

# HALLIBURTON

iCem<sup>®</sup> Service

## **Terra Energy Partners**

**For: Terra**

Date: Thursday, May 04, 2017

**TR 634-27-597 Production PJR**

API/UWI #: 05-045-23502-00

Sincerely,

**Grand Junction Cement Engineering**

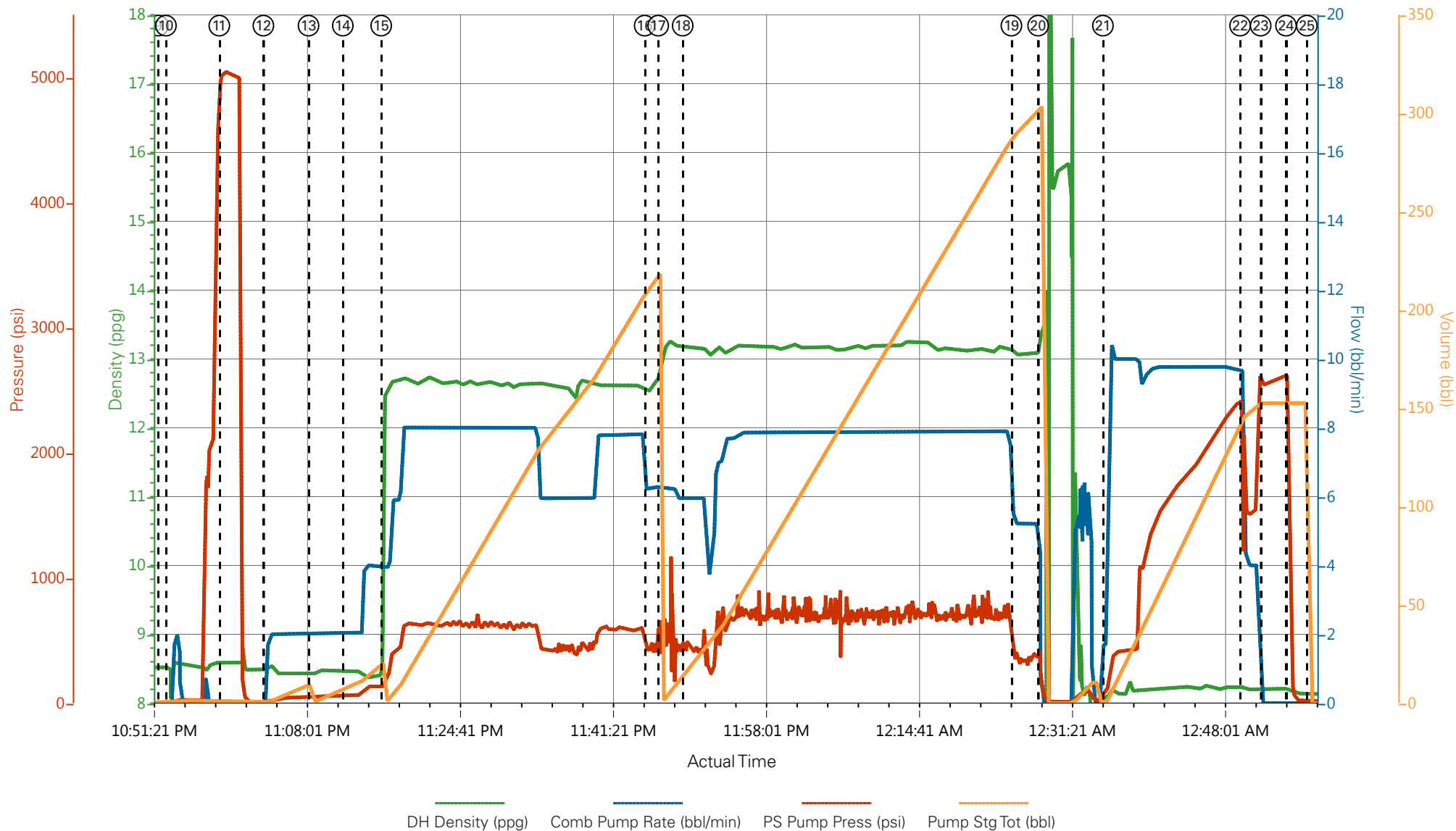
## 1.0 Real-Time Job Summary

## 1.1 Job Event Log

Type	Seq. No.	Graph Label	Date	Time	Source	DH Density (ppg)	Comb Pump Rate (bbl/min)	PS Pump Press (psi)	Pump Stg Tot (bbl)	Comments
Event	1	Call Out	5/3/2017	12:00:00	USER					Requested on Location @ 1730
Event	2	Pre-Convoy Safety Meeting	5/3/2017	14:00:00	USER					With all HES personnel
Event	3	Crew Leave Yard	5/3/2017	14:10:00	USER					1 Elite, 1 660, 1 pickup
Event	4	Arrive At Loc	5/3/2017	17:30:00	USER					Rig running casing
Event	5	Assessment Of Location Safety Meeting	5/3/2017	17:40:00	USER					JSA completed - Customer offered/received SDS - water test pH 7.0, Cl <200, temp 46 degrees
Event	6	Pre-Rig Up Safety Meeting	5/3/2017	18:00:00	USER					With all HES personnel
Event	7	Rig-Up Equipment	5/3/2017	18:15:00	USER					Iron to ground manifold, standpipe, hardline to pit. Water hoses to both uprights, bulk hoses to silo and 660.
Event	8	Pre-Job Safety Meeting	5/3/2017	21:30:00	USER					All HES personnel, rig crew, and company rep.
Event	9	Start Job	5/3/2017	22:52:09	COM6					TD 10027', TP 10017', SJ 31', SFC CSG 9 5/8" 36 LB/FT SET AT 2839', CSG 4 1/2" 11.6 LB/FT, OH 8 3/4", MUD 8.8 PPG 45 Visc.
Event	10	Prime Lines	5/3/2017	22:53:00	USER	8.4	2.0	129.0	2.0	Fresh Water
Event	11	Test Lines	5/3/2017	22:58:48	COM6			5050.0		Tested lines to 5050 PSI, Pressure holding
Event	12	Pump Water Spacer	5/3/2017	23:03:36	COM6	8.4	4.0	10.0	60.0	Fresh Water
Event	13	Pump Mud Flush Spacer	5/3/2017	23:08:31	COM6	8.4	4.0	40.0	64.0	80 lbs. Mud Flush III

Event	14	Check weight	5/3/2017	23:12:15	COM6					Density verified via mud cup
Event	15	Pump Lead Cement	5/3/2017	23:16:26	COM6	12.5	8.0	630.0	212.5	615 sks 12.5 ppg 1.94 yield 9.58 gal/sk, 93 lbs tuff fiber
Event	16	Slow Rate	5/3/2017	23:45:08	USER	12.5	6.0	431.00	200.0	Slowed rate to finish lead cement
Event	17	Pump Tail Cement	5/3/2017	23:46:37	COM6	13.0	8.0	700.0	289.4	785 sks 13.0 ppg 2.07 yield 9.43 gal/sk
Event	18	Check weight	5/3/2017	23:49:17	COM6					Density verified via mud cup
Event	19	Slow Rate	5/4/2017	00:25:05	USER	13.0	5.0	375.00	260.0	Slowed rate to finish cement
Event	20	Shutdown	5/4/2017	00:28:00	USER					Wash lines to pit
Event	21	Pump Displacement	5/4/2017	00:35:03	COM6	8.4	10.0	2400.0	154.8	Fresh Water, 3 lbs BE-6, 1 gal MMCR, 2% KCl
Event	22	Slow Rate	5/4/2017	00:50:00	USER	8.4	4.0	1500.0	144.0	Slow Rate 10 bbls to Calculated Displacement
Event	23	Bump Plug	5/4/2017	00:52:14	COM6			2540.00		Plug Bumped at 1540 psi, Brought up to 2540 psi
Event	24	Check Floats	5/4/2017	00:55:00	USER			2630.0		Floats holding, returned 1.5 bbls back to pump
Event	25	End Job	5/4/2017	00:57:16	COM6					No returns throughout job. Pipe was static during job. Supervisor had to go in the air due to casing height above rig floor.
Event	26	Pre-Rig Down Safety Meeting	5/4/2017	01:15:00	USER					With all HES personnel
Event	27	Rig-Down Equipment	5/4/2017	01:30:00	USER					No sugar, HES top plug not used, no add hours
Event	28	Pre-Convoy Safety Meeting	5/4/2017	03:00:00	USER					With all HES personnel
Event	29	Crew Leave Location	5/4/2017	03:15:00	USER					
Event	30	Comment	5/4/2017	03:30:00	USER					Thank you for choosing Halliburton Cement Department, Steven Wardell and Crew.

# TEP Rocky Mountain LLC - TR 634-27-597 - Production



- |   |                          |                         |                      |                                |
|---|--------------------------|-------------------------|----------------------|--------------------------------|
| ① Call Out                              | ⑦ Rig-Up Equipment       | ⑬ Pump Mud Flush Spacer | ⑰ Slow Rate          | 25 End Job                     |
| ② Pre-Convoy Safety Meeting             | ⑧ Pre-Job Safety Meeting | ⑭ Check weight          | 20 Shutdown          | 26 Pre-Rig Down Safety Meeting |
| ③ Crew Leave Yard                       | ⑨ Start Job              | ⑮ Pump Lead Cement      | 21 Pump Displacement | 27 Rig-Down Equipment          |
| ④ Arrive At Loc                         | ⑩ Prime Lines            | ⑯ Slow Rate             | 22 Slow Rate         | 28 Pre-Convoy Safety Meeting   |
| ⑤ Assessment Of Location Safety Meeting | ⑪ Test Lines             | ⑰ Pump Tail Cement      | 23 Bump Plug         | 29 Crew Leave Location         |
| ⑥ Pre-Rig Up Safety Meeting             | ⑫ Pump Water Spacer      | ⑱ Check weight          | 24 Check Floats      | 30 Comment                     |

▼ **HALLIBURTON** | iCem® Service

Created: 2017-05-03 19:06:30, Version: 4.2.393

Edit

Customer: TEP ROCKY MOUNTAIN LLC

Job Date: 5/3/2017

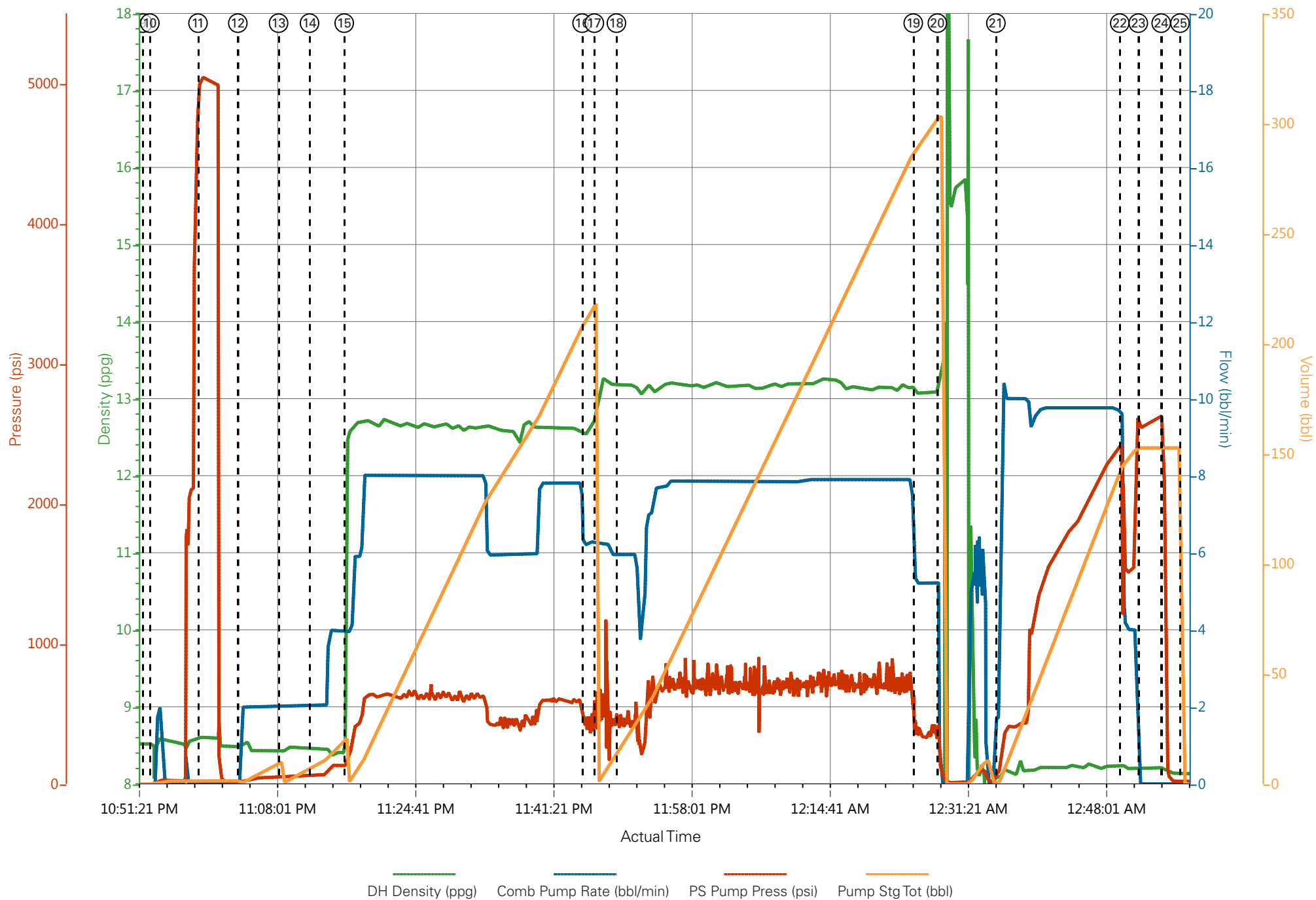
Well: TR 634-27-597

Representative: Curt Patterson

Sales Order #: 904008630

Elite # 1: Steve Wardell / Dirk Brennecke

# TEP Rocky Mountain LLC - TR 634-27-597 - Production



### Job Information

<b>Request/Slurry</b>	2385021/1	<b>Rig Name</b>	H&P 318	<b>Date</b>	29/APR/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>	Trail Ridge 634-27-597

### Well Information

<b>Casing/Liner Size</b>	4.5 in	<b>Depth MD</b>	10040 ft	<b>BHST</b>	119°C / 247°F
<b>Hole Size</b>	8.75 in	<b>Depth TVD</b>	9800 ft	<b>BHCT</b>	81°C / 177°F
<b>Pressure</b>	6160 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

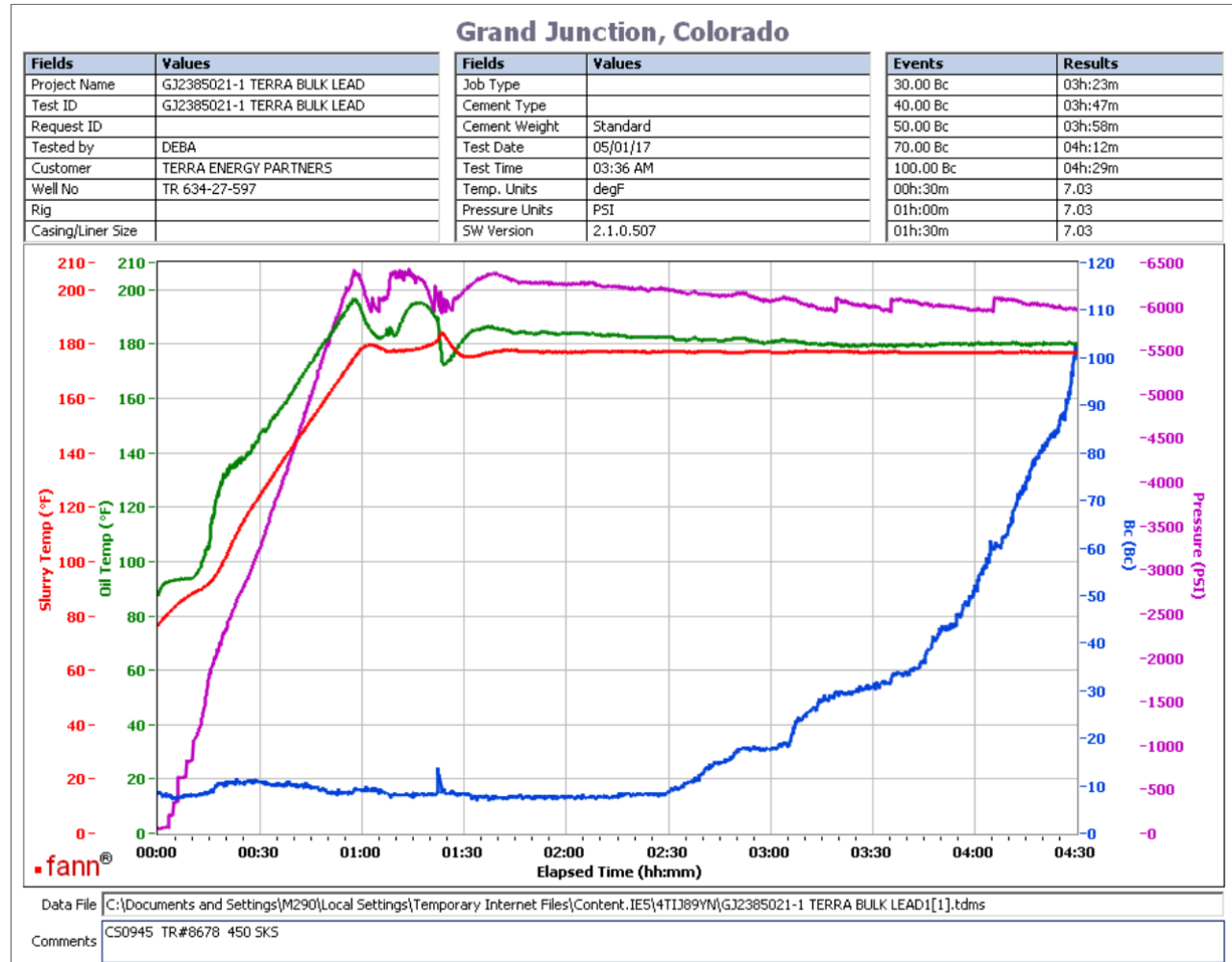
<u>Conc</u>	<u>UOM</u>	<u>Cement/Additive</u>	<u>Sample Type</u>	<u>Sample Date</u>	<u>Lot No.</u>	<b>Cement Properties</b>		
						Slurry Density	12.5	lbm/gal
						Slurry Yield	1.941	ft3/sack
						Water Requirement	9.623	gal/sack
						Total Mix Fluid	9.623	gal/sack
						Water Source	Fresh Water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

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Thickening Time - ON-OFF-ON

01/MAY/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)
177	6160	53	3:23	3:58	4:12	4:29	6	67	15	8



Total sks = 615  
 CS0945 TR# 8678 450 SKS  
 deflected from 5Bc to 7 Bc

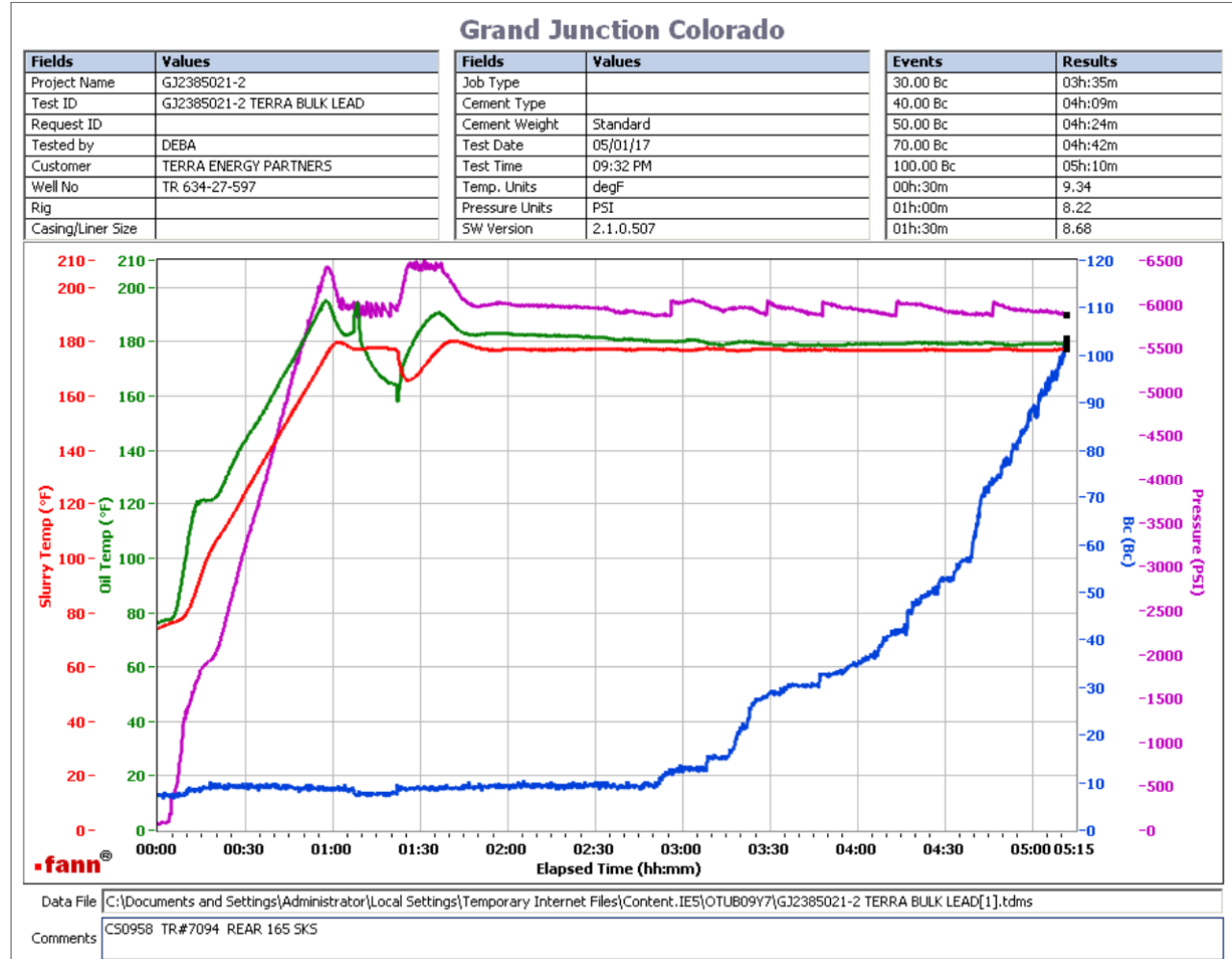
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## Operation Test Results Request ID 2385021/2

### Thickening Time - ON-OFF-ON

01/MAY/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)
172	6160	52	3:35	4:24	4:42	5:10	7	67	15	9



Total sks = 615  
 CS0958 TR# 7094 Rear 165 SKS  
 deflected from 7Bc to 9Bc

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# HALLIBURTON

## Rockies, Grand Junction

## Lab Results- Tail

### Job Information

<b>Request/Slurry</b>	2385022/1	<b>Rig Name</b>	H&P 318	<b>Date</b>	29/APR/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>	Trail Ridge 634-27-597

### Well Information

<b>Casing/Liner Size</b>	4.5 in	<b>Depth MD</b>	10040 ft	<b>BHST</b>	119°C / 247°F
<b>Hole Size</b>	8.75 in	<b>Depth TVD</b>	9800 ft	<b>BHCT</b>	81°C / 177°F
<b>Pressure</b>	6160 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 - Tail Design



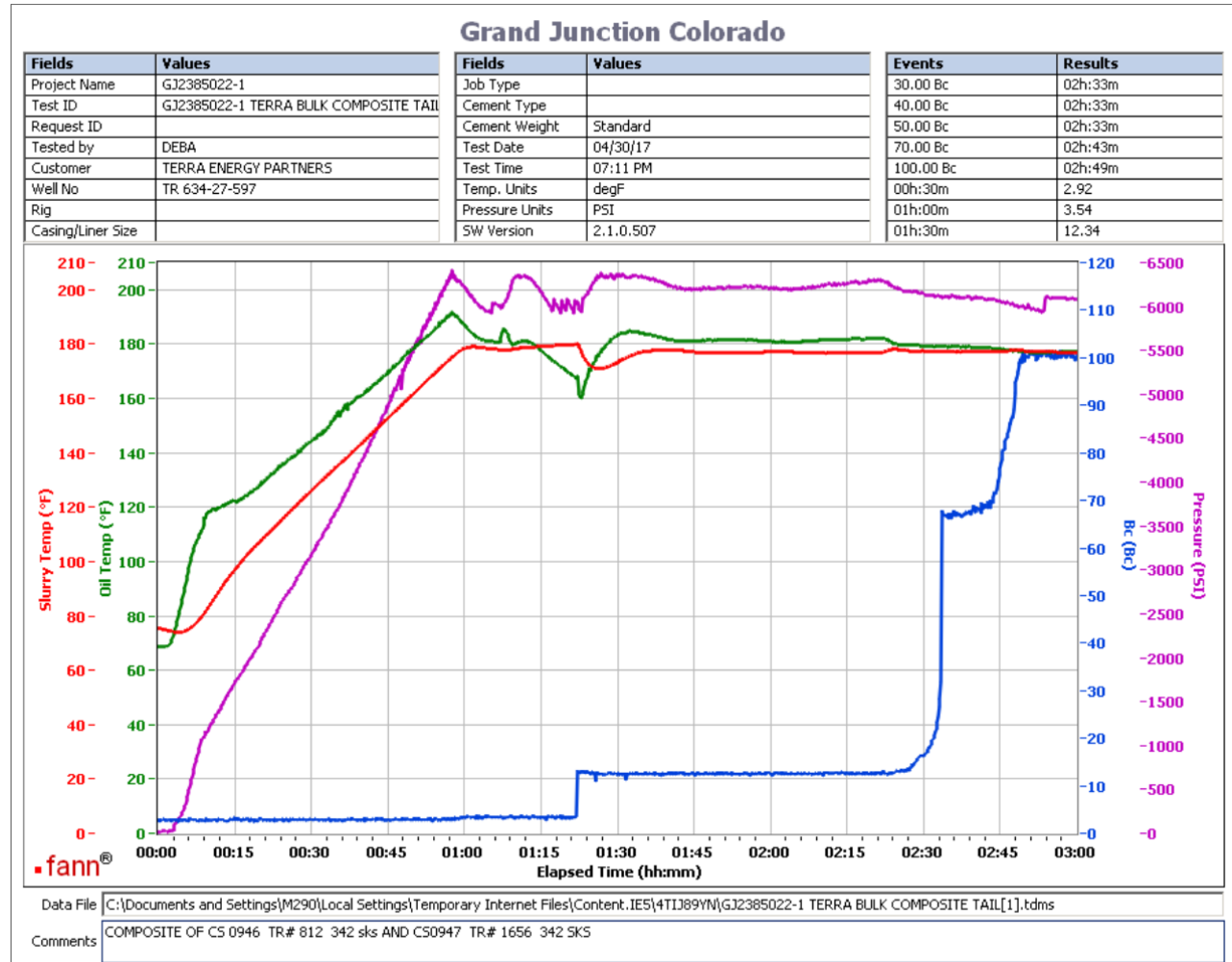
<u>Conc</u>	<u>UOM</u>	<u>Cement/Additive</u>	<u>Sample Type</u>	<u>Sample Date</u>	<u>Lot No.</u>	<b>Cement Properties</b>		
						Slurry Density	13	lbm/gal
						Slurry Yield	2.065	ft3/sack
						Water Requirement	9.429	gal/sack
						Total Mix Fluid	9.429	gal/sack
						Water Source	Fresh Water	
						Water Chloride		

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Thickening Time - ON-OFF-ON

01/MAY/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)
177	6160	57	2:33	2:33	2:43	2:49	3	67	15	11



Total sks = 785  
 composite of: CS0946 TR#0812 342 SKS and  
 CS0947 TR#1656 342 SKS  
 deflected from 5Bc to 11bc data taken from the graph

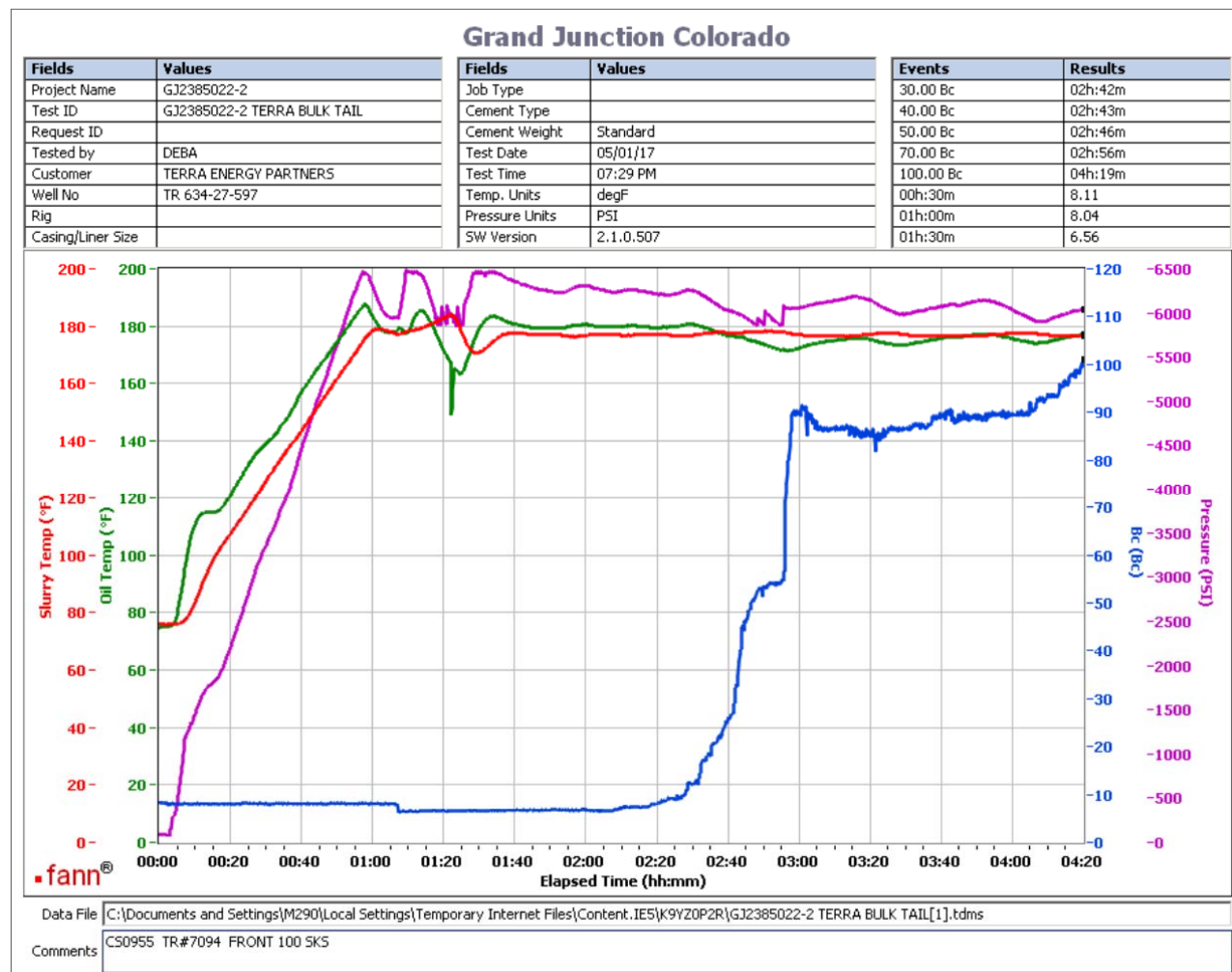
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# Operation Test Results Request ID 2385022/2

## Thickening Time - ON-OFF-ON

01/MAY/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)
177	6160	57	2:42	2:56	4:19	8	67	15	7



Total sks = 785

CS0955 TR# 7094 100SKS

deflected from 5Bc to 7Bc when the stirring was resumed.

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