

# HALLIBURTON

iCem<sup>®</sup> Service

## **TERRA ENERGY PARTNERS**

**For: Terra**

Date: Wednesday, November 22, 2017

**SR 423-12 Production PJR**

API# 05-045-23440-00

Sincerely,

**Grand Junction Cement Engineering**

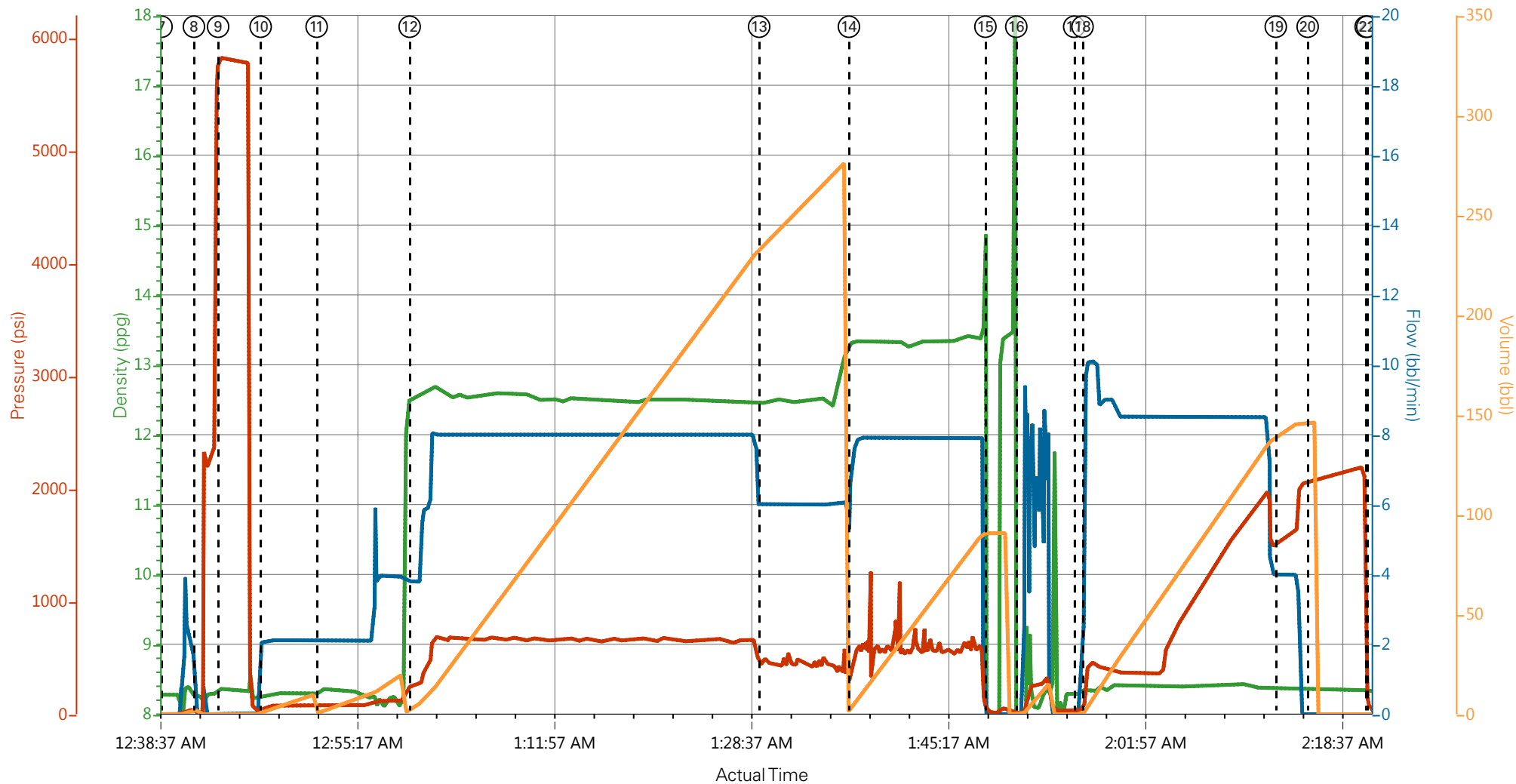
## 2.0 Real-Time Job Summary

## 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	11/21/2017	14:00:00	USER					
Event	2	Pre-Convoy Safety Meeting	11/21/2017	16:00:00	USER					ALL HES PERSONNEL
Event	3	Arrive at Location from Service Center	11/21/2017	17:30:00	USER					RIG RUNNING CASING, THEN CIRCULATED FOR ABOUT 1.5 HOURS
Event	4	Assessment Of Location Safety Meeting	11/21/2017	18:00:00	USER					ALL HES PERSONNEL
Event	5	Pre-Rig Up Safety Meeting	11/21/2017	18:20:00	USER					ALL HES PERSONNEL
Event	6	Pre-Job Safety Meeting	11/22/2017	00:20:00	USER					ALL ON LOCATION PERSONNEL
Event	7	Start Job	11/22/2017	00:39:00	COM5					4.5 11.6# TP- 9474, TD-9484, S.J.-27.23, HOLE- 8 3/4, MUD#-9.4, 9 5/8 SURFACE CASING SET AT 1105
Event	8	Prime Pumps	11/22/2017	00:41:44	COM5					FRESH WATER
Event	9	Test Lines	11/22/2017	00:43:47	COM5	8.36	0.00	5834.00	0.0	5834 PSI
Event	10	Pump Spacer 1	11/22/2017	00:47:22	COM5	8.33	2.20	57.00	10.00	FRESH WATER
Event	11	Pump Spacer 2	11/22/2017	00:52:07	COM5	8.35	4.0	133	20	MUD FLUSH
Event	12	Pump Lead Cement	11/22/2017	00:59:59	COM5	12.50	8.0	675.00	279.8	810 SKS NEOCEM, 12.5 PPG, 1.94 FT3/SK, 9.6 GAL/SK
Event	13	Slow Rate	11/22/2017	01:29:33	USER	12.50	6.00	428.00	250	SLOW TO KEEP DENSITY DURING POD SWAP

Event	14	Pump Tail Cement	11/22/2017	01:37:09	COM5	13.30	8.00	600	81.6	265 SKS THERMACEM, 13.3 PPG, 1.73 FT3/SK, 7.81 GAL/SK
Event	15	Shutdown	11/22/2017	01:48:41	COM5					TO WASH PUMPS AND LINES
Event	16	Clean Lines	11/22/2017	01:51:18	COM5					TO PIT
Event	17	Drop Top Plug	11/22/2017	01:56:12	COM5					AWAY
Event	18	Pump Displacement	11/22/2017	01:56:54	COM5	8.40	8.5	1500	146.8	KCL WATER WITH 1 GAL MMCR, 3 BAGS BE-6
Event	19	SLOW RATE	11/22/2017	02:13:15	COM5	8.40	4.00	1520	136	SLOW RATE TO BUMP PLUG
Event	20	Bump Plug	11/22/2017	02:15:57	COM5	8.40	4.00	1640	146.8	PLUG BUMPED
Event	21	Check Floats	11/22/2017	02:20:51	USER			2075		FLOATS HELD, 1.5 BBLS BACK TO TRUCK
Event	22	End Job	11/22/2017	02:21:00	USER					GOOD CIRCULATION THROUGHOUT JOB, NO PIPE MOVEMENT
Event	23	Post-Job Safety Meeting (Pre Rig-Down)	11/22/2017	02:36:37	USER					ALL HES PERSONNEL
Event	24	Rig Down Lines	11/22/2017	03:00:00	USER					
Event	25	Pre-Convoy Safety Meeting	11/22/2017	03:30:00	USER					ALL HES PERSONNEL
Event	26	Crew Leave Location	11/22/2017	03:45:00	USER					THANK YOU FOR USING HALLIBURTON CEMENT, JAMES LEIST AND CREW

# TEP - SR 423-12 4.5 PRODUCTION CASING



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

① Call Out <span style="color: orange;">n/a;n/a;n/a;n/a</span>	⑧ Prime Pumps <span style="color: orange;">8.25;0;10;2</span>	⑮ Shutdown <span style="color: orange;">-0.21;0;18;90.7</span>	22 End Job <span style="color: orange;">8.32;0;38;0</span>
② Pre-Convoy Safety Meeting <span style="color: orange;">n/a;n/a;n/a;n/a</span>	⑨ Test Lines <span style="color: orange;">8.36;0;5833;0</span>	⑯ Clean Lines <span style="color: orange;">-0.08;0;9;0</span>	23 Post-Job Safety Meeting (Pre Rig-Down) <span style="color: orange;">n/a;n/a;n/a;n/a</span>
③ Arrive at Location from Service Center <span style="color: orange;">n/a;n/a;n/a;n/a</span>	⑩ Pump Spacer 1 <span style="color: orange;">8.28;2.2;57;1</span>	⑰ Drop Top Plug <span style="color: orange;">8.31;0;21;0</span>	24 Rig Down Lines <span style="color: orange;">n/a;n/a;n/a;n/a</span>
④ Assessment Of Location Safety Meeting <span style="color: orange;">n/a;n/a;n/a;n/a</span>	⑪ Pump Spacer 2 <span style="color: orange;">8.35;2.1;75;1</span>	⑱ Pump Displacement <span style="color: orange;">8.37;9.8;346;2.1</span>	25 Pre-Convoy Safety Meeting <span style="color: orange;">n/a;n/a;n/a;n/a</span>
⑤ Pre-Rig Up Safety Meeting <span style="color: orange;">n/a;n/a;n/a;n/a</span>	⑫ Pump Lead Cement <span style="color: orange;">12.51;3.8;265;3.3</span>	⑲ SLOW RATE <span style="color: orange;">8.37;4;1541;139.8</span>	26 Crew Leave Location <span style="color: orange;">n/a;n/a;n/a;n/a</span>
⑥ Pre-Job Safety Meeting <span style="color: green;">8.29;0;-1;0</span>	⑬ Slow Rate <span style="color: orange;">12.45;6;428;234.6</span>	20 Bump Plug <span style="color: orange;">8.35;0;2063.03;146.1</span>	
⑦ Start Job <span style="color: orange;">8.28;0;-2;0</span>	⑭ Pump Tail Cement <span style="color: orange;">13.33;7.1;437;3.7</span>	21 Check Floats <span style="color: orange;">8.33;0;64;0</span>	

▼ **HALLIBURTON** | iCem® Service

Created: 2017-11-21 15:30:34, Version: 4.2.393

Edit

Customer: TERRA ENERGY PARTNERS-EBUS

Job Date: 11/21/2017 10:07:47 PM

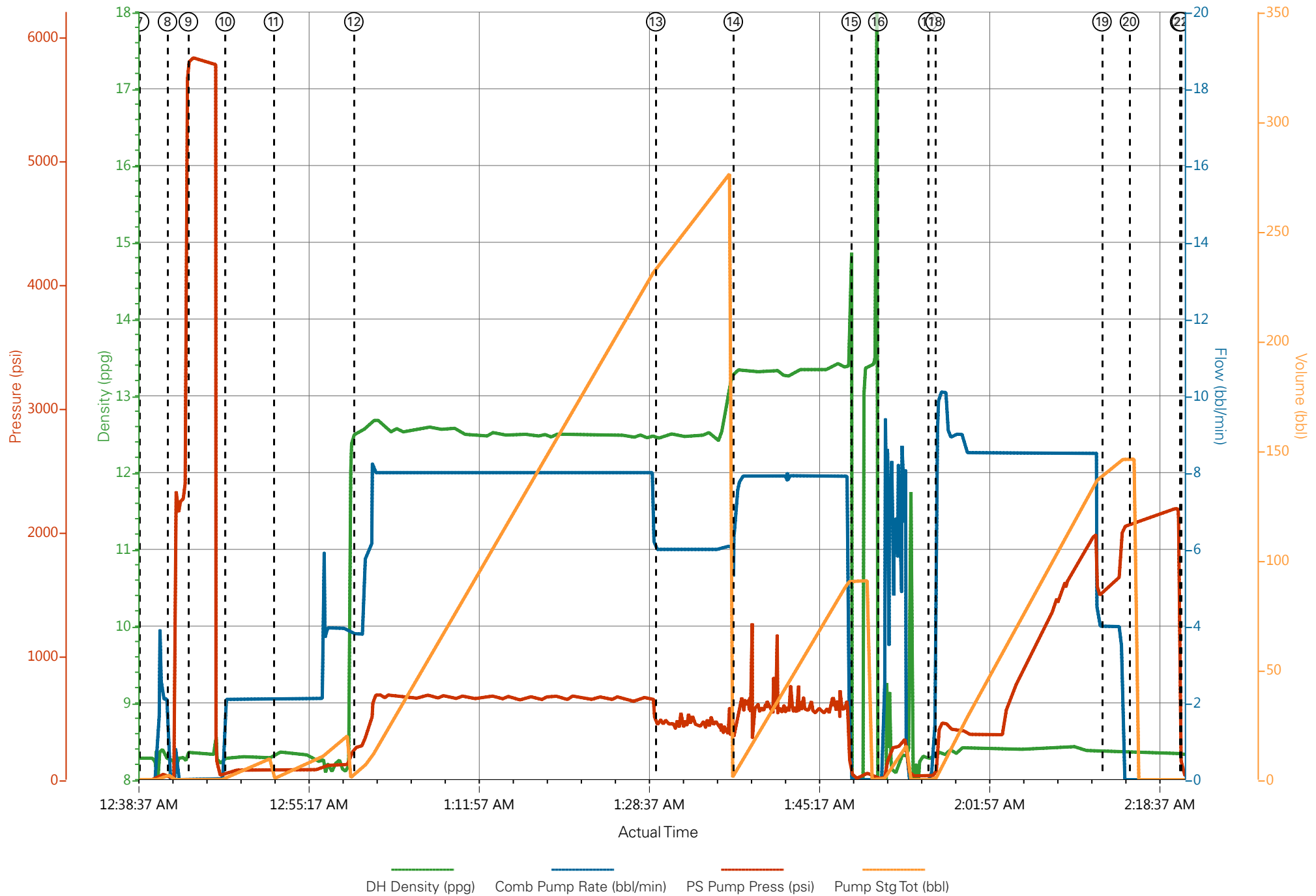
Well: SR 423-12

Representative: JOSH PHILLIPS

Sales Order #: 904449820

ELITE 2: WES GOWEN

# TEP - SR 423-12 4.5 PRODUCTION CASING



# HALLIBURTON

## Rockies, Grand Junction

### Lab Results- Lead

#### Job Information

<b>Request/Slurry</b>	2431094/1	<b>Rig Name</b>	H&P 318	<b>Date</b>	17/NOV/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>	SR 423-12

#### Well Information

<b>Casing/Liner Size</b>	4.5 in	<b>Depth MD</b>	9500 ft	<b>BHST</b>	116°C / 241°F
<b>Hole Size</b>	8.75 in	<b>Depth TVD</b>	9473 ft	<b>BHCT</b>	77°C / 171°F
<b>Pressure</b>	5931 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>	<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		

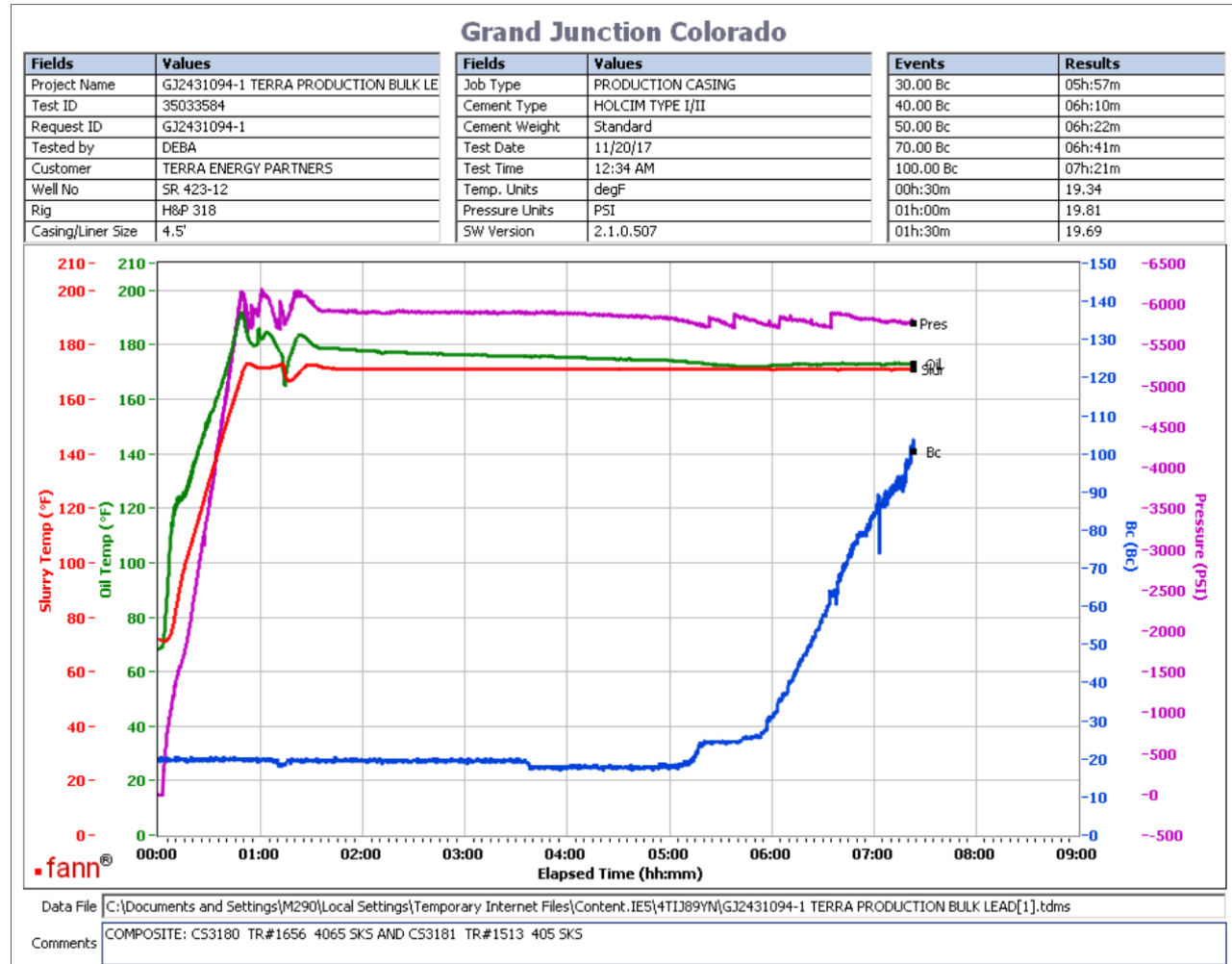
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## Operation Test Results Request ID 2431094/1

### Thickening Time - ON-OFF-ON

20/NOV/2017

Test Temp (degF)	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)
171	5931	48	5:57	6:22	6:41	7:21	19	58	15	19



Total sks= 810  
 CS3180 TR#1656 405 SKS  
 CS3181 TR#1513 405 SKS  
 Deflected 18-- > 19

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# HALLIBURTON

## Rockies, Grand Junction

## Lab Results- Tail

### Job Information

<b>Request/Slurry</b>	2431095/1	<b>Rig Name</b>	H&P 318	<b>Date</b>	17/NOV/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>	SR 423-12

### Well Information

<b>Casing/Liner Size</b>	4.5 in	<b>Depth MD</b>	9500 ft	<b>BHST</b>	116°C / 241°F
<b>Hole Size</b>	8.75 in	<b>Depth TVD</b>	9473 ft	<b>BHCT</b>	77°C / 171°F
<b>Pressure</b>	5931 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>		
		ThermaCem Tail				Slurry Density	13.3	lbm/gal
						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		

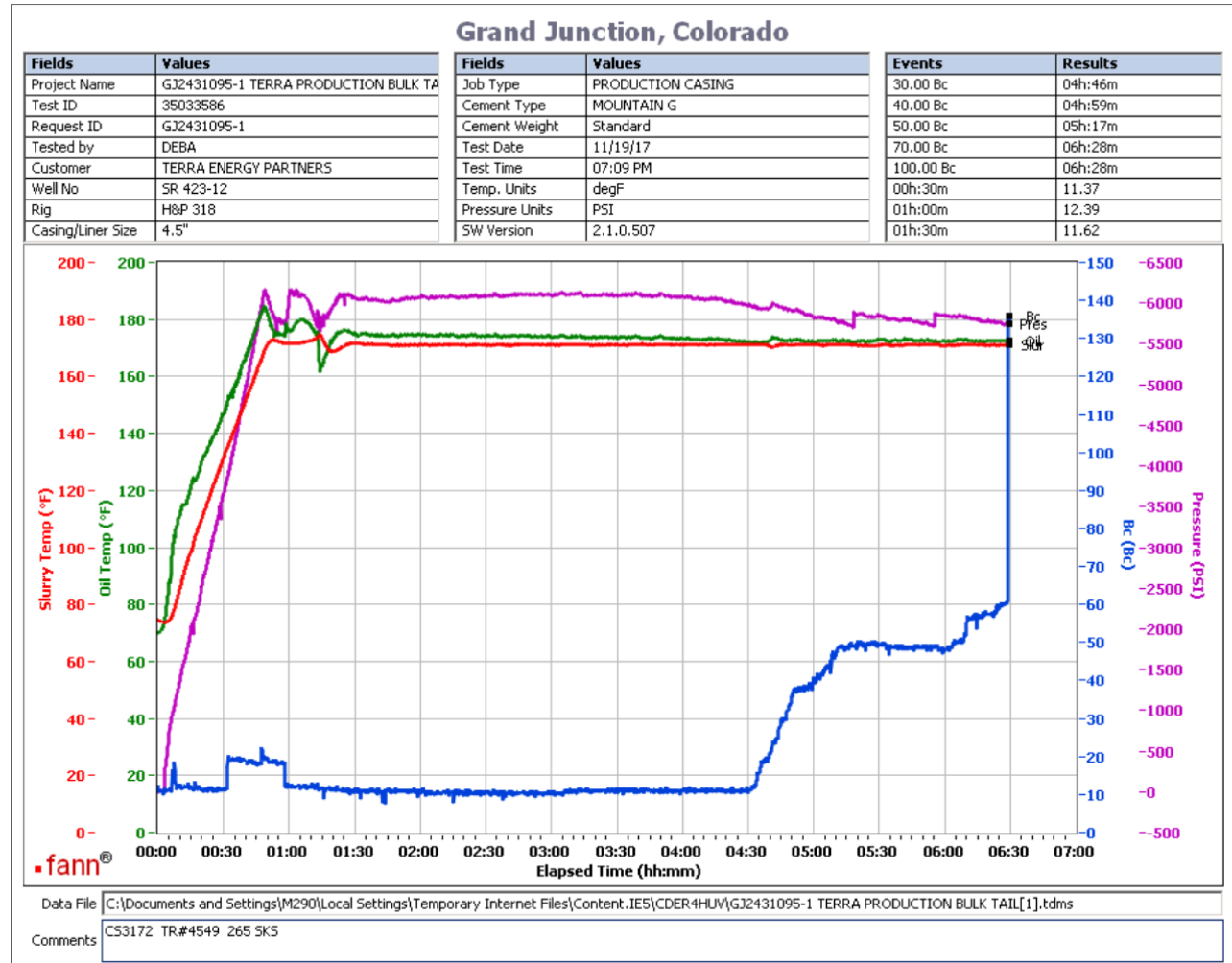
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Thickening Time - ON-OFF-ON

19/NOV/2017

Test Temp (degF)	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)
171	5931	48	4:46	5:17	6:28	6:28	12	58	15	13



265 sks tail  
CS3172 TR#4549 265 sks  
deflected from 12Bc--- > 13Bc

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