

# HALLIBURTON

iCem<sup>®</sup> Service

## **TERRA ENERGY PARTNERS**

United States of America, COLORADO

### **For: Terra**

Date: Thursday, May 31, 2018

### **Federal PA 11-26 Production PJR**

API #: 05-045-23704

Sincerely,

**Grand Junction Cement Engineering**

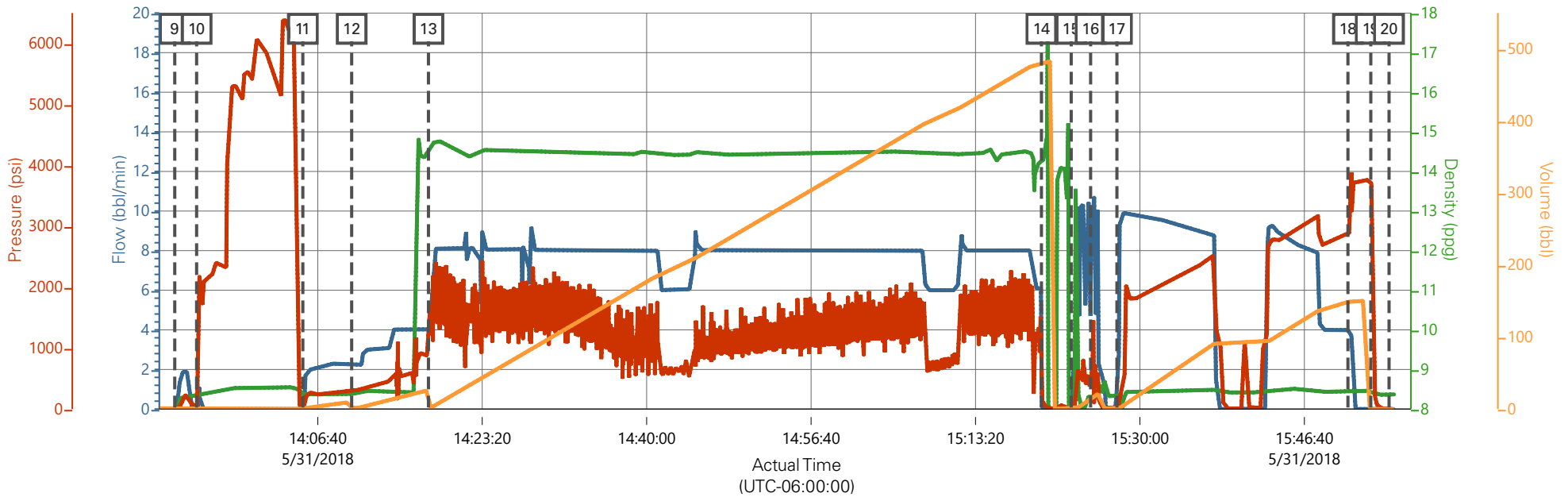
## 2.0 Real-Time Job Summary

### 2.1 Job Event Log

Type	Seq. No.	Graph Label	Date	Time	Source	Comb Pump Rate (bbl/min)	DH Density (ppg)	PS Pump Press (psi)	Pump Stg Tot (bbl)	Comments
Event	1	Call Out	5/31/2018	01:30:00	USER					REQUESTED ON LOCATION 5/31/18 @ 07:30
Event	2	Depart Yard Safety Meeting	5/31/2018	03:25:00	USER					JSA COMPLETED
Event	3	Crew Leave Shop	5/31/2018	03:30:00	USER					
Event	4	Arrive At Loc	5/31/2018	05:00:00	USER					RIG RUNNING CASING
Event	5	Assessment Of Location Safety Meeting	5/31/2018	05:05:00	USER					JSA COMPLETED
Event	6	Pre-Rig Up Safety Meeting	5/31/2018	05:15:00	USER					JSA COMPLETED
Event	7	Rig-Up Equipment	5/31/2018	05:20:00	USER					
Event	8	Pre-Job Safety Meeting	5/31/2018	11:00:00	USER					JSA COMPLETED
Event	9	Start Job	5/31/2018	13:52:10	COM4					4 1/2" - 11.6# CASING IN 8 3/4" OH, TD 9565', TP 9555', ST 33', MUD 12.6 PPG, WATER TEMP 65, PH 7, CHLORIDES 0
Event	10	Test Lines	5/31/2018	13:54:23	COM4			5000.00		TEST LINES TO 5000 PSI
Event	11	Pump Spacer 1	5/31/2018	14:05:09	COM4	2.50	8.33	300.00	10.00	10 BBL FRESHWATER
Event	12	Pump Spacer 2	5/31/2018	14:10:06	COM4	4.00	8.40	560.00	20.00	20 BBL MUDFLUSH
Event	13	Pump Lead Cement	5/31/2018	14:17:53	COM4	8.00	14.50	1700.00	456.10	456.1 BBL PRIMARY CEMENT, 1940 SKS @ 14.5 PPG / 1.32 YLD / 5.85 GAL/SK

Event	14	Shutdown	5/31/2018	15:20:01	COM4					
Event	15	Clean Lines	5/31/2018	15:23:02	COM4					
Event	16	Drop Top Plug	5/31/2018	15:25:00	COM4					PLUG AWAY
Event	17	Pump Displacement	5/31/2018	15:27:40	COM4	10.00	8.40	3160.00	147.60	147.6 BBL KCL WATER DISPLACEMENT, SLOW RATE AT 137 BBL AWAY, 3160 PSI TO 2680 PSI @ 4 BBL/MIN
Event	18	Bump Plug	5/31/2018	15:51:05	COM4	4.00	8.40	2900.00	147.6	PLUG BUMPED AT CALCULATED, FINAL CIRCULATING PRESSURE 2900 PSI, BROUGHT TO 3750 PSI
Event	19	Check Floats	5/31/2018	15:53:24	COM4					FLOATS HELD, 2.5 BBL BACK TO PUMP
Event	20	End Job	5/31/2018	15:55:15	COM4					GOOD RETURNS THROUGHOUT, PIPE WAS RECIPRICATED, NO SUGAR USED AND 1 ADD HOUR CHARGED
Event	21	Pre-Rig Down Safety Meeting	5/31/2018	16:25:00	USER					JSA COMPLETED
Event	22	Rig-Down Equipment	5/31/2018	16:30:00	USER					
Event	23	Pre-Convoy Safety Meeting	5/31/2018	17:25:00	USER					JSA COMPLETED
Event	24	Crew Leave Location	5/31/2018	17:30:00	USER					THANK YOU FOR CHOOSING HALLIBURTON CEMENTING OF GRAND JUNCTION, CO - RYAN MARTIN AND CREW

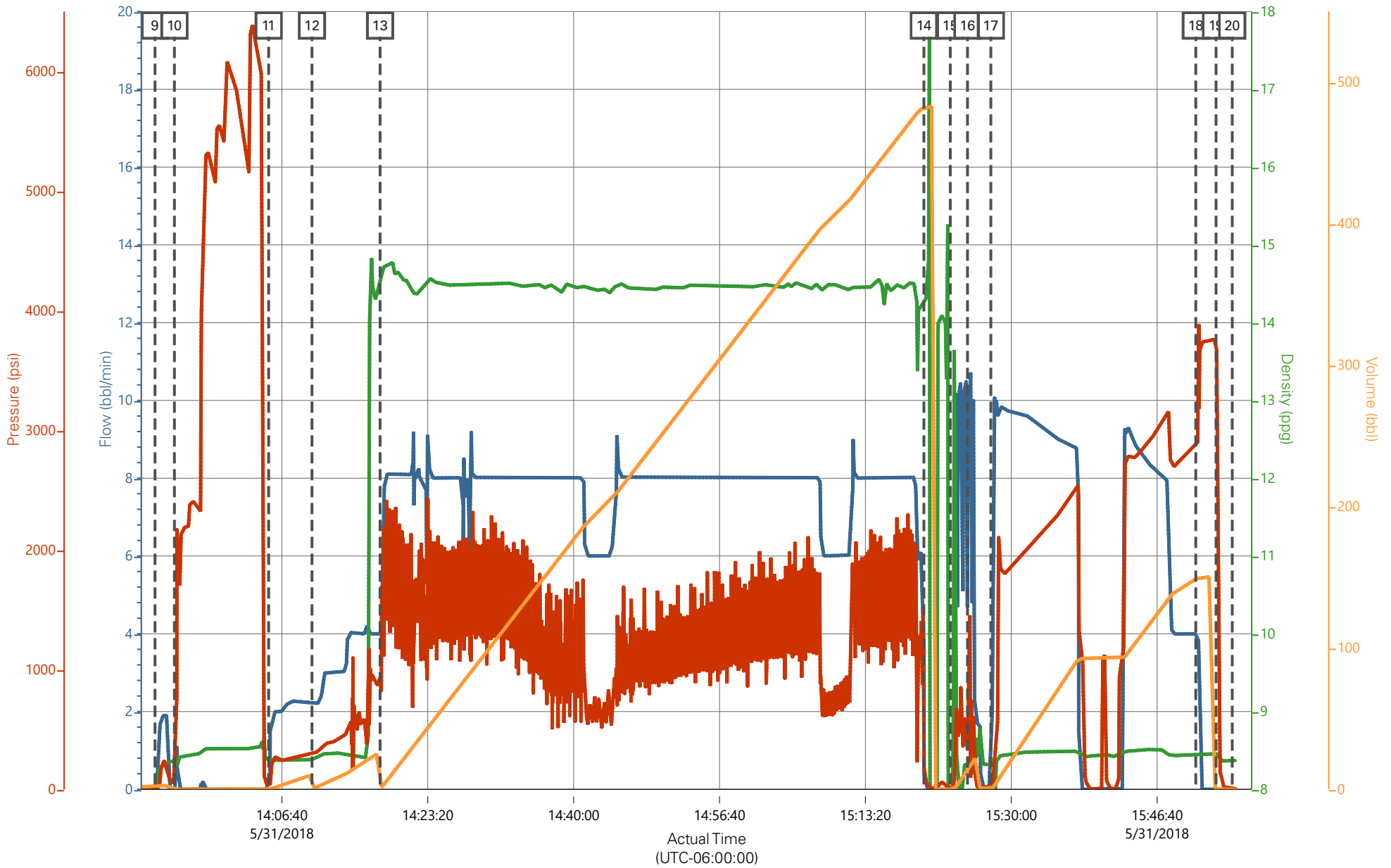
# TEP - FEDERAL PA 11-26 - 4 1/2" PRODUCTION CASING



— Comb Pump Rate (bbl/min) 0    
 — DH Density (ppg) 8.37    
 — PS Pump Press (psi) 6    
 — Pump Stg Tot (bbl) 0

Description	Actual Time (UTC-06:00:00)	Comb Pump Rate (bbl/min)	DH Density (ppg)	PS Pump Press (psi)	Pump Stg Tot (bbl)
9 Start Job	13:52:10	0.00	-0.16	4.00	1.20
10 Test Lines	13:54:23	0.00	8.36	48.00	0.00
11 Pump Spacer 1	14:05:09	0.00	8.38	30.00	0.00
12 Pump Spacer 2	14:10:06	2.30	8.38	298.00	0.20
13 Pump Lead Cement	14:17:53	4.00	14.53	904.00	0.50
14 Shutdown	15:20:01	3.60	14.22	208.00	482.90
15 Clean Lines	15:23:02	0.00	-0.35	4.00	0.00
16 Drop Top Plug	15:25:00	5.40	8.26	318.00	14.30
17 Pump Displacement	15:27:40	1.70	8.34	34.00	0.10
18 Bump Plug	15:51:05	4.00	8.43	2884.00	148.70
19 Check Floats	15:53:24	0.00	8.47	3766.00	0.00
20 End Job	15:55:15	0.00	8.37	5.00	0.00

# TEP - FEDERAL PA 11-26 - 4 1/2" PRODUCTION CASING



— Comb Pump Rate (bbl/min) 0    
 — DH Density (ppg) 8.37    
 — PS Pump Press (psi) 6    
 — Pump Stg Tot (bbl) 0

### Job Information

<b>Request/Slurry</b>	2476100/3	<b>Rig Name</b>	H&P 271	<b>Date</b>	21/MAY/2018
<b>Submitted By</b>	Connor Matthews	<b>Job Type</b>	Production Casing	<b>Bulk Plant</b>	Grand Junction
<b>Customer</b>	Terra Energy Partners	<b>Location</b>	Garfield	<b>Well</b>	PA 11-26

### Well Information

<b>Casing/Liner Size</b>	4.5 in	<b>Depth MD</b>	9594 ft	<b>BHST</b>	107°C / 224°F
<b>Hole Size</b>	8.75 in	<b>Depth TVD</b>	8486 ft	<b>BHCT</b>	68°C / 154°F
<b>Pressure</b>	5240 psi				

### Drilling Fluid Information

<b>Mud Supplier Name</b>	AMC	<b>Mud Trade Name</b>		<b>Density</b>	
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### Cement Information - Primary Design

#### Cement Properties

Slurry Density	14.5	lbm/gal
Slurry Yield	1.32	ft3/sack
Water Requirement	5.849	gal/sack
Total Mix Fluid	5.849	gal/sack

Water Source	Fresh Water
Water Chloride	

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**Operation Test Results Request ID 2476100/3**

**Thickening Time - ON-OFF-ON**

**28/MAY/2018**

Test Temp (°F)	Pressure (psi)	Reached in (min)	30 Bc (h:mm)	50 Bc (h:mm)	70 Bc (h:mm)	100 Bc (h:mm)	Start Bc	Stirring (min)	Static (min)	Peak (min)
154	5240	43	3:54	4:03	4:07	4:10	17	53	15	30

total sks=1940

CS1103 TR#1972 240 SKS

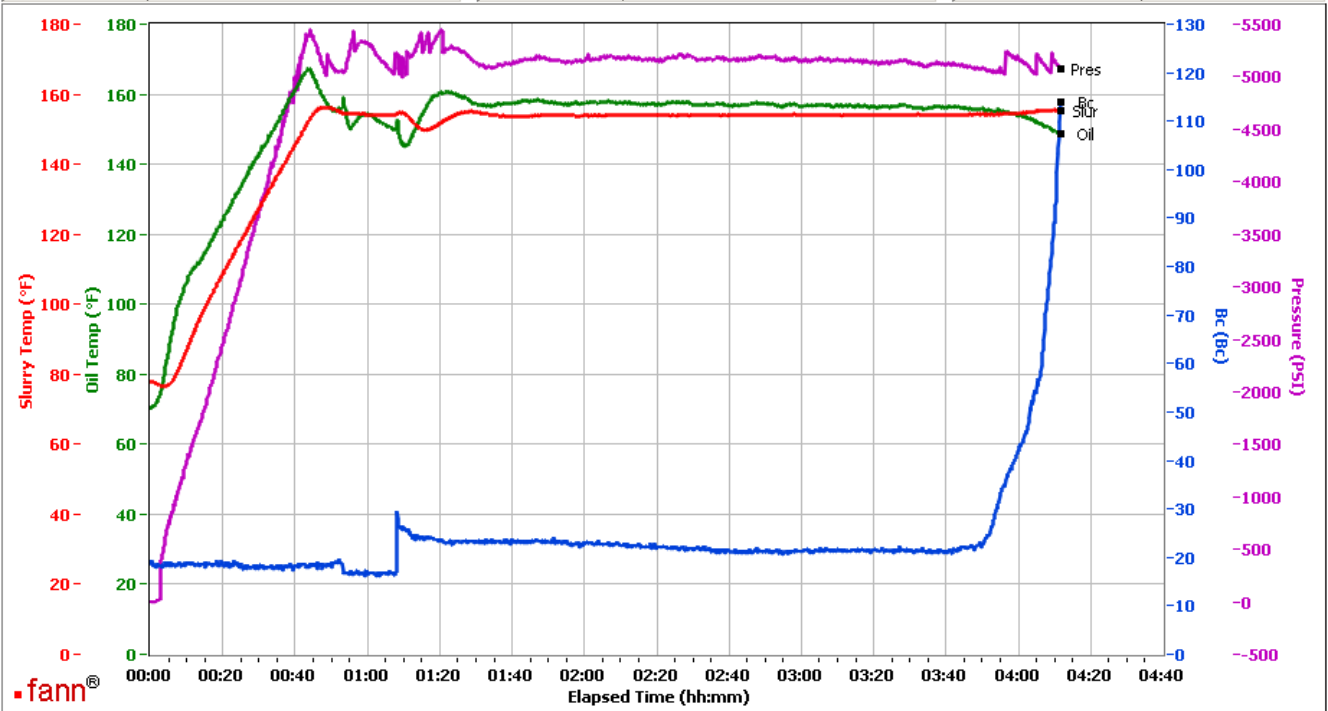
deflected from 16Bc--- > 30Bc---24Bc within one minute

**Grand Junction, Colorado**

Fields	Values
Project Name	GJ2476100-3 TERRA PRODUCTION BULK PR
Test ID	35535124
Request ID	GJ2476100-3
Tested by	DEBA
Customer	TERRA ENERGY PARTNERS
Well No	PA 1-26
Rig	H&P 271
Casing/Liner Size	4.5"

Fields	Values
Job Type	PRODUCTION CASING
Cement Type	MOUNTAIN G
Cement Weight	Standard
Test Date	05/29/18
Test Time	04:59 PM
Temp. Units	degF
Pressure Units	PSI
SW Version	2.1.0.507

Events	Results
30.00 Bc	03h:54m
40.00 Bc	03h:59m
50.00 Bc	04h:03m
70.00 Bc	04h:07m
100.00 Bc	04h:10m
00h:30m	17.85
01h:00m	16.67
01h:30m	23.31



Data File C:\Documents and Settings\M290\Local Settings\Temporary Internet Files\Content.IE5\K9Y20P2R\GJ2476100-3 TERRA PRODUCTION BULK PRIMARY[1].tdms  
 Comments CS1103 TR#1972 240 SKS

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**Operation Test Results Request ID 2476100/2**

**Thickening Time - ON-OFF-ON**

**26/MAY/2018**

Test Temp (°F)	Pressure (PSI)	Reached in (min)	30 Bc (h:mm)	50 Bc (h:mm)	70 Bc (h:mm)	100 Bc (h:mm)	Start Bc	Stirring (min)	Static (min)	Peak (min)
154	5240	43	3:47	3:56	4:01	4:04	16	53	15	26

total sks= 1940

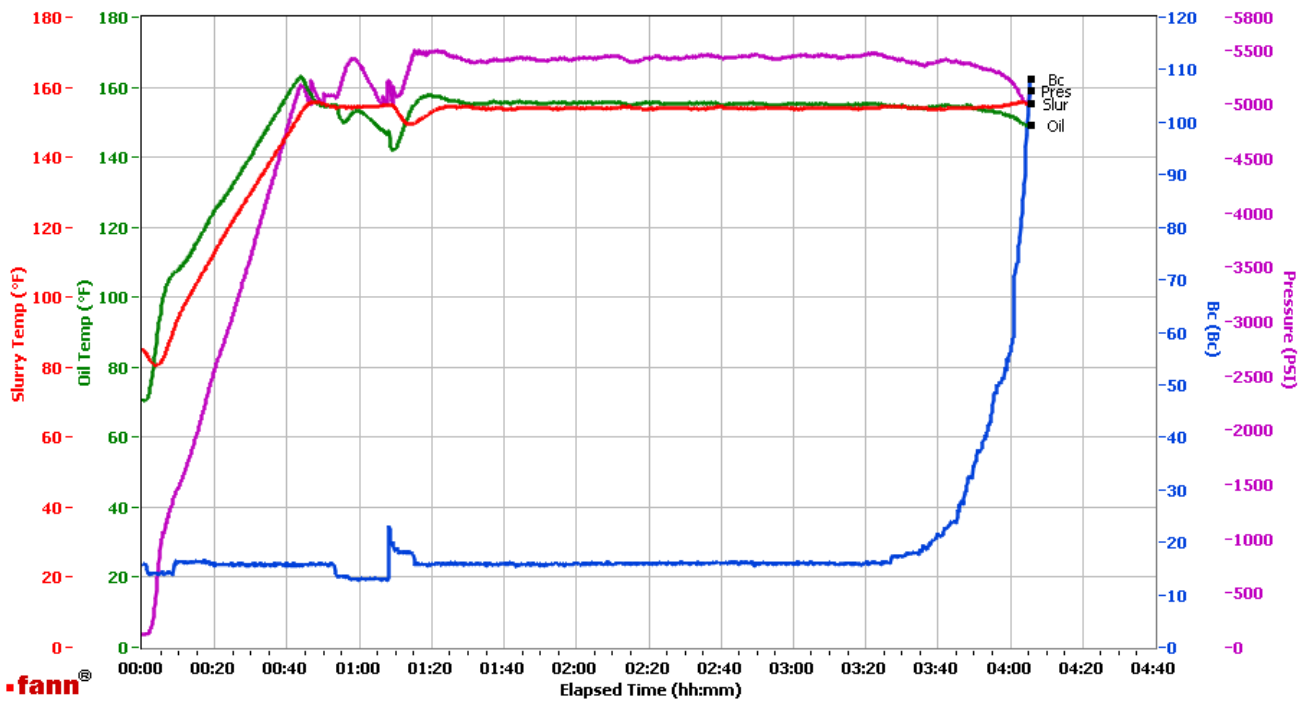
CS1100 TR 8677 425 SKS

CS1101 TR 1513 425 SKS

deflection recorded on the graph from 16Bc--- > 26BC

**Grand Junction, Colorado**

Fields	Values	Fields	Values	Events	Results
Project Name	GJ2476100-2 TERRA BULK PRODUCTION PR	Job Type	PRODUCTION CASING	30.00 Bc	03h:47m
Test ID	35529321 - TT	Cement Type	MOUNTAIN G	40.00 Bc	03h:53m
Request ID	2476100-2	Cement Weight	Standard	50.00 Bc	03h:56m
Tested by	CT	Test Date	05/25/18	70.00 Bc	04h:01m
Customer	TERRA ENERGY PARTNERS	Test Time	05:52PM	100.00 Bc	04h:04m
Well No	PA 11-26	Temp. Units	degF	00h:30m	15.97
Rig	H8P 271	Pressure Units	PSI	01h:00m	12.85
Casing/Liner Size	4.5 INCH	SW Version	2.1.0.507	01h:30m	15.94



Data File C:\Documents and Settings\M290\Local Settings\Temporary Internet Files\Content.IE5\CDER4HUV\GJ2476100-1 TERRA BULK PRODUCTION PRIMARY[1].tdms  
 Comments CS1100 TR 8677 425 SKS CS1101 TR 1513 425 SKS

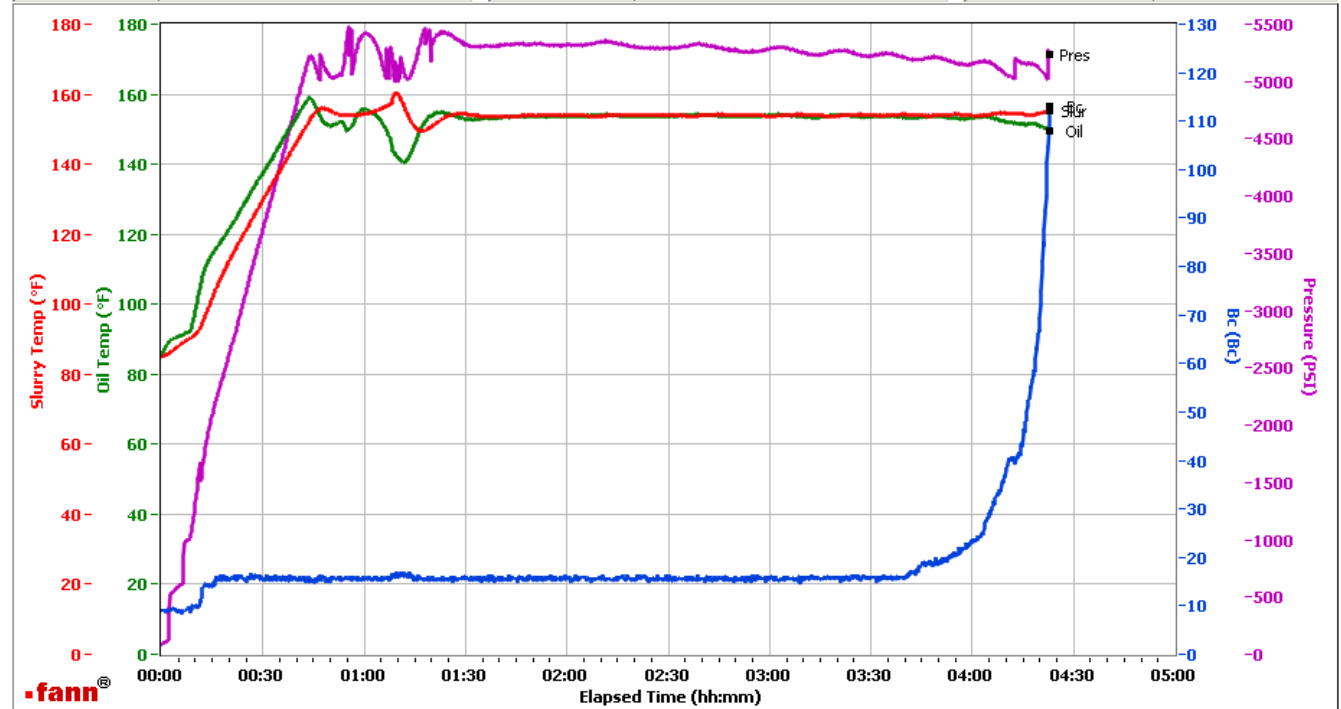
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Test Temp (°F)	Pressure (PSI)	Reached in (min)	30 Bc (h:mm)	50 Bc (h:mm)	70 Bc (h:mm)	100 Bc (h:mm)	Start Bc	Stirring (min)	Static (min)	Peak (min)
154	5240	43	4:05	4:16	4:20	4:22	9	53	15	16

total sks= 1940  
 CS1098, Trailer 8678, 425 sks  
 CS1099, Trailer 8476, 425 sks  
 no deflection, 16Bc--- > 16Bc

Grand Junction Colorado

Fields	Values	Fields	Values	Events	Results
Project Name	GJ2476100-1 TERRA BULK PRODUCTION PR	Job Type	PRODUCTION CASINGT	30.00 Bc	04h:05m
Test ID	35516395 - TT	Cement Type	MOUNTAIN G	40.00 Bc	04h:10m
Request ID	2476100-1	Cement Weight	Standard	50.00 Bc	04h:16m
Tested by	CT	Test Date	07/02/11	70.00 Bc	04h:20m
Customer	TERRA ENERGY PARTNERS	Test Time	03:44 PM	100.00 Bc	04h:22m
Well No	PA 11-26	Temp. Units	degF	00h:30m	15.88
Rig	H8P 271	Pressure Units	PSI	01h:00m	15.86
Casing/Liner Size	4.5 INCH	SW Version	2.1.0.1219	01h:30m	15.81



Data File C:\Documents and Settings\HPHT\Local Settings\Temporary Internet Files\Content.IE5\636B21WN\GJ2476100-1 TERRA BULK PRODUCTION PRIMARY[1].tdms  
 Comments CS1098, TRAILER 8678, 425 SKS - CS1099, TRAILER 8476, 425 SKS

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