

# HALLIBURTON

iCem<sup>®</sup> Service

## **PDC ENERGY - EBUS**

Ft. Lupton District, COLORADO

## **For: VAUGHN**

Date: Tuesday, January 15, 2019

## **THISTLE DOWN**

WELD

PDC THISTLE DOWN 31G-402 PRODUCTION SO 905410292

Job Date: Tuesday, January 15, 2019

Sincerely,

**SAM CARPENTER**

## Legal Notice

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*The Road to Excellence Starts with Safety*

<b>Sold To #:</b> 304535		<b>Ship To #:</b> 3835189		<b>Quote #:</b>		<b>Sales Order #:</b> 0905410292					
<b>Customer:</b> PDC ENERGY-EBUS				<b>Customer Rep:</b> VAUGHN							
<b>Well Name:</b> THISTLE DOWN			<b>Well #:</b> 31G-402		<b>API/UWI #:</b> 05-123-45746-00						
<b>Field:</b> WATTENBERG		<b>City (SAP):</b> KERSEY		<b>County/Parish:</b> WELD		<b>State:</b> COLORADO					
<b>Legal Description:</b> NE SW-31-5N-64W-1519FSL-1357FWL											
<b>Contractor:</b> ENSIGN DRLG				<b>Rig/Platform Name/Num:</b> ENSIGN 152							
<b>Job BOM:</b> 7523 7523											
<b>Well Type:</b> HORIZONTAL OIL											
<b>Sales Person:</b> HALAMERICA\HX38199				<b>Srvs Supervisor:</b> Lance Carpenter							
<b>Job</b>											
<b>Formation Name</b>											
<b>Formation Depth (MD)</b>		<b>Top</b>		<b>Bottom</b>							
<b>Form Type</b>					<b>BHST</b>						
<b>Job depth MD</b>		12856ft		<b>Job Depth TVD</b>		7705					
<b>Water Depth</b>					<b>Wk Ht Above Floor</b>		5				
<b>Perforation Depth (MD)</b>		<b>From</b>		<b>To</b>							
<b>Well Data</b>											
<b>Description</b>	<b>New / Used</b>	<b>Size in</b>	<b>ID in</b>	<b>Weight lbm/ft</b>	<b>Thread</b>	<b>Grade</b>	<b>Top MD ft</b>	<b>Bottom MD ft</b>	<b>Top TVD ft</b>	<b>Bottom TVD ft</b>	
Casing		9.625	8.921	36			0	2562			
Casing		5.5	4.778	20			0	12856			
Open Hole Section			8.5				2562	6700			
Open Hole Section			8.5				6700	12863			
<b>Tools and Accessories</b>											
<b>Type</b>	<b>Size in</b>	<b>Qty</b>	<b>Make</b>	<b>Depth ft</b>		<b>Type</b>	<b>Size in</b>	<b>Qty</b>	<b>Make</b>		
<b>Guide Shoe</b>	5.5			12856		<b>Top Plug</b>	5.5	1			
<b>Float Shoe</b>	5.5					<b>Bottom Plug</b>	5.5	1			
<b>Float Collar</b>	5.5			12842		<b>SSR plug set</b>	5.5		HES		
<b>Insert Float</b>	5.5					<b>Plug Container</b>	5.5	1	HES		
<b>Stage Tool</b>	5.5					<b>Centralizers</b>	5.5		HES		
<b>Fluid Data</b>											
<b>Stage/Plug #:</b> 1											
<b>Fluid #</b>	<b>Stage Type</b>	<b>Fluid Name</b>			<b>Qty</b>	<b>Qty UoM</b>	<b>Mixing Density lbm/gal</b>	<b>Yield ft3/sack</b>	<b>Mix Fluid Gal</b>	<b>Rate bbl/min</b>	<b>Total Mix Fluid Gal</b>
1	12.5 lb/gal Tuned Spacer III	Tuned Spacer III			150	bbl	12.5	2.72	16.8		

205.69 lbm/bbl	<b>BARITE, BULK (100003681)</b>								
34.60 gal/bbl	<b>FRESH WATER</b>								
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	1040	sack	13.2	1.55		6	7.73
5.13 Gal	<b>FRESH WATER</b>								
0.10 Gal	<b>D-AIR 3000L, TOTETANK (101396181)</b>								
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	876	sack	14.4	1.7		8	7.29
0.50 %	<b>HR-5, 50 LB SK (100005050)</b>								
7.32 Gal	<b>FRESH WATER</b>								
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	<b>MICRO MATRIX CEMENT RETARDER, 5 GAL PAIL (100003781)</b>								
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		265	bbl	8.34				
Cement Left In Pipe	Amount	14 ft	Reason				Shoe Joint		
Mix Water:	pH 7	Mix Water Chloride:	150 ppm	Mix Water Temperature:			68 °F °C		
Cement Temperature:	## °F °C	Plug Displaced by:	## lb/gal kg/m3 XXXX	Disp. Temperature:			## °F °C		
Plug Bumped?	Yes	Bump Pressure:	2420 psi MPa	Floats Held?			Yes		
Cement Returns:	## bbl m3	Returns Density:	13 lb/gal kg/m3	Returns Temperature:			## °F °C		
<b>Comment</b> JOB WENT WELL. ALL 150 BBL SPACER TO SURFACE AND 30 BBL CEMENT TO SURFACE. BUMP PLUG FINAL CIRCULATING PRESSURE 2420 AT 3 BPM. TOOK TO 2900 PSI AND HELD FOR 5 MINUTES. PRESSURED UP TO 3850 TO OPEN WET SHOE SUB AND PUMPED 5 BBL. FULL RETURNS THROUGHOUT THE JOB. TOP OF TAIL 6200'									

## 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	Check Floats	Call Out	1/15/2019	00:00:00	USER					CREW CALLED OUT WHILE ON ANOTHER LOCATION. ON LOCATION TIME 0930
Event	2	Depart Shop for Location	Depart Shop for Location	1/15/2019	07:30:00	USER					CREW HAS JOURNEY MANAGEMENT SAFETY MEETING DISCUSSING ROUTE, CONVOY ORDER, FOLLOWING DISTANCE AND DEPARTS FOR LOCATION
Event	3	Arrive At Loc	Arrive At Loc	1/15/2019	08:30:00	USER					CREW ARRIVES AT LOCATION. SPILL CONTAINMENT NOT ARRIVED YET. RIG RIH CASING 10800'.
Event	4	Comment	Comment	1/15/2019	09:30:00	USER					SPILL CONTAINMENT ARRIVES. CREW HAS PRE RIG UP SAFETY MEETING DISCUSSING ROLES, HAZARDS, OTHER OPERATIONS AND BEGIN SPOTTING EQUIPMENT AND RIGGING UP
Event	5	Casing on Bottom	Casing on Bottom	1/15/2019	10:45:00	USER					CASING ON BOTTOM. RIG BEGINS CIRCULATION. CIRCULATED 10 BPM AT 800 PSI, FULL RETURNS
Event	6	Comment	Comment	1/15/2019	13:45:00	USER	15.00	8.42	0.00	32.80	CREW RIGGED UP TO THE FLOOR. WAITING ON SAFETY MEETING TO BEGIN. LATEX MIXED UP AND SHEARED FOR 1 HOUR

Event	7	Safety Meeting - Pre Job	Safety Meeting - Pre Job	1/15/2019	14:45:00	USER	13.00	8.41	0.00	32.80	CREW, RIG CREW AND CUSTOMER REP HAVE PRE JOB SAFETY MEETING DISCUSSING HAZARDS, JOB PROCEEDURE, RED ZONES, ROLES AND RESPONSIBILITES
Event	8	Start Job	Start Job	1/15/2019	14:56:53	COM6	22.00	8.41	0.00	32.80	START JOB
Event	9	Test Lines	Test Lines	1/15/2019	15:08:57	COM6	12.00	8.57	0.00	32.80	FILL LINES WITH 3 BBL WATER. TEST HES LINES TO 4500 PSI. HOLD FOR 5 MINUTES. TEST GOOD.
Event	10	Pump Spacer 1	Pump Spacer 1	1/15/2019	15:21:56	COM6	43.00	8.49	0.00	0.00	PUMP 150 BBL 12.5# TUNED SPACER 1.55 YIELD 16.8 GAL
Event	11	Drop Bottom Plug	Drop Bottom Plug	1/15/2019	15:45:44	COM6	142.00	12.10	4.00	137.20	LAUNCHED BOTTOM PLUG ON THE FLY AT END OF SPACER. SLOWED RATE TO 4 BPM
Event	12	Pump Lead Cement	Pump Lead Cement	1/15/2019	15:46:45	COM6	158.00	12.50	3.90	141.20	PUMP 287 BBL GASSTOP 13.2# 1.55 YIELD 7.73 GAL 1040 SACKS
Event	13	Pump Tail Cement	Pump Tail Cement	1/15/2019	16:29:36	COM6	214.00	13.72	4.00	311.30	PUMP 265 BBL ELASTICEM 14.4# 1.7 YIELD 7.29 GAL 876 SACKS
Event	14	Check Weight	Check Weight	1/15/2019	16:33:11	COM6	717.00	14.21	8.00	27.20	
Event	15	Shutdown	Shutdown	1/15/2019	17:10:38	USER	71.00	14.29	0.00	277.90	SHUTDOWN. BLOW DOWN LINES TO THE PIT. WASH PUMP TO THE PIT.
Event	16	Drop Top Plug	Drop Top Plug	1/15/2019	17:30:56	COM6	18.00	9.01	0.00	293.40	DROP TOP PLUG
Event	17	Pump Displacement	Pump Displacement	1/15/2019	17:32:24	COM6	14.00	8.36	0.00	293.40	PUMP 285 BBL WATER DISPLACEMENT 8.34# WITH MMCR IN THE FIRST 20 BBL AND BIOCIDIE IN ALL EXCEPT THE LAST 10 BBL

Event	18	Other	Other	1/15/2019	17:36:11	USER	106.00	8.34	4.90	17.00	CAUGHT CEMENT AT 18 BBL AWAY. PICKED RATE UP TO 8 BPM
Event	19	Slow Rate	Slow Rate	1/15/2019	18:15:02	USER	2733.00	8.38	5.50	261.20	SLOW RATE TO 3 BPM TO BUMP AT 260 AWAY
Event	20	Bump Plug	Bump Plug	1/15/2019	18:20:08	COM6	2852.00	8.37	0.80	277.50	BUMP PLUG. FINAL CIRCULATING PRESSURE 2420 PSI. TOOK TO 2900 PSI AND HELD FOR 5 MINUTES
Event	21	Other	Other	1/15/2019	18:26:26	USER	3065.00	8.37	0.00	277.50	OPEN WET SHOE SUB AT 3850 PSI. PUMP 5 BBL WET SHOE
Event	22	Check Floats	Check Floats	1/15/2019	18:29:52	USER	1989.00	8.36	0.00	283.90	CHECK FLOATS. FLOATS HELD. 2 BBL BACK
Event	23	Safety Meeting - Pre Rig-Down	Safety Meeting - Pre Rig-Down	1/15/2019	18:35:00	USER	11.00	8.32	0.00	283.90	CREW HAS PRE RIG DOWN SAFETY MEETING DISCUSSING HAZARDS, RIG OPERATIONS, ROLES AND BEGIN RIGGING DOWN EQUIPMENT
Event	24	Depart Location	Depart Location	1/15/2019	20:00:00	USER					CREW DEPARTS FROM LOCATION AFTER HAVING JOURNEY MANAGEMENT SAFETY MEETING DISCUSSING HOURS OF SERVICE, FOLLOWING DISTANCES, CONVOY ORDER AND ROUTE