

HALLIBURTON

iCem[®] Service

PDC ENERGY - EBUS

Ft. Lupton District, COLORADO

For:

Date: Thursday, December 20, 2018

THISTLE DOWN

WELD

Case 1

Sincerely,

Legal Notice

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The Road to Excellence Starts with Safety

Sold To #: 304535		Ship To #: 3819719		Quote #: 0022519509		Sales Order #: 0905355052					
Customer: PDC ENERGY-EBUS				Customer Rep: CHRIS							
Well Name: THISTLE DOWN			Well #: 31H-302		API/UWI #: 05-123-45258-00						
Field: WATTENBERG		City (SAP): KERSEY		County/Parish: WELD		State: COLORADO					
Legal Description: NE SW-31-5N-64W-1444FSL-1357FWL											
Contractor: ENSIGN DRLG				Rig/Platform Name/Num: ENSIGN 152							
Job BOM: 7523 7523											
Well Type: HORIZONTAL OIL											
Sales Person: HALAMERICA\HX38199				Srv Supervisor: Lance Carpenter							
Job											
Formation Name											
Formation Depth (MD)		Top		Bottom							
Form Type				BHST							
Job depth MD		12487 FT		Job Depth TVD		6920					
Water Depth				Wk Ht Above Floor		4					
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			0	1675			
Casing		5.5	4.778	20			0	12481			
Open Hole Section			8.5				1675	6700			
Open Hole Section			8.5				6700	12487			
Tools and Accessories											
Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make		
Guide Shoe	5.5			12481		Top Plug	5.5	1	WEATH		
Float Shoe	5.5					Bottom Plug	5.5	1	WEATH		
Float Collar	5.5			12467		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	12.5 lb/gal Tuned Spacer III	Tuned Spacer III			150	bbl	12.5	2.74			
203.65 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	
2	Gasstop B1	GASSTOP (TM) SYSTEM	615	sack	13.2	1.55		6	7.61	
5.01 Gal		FRESH WATER								
0.10 Gal		D-AIR 3000L, TOTETANK (101396181)								
0.35 %		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	
3	ElastiCem	ELASTICEM (TM) SYSTEM	830	sack	14.4	1.7		8	7.3	
0.45 %		HR-5, 50 LB SK (100005050)								
7.30 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	MMCR Displacement	MMCR Displacement	20	bbl	8.34					
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	
5	Displacement fluid		276	bbl	8.34					
Cement Left In Pipe		Amount	45 ft		Reason			Shoe Joint		
Mix Water:		pH 7	Mix Water Chloride:		200 ppm		Mix Water Temperature:		65 °F °C	
Cement Temperature:		35 °F °C		Plug Displaced by:		8.34 lb/gal WATER		Disp. Temperature:		62 °F °C
Plug Bumped?		Yes		Bump Pressure:		2200 psi		Floats Held?		Yes
Cement Returns:		0 bbl		Returns Density:		12.5 lb/gal kg/m3		Returns Temperature:		## °F °C
Comment JOB WENT WELL. PRESSURES CLOSE TO CALCULATED. SPACER RETURNS AT 220 BBL AWAY DISPLACEMENT SO CALCULATED. WET SHOE SUB OPENED AT 3750, 5 BBL WET SHOE PUMPED BEHIND. FLOATS HELD 2 BBL BACK.										

1.0 Real-Time Job Summary

1.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	DS Pump Press (psi)	DH Density (ppg)	Comb Pump Rate (bbl/min)	Pump Stg Tot (bbl)	Comments
Event	1	Call Out	Call Out	12/20/2018	04:00:00	USER					CREW CALLED OUT FOR JOB. ON LOCATION READY TO PUMP AT 1200
Event	2	Depart from Service Center or Other Site	Depart from Service Center or Other Site	12/20/2018	09:00:00	USER					CREW HAS JOURNEY MANAGEMENT SAFETY MEETING DISCUSSING HAZARDS, ROUTE, CONVOY ORDER AND THEN DEPARTS FROM THE YARD FOR LOCATION
Event	3	Arrive At Loc	Arrive At Loc	12/20/2018	10:00:00	USER					CREW ARRIVES AT LOCATION. CASING JUST LANDED AND RIG BEGAN FILLING PIPE. CAUGHT CIRCULATION AT 1015 AND WANT TO CIRCULATE FOR 3 HOURS
Event	4	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	12/20/2018	10:15:00	USER					CREW HAS PRE RIG UP SAFETY MEETING DISCUSSING EQUIPMENT LAYOUT, HAZARDS, RIG OPERATIONS AND ROLES
Event	5	Pre-Job Safety Meeting	Pre-Job Safety Meeting	12/20/2018	13:20:00	USER	9.00	8.51	0.00	12.40	CREW, RIG CREW AND CUSTOMER REPS HAVE PRE JOB SAFETY MEETING DISCUSSING HAZARDS, ROLES, RED ZONES, JOB PROCEEDURE, ETC
Event	6	Drop Bottom Plug	Start Job	12/20/2018	13:58:33	COM6	7.00	8.49	0.00	12.40	

Event	7	Test Lines	Test Lines	12/20/2018	13:58:38	COM6	7.00	8.49	0.00	12.40	FILL LINES AND PRESSURE TEST TO 4500 PSI FOR A FEW MINUTES
Event	8	Drop Bottom Plug	Drop Bottom Plug	12/20/2018	14:11:37	USER	7.00	8.47	0.00	15.50	DROP WEATHERFORD BOTTOM PLUG
Event	9	Pump Spacer 1	Pump Spacer 1	12/20/2018	14:14:28	COM6	9.00	8.46	0.00	15.50	PUMP 150 BBL 12.5# TUNED SPACER 2.74 YIELD 16.9 GAL
Event	10	Check Weight	Check Weight	12/20/2018	14:33:32	COM6	442.00	11.77	6.10	53.40	
Event	11	Pump Lead Cement	Pump Lead Cement	12/20/2018	14:52:49	COM6	312.00	13.57	6.00	168.10	PUMP 169 BBL GASSTOP 13.2# 1.55 YIELD 7.61 GAL 615 SKS
Event	12	Check Weight	Check Weight	12/20/2018	15:09:11	COM6	349.00	13.33	6.90	104.00	
Event	13	Check Weight	Check Weight	12/20/2018	15:10:21	COM6	369.00	13.64	6.90	112.10	
Event	14	Pump Tail Cement	Pump Tail Cement	12/20/2018	15:25:08	COM6	336.00	13.39	6.00	0.10	PUMP 251 BBL ELASTICEM 14.4# 1.7 YIELD 7.3 GAL 830 SKS
Event	15	Check Weight	Check Weight	12/20/2018	15:29:16	COM6	589.00	14.44	7.00	26.00	
Event	16	Shutdown	Shutdown	12/20/2018	15:59:11	USER	664.00	14.38	8.00	262.80	SHUTDOWN. BLOW LINES BACK TO PIT. WASH UP PUMPS TO THE PIT
Event	17	Drop Top Plug	Drop Top Plug	12/20/2018	16:14:05	COM6	11.00	8.62	0.00	273.70	DROP WEATHERFORD TOP PLUG
Event	18	Pump Displacement	Pump Displacement	12/20/2018	16:14:16	COM6	10.00	8.62	0.00	273.70	PUMP 276 BBL DISPLACEMENT. FIRST 20 BBLS MMCR. ALL BUT LAST 36 BBLS ADDED BIOCID
Event	19	Other	Other	12/20/2018	16:50:24	USER	2772.00	8.56	7.00	230.80	SPACER RETURNS TO SURFACE AT 220 BBL AWAY

Event	20	Slow Rate	Slow Rate	12/20/2018	16:54:00	USER	2704.00	8.56	7.00	256.10	SLOW RATE AT 250 BBL AWAY TO BUMP
Event	21	Bump Plug	Bump Plug	12/20/2018	16:58:07	USER	2837.00	8.56	0.00	266.90	BUMP PLUG AT 2200 PSI. TOOK TO 2800 FOR 3 MINUTES. CALCULATED DISPLACEMENT
Event	22	Other	Other	12/20/2018	16:59:31	USER	2998.00	8.56	1.70	267.10	OPEN WET SHOE SUB AT 3750 PSI. PUMP 5 BBL WATER BEHIND FOR WET SHOE
Event	23	Check Floats	Check Floats	12/20/2018	17:01:16	USER	2255.00	8.56	4.00	272.70	CHECK FLOATS. FLOATS HELD. 2 BBL BACK
Event	24	Post-Job Safety Meeting (Pre Rig-Down)	Post-Job Safety Meeting (Pre Rig-Down)	12/20/2018	17:05:00	USER	18.00	8.51	0.00	273.00	CREW HAS POST JOB SAFETY MEETING DISCUSSING RIG DOWN, HAZARDS, ROLES, ETC
Event	25	Depart Location	Depart Location	12/20/2018	18:30:00	USER					CREW IS RIGGED DOWN. HAS JOURNEY MANAGEMENT SAFETY MEETING DISCUSSING ROUTE, HOURS OF SERVICE, HAZARDS AND DEPARTS LOCATION