

HALLIBURTON

iCem[®] Service

EXTRACTION OIL & GAS-EBUS

Rinn Valley East N17-20-11N Production

Sincerely,
Meghan Jacobs

Legal Notice

Disclaimer:

All information in this report is provided subject to the terms and conditions which govern the services provided by Halliburton. Halliburton personnel use their best efforts in gathering information and their best judgment in interpreting it, but any interpretation, research, analysis or recommendation furnished by Halliburton are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and empirical relationships and assumptions are not infallible, and with respect to which professionals in the industry may differ. iCem 3D Displacement results are used to understand how fluids intermix during a cement job. Simulation and 3D displacement results are not intended as and should not be used as a replacement for bond logs in determining top of cement. Current 3D model calculations are known to model more volume than the input volume for standard cases due to known calculation improvements required. For rotational cases, the modeled volume will be impacted by the same calculations impacting the standard cases, as well as additional constraints imposed to make the calculation time required operationally feasible. Therefore, until further notice, 3D displacement results should not be used for replacement of a bond log, or used as an identifier of top of cement. HALLIBURTON IS UNABLE TO GUARANTEE THE ACCURACY OF ANY CHART INTERPRETATION, RESEARCH ANALYSIS, OR JOB RECOMMENDATION and any interpretation or recommendation is not for use of or reliance upon by any third party. The customer has full responsibility for any of its decisions which are based on the information provided in this report.

Table of Contents

1.0	Cementing Job Summary	4
1.1	Executive Summary	4
2.0	Real-Time Job Summary	7
2.1	Job Event Log	7
3.0	Attachments.....	9
3.1	Rinn Valley East N17-20-11N Production – Job Chart with Events.....	9
3.2	Rinn Valley East N17-20-11N Production – Job Chart without Events	10

1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Rinn Valley East N17-20-11N** 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 60bbls of cement 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 [Ft. Lupton]

HALLIBURTON

Cementing Job Summary

The Road to Excellence Starts with Safety

Sold To #: 369404		Ship To #: 3888634		Quote #:		Sales Order #: 0905032617					
Customer: EXTRACTION OIL & GAS				Customer Rep: Shayne Hackford							
Well Name: RINN VALLEY EAST			Well #: N17-20-11N			API/UWI #: 05-123-47176-00					
Field: WATTENBERG		City (SAP): FIRESTONE		County/Parish: WELD		State: COLORADO					
Legal Description: SE SE-18-2N-68W-198FSL-477FEL											
Contractor: PATTERSON-UTI ENERGY					Rig/Platform Name/Num: PATTERSON 346						
Job BOM: 7523 7523											
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		17873ft			Job Depth TVD		7350				
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	0	9.625	8.921	36		J-55	0	1658	0	1658	
Casing	0	5.5	4.778	20	BTC	P-110	0	17873	0	7350	
Open Hole Section			8.5				1658	17880	1658	7350	
Tools and Accessories											
Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make		
Guide Shoe	5.5			17873		Top Plug	5.5		HES		
Float Shoe	5.5					Bottom Plug	5.5		HES		
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 ft ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
1	11.5 lb/gal Tuned Spacer III	Tuned Spacer III			50	bbl	11.5	3.73		6	
Stage/Plug #: 2											
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	ElastiCem	ELASTICEM (TM) SYSTEM			2850	sack	13.2	1.57		8	7.53

HALLIBURTON

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
3	Displacement	Displacement	396	bbl	8.33			10	
Cement Left In Pipe		Amount	0 ft		Reason			Wet Shoe	
Mix Water:pH		07	Mix Water Chloride:		0 ppm		Mix Water Temperature:		
Cement Temperature:##		°F °C	Plug Displaced by:		8.33 lb/gal		Disp. Temperature:		
Plug Bumped?:		Yes	Bump Pressure:		3100 psi		Floats Held?:		
Cement Returns:		60 bbl	Returns Density:##		lb/gal kg/m ³		Returns Temperature:##		
Comment Got 60bbls Cement to surface.									

2.0 Real-Time Job Summary

2.1 Job Event Log

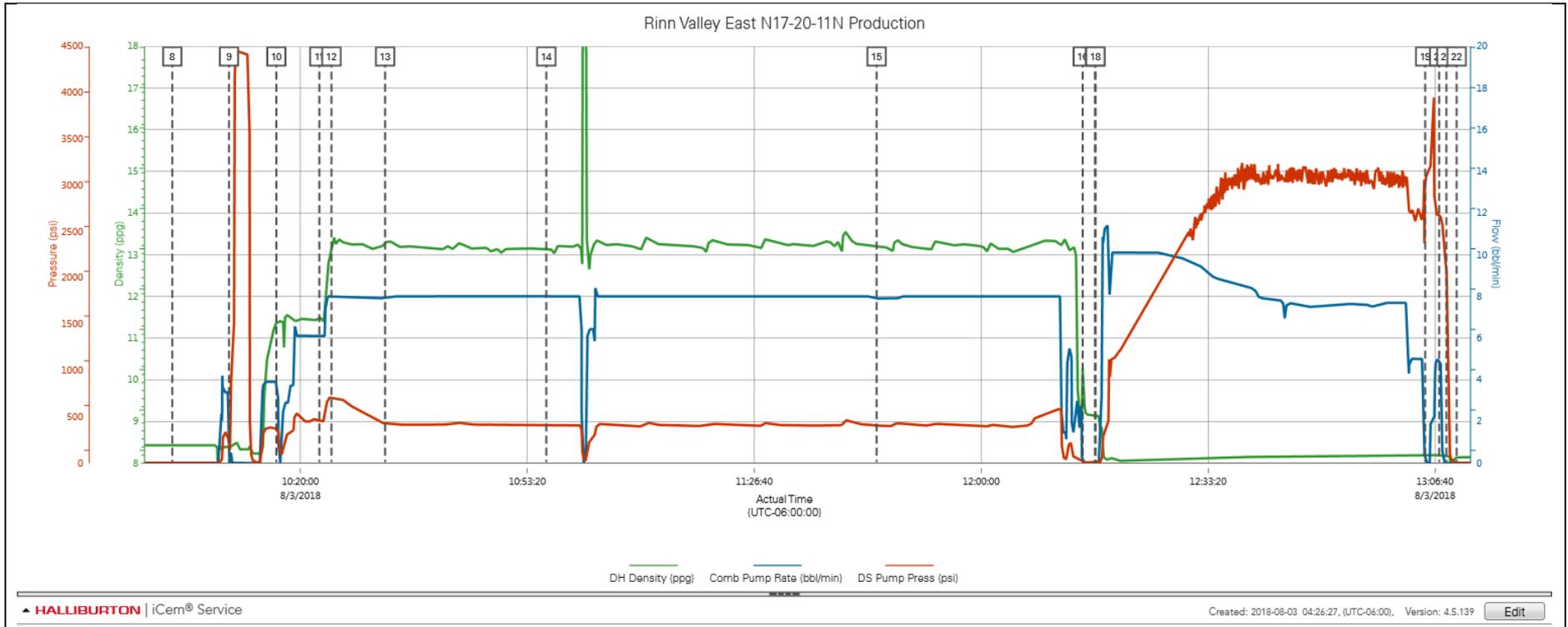
Type	Seq. No.	Activity	Graph Label	Date	Time	Source	DH Density (ppg)	Comb Pump Rate (bbl/min)	DS Pump Press (psi)	Comments
Event	1	Call Out	Call Out	8/3/2018	00:00:00	USER				Called out by Service Coordinator for O/L at 0600
Event	2	Depart Yard Safety Meeting	Depart Yard Safety Meeting	8/3/2018	03:15:00	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	8/3/2018	03:30:00	USER				Journey Management prior to departure
Event	4	Arrive at Location from Service Center	Arrive at Location from Service Center	8/3/2018	04:00:00	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	8/3/2018	04:30:00	USER				Discussed rigging up hazards and procedure according to HMS.
Event	6	Other	Other	8/3/2018	04:45:00	USER				Water test- PH-6, Chlor-0, Temp-85.
Event	7	Safety Meeting - Pre Job	Safety Meeting - Pre Job	8/3/2018	09:30:00	USER	8.43	0.00	5.00	Held safety meeting with all job associated personnel to discuss job procedure, hazards and stop work authority.
Event	8	Start Job	Start Job	8/3/2018	10:01:10	COM4	8.43	0.00	4.00	TD-17880', OH-8.5", TP-17873' 5.5" 20#, TVD-7350', SURF-1658' 9.625" 36#, MUD 10#
Event	9	Test Lines	Test Lines	8/3/2018	10:09:31	COM4	8.38	0.00	183.00	Pumped 5bbls fresh water to fill lines at 4bpm 320psi, shut manifold, and performed 500psi k/o function test, followed with 5th gear stall at 1800psi, proceeded to bring pressure to 4500psi, held well and no leaks.
Event	10	Pump Spacer 1	Pump Spacer 1	8/3/2018	10:16:28	COM4	11.37	3.90	403.00	Pumped 50bbls of 11.5# 3.78y 23.8g/s Tuned Spacer III with 25g Musol A, 25g Dual Spacer B and 10g D-air at 6bpm 447psi.
Event	11	Check Weight	Check Weight	8/3/2018	10:22:47	COM4	11.50	6.10	465.00	Weight verified with pressurized mud scales.
Event	12	Pump Lead Cement	Pump Lead Cement	8/3/2018	10:24:33	COM4	13.16	8.00	706.00	Pumped 2850sk or 797bbls of 13.2# 1.57y 7.53g/s

Elasticem at 8bpm 470psi.

Event	13	Check Weight	Check Weight	8/3/2018	10:32:26	COM4	13.29	7.90	426.00	Weight verified with pressurized mud scales.
Event	14	Check Weight	Check Weight	8/3/2018	10:56:07	COM4	13.14	8.00	413.00	Weight verified with pressurized mud scales.
Event	15	Check Weight	Check Weight	8/3/2018	11:44:38	COM4	13.16	7.90	401.00	Weight verified with pressurized mud scales.
Event	16	Shutdown	Shutdown	8/3/2018	12:14:54	COM4	10.22	0.00	10.00	Pumped 2bbls fresh water ahead of plug to clean lines.
Event	17	Drop Top Plug	Drop Top Plug	8/3/2018	12:16:43	COM4	9.13	0.00	6.00	Dropped by KLX tool hand, witnessed by company man and HES supervisor.
Event	18	Pump Displacement	Pump Displacement	8/3/2018	12:16:47	COM4	9.13	0.00	6.00	Pumped 396bbls fresh water at 8bpm.
Event	19	Bump Plug	Bump Plug	8/3/2018	13:05:13	COM4	8.19	0.00	3125.00	Slowed down at 370bbls away to 5bpm, final circulating pressure-2700psi. Bump pressure-3150psi.
Event	20	Pressure Up Well	Pressure Up Well	8/3/2018	13:07:17	COM4	8.18	4.80	2663.00	Pressured up to burst plug at 3950psi, continued to pump 5bbls at 5bpm 2650psi.
Event	21	Check Floats	Check Floats	8/3/2018	13:08:20	USER	8.17	0.00	2081.00	Released pressure and got 3bbls back. Floats held.
Event	22	End Job	End Job	8/3/2018	13:09:50	COM4	8.15	0.00	0.00	Got 60bbls Cement to surface.
Event	23	Safety Meeting - Pre Rig-Down	Safety Meeting - Pre Rig-Down	8/3/2018	13:15:00	USER	8.16	10.90	273.00	All HSE present. Discussed red zone areas and trapped pressure hazards. Watch for suspended loads and rig down procedures, including hand placement, lifting techniques, and swing radius.
Event	24	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	8/3/2018	14:45:00	USER				All HSE present and fit to drive. Aware of directions and hazards.
Event	25	Depart Location for Service Center or Other Site	Depart Location for Service Center or Other Site	8/3/2018	15:00:00	USER				Pre journey management prior to departure.

3.0 Attachments

3.1 Rinn Valley East N17-20-11N Production – Job Chart with Events



3.2 Rinn Valley East N17-20-11N Production – Job Chart without Events

