

# HALLIBURTON

iCem<sup>®</sup> Service

## **Terra Energy Partners**

**For: Terra**

Date: Thursday, June 15, 2017

**TR 23-23-597 Production PJR**

API# 05-045-23461-00

Sincerely,

**Grand Junction Cement Engineering**

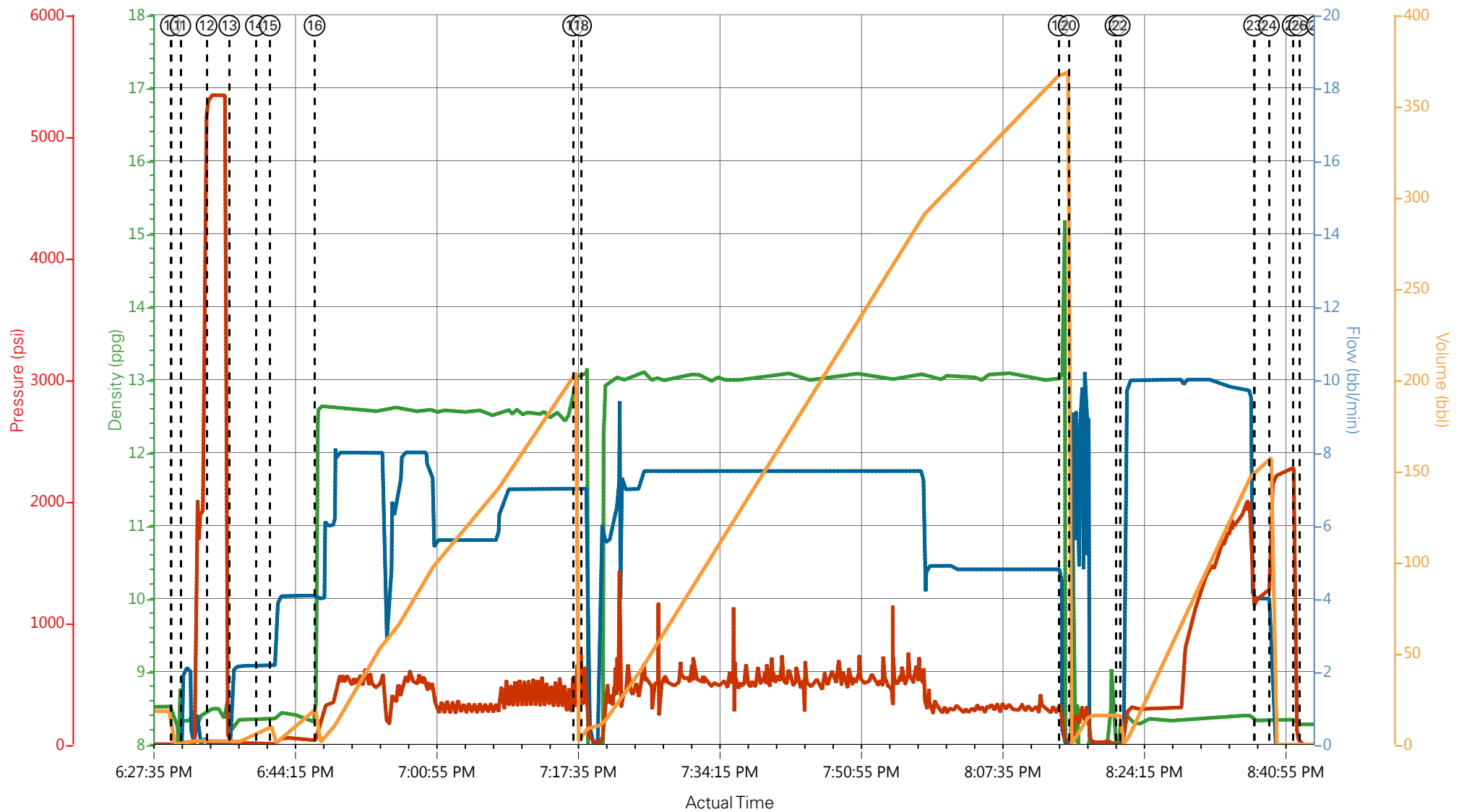
## 2.0 Real-Time Job Summary

### 2.1 Job Event Log

Type	Seq. No.	Graph Label	Date	Time	Source	DH Density (ppg)	Comb Pump Rate (bbl/min)	PS Pump Press (psi)	Pump Stg Tot (bbl)	Comments
Event	1	Call Out	6/15/2017	09:00:00	USER					ON LOCATION REQUESTED 15:00
Event	2	Pre-Convoy Safety Meeting	6/15/2017	10:45:00	USER					ALL HES PRESENT
Event	3	Crew Leave Yard	6/15/2017	11:00:00	USER					1-ELITE, 1-660 BULK TRAILER, 1-450PICK UP
Event	4	Arrive at Location from Other Job or Site	6/15/2017	14:30:00	USER					RIG RUNNING CASING
Event	5	Assessment Of Location Safety Meeting	6/15/2017	14:45:00	USER					MET WITH COMPANY REP DISCUSSED JOB PROCEDURE, SDS OFFERED
Event	6	Pre-Rig Up Safety Meeting	6/15/2017	15:33:24	USER					ALL HES PRESENT
Event	7	Rig-Up Completed	6/15/2017	17:30:00	USER					1-ELITE, 1-660 BULK TRAILER, 2-FIELD SILO, 2" PUMP IRON, 4" SUCTION HOSE, 4.5" QUICK LATCH PLUG CONTAINER, POSITIVE DISPLACEMENT MANIFOLD
Event	8	Pre-Job Safety Meeting	6/15/2017	18:01:00	USER					ALL HES AND RIG CREW PRESENT
Event	9	Other	6/15/2017	18:15:00	USER					RIG CIRCULATED 1 HOUR 12bpm 1600PSI, WATER: TEMP-62, CL-0, PH-7
Event	10	Start Job	6/15/2017	18:30:00	USER	8.35	0.00	3.00	0.0	TD-10349', TP-10359.58', SJ-43.49, CSG-4.5" 11.6# P110, OH-8.75", SCSG-9.625" 36# SHOE @ 3009'
Event	11	Prime Pumps	6/15/2017	18:31:07	USER	8.33	2.10	30.00	2.0	FRESH WATER

Event	12	Test Lines	6/15/2017	18:34:12	COM5	8.49	0.00	5333.00	2.1	ALL PRESSURE HELD ON LINES
Event	13	Pump Water	6/15/2017	18:36:52	COM5	8.31	2.00	10.00	10.0	FRESH WATER
Event	14	Check weight	6/15/2017	18:40:00	COM5	12.50				WEIGHT VERIFIED BY PRESSURIZED MUD SCALES
Event	15	Pump Mud Flush III	6/15/2017	18:41:38	COM5	8.40	4.00	54.00	20.0	MUD FLUSH III, 80 LBS
Event	16	Pump Lead Cement	6/15/2017	18:46:55	COM5	12.54	8.00	600.00	198.6	NEOCER LEAD, 12.5PPG, 1.94CF/SK, 9.58GAL/SK. 45LBS TUFF FIBER ADDED THROUGH OUT STAGE.
Event	17	Pump Tail Cement	6/15/2017	19:17:23	COM5	13.02	7.50	550.00	329.9	NEOCER TAIL, 13.0PPG, 2.07CF/SK, 9.43GAL/SK
Event	18	Check weight	6/15/2017	19:18:19	COM5	13.05				
Event	19	Shutdown	6/15/2017	20:14:34	USER	13.04	5.00	275.00	329.9	END OF CEMENT
Event	20	Clean Lines	6/15/2017	20:15:44	COM5					CLEANED PUMPS AND LINES TO PIT
Event	21	Drop Plug	6/15/2017	20:21:15	USER					PLUG DROP VERIFIED BY COMPANY REP
Event	22	Pump Displacement	6/15/2017	20:21:46	COM5	8.33	10.00	2010.00	150.0	KCL WATER, 3# BE6, 1 GAL MMCR
Event	23	Slow Rate	6/15/2017	20:37:35	USER	8.32	4.00	1211.00	10.0	SLOW RATE LAST 10 BBLs
Event	24	Bump Plug	6/15/2017	20:39:20	COM5	8.33	4.00	1270.00	160.0	PLUG BUMPED
Event	25	Check Floats	6/15/2017	20:42:08	USER	8.33	0.00	2290.00	0.0	FLOATS HELD 1 BBL BACK TO DISPLACEMENT TANK
Event	26	End Job	6/15/2017	20:42:54	COM5	8.27	0.00	2.00	0.0	FULL RETURNS THROUGH CEMENT, PARTIAL RETURNS THROUGH DISPLACEMENT
Event	27	Pre-Rig Down Safety Meeting	6/15/2017	20:45:00	USER					ALL HES PRESENT
Event	28	Rig-Down Completed	6/15/2017	22:00:00	USER					RIG DOWN COMPLETED SAFELY
Event	29	Pre-Convoy Safety Meeting	6/15/2017	22:15:00	USER					ALL HES PRESENT
Event	30	Crew Leave Location	6/15/2017	22:20:00	USER					THANK YOU FOR CHOOSING HALLIBURTON, ANDREW BRENNECKE AND CREW

# TEP - CHEVRON TR 23-23-597 - 4.5" PRODUCTION



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

- |   |   |  |                               |                                      |
|---|---|--|-------------------------------|--------------------------------------|
| ① Call Out n/a;n/a;n/a;n/a                  | ④ Arrive at Location from Other Job or Site n/a;n/a;n/a;n/a | ⑦ Rig-Up Completed 8.51;0;2;18.3       | ⑩ Start Job 8.35;0;3;0        | ⑬ Pump Water 8.21;0;5;0              |
| ② Pre-Convoy Safety Meeting n/a;n/a;n/a;n/a | ⑤ Assessment Of Location Safety Meeting n/a;n/a;n/a;n/a     | ⑧ Pre-Job Safety Meeting 8.51;0;3;18.3 | ⑪ Prime Pumps 8.33;2.1;30;0.3 | ⑭ Check weight 8.34;2.2;0            |
| ③ Crew Leave Yard n/a;n/a;n/a;n/a           | ⑥ Pre-Rig Up Safety Meeting n/a;n/a;n/a;n/a                 | ⑨ Other 8.51;0;3;18.3                  | ⑫ Test Lines 8.49;0;5333;2.1  | ⑮ Pump Mud Flush III 8.49;0;5333;2.1 |

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Created: 2017-06-15 15:50:10, Version: 4.2.393

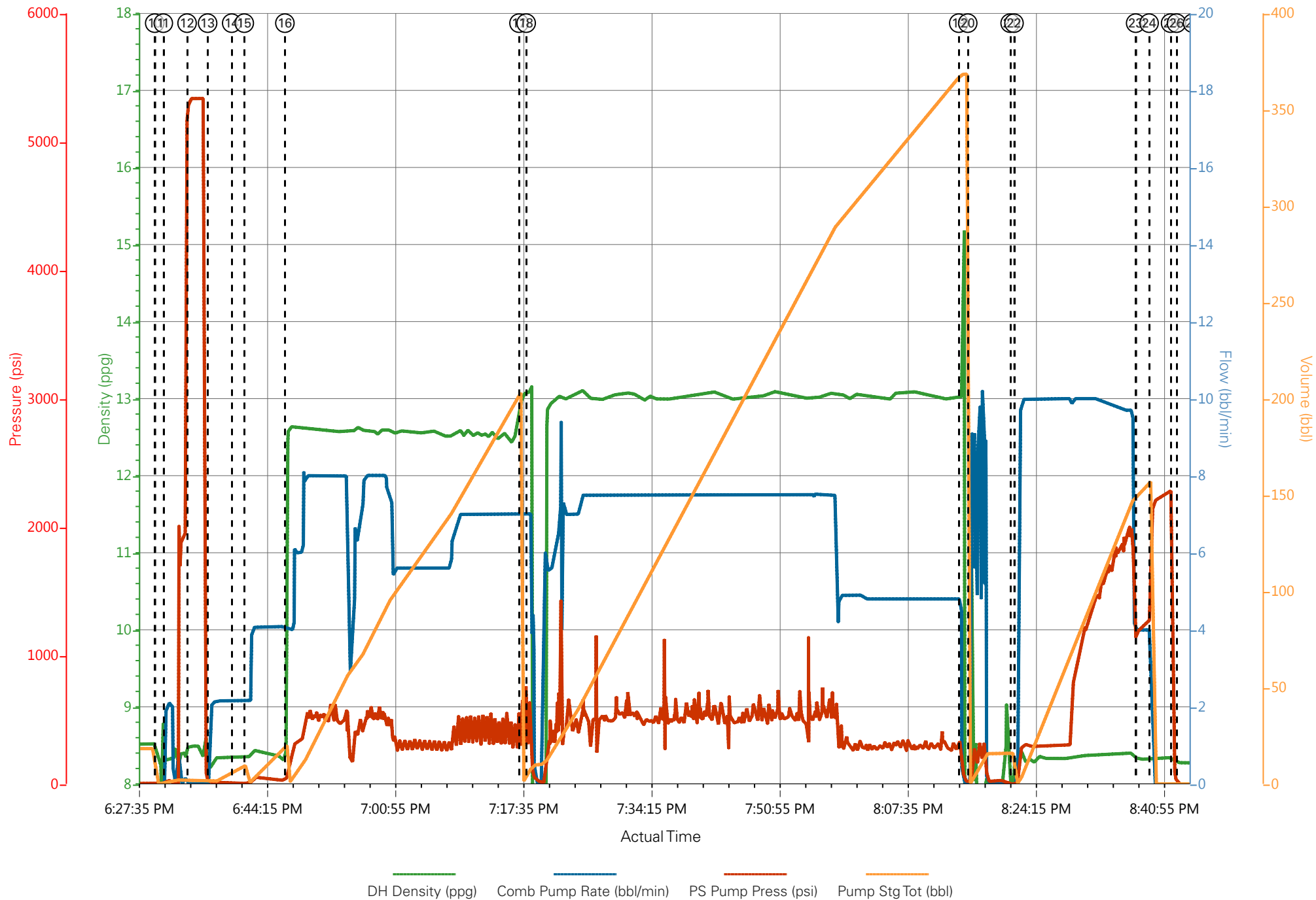
Edit

Customer : TERRA ENERGY PARTNERS  
Representative : C.PATTERSON

Job Date : 6/15/2017 4:53:18 PM  
Sales Order # : 904097564

Well : CHEVRON TR 23-23-597  
ELITE1 : A.BRENNECKE/A.ANGELO

# TEP - CHEVRON TR 23-23-597 - 4.5" PRODUCTION



# HALLIBURTON

## Rockies, Grand Junction

## Lab Results- Lead

### Job Information

<b>Request/Slurry</b>	2393688/1	<b>Rig Name</b>	H&P 271	<b>Date</b>	12/JUN/2017
<b>Submitted By</b>	Patrick Ealey	<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>	TR 23-23-597

### Well Information

<b>Casing/Liner Size</b>	4.5 in	<b>Depth MD</b>	10367 ft	<b>BHST</b>	123°C / 253°F
<b>Hole Size</b>	8.75 in	<b>Depth TVD</b>	10198 ft	<b>BHCT</b>	89°C / 192°F
<b>Pressure</b>	6440 psi				

### Drilling Fluid Information

<b>Mud Supplier Name</b>	Baroid	<b>Mud Trade Name</b>	BARADRIL-N	<b>Density</b>	10.4 lbm/gal
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### Cement Information - Lead Design



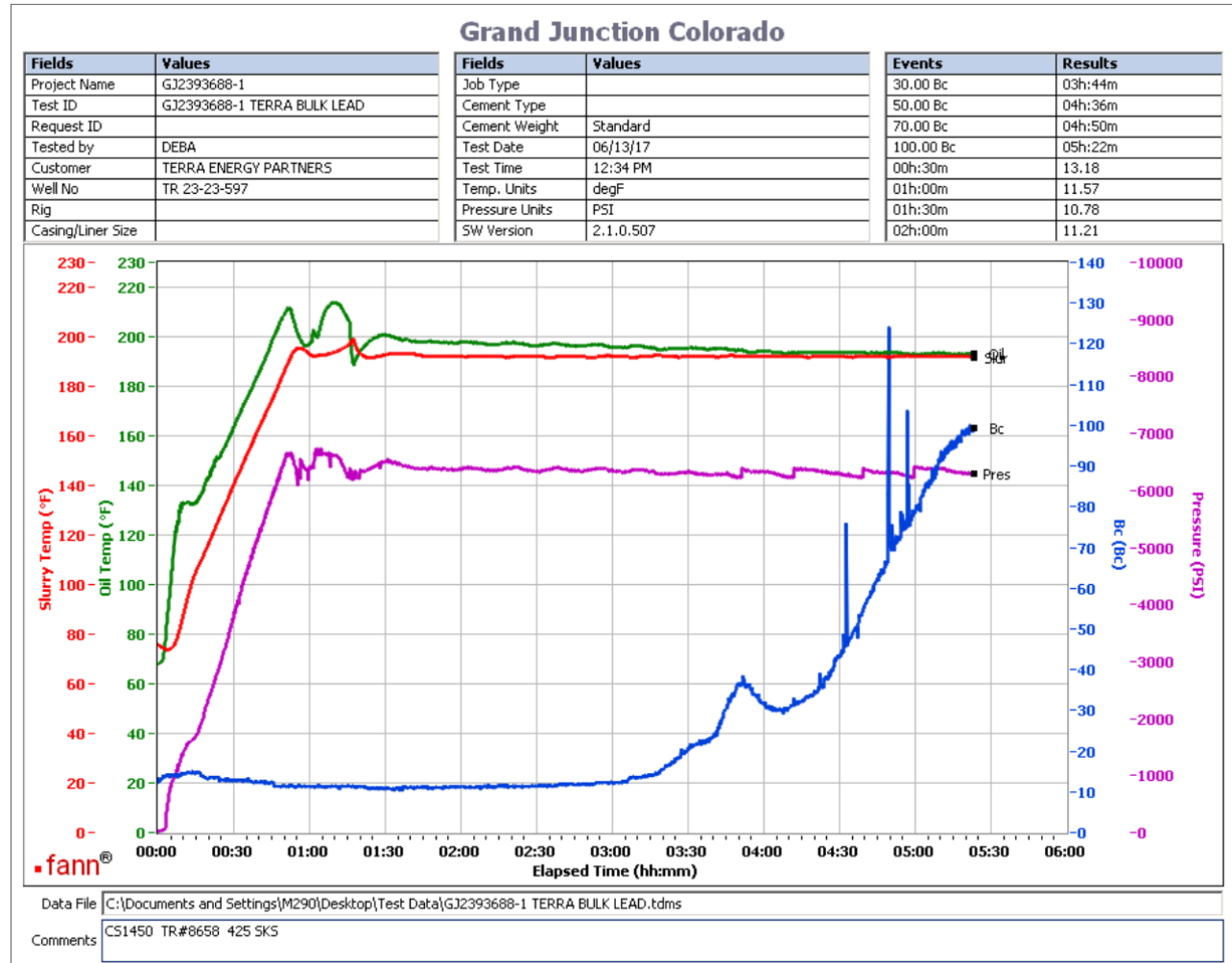
<u>Conc</u>	<u>UOM</u>	<u>Cement/Additive</u>	<u>Sample Type</u>	<u>Sample Date</u>	<u>Lot No.</u>	<b>Cement Properties</b>		
		NeoCem Lead				Slurry Density	12.5	lbm/gal
						Slurry Yield	1.941	ft3/sack
						Water Requirement	9.623	gal/sack
						Total Mix Fluid	9.623	gal/sack
						Water Source	Fresh Water	
						Water Chloride		

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Thickening Time - ON-OFF-ON

13/JUN/2017

Test Temp (°F)	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)
192	6440	51	3:44	4:36	4:50	5:22	12	61	15	11



Total sks = 575  
 Composite:  
 CS1450 TR#8658 425 SKS  
 Deflection: 11 – 11

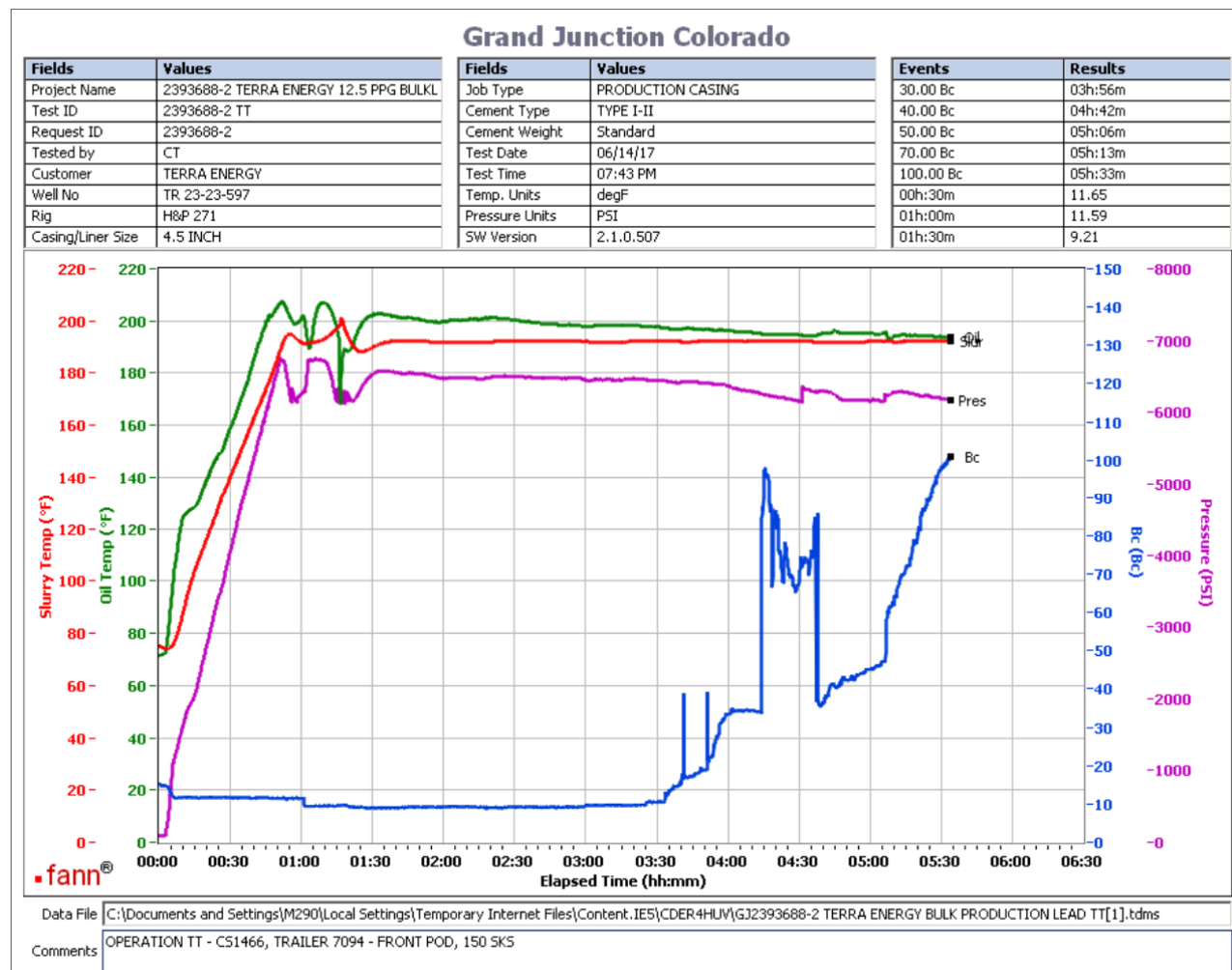
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# **Operation Test Results Request ID 2393688/2**

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

**14/JUN/2017**

Test Temp (°F)	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)
192	6440	51	3:56	5:06	5:13	5:33	15	61	15	9



Total sks = 575

CS1466, Trailer 7094 (Front Pod), 150 sks

No deflection

Spike around 4:15 to 4:35 was caused by a burn spot on potentiometer. There is a trend line on the graph and no heat of hydration occurred when test spiked to indicate test was pumped off. Results taken from graph due to spike.

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# HALLIBURTON

## Rockies, Grand Junction

## Lab Results- Tail

### Job Information

<b>Request/Slurry</b>	2393689/1	<b>Rig Name</b>	H&P 271	<b>Date</b>	12/JUN/2017
<b>Submitted By</b>	Patrick Ealey	<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>	TR 23-23-597

### Well Information

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### Drilling Fluid Information

<b>Mud Supplier Name</b>	Baroid	<b>Mud Trade Name</b>	BARADRIL-N	<b>Density</b>	10.4 lbm/gal
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### Cement Information - Tail Design



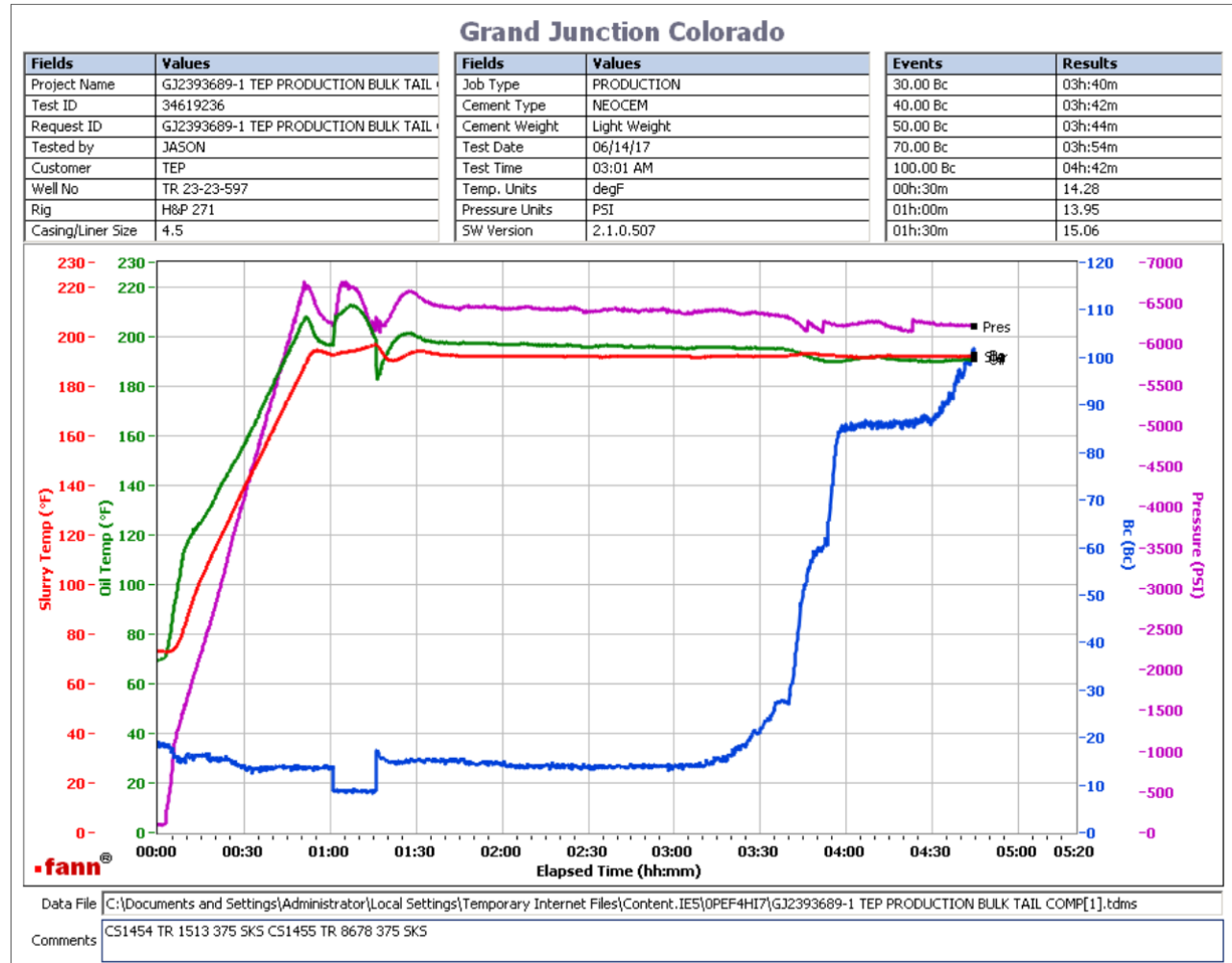
<u>Conc</u>	<u>UOM</u>	<u>Cement/Additive</u>	<u>Sample Type</u>	<u>Sample Date</u>	<u>Lot No.</u>	<b>Cement Properties</b>		
		NeoCem Tail				Slurry Density	13	lbm/gal
						Slurry Yield	2.065	ft3/sack
						Water Requirement	9.424	gal/sack
						Total Mix Fluid	9.424	gal/sack
						Water Source	Fresh Water	
						Water Chloride		

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Thickening Time - ON-OFF-ON

14/JUN/2017

Test Temp (°F)	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)
192	6440	51	3:40	3:44	3:54	4:42	19	61	15	20



Total sks = 895

Composite:

CS1454, Trailer 1513, 375 sks

CS1455, Trailer 8678, 375 sks

deflected from 9Bc to 20Bc when the stirring was resumed.

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## Operation Test Results Request ID 2393689/2

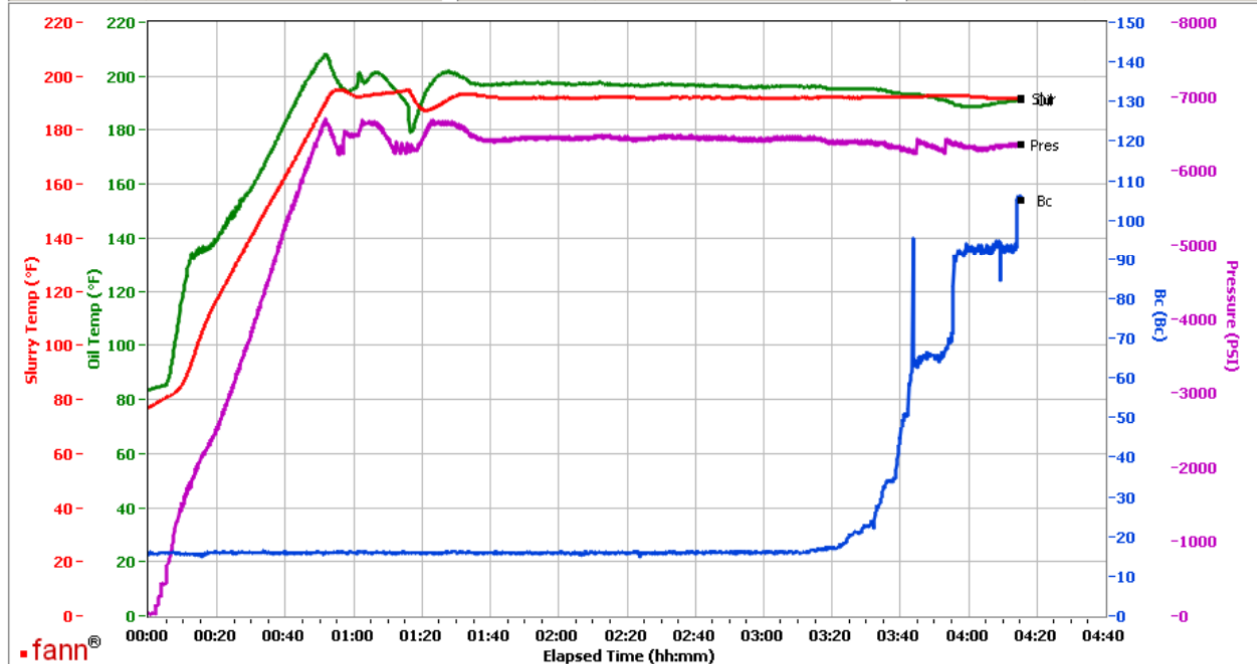
### Thickening Time - ON-OFF-ON

14/JUN/2017

Test Temp (°F)	Pressure (psi)	Reached in (min)	30 Bc (hh:min)	50 Bc (hh:min)	70 Bc (hh:min)	100 Bc (hh:min)	Start Bc	Stirring before stop (mins)	Static Period (min)	Peak reading (BC)
192	6440	51	3:34	3:41	3:55	4:14	16	61	15	16

### Grand Junction Colorado

Fields	Values	Fields	Values	Events	Results
Project Name	2393689-2 TERRA ENERGY 13.0 PPG BULK F	Job Type	PRODUCTION CASING	30.00 Bc	03h:34m
Test ID	2393689-2 TT	Cement Type	TYPE I-II	40.00 Bc	03h:39m
Request ID	2393689-2	Cement Weight	Standard	50.00 Bc	03h:41m
Tested by	CT	Test Date	06/14/17	70.00 Bc	03h:43m
Customer	TERRA ENERGY	Test Time	04:05 PM	100.00 Bc	04h:14m
Well No	TR 23-23-597	Temp. Units	degF	00h:30m	16.07
Rig	H&P 271	Pressure Units	PSI	01h:00m	15.95
Casing/Liner Size	4.5 INCH	SW Version	2.1.0.507	01h:30m	15.90



Data File C:\Documents and Settings\M290\Desktop\Test Data\GJ2393689-2 TERRA ENERGY BULK PRODUCTION TAIL TT.tdms

Comments OPERATION TT - CS1467, TRAILER 7094 - REAR POD, 145 SKS

No deflection

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