

# HALLIBURTON

iCem<sup>®</sup> Service

**TERRA ENERGY LTD.**

**For: Terra**

Date: Tuesday, September 19, 2017

**SR 432-12**

API#05-045-23295

Sincerely,

**Grand Junction Cement Engineering**

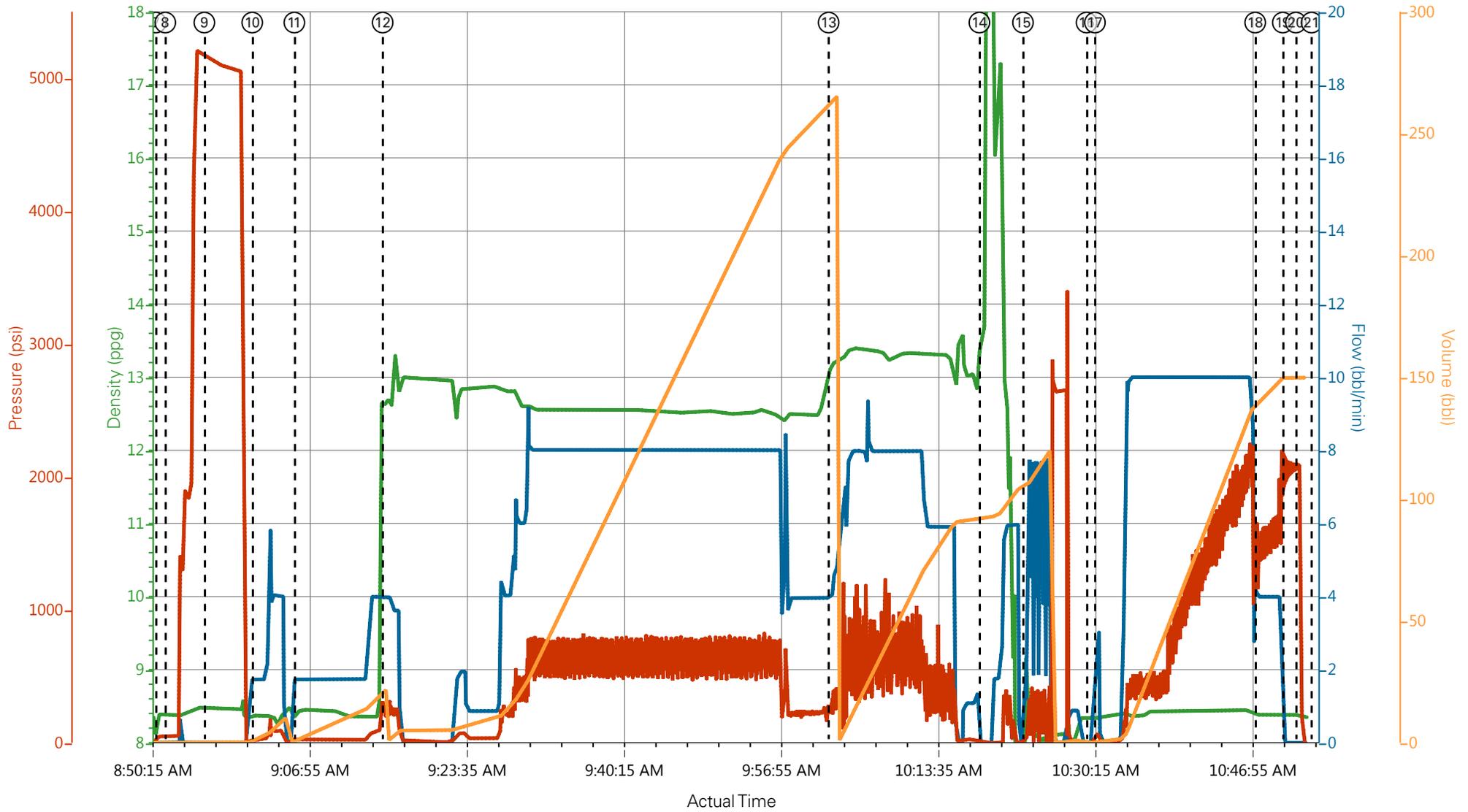
## 1.0 Real-Time Job Summary

### 1.1 Job Event Log

Type	Seq. No.	Graph Label	Date	Time	Source	Pass-Side Pump Pressure (psi)	Downhole Density (ppg)	Combined Pump Rate (bbl/min)	Pump Stage Total (bbl)	Comments
Event	1	Call Out	9/18/2017	03:00:00	USER					REQUESTED ON LOCATION @ 0700
Event	2	Pre-Convoy Safety Meeting	9/18/2017	04:30:00	USER					ALL HES PRESENT
Event	3	Arrive At Loc	9/18/2017	06:30:00	USER					RIG RUNNING CASING
Event	4	Assessment Of Location Safety Meeting	9/18/2017	06:45:00	USER					MET WITH COMP REP, B. BROWN, AND WENT OVER NUMBERS AND JOB PROCEDURE. WALKED AROUND LOCATION AND COLLECTED WATER SAMPLE (PH- 7, CHLORIDES- 0, TEMP- 63F). COMP REP WAS OFFERED SDS FOR ALL CHEMICLES USED BY HES.
Event	5	Pre-Rig Up Safety Meeting	9/18/2017	07:15:00	USER					ALL HES PRESENT
Event	6	Pre-Job Safety Meeting	9/18/2017	08:30:00	USER					ALL HES AND RIG CREW PRESENT
Event	7	Start Job	9/18/2017	08:50:55	USER					TD 9338', TP 9331', SJ 27.35', OH 8.75", CSG 4.5" 11.6#, MUD 10 PPG. RIG CIRCULATED WELL @ 10 BPM WITH 800 PSI FOR APPROX 1.5 HRS.
Event	8	Prime Pumps	9/18/2017	08:51:55	USER	54.53	8.38	1.00	2.0	8.33 PPG FRESH WATER
Event	9	Test Lines	9/18/2017	08:56:04	USER	5149.93	8.37	0.50	0.5	ALL LINES HELD PRESSURE AT 5149 PSI
Event	10	Pump Spacer 1	9/18/2017	09:01:08	USER	122.65	8.33	4.00	10.0	8.33 PPG FRESH WATER (10 BBL)
Event	11	Pump Spacer 2	9/18/2017	09:05:36	USER	224.53	8.42	4.2	20.2	8.4 PPG MUDFLUSH III (20 BBL)
Event	12	Pump Lead Cement	9/18/2017	09:14:58	USER	672.03	12.50	7.99	268.0	NEOCEM CEMENT 775 SKS (268 BBLs), 12.5 PPG, 1.94 FT3/SK, 9.6 GAL/SK
Event	13	Pump Tail Cement	9/18/2017	10:02:16	USER	317.97	13.26	7.97	85.9	THERMACEM CEMENT 265 SKS (82 BBLs), 13.3 PPG, 1.73 FT3/SK, 7.81 GAL/SK
Event	14	Shutdown	9/18/2017	10:18:16	USER					END OF JOB

Event	15	Clean Lines	9/18/2017	10:22:53	USER					WASH UP PUMPS AND LINES TO THE PIT
Event	16	Drop Plug	9/18/2017	10:29:38	USER					PLUG WENT, VERIFIED BY CO REP
Event	17	Pump Displacement	9/18/2017	10:30:31	USER	2097.22	8.33	10.00	134.0	8.34 PPG FRESH WATER (144 BBLs) 3 BAGS BE6, 1 GAL MMCR & 13 SKS KCL
Event	18	Slow Rate	9/18/2017	10:47:31	USER	1447.99	8.30	3.99	10.3	SLOW RATE TO 4 BPM PER CO REP TO LAND PLUG
Event	19	Bump Plug	9/18/2017	10:50:26	USER	2100.63	8.34	0.00	144.2	LAND PLUG AT 1550 PSI, BROUGHT UP TO 2100 PSI
Event	20	Check Floats	9/18/2017	10:51:49	USER					FLOATS HELD, 1 BBL BACK TO TRUCK
Event	21	End Job	9/18/2017	10:53:30	USER					GOOD RETURNS THROUGHOUT, PIPE WAS RECIPROCATED
Event	22	Post-Job Safety Meeting (Pre Rig-Down)	9/18/2017	11:00:00	USER					ALL HES PRESENT
Event	23	Pre-Convoy Safety Meeting	9/18/2017	11:45:00	USER					ALL HES PRESENT
Event	24	Crew Leave Location	9/18/2017	12:00:00	USER					THANK YOU FOR CHOOSING HALLIBURTON CEMENT, CHRIS SMITH AND CREW

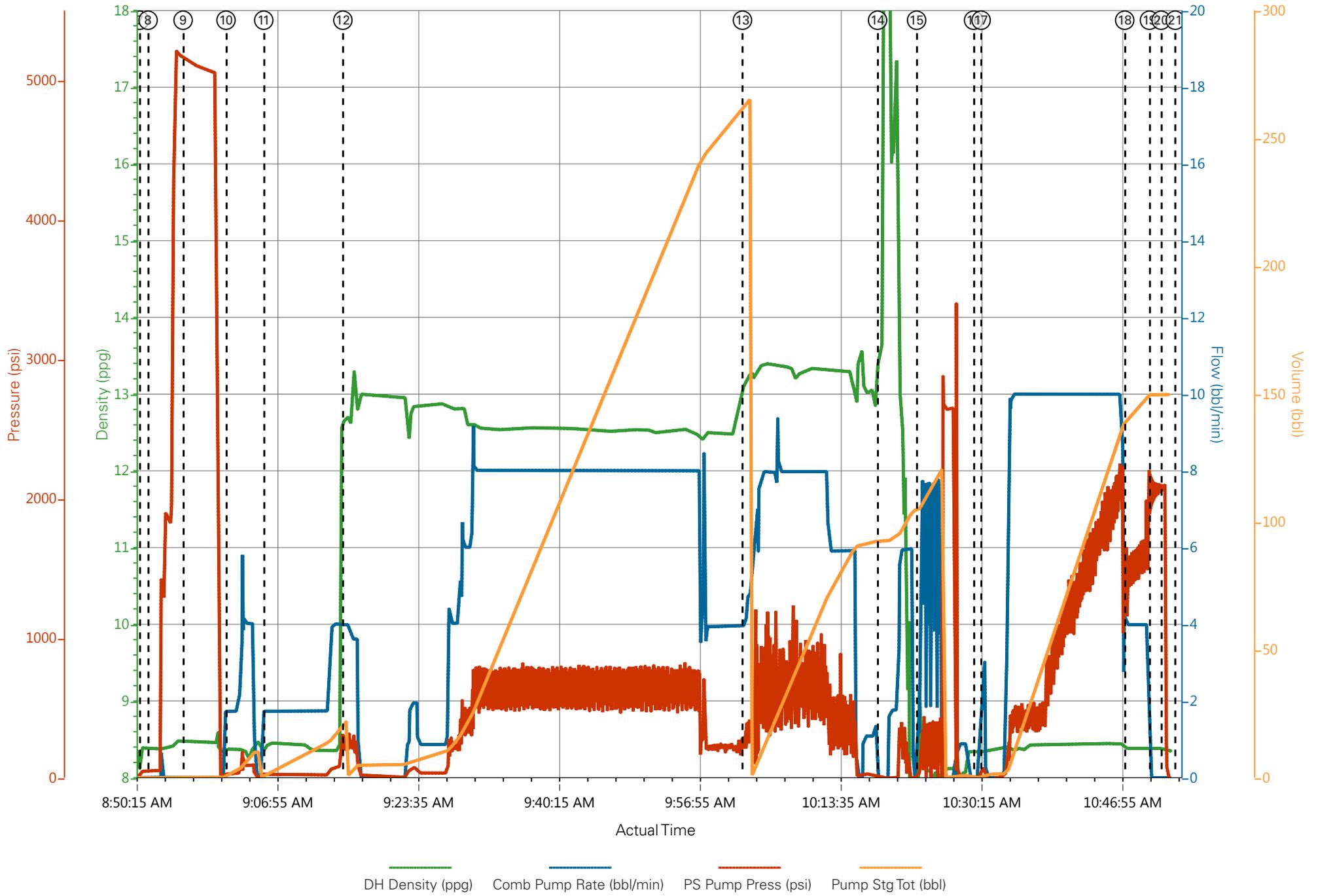
# TEP - SR 432-12 - 4.5" PRODUCTION



— 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 Assessment Of Location Safety Meeting n/a;n/a;n/a;n/a | ⑦ Start Job 8.39;0;45.16;0       | ⑩ Pump Spacer 1 8.37;1.73;22.65;1.16      |
| ② Pre-Convoy Safety Meeting n/a;n/a;n/a;n/a | ⑤ Pre-Rig Up Safety Meeting n/a;n/a;n/a;n/a             | ⑧ Prime Pumps 8.38;0;54.53;0     | ⑪ Pump Spacer 2 8.42;1.72;24.53;1.22      |
| ③ Arrive At Loc n/a;n/a;n/a;n/a             | ⑥ Pre-Job Safety Meeting 8.32;0;0.15;0                  | ⑨ Test Lines 8.47;0;5149.93;0.03 | ⑫ Pump Lead Cement 12.7;3.99;272.03;21.76 |
|                                             |                                                         |                                  | ⑬ Pump Tail Ceme                          |
|                                             |                                                         |                                  | ⑭ Shutdown 13.52                          |
|                                             |                                                         |                                  | ⑮ Clean Lines 9.07                        |

# TEP - SR 432-12 - 4.5" PRODUCTION



### Job Information

<b>Request/Slurry</b>	2416402/1	<b>Rig Name</b>	H&P 318	<b>Date</b>	12/SEP/2017
<b>Submitted By</b>	Aaron Katz	<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>	SR 432-12

### Well Information

<b>Casing/Liner Size</b>	4.5 in	<b>Depth MD</b>	9338 ft	<b>BHST</b>	115°C / 239°F
<b>Hole Size</b>	8.75 in	<b>Depth TVD</b>	9297 ft	<b>BHCT</b>	76°C / 169°F
<b>Pressure</b>	5830 psi				

### Drilling Fluid Information

<b>Mud Supplier Name</b>	<b>Mud Trade Name</b>	<b>Density</b>
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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>	<u>Cement Properties</u>		
						Slurry Density	12.5	lbm/gal
						Slurry Yield	1.941	ft <sup>3</sup> /sack
						Water Requirement	9.623	gal/sack
						Total Mix Fluid	9.623	gal/sack
						Water Source	Fresh Water	
						Water Chloride		

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# Operation Test Results Request ID 2416402/1

## Thickening Time - ON-OFF-ON

16/SEP/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)
169	5830	47	4:14	9:41	10:11	11:32	57	15	7	7

Total sks= 775

Composite:

CS2521 TR 8677 387.5 SKS

CS2522 TR 8678 387.5 SKS

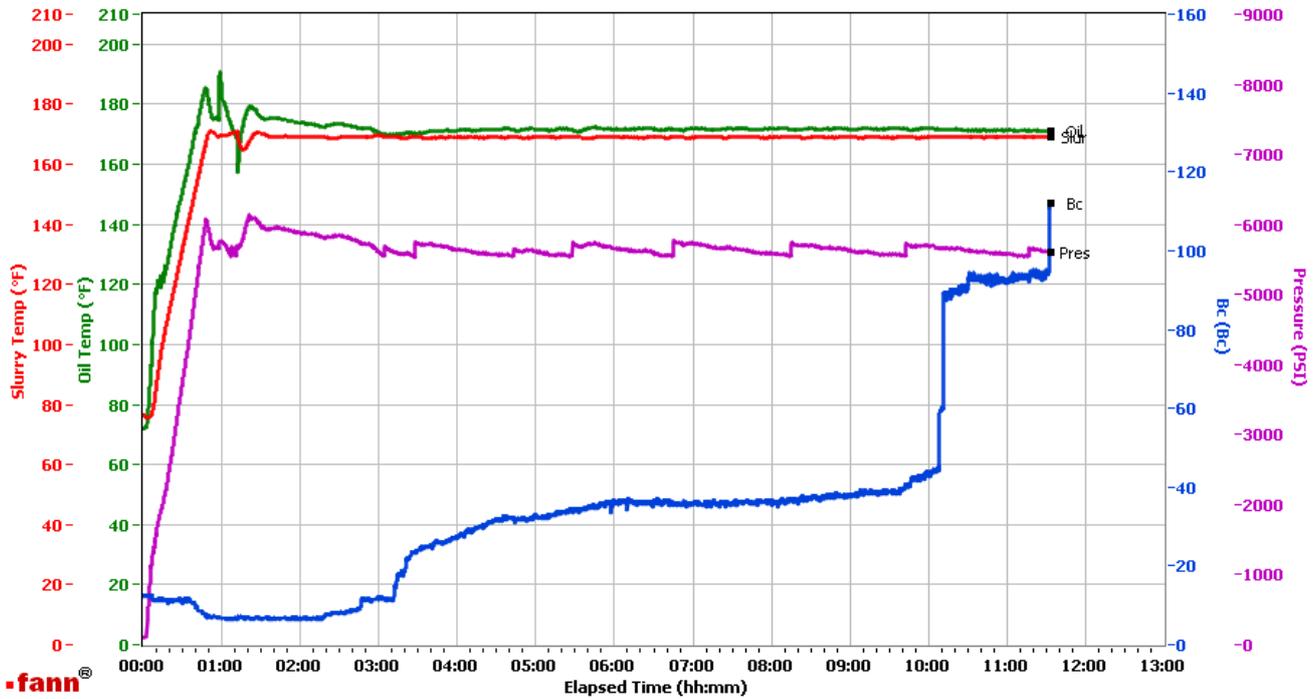
Deflection: 7 - 7

### Grand Junction Colorado

Fields	Values
Project Name	GJ2416402-1 TERRA PRODUCTION LEAD BL
Test ID	34857008
Request ID	GJ2416402-1
Tested by	JASON
Customer	TERRA ENERGY PARTNERS
Well No	SR 432-12
Rig	H&P 318
Casing/Liner Size	4.5"

Fields	Values
Job Type	PRODUCTION
Cement Type	HOLCIM TYPE I-II
Cement Weight	Light Weight
Test Date	09/15/17
Test Time	10:14 PM
Temp. Units	degF
Pressure Units	PSI
SW Version	2.1.0.507

Events	Results
30.00 Bc	04h:14m
40.00 Bc	09h:41m
50.00 Bc	10h:08m
70.00 Bc	10h:11m
100.00 Bc	11h:32m
00h:30m	11.59
01h:00m	6.74
01h:30m	6.70



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Comments CS2521 TR 8677 387.5 SKS CS2522 TR 8678 387.5 SKS

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### Job Information

<b>Request/Slurry</b>	2416403/1	<b>Rig Name</b>	H&P 318	<b>Date</b>	12/SEP/2017
<b>Submitted By</b>	Aaron Katz	<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>	SR 432-12

### Well Information

<b>Casing/Liner Size</b>	4.5 in	<b>Depth MD</b>	9338 ft	<b>BHST</b>	115°C / 239°F
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<b>Pressure</b>	5830 psi				

### Drilling Fluid Information

<b>Mud Supplier Name</b>		<b>Mud Trade Name</b>		<b>Density</b>	
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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>	
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						Slurry Yield	1.733 ft3/sack
						Water Requirement	7.799 gal/sack
						Total Mix Fluid	7.799 gal/sack
						Water Source	Fresh Water
						Water Chloride	

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# Operation Test Results Request ID 2416403/1

## Thickening Time - ON-OFF-ON

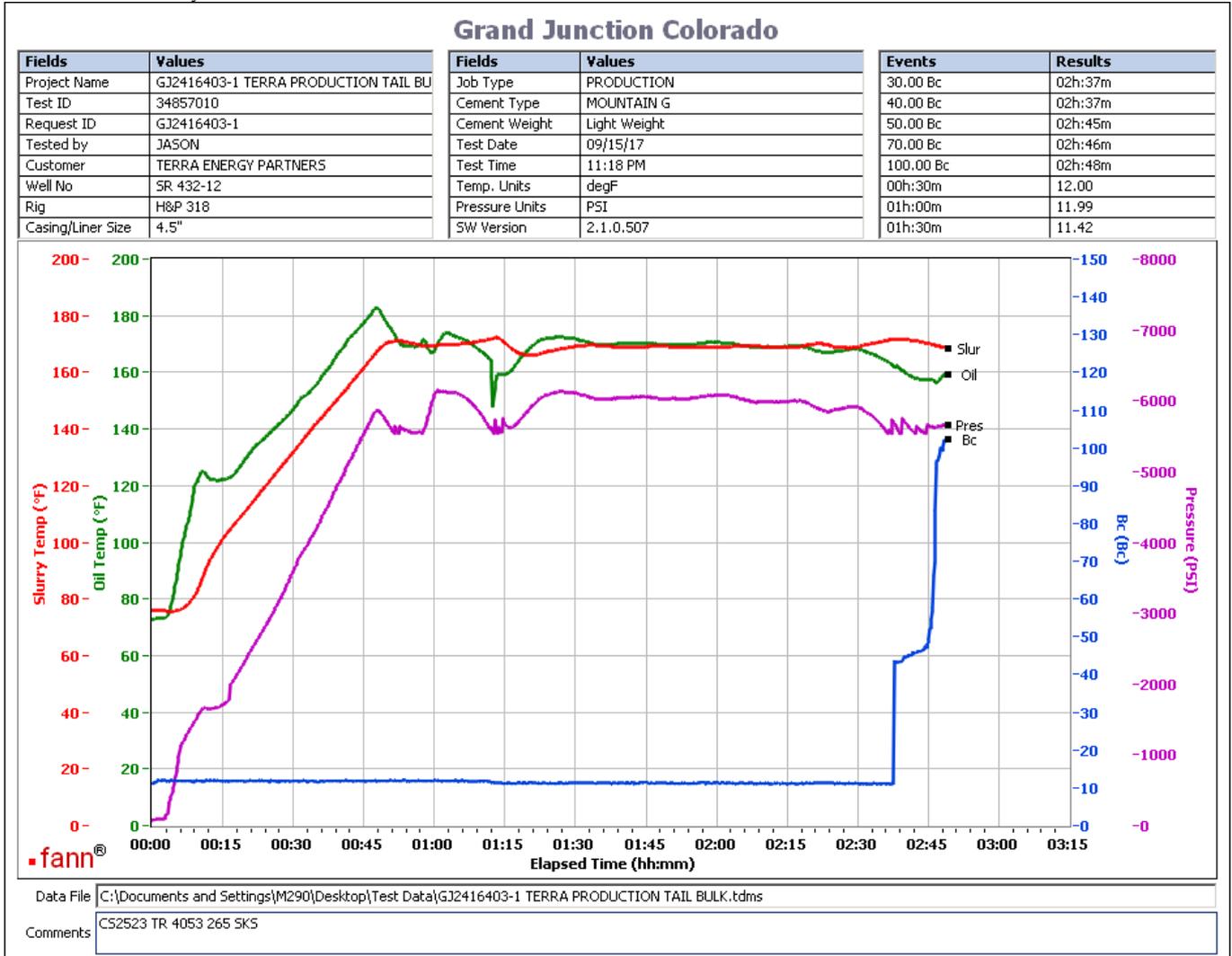
15/SEP/2017

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)
169	5830	47	2:37	2:45	2:46	2:48	11	57	15	12

265 sks tail

CS2523 TR 4053 265 SKS

No deflection. Heat of hydration started around 2.5 hours.



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