5	
207.44 lbm/bbl		BARITE, BULK (100003681)							
34.60 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	HalCem Cap	HALCEM (TM) SYSTEM	100	sack	15.6	1.18		5	5.19
0.40 %		HALAD-766, 55 LB SACK (101477695)							
5.19 Gal		FRESH WATER							
0.35 %		HR-601, 50 LB BAG (101328348)							
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	HalCem	HALCEM (TM) SYSTEM	620	sack	15.6	1.18		5	5.19
1.50 %		FOAMER 1026, TOTE (102166506)							
0.40 %		HALAD-766, 55 LB SACK (101477695)							
5.19 Gal		FRESH WATER							
0.35 %		HR-601, 50 LB BAG (101328348)							
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	14.4# ElastiCem	ELASTICEM (TM) SYSTEM	760	sack	14.4	1.7		5	7.3
7.30 Gal		FRESH WATER							
0.20 %		HALAD(R)-344, 50 LB (100003670)							
0.3750 %		HR-5, 50 LB SK (100005050)							
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
6	MMCR Displacement	MMCR Displacement	20	bbl	8.34			5	
0.50 gal/bbl		MICRO MATRIX CEMENT RETARDER, 5 GAL PAIL (100003781)							

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
7	Water	Water	247	bbl	8.33			6	
Cement Left In Pipe		Amount	0 ft		Reason			Wet Shoe	
Mix Water:		pH 06	Mix Water Chloride:			500 ppm		Mix Water Temperature:	67 °F °C
Cement Temperature:		## °F °C	Plug Displaced by:			8.33lb/gal		Disp. Temperature:	67 °F °C
Plug Bumped?		Yes	Bump Pressure:			3000 psi MPa		Floats Held?	Yes
Cement Returns:		bbl m3	Returns Density:			lb/gal kg/m3		Returns Temperature:	## °F °C
Comment Got Trace Spacer to surface. Est Tot-5950', TOL-2760', TOCAP-2300'									

2.0 Real-Time Job Summary

2.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	Truck 1 Pressure (psi)	Truck 1 Density (ppg)	Truck 1 Slurry Rate (bbl/min)	Comments
Event	1	Call Out	Call Out	7/3/2018	22:00:00	USER				CALLOUT FOR AN ON LOCATION TIME OF 0500
Event	2	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	7/4/2018	02:45:00	USER				ROUTE AND HAZARDS DISCUSSED, JOURNEY CALLED IN
Event	3	Depart Shop for Location	Depart Shop for Location	7/4/2018	03:00:00	USER				LEAVE YARD FOR LOCATION
Event	4	Arrive At Loc	Arrive At Loc	7/4/2018	04:00:00	USER				ARRIVE ON LOCATION, RIG HAD 3000' OF CASING LEFT TO RUN, LOCATION AND HAZARDS ASSESSED
Event	5	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	7/4/2018	04:15:00	USER				SAFETY MEETING HELD PRIOR TO RIGGING UP
Event	6	Start Job	Start Job	7/4/2018	10:15:43	COM11	1.00	6.77	0.00	BEGIN RECORDING JOB DATA
Event	7	Test Lines	Test Lines	7/4/2018	10:19:51	COM11	389.00	8.35	0.00	TEST CEMENT LINES TO 7000 PSI AND N2 LINES TO 9000 PSI. BOTH SUCCESSFUL. LEFT 2000 PSI ON N2 LINES FOR START OF FOAM
Event	8	Drop Bottom Plug	Drop Bottom Plug	7/4/2018	10:49:58	USER	27.00	8.38	0.00	DROP BOTTOM PLUG. VERIFIED BY COMPANY MAN
Event	9	Pump Spacer 1	Pump Spacer 1	7/4/2018	10:50:52	COM11	27.00	8.36	0.00	PUMP 50 BBLS OF MUD FLUSH III AT 5 BBLS/MIN
Event	10	Pump Spacer 2	Pump Spacer 2	7/4/2018	11:04:19	COM11	592.00	8.35	0.00	PUMP 100 BBLS OF 12.5PPG TUNED SPACER III AT 5

										BBLs/MIN
Event	11	Check Weight	Check Weight	7/4/2018	11:15:44	COM11	893.00	12.74	5.00	VERIFY DENSITY WITH PRESSURIZED MUD SCALE.
Event	12	Pump Lead Cement	Pump Cap Cement	7/4/2018	11:27:31	COM11	173.00	12.43	0.00	PUMP 21 BBLS OF 15.6PPG HALCEM CAP CEMENT (100 SACKS) AT 5 BBLS/MIN
Event	13	Check Weight	Check Weight	7/4/2018	11:31:27	COM11	178.00	12.43	0.00	VERIFY DENSITY WITH PRESSURIZED MUD SCALE.
Event	14	Pump Foam Cement	Pump Foam Cement	7/4/2018	11:40:53	COM11	703.00	15.64	5.00	PUMP 130.5 BBLS 15.6PPG LEAD CEMENT FOAMED DOWN TO 13.7 PPG (620 SACKS) AT 5 BBLS/MIN. 48 GALLONS FOAMER USED, 68,200 SCFT N2 USED.
Event	15	Check Weight	Check Weight	7/4/2018	11:51:23	COM11	813.00	15.59	5.00	VERIFY DENSITY WITH PRESSURIZED MUD SCALE.
Event	16	Pump Tail Cement	Pump Tail Cement	7/4/2018	12:09:24	COM11	1177.00	15.06	5.00	PUMP 230.5 BBLS OF 14.4PPG TAIL CEMENT (760 SACKS) AT 5 BBLS/MIN
Event	17	Check Weight	Check Weight	7/4/2018	12:15:43	COM11	473.00	14.53	5.00	VERIFY DENSITY WITH PRESSURIZED MUD SCALE.
Event	18	Check Weight	Check Weight	7/4/2018	12:32:41	COM11	479.00	14.47	5.00	VERIFY DENSITY WITH PRESSURIZED MUD SCALE.
Event	19	Drop Top Plug	Drop Top Plug	7/4/2018	13:08:17	COM11	11.00	11.85	0.00	SHUT DOWN, CLOSE RIG CHOKES, WASH PUMPS AND LINES, DROP TOP PLUG, VERIFIED BY COMPANY MAN
Event	20	Pump Displacement	Pump Displacement	7/4/2018	13:18:07	COM11	138.00	8.06	4.80	PUMP 267 BBLS DISPLACEMENT, FIRST 20 BBLS WITH MMCR, 207 BBLS WITH BIOCID, LAST 40 BBLS WITH FRESH
Event	21	Spacer Returns to	Spacer Returns to Surface	7/4/2018	13:52:39	USER	2246.00	8.43	5.00	MUD FLUSH III TO SURFACE

Surface										200 BBLS INTO DISPLACEMENT
Event	22	Bump Plug	Bump Plug	7/4/2018	14:11:31	COM11	3040.00	8.45	0.00	BUMP PLUG AT 2270 PSI. BROUGHT UP TO 3040 PSI TO ENSURE SEAT. INTERFACE OF TUNED SPACER BACK TO SURFACE.
Event	23	Pressure Up Well	Pressure Up Well	7/4/2018	14:13:29	COM11	3063.00	8.46	0.00	PRESSURE UP TO SHEAR WEATHERFORD WET SHOE SUB. SHEARED AT 3619 PSI, PUMPED 5 BBL WET SHOE.
Event	24	Check Floats	Check Floats	7/4/2018	14:16:10	USER	1457.00	8.42	0.00	FLOATS HELD. 2 BBLS BACK TO THE TRUCK. RIG TO CLOSE CHOKES AFTER FLUSHING STACK.
Event	25	End Job	End Job	7/4/2018	14:17:01	COM11	13.00	8.37	0.00	STOP RECORDING JOB DATA
Event	26	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	7/4/2018	14:20:00	USER	10.00	8.37	0.00	SAFETY MEETING HELD PRIOR TO RIGGING DOWN
Event	27	Depart Location Safety Meeting	Depart Location Safety Meeting	7/4/2018	15:25:00	USER				SAFETY MEETING HELD PRIOR TO DEPARTING LOCATION, ROUTE AND HAZARDS DISCUSSED, JOURNEY CALLED IN
Event	28	Depart Location	Depart Location	7/4/2018	15:30:00	USER				DEPART LOCATION