

HALLIBURTON

iCem[®] Service

TERRA ENERGY PARTNERS

For: Terra

Date: Saturday, September 08, 2018

CLOUGH NR 322-3 Production

Sincerely,

Grand Junction Cement Engineering

1.0 Real-Time Job Summary

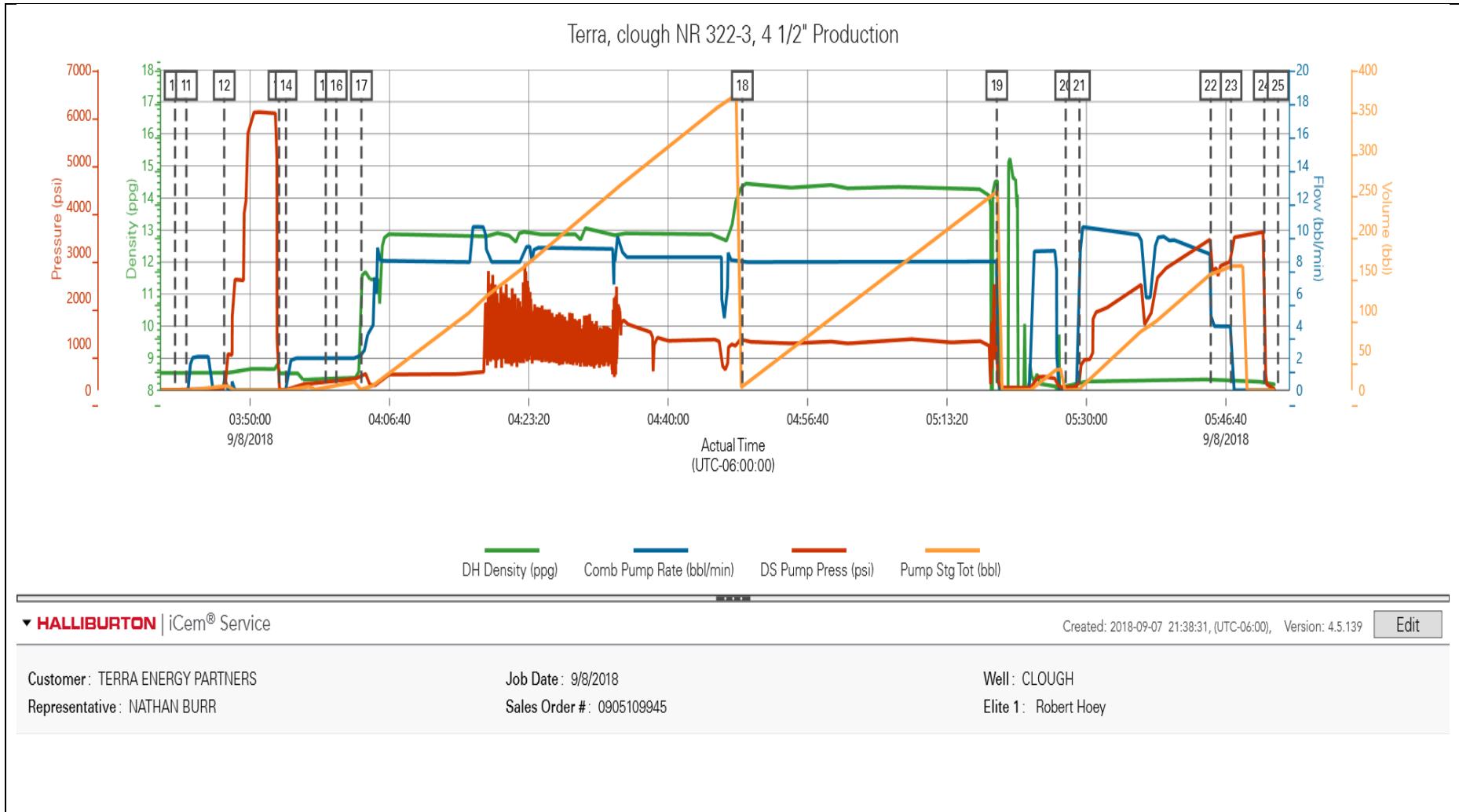
1.1 Job Event Log

Type	Seq. No.	Graph Label	Date	Time	Source	DH Density (ppg)	Comb Pump Rate (bbl/min)	DS Pump Press (psi)	Pump Stg Tot (bbl)	Comments
Event	1	Call Out	9/7/2018	16:00:00						Requested on Location @ 22:00
Event	2	Pre-Convoy Safety Meeting	9/7/2018	18:00:00						
Event	3	Crew Leave Yard	9/7/2018	18:05:00						1 Elite, 1 660, 1 pickup
Event	4	Arrive At Loc	9/7/2018	22:00:00						Rig running casing
Event	5	Assessment Of Location Safety Meeting	9/7/2018	22:10:00						JSA completed - Customer offered/received SDS - water test pH 7.0, Cl <200, temp 83 degrees
Event	6	Pre-Rig Up Safety Meeting	9/7/2018	22:15:00						
Event	7	Rig-Up Equipment	9/7/2018	22:25:00						DME iron to ground manifold, standpipe, hardline to pit. Water hoses to both uprights, bulk hoses to Silo and 660's.
Event	8	Other	9/7/2018	23:00:00						Rig Circulated 2 hrs prior to cement job at 5 bpm 1093 psi. Mud scales calibrated to drinking water prior to job.
Event	9	Pre-Job Safety Meeting	9/7/2018	23:40:31						All HES personnel, rig crew, and company rep.
Event	10	Start Job	9/8/2018	03:41:02						TD 10062', TP 10052', SJ 30.65', OH 8.75'', Csg 4.5'' 11.6 lb/ft P-110 Prev. Csg. 9.625'' 36# @ 1143', Mud 11.8 ppg.
Event	11	Fill Lines	9/8/2018	03:42:23		8.33	2	52	5	Fresh Water
Event	12	Test Lines	9/8/2018	03:46:55				6080		Held pressure 2 minutes
Event	14	Pump Spacer	9/8/2018	03:54:18		8.33	2	125	5	Fresh Water
Event	15	Pump Spacer	9/8/2018	03:59:03		8.4	2	212	10	80 lbs. Mud Flush III
Event	16	Check Weight	9/8/2018	04:00:19						Density verified via mud cup
Event	17	Pump Lead Cement	9/8/2018	04:03:19		12.7	8	1600	219.1	665 sks, 12.7 ppg, 1.85 yield, 8.94 gal/sk

Event	18	Pump Tail Cement	9/8/2018	04:48:51	14.2	8	1100	224.1	740 sks, 14.2 ppg, 1.7 Yield, 7.53 gal/sk
Event	19	Shutdown	9/8/2018	05:19:17					Wash lines to pit
Event	20	Drop Top Plug	9/8/2018	05:27:31					Co-Rep Verify Plug Launched
Event	21	Pump Displacement	9/8/2018	05:29:10	8.4	10	3220	155	3 lbs BE-6, 1 gal MMCR, 2% KCl
Event	22	Slow Rate	9/8/2018	05:44:52	8.4	4	2820	145	Slow Rate 10 bbls to Calculated Displacement
Event	23	Bump Plug	9/8/2018	05:47:17			3472		Plug Bumped at 2820 psi, Brought up to 3472 psi
Event	24	Check Floats	9/8/2018	05:51:16					Floats held – 2 bbl back
Event	25	End Job	9/8/2018	05:52:55					Good returns throughout job. Pipe was reciprocated during job.
Event	26	Pre-Rig Down Safety Meeting	9/8/2018	05:59:47					No sugar, HES top plug used, 0 add hours
Event	27	Rig-Down Equipment	9/8/2018	06:00:34					
Event	28	Pre-Convoy Safety Meeting	9/8/2018	06:01:44					
Event	29	Crew Leave Location	9/8/2018	06:02:53					Thanks for using Halliburton Cement, Chris Martinez and crew.

2.0 Attachments

2.1 CLOUGH NR322-3-Custom Results.png



Job Information

Request/Slurry	2497828/1	Rig Name	H&P 318	Date	29/AUG/2018
Submitted By	Lukas Van Zyl	Job Type	Production Casing	Bulk Plant	Grand Junction
Customer	Terra Energy Partners	Location	Garfield	Well	NR 322-3

Well Information

Casing/Liner Size	4.5 in	Depth MD	10093 ft	BHST	121°C / 250°F
Hole Size	8.75 in	Depth TVD	10014 ft	BHCT	88°C / 190°F
Pressure	6310 psi				

Drilling Fluid Information

Mud Supplier Name	Mud Trade Name	Density
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Cement Information - Lead Design

Conc	UOM	Cement/Additive	Sample Type	Sample Date	Lot No.	Cement Properties		
		NeoCem				Slurry Density	12.7	lbm/gal
						Slurry Yield	1.852	ft3/sack
						Water Requirement	8.959	gal/sack
						Total Mix Fluid	8.959	gal/sack
						Water Source	Fresh Water	
						Water Chloride		

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Operation Test Results Request ID 2497828/1

Thickening Time - ON-OFF-ON

03/SEP/2018

Test Temp (degF)	Pressure (psi)	Reached in (min)	30 Bc (hh:mm)	50 Bc (hh:mm)	70 Bc (hh:mm)	100 Bc (hh:mm)	Start Bc	Stirring before stop (mins)	Static Period (min)	Peak reading (BC)
190	6310	50	3:14	3:18	3:44	3:52	13	60	15	14

Total SKS = 665

CS1929 TR#8677 400 SKS

CS1932 TR#4080 265 SKS

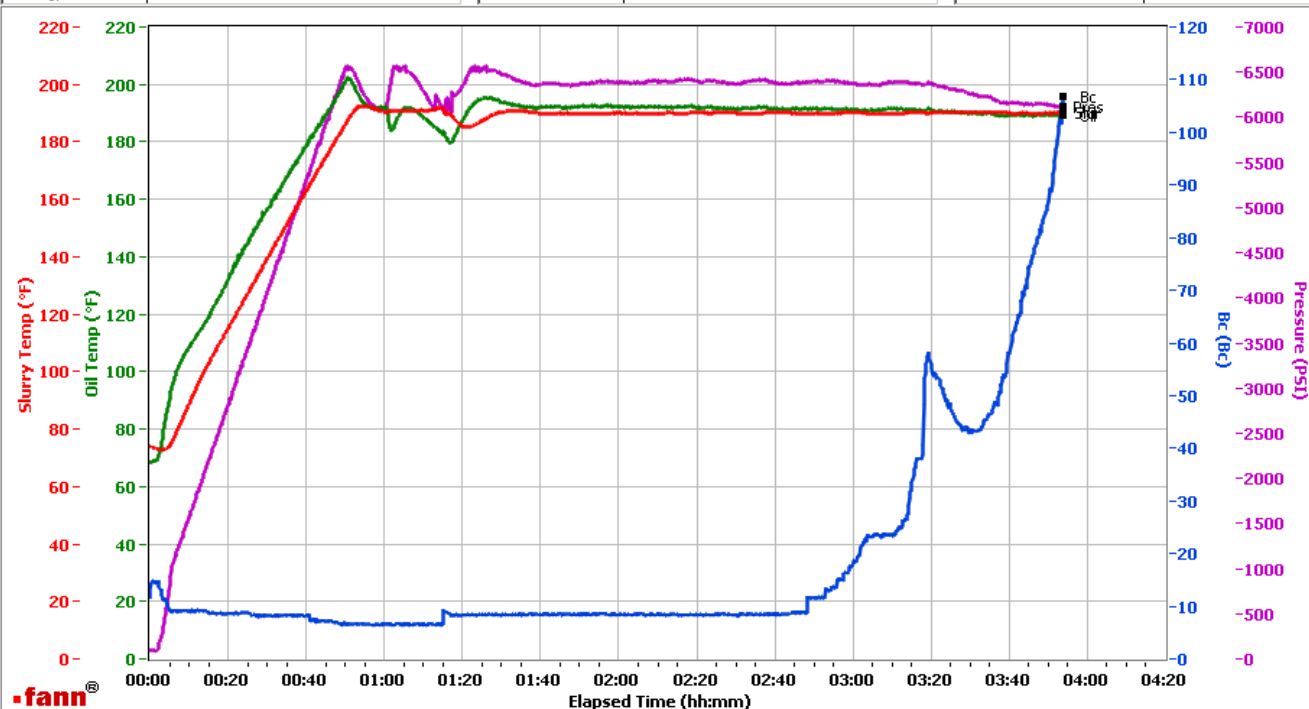
No deflection, 14Bc--- > 14Bc

Grand Junction, Colorado

Fields	Values
Project Name	GJ2497828-1 TERRA PRODUCTION BULK LE
Test ID	35777851
Request ID	GJ2497828-1 TT
Tested by	DEBA
Customer	TERRA ENERGY PARTNERS
Well No	NR 322-3
Rig	H8P 318
Casing/Liner Size	4.5"

Fields	Values
Job Type	PRODUCTION CASING
Cement Type	GCC TYPE I-II
Cement Weight	Standard
Test Date	09/02/18
Test Time	04:54 PM
Temp. Units	degF
Pressure Units	PSI
SW Version	2.1.0.507

Events	Results
30.00 Bc	03h:14m
40.00 Bc	03h:18m
50.00 Bc	03h:18m
70.00 Bc	03h:44m
100.00 Bc	03h:52m
00h:30m	8.15
01h:00m	6.57
01h:30m	8.24



Data File C:\Documents and Settings\M290\Desktop\Test Data\GJ2497828-1 TERRA PRODUCTION BULK LEAD.tdms

Comments CS1929 TR#8677 400 SKS AND CS1932 TR#4080 265 SKS

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HALLIBURTON

Rockies, Grand Junction

Lab Results- Tail

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Customer	Terra Energy Partners	Location	Garfield	Well	NR 322-3

Well Information

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Pressure	6310 psi				

Drilling Fluid Information

Mud Supplier Name	Mud Trade Name	Density
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Cement Information - Tail Design



<u>Conc</u>	<u>UOM</u>	<u>Cement/Additive</u>	<u>Sample Type</u>	<u>Sample Date</u>	<u>Lot No.</u>	<u>Cement Properties</u>		
		ThermaCem				Slurry Density	14.2	lbm/gal
						Slurry Yield	1.704	ft3/sack
						Water Requirement	7.53	gal/sack
						Total Mix Fluid	7.53	gal/sack
						Water Source	Fresh Water	
						Water Chloride		

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Operation Test Results Request ID 2497829/1

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Test Temp (degF)	Pressure (psi)	Reached in (min)	30 Bc (hh:mm)	50 Bc (hh:mm)	70 Bc (hh:mm)	100 Bc (hh:mm)	Start Bc	Stirring before stop (mins)	Static Period (min)	Peak reading (BC)
190	6310	50	2:41	2:43	2:46	2:52	13	60	15	13

Total sks = 740

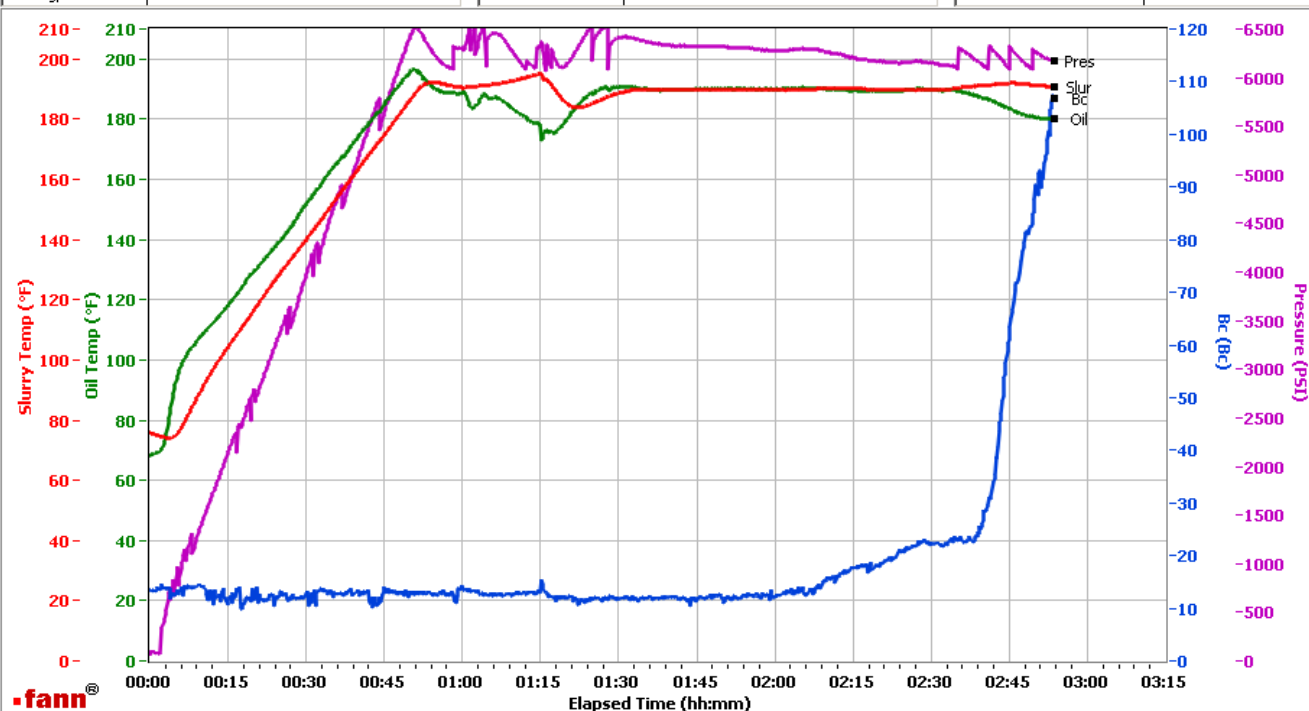
CS1930 TR#2878 370 sks

CS1931 TR#1513 370 sks

no deflection, 13Bc--- > 13Bc please note heat of hydration on the graph at 2:34

Grand Junction Colorado

Fields	Values	Fields	Values	Events	Results
Project Name	GJ2497829-1 TERRA PRODUCTION BULK TA	Job Type	production casing	30.00 Bc	02h:41m
Test ID	35777853	Cement Type	MOUNTAIN G	40.00 Bc	02h:42m
Request ID	GJ2497829-1 TT	Cement Weight	Standard	50.00 Bc	02h:43m
Tested by	DEBA	Test Date	09/02/18	70.00 Bc	02h:46m
Customer	TERRA ENERGY PARTNERS	Test Time	04:21 PM	100.00 Bc	02h:52m
Well No	NR 322-3	Temp. Units	degF	00h:30m	12.81
Rig	H&P 318	Pressure Units	PSI	01h:00m	14.32
Casing/Liner Size	4.5'	SW Version	2.1.0.1219	01h:30m	11.94



Data File C:\Documents and Settings\HPHT\Local Settings\Temporary Internet Files\Content.IE5\09ERK9UN\GJ2497829-1 TERRA PRODUCTION BULK TAIL[1].tdms

Comments CS1930 TR#2878 370 SKS AND CS1931 TR#1513 370 SKS

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