

HALLIBURTON

iCem[®] Service

NOBLE ENERGY INC-EBUS

Date: Tuesday, December 26, 2017

Bison Ridge Y22-734 Production

Job Date: Sunday, December 17, 2017

Sincerely,

Adam McKay

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 **Bison Ridge Y22-734** 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.

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 [Ft. Lupton]

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Cementing Job Summary

The Road to Excellence Starts with Safety

Sold To #: 345242		Ship To #: 3822336		Quote #:		Sales Order #: 0904506510				
Customer: NOBLE ENERGY INC - EBUS				Customer Rep: Jim Turner						
Well Name: BISON RIDGE		Well #: Y22-734		API/UWI #: 05-123-45371-00						
Field: WATTENBERG		City (SAP): KEENESBURG		County/Parish: WELD		State: COLORADO				
Legal Description: NW SE-10-2N-64W-2230FSL-2060FEL										
Contractor: Noble				Rig/Platform Name/Num: H&P 524						
Job BOM: 7523 7523										
Well Type: HORIZONTAL OIL										
Sales Person: HALAMERICA\HB70026				Srv Supervisor: Nicholas Roles						
Job										
Formation Name										
Formation Depth (MD)		Top		Bottom						
Form Type				BHST		230 degF				
Job depth MD		17023ft		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		J-55	0	2039	0	2039
Casing	0	5.5	4.778	20	BTC	P-110	0	17023	0	6846
Open Hole Section			8.5				2039	17033	2039	6846
Tools and Accessories										
Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make	
Guide Shoe	5.5					Top Plug	5.5	1	HES	
Float Shoe	5.5			17023		Bottom Plug	5.5	2	HES	
Float Collar	5.5					SSR plug set	5.5		HES	
Insert Float	5.5					Plug Container	5.5		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 ft ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
1	11.5 lb/gal Tuned Spacer III	Tuned Spacer III	80	bbl	11.5	3.73		5		
0.60 gal/bbl		DUAL SPACER SURFACTANT B, 5 GAL PAIL (100003665)								
0.60 gal/bbl		MUSOL A, 330 GAL TOTE - (790828)								
149.34 lbm/bbl		BARITE, BULK (100003681)								

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Cementing Job Summary

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	ElastiCem	ELASTICEM (TM) SYSTEM	150	sack	13.2	1.57		8	7.53
7.53 Gal		FRESH WATER							
0.75 %		SCR-100 (100003749)							
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 w/ SCBL	ELASTICEM (TM) SYSTEM	538	sack	13.2	1.6		8	7.69
7.69 Gal		FRESH WATER							
0.40 %		SCR-100 (100003749)							
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	NeoCem NT1	NeoCem TM	1180	sack	13.2	2.04		8	9.75
9.75 Gal		FRESH WATER							
0.08 %		SCR-100 (100003749)							
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	MMCR Displacement	MMCR Displacement	20	bbl	8.33			10	
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
6	Displacement	Displacement	357	bbl	8.33			10	
Cement Left In Pipe		Amount	49 ft		Reason			Shoe Joint	
Comment Got 0 spacer to surface. Estimated TOL#1-1790', TOL#2-2783',TOT-6533'									

2.0 Real-Time Job Summary

2.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	DH Density (ppg)	Comb Pump Rate (bbl/min)	DS Pump Press (psi)	Comments
Event	1	Call Out	Call Out	12/17/2017	11:00:00	USER				Called out by Service Coordinator for O/L at 1600
Event	2	Depart Location Safety Meeting	Depart Location Safety Meeting	12/17/2017	13:45:00	USER				Held meeting with all personnel in convoy to discuss directions and hazards associated with drive, all fit to drive.
Event	3	Depart from Service Center or Other Site	Depart from Service Center or Other Site	12/17/2017	14:00:00	USER				Journey Management prior to departure
Event	4	Arrive at Location from Service Center	Arrive at Location from Service Center	12/17/2017	15:00:00	USER				Upon arrival met with company man to discuss job details and calculations, performed hazard hunt and site assessment.
Event	5	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	12/17/2017	15:15:00	USER				Discussed rigging up hazards and procedure according to HMS.
Event	6	Other	Other	12/17/2017	15:30:00	USER				Water test- PH-6, Chlor-0, Temp-55. Cement temp-55.
Event	7	Pre-Job Safety Meeting	Pre-Job Safety Meeting	12/17/2017	17:00:00	USER				Held safety meeting with all job associated personnel to discuss job procedure, hazards and stop work authority.
Event	8	Start Job	Start Job	12/17/2017	17:32:03	COM4				TD-17033', TP-17023' 5.5" 20#, FC-16974', TVD-6846', SURF-2039' 9.625" 36#, OH-8.5" MUD-9.3#
Event	9	Drop Bottom Plug	Drop Bottom Plug	12/17/2017	17:35:40	USER				Dropped by HES supervisor, witnessed by company man.
Event	10	Test Lines	Test Lines	12/17/2017	17:37:00	COM4	8.88		4364.00	Pumped 5bbls fresh water to fill lines, closed 2" lo torc, performed 500psi k/o function test, followed with 5th gear stall at 1320psi, Performed 3000psi test on Rig Kelly Line. Held pressure, no leaks. proceeded to bring pressure to 4500psi, held pressure, no leaks.
Event	11	Pump Spacer 1	Pump Spacer 1	12/17/2017	17:52:21	COM4	11.71	3.10	42.00	Pumped 80bbls Tuned Spacer III 11.5# 3.78y 23.5g/s with 50g Musol A, 50g Dual Spacer B and 20g D-Air at 5bpm 240psi.
Event	12	Drop Bottom Plug	Drop Bottom Plug	12/17/2017	18:13:26	USER				Dropped by HES supervisor, witnessed by company man.
Event	13	Pump Lead Cement	Pump Lead Cement	12/17/2017	18:17:38	COM4	13.28	6.00	394.00	Pumped 150sks or 41.9bbls Elasticem w/o CBL 13.2# 1.53y 7.53g/s at 8bpm 600psi.
Event	14	Check Weight	Check weight	12/17/2017	18:22:09	COM4	13.23	7.80	568.00	Weight verified with pressurized mud scales.

Event	15	Pump Lead Cement	Pump Lead Cement	12/17/2017	18:22:58	COM4	13.26	7.70	546.00	Pumped 538sks or 153bbls Elasticem w/CBL 13.2# 1.6y 7.69g/s at 8bpm 600psi.
Event	16	Check Weight	Check Weight	12/17/2017	18:30:28	USER	13.32	8.20	630.00	Weight verified with pressurized mud scales.
Event	17	Pump Tail Cement	Pump Tail Cement	12/17/2017	18:42:02	COM4	13.06	8.20	671.00	Pumped 1180sks or 429bbls 13.2# 2.04y 9.75g/s Neocem at 8bpm 920psi.
Event	18	Check Weight	Check weight	12/17/2017	18:56:37	COM4	13.19	8.20	915.00	Weight verified with pressurized mud scales.
Event	19	Check Weight	Check Weight	12/17/2017	19:16:16	USER	13.16	8.10	899.00	Weight verified with pressurized mud scales.
Event	20	Clean Lines	Clean Lines	12/17/2017	19:40:13	USER				Shutdown, rig blew air through lines to pits, followed with 5bbls fresh water through pumps and lines.
Event	21	Drop Top Plug	Drop Top Plug	12/17/2017	19:52:24	COM4				Dropped by HES supervisor, witnessed by company man.
Event	22	Pump Displacement	Pump Displacement	12/17/2017	19:52:29	COM4	8.11	10.10	192.00	Pumped 377bbls fresh water with 10g MMCR in first 20bbls, 15g Algicide throughout.
Event	23	Bump Plug	Bump Plug	12/17/2017	20:34:46	COM4	8.16	2.90	1762.00	Slowed down to 3bpm at 350bbls away, final circulating pressure-1800psi, bump pressure-2500PSI
Event	24	Check Floats	Check Floats	12/17/2017	20:38:48	USER				Released pressure and got 4bbls fresh water to truck, floats held.
Event	25	End Job	End Job	12/17/2017	20:42:20	COM4				Got 0bbl spacer to surface. Estimated TOL#1-1790', TOL#2-2783',TOT-6533'
Event	26	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	12/17/2017	20:45:00	USER				Discussed rigging down hazards and procedure according to HMS.
Event	27	Depart Location Safety Meeting	Depart Location Safety Meeting	12/17/2017	22:45:00	USER				Held meeting with all personnel in convoy to discuss directions and hazards associated with drive, all fit to drive.
Event	28	Depart Location for Service Center or Other Site	Depart Location for Service Center or Other Site	12/17/2017	23:00:00	USER				Pre journey management prior to departure.

3.0 Attachments

3.1 H&P 524 Bison Ridge Y22-734-Custom Results.png

