

# HALLIBURTON

iCem<sup>®</sup> Service

**TERRA ENERGY LTD.**

**For: Terra**

Date: Wednesday, April 19, 2017

**TR 413-21-597 Production**

**API#05-045-23344-00**

Sincerely,  
Grand Junction Cement Engineering

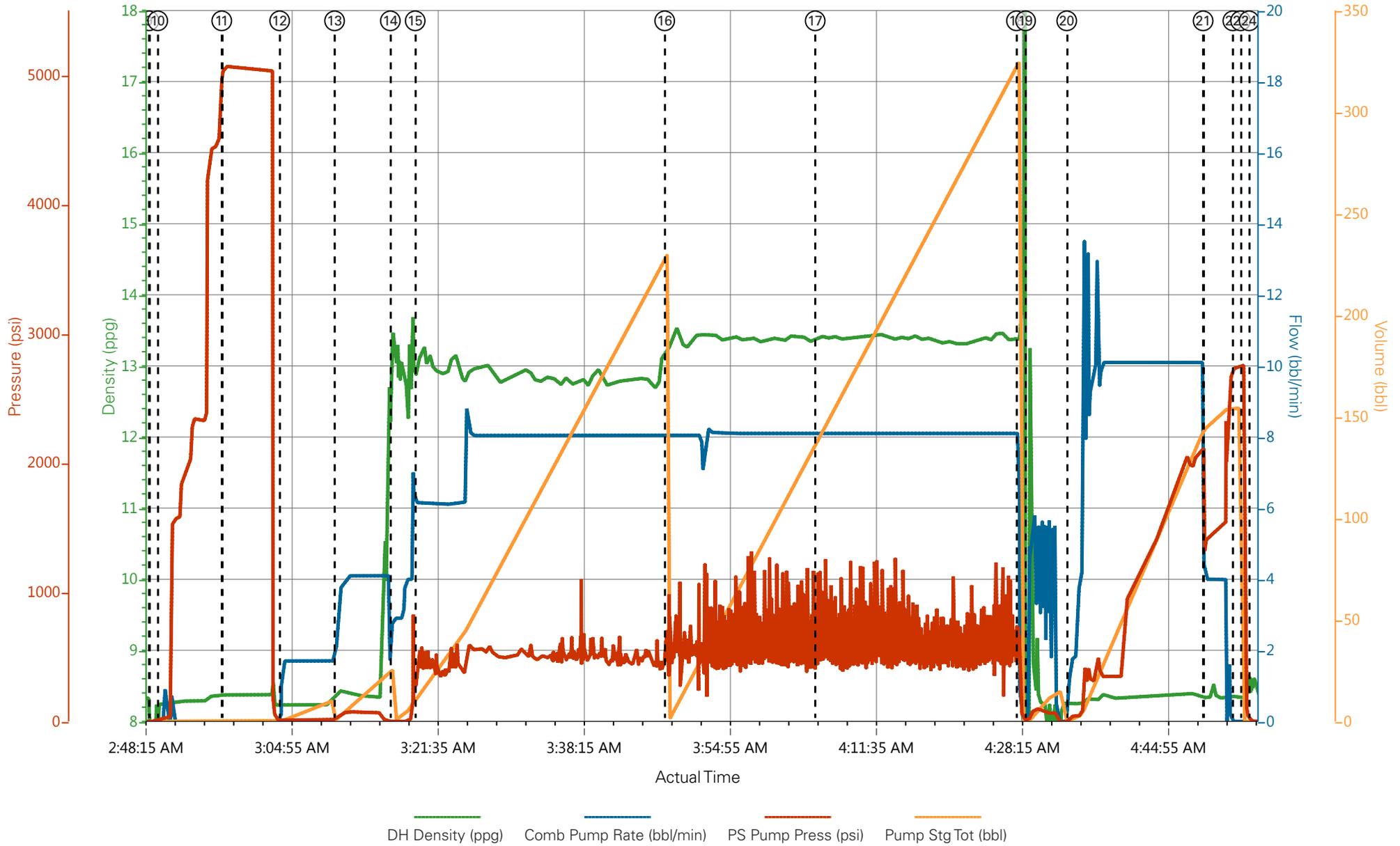
## 1.0 Real-Time Job Summary

### 1.1 Job Event Log

Type	Seq. No.	Graph Label	Date	Time	Source	Pass-Side Pump Pressure (psi)	Downhole Density (ppg)	Combined Pump Rate (bbl/min)	Pump Stage Total (bbl)	Comments
Event	1	Call Out	4/18/2017	17:00:00	USER					REQUESTED ON LOCATION @ 0001
Event	2	Pre-Convoy Safety Meeting	4/18/2017	19:00:00	USER					ALL HES PRESENT
Event	3	Crew Leave Yard	4/18/2017	19:10:00	USER					1 F550, 1 PUMP TRUCK & 1 660 BULK TURCK
Event	4	Assessment Of Location Safety Meeting	4/18/2017	22:30:00	USER					MET WITH COMP REP, K.PATTERSON, AND WENT OVER NUMBERS AND JOB PROCEDURE. WALKED AROUND LOCATION AND COLLECTED WATER SAMPLE (PH- 7, CHLORIDES- 0, TEMP- 54F). COMP REP WAS OFFERED SDS FOR ALL CHEMICLES USED BY HES.
Event	5	Arrive At Loc	4/18/2017	23:30:00	USER					RIG RUNNING CASING
Event	6	Pre-Rig Up Safety Meeting	4/19/2017	00:45:00	USER					ALL HES PRESENT
Event	7	Rig-Up Equipment	4/19/2017	01:00:00	USER					HES RIGGED UP EQUIPMENT WITHOUT ENTERING RED ZONE.
Event	8	Pre-Job Safety Meeting	4/19/2017	02:30:00	USER					ALL HES AND RIG CREW PRESENT
Event	9	Start Job	4/19/2017	02:49:00	COM6					TD 9584', TP 9577', SJ 32', OH 8.75'', CSG 4.5'' 11.6#, MUD 8.8 PPG. RIG CIRCULATED WELL FOR APPROX 2 HRS.
Event	10	Fill Lines	4/19/2017	02:50:00	USER	31.00	8.24	0.00	0.0	8.33 PPG FRESH WATER
Event	11	Test Lines	4/19/2017	02:57:17	COM6	5064.00	8.37	0.00	0.4	ALL LINES HELD PRESSURE AT 5068 PSI
Event	12	Pump Spacer 1	4/19/2017	03:03:54	COM6	14.00	8.23	1.70	0.4	FRESH WATER (10 BBL), 8.33 PPG
Event	13	Pump Spacer 2	4/19/2017	03:10:10	COM6	21.00	8.44	2.70	1.2	MUD FLUSH III (20 BBL), 8.4 PPG
Event	14	Pump Lead Cement	4/19/2017	03:16:31	COM6	0.00	13.34	2.90	0.0	NEOCEM CEMENT 550 SKS (190 BBLS), 12.5 PPG, 1.94 FT3/SK, 9.58 GAL/SK
Event	15	Check weight	4/19/2017	03:19:21	COM6					WEIGHT VERIFIED VIA PRESSUREIZED MUD SCALES

Event	16	Pump Tail Cement	4/19/2017	03:47:49	COM6	524.00	13.24	8.10	230.4	NEOCEM CEMENT 765 SKS (282 BBLS), 13 PPG, 2.07 FT3/SK, 9.43 GAL/SK. AIR ON PARASITE REDUCED TO 600 UNITS.
Event	17	Post-Job Safety Meeting (Pre Rig-Down)	4/19/2017	04:05:00	USER					ALL HES PRESENT
Event	18	Shutdown	4/19/2017	04:27:57	USER					END OF CMT
Event	19	Clean Lines	4/19/2017	04:29:00	USER					WASH UP PUMPS AND LINES
Event	20	Pump Displacement	4/19/2017	04:33:41	COM6	39.00	8.23	1.70	0.2	8.34 PPG KCL WATER (113.9 BBLS) 1 GAL MMCR & 3 BAGS BE6. AIR ON PARASITE SHUT OFF.
Event	21	Slow Rate	4/19/2017	04:49:15	USER	1420.00	8.32	4.00	144.7	SLOW RATE TO 4 BPM PER CO REP TO LAND PLUG
Event	22	Bump Plug	4/19/2017	04:52:38	USER	2739.00	8.35	0.00	154.2	LAND PLUG AT 1580 PSI, BROUGHT UP TO 2773 PSI
Event	23	Check Floats	4/19/2017	04:53:31	USER	2648.00	8.35	0.00	0.0	FLOATS HELD, 1 BBL BACK TO TRUCK
Event	24	End Job	4/19/2017	04:54:30	USER					LAND PLUG AT 1580 PSI, BROUGHT UP TO 2773 PSI
Event	25	Rig-Down Equipment	4/19/2017	05:10:00	USER					ALL HES PRESENT
Event	26	Pre-Convoy Safety Meeting	4/19/2017	05:55:00	USER					ALL HES PRESENT
Event	27	Crew Leave Location	4/19/2017	06:00:00	USER					PIPE WAS RECIPROCATED DURING THE JOB, 0 BBL CEMENT BACK TO SURFACE

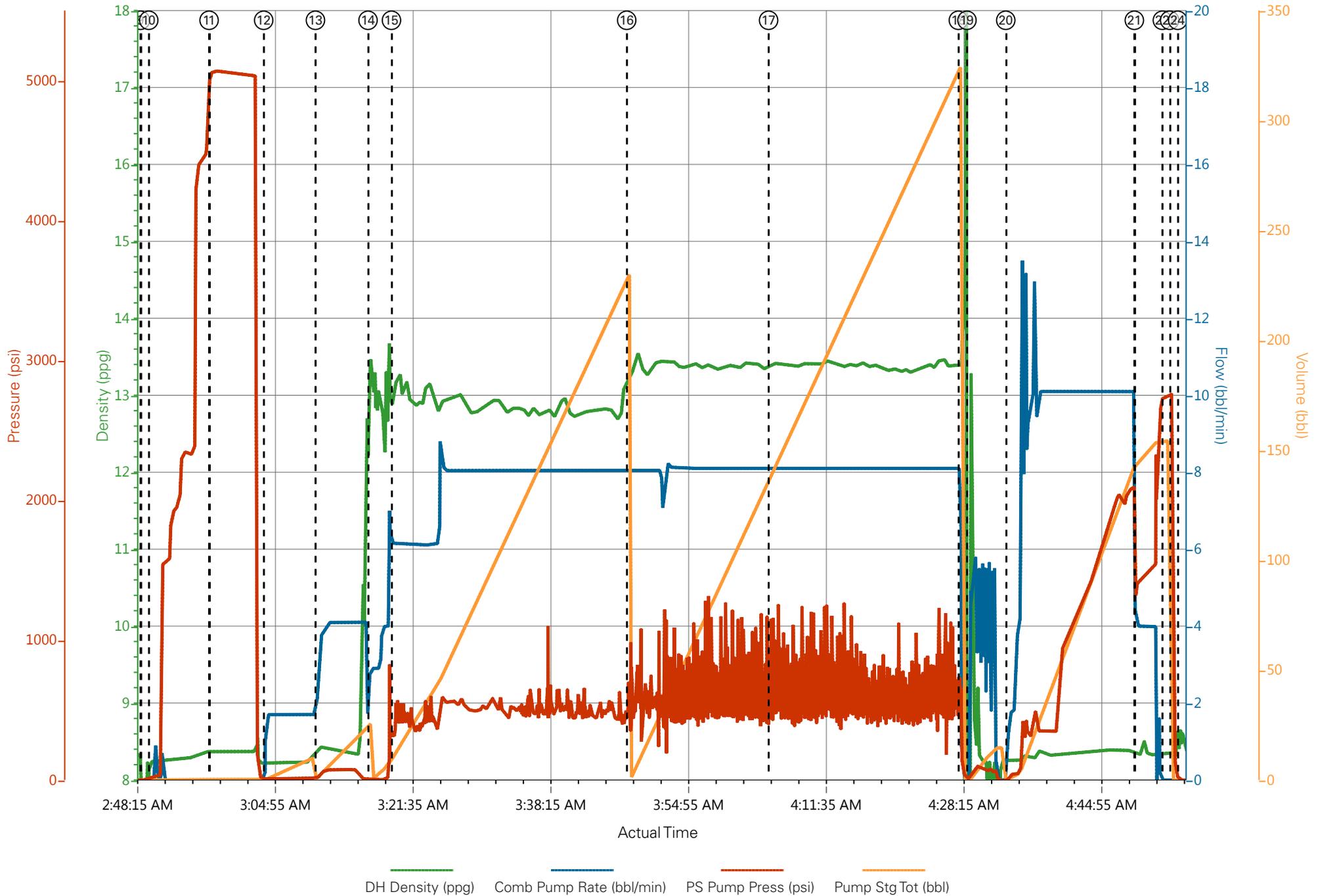
# TEP - TR 413-21-597 - 4.5" PRODUCTION



- ① Call Out n/a;n/a;n/a;n/a
- ② Pre-Convoy Safety Meeting n/a;n/a;n/a;n/a
- ③ Crew Leave Yard n/a;n/a;n/a;n/a
- ④ Assessment Of Location Safety Meeting n/a;n/a;n/a;n/a
- ⑤ Arrive At Loc n/a;n/a;n/a;n/a
- ⑥ Pre-Rig Up Safety Meeting n/a;n/a;n/a;n/a
- ⑦ Rig-Up Equipment 8.76;0;3;24.6
- ⑧ Pre-Job Safety Meeting 8.84;0;2;0
- ⑨ Start Job 0.36;0;1;0
- ⑩ Fill Lines 8.24;0;31;0
- ⑪ Test Lines 8.37;0;5064;0.4
- ⑫ Pump Spacer 1 8.24;1.7;14;0.4
- ⑬ Pump Spacer 2 8.44;2.7;14;0.4
- ⑭ Pump Lead Cement 13.3;0;0;0
- ⑮ Check weight 12.99;6.2;0;0



# TEP - TR 413-21-597 - 4.5" PRODUCTION



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

### Job Information

<b>Request/Slurry</b>	2379820/2	<b>Rig Name</b>	H&P 271	<b>Date</b>	12/APR/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 413-21-597

### Well Information

<b>Casing/Liner Size</b>	4.5 in	<b>Depth MD</b>	9321 ft	<b>BHST</b>	114°C / 238°F
<b>Hole Size</b>	8.75 in	<b>Depth TVD</b>	9626 ft	<b>BHCT</b>	76°C / 168°F
<b>Pressure</b>	5820 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 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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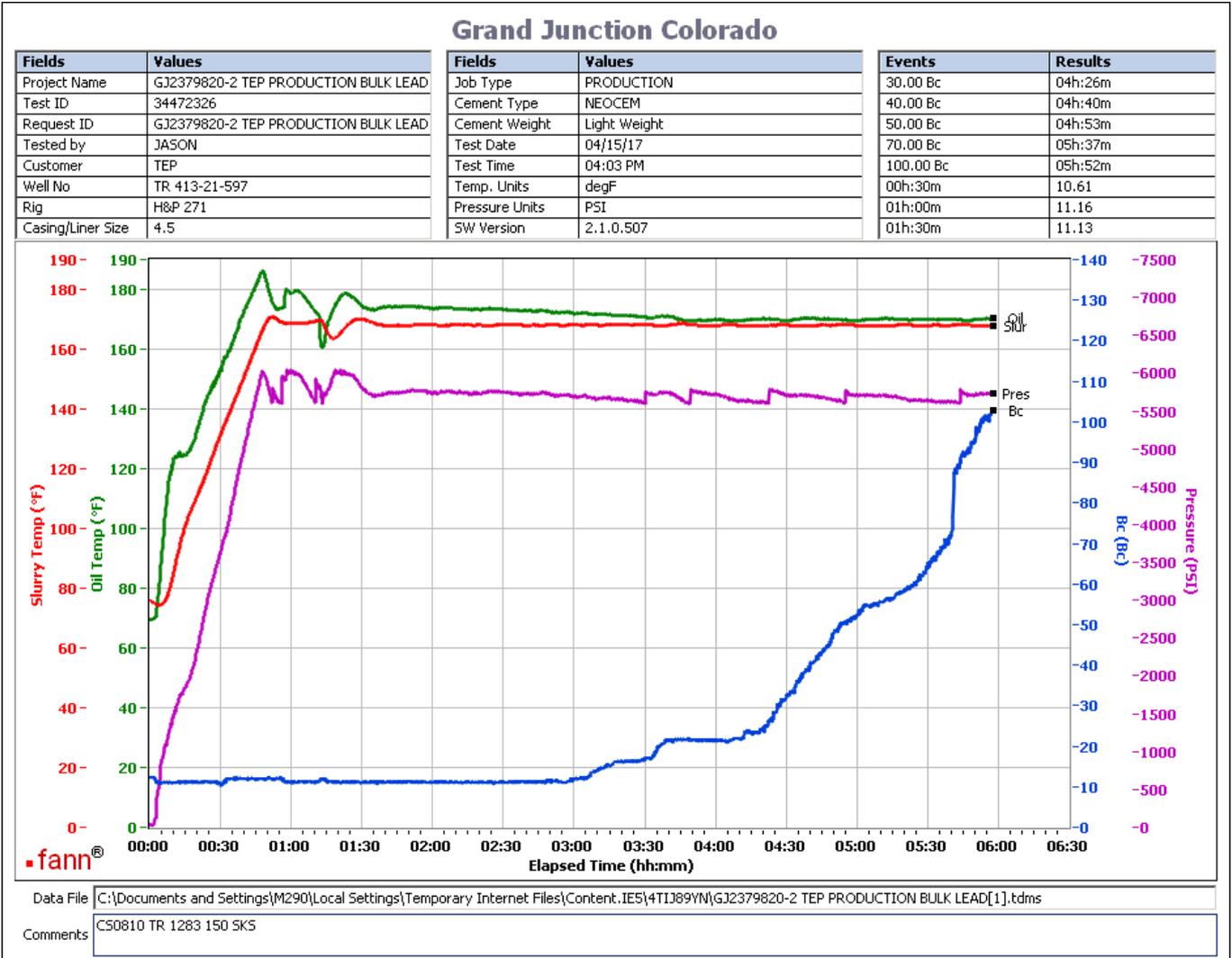
**Operation Test Results Request ID 2379820/2**

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

**15/APR/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)
168	5820	47	4:26	4:53	5:37	5:52	12	57	15	12

Total Sacks= 550  
 CS0810 TR 1283 150 SKS  
 Deflected 11--> 12



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# Operation Test Results Request ID 2379820/1

## Thickening Time - ON-OFF-ON

14/APR/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)
168	5820	47	3:54	4:58	5:00	5:03	7	57	15	18

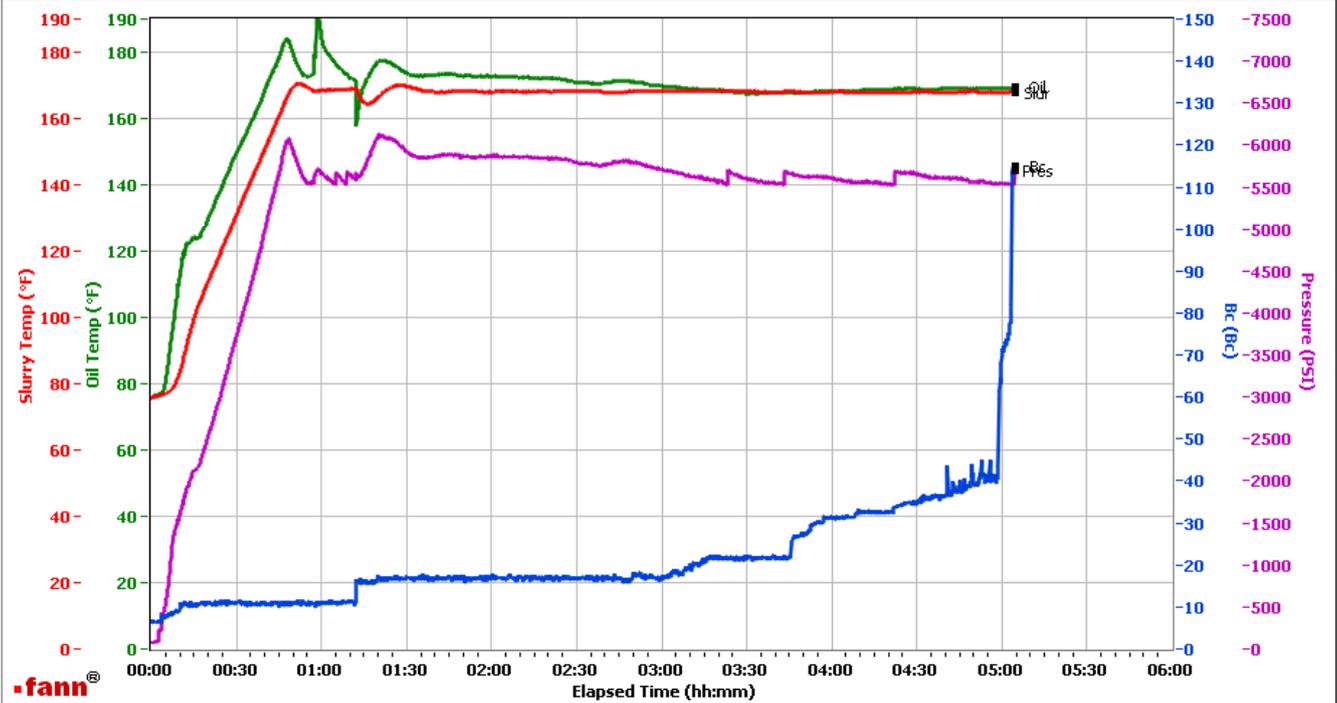
Total Sacks= 550  
 CS0796 TR 0812 400 SKS  
 Deflected 11-- > 18

### Grand Junction Colorado

Fields	Values
Project Name	GJ2379820-1 TEP PRODUCTION BULK LEAD
Test ID	34465417
Request ID	GJ2379820-1 TEP PRODUCTION BULK LEAD
Tested by	JASON
Customer	TEP
Well No	TR 413-21-597
Rig	H&P 271
Casing/Liner Size	4.5

Fields	Values
Job Type	PRODUCTION
Cement Type	NEOCEM
Cement Weight	Light Weight
Test Date	04/14/17
Test Time	07:18 PM
Temp. Units	degF
Pressure Units	PSI
SW Version	2.1.0.507

Events	Results
30.00 Bc	03h:54m
40.00 Bc	04h:40m
50.00 Bc	04h:58m
70.00 Bc	05h:00m
100.00 Bc	05h:03m
00h:30m	11.34
01h:00m	11.07
01h:30m	17.12



Data File C:\Documents and Settings\Administrator\Desktop\Test Data\GJ2379820-1 TEP PRODUCTION BULK LEAD.tdms

Comments CS0796 TR 0812 400 SKS

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### Job Information

<b>Request/Slurry</b>	2379821/2	<b>Rig Name</b>	H&P 271	<b>Date</b>	12/APR/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 413-21-597

### Well Information

<b>Casing/Liner Size</b>	4.5 in	<b>Depth MD</b>	9321 ft	<b>BHST</b>	114°C / 238°F
<b>Hole Size</b>	8.75 in	<b>Depth TVD</b>	9626 ft	<b>BHCT</b>	76°C / 168°F
<b>Pressure</b>	5820 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 ft <sup>3</sup> /sack
						Water Requirement	9.429 gal/sack
						Total Mix Fluid	9.429 gal/sack
						Water Source	Fresh Water
						Water Chloride	

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# Operation Test Results Request ID 2379821/2

## Thickening Time - ON-OFF-ON

15/APR/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)
168	5820	47	2:20	2:28	2:33	2:38	20	57	15	14

Total sks = 765

CS0809 TR 1283 100 SKS

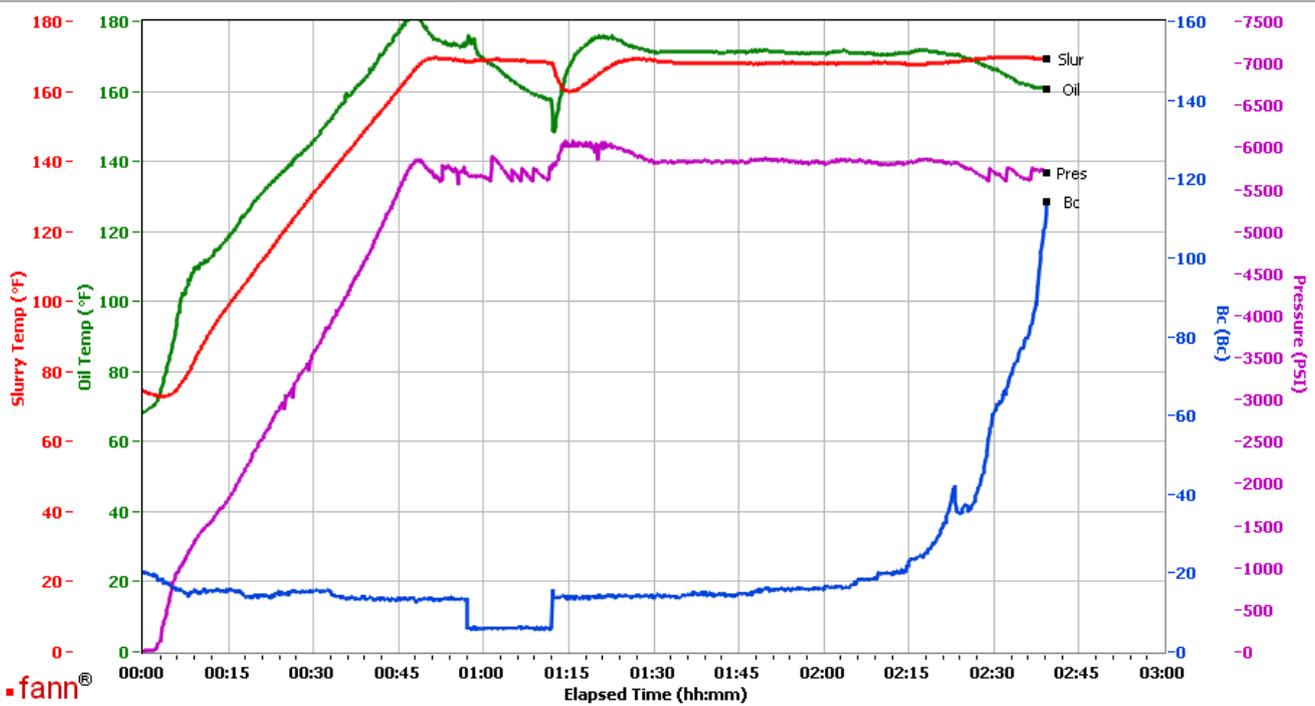
Deflected 6-- > 14. Went into SD at 14 Bc

### Grand Junction, Colorado

Fields	Values
Project Name	GJ2379821-2 TEP PRODUCTION BULK TAIL
Test ID	34472315
Request ID	GJ2379821-2 TEP PRODUCTION BULK TAIL
Tested by	JASON
Customer	TEP
Well No	TR 413-21-597
Rig	H8P 271
Casing/Liner Size	4.5

Fields	Values
Job Type	PRODUCTION
Cement Type	NEOCEM
Cement Weight	Light Weight
Test Date	04/15/17
Test Time	10:52 PM
Temp. Units	degF
Pressure Units	PSI
SW Version	2.1.0.507

Events	Results
30.00 Bc	02h:20m
40.00 Bc	02h:22m
50.00 Bc	02h:28m
70.00 Bc	02h:33m
100.00 Bc	02h:38m
00h:30m	15.24
01h:00m	5.89
01h:30m	13.51



Data File C:\Documents and Settings\M290\Desktop\Test Data\GJ2379821-2 TEP PRODUCTION BULK TAIL.tdms  
 Comments CS0809 TR 1283 100 SKS

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# Operation Test Results Request ID 2379821/1

## Thickening Time - ON-OFF-ON

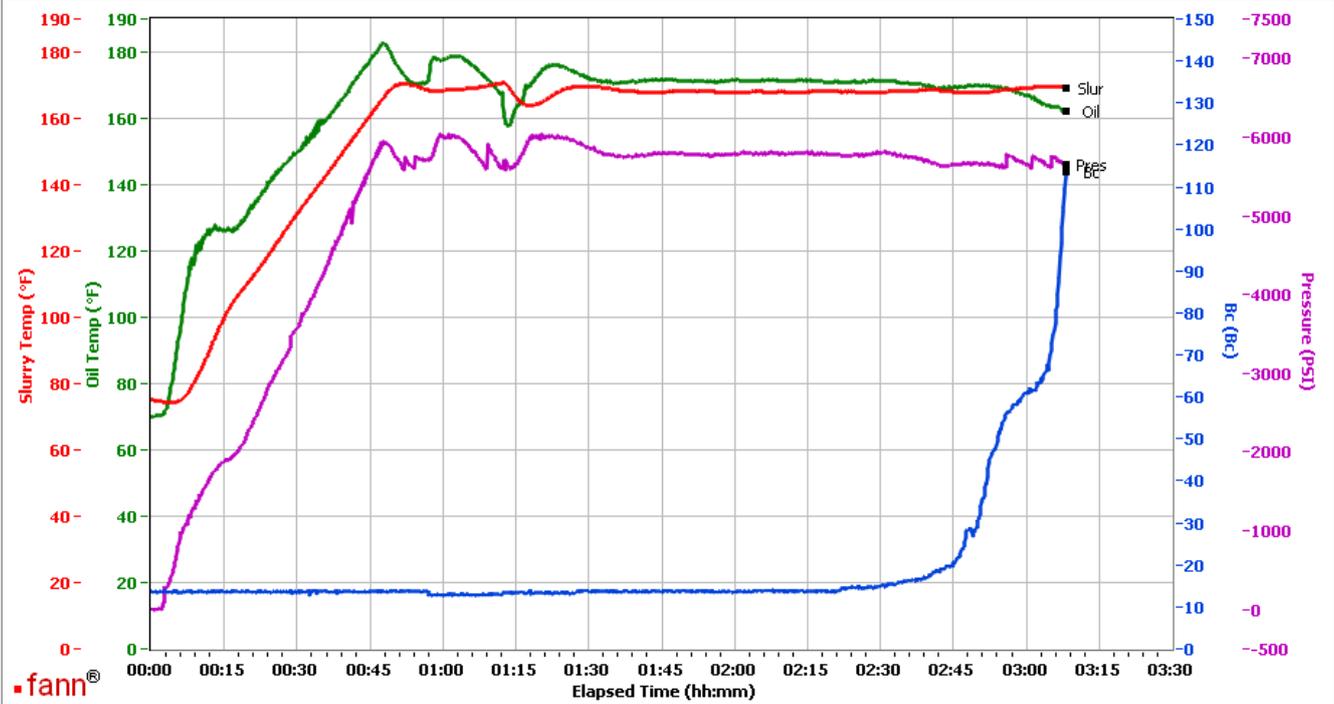
14/APR/2017

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)
168	5820	47	2:50	2:54	3:05	3:07	14	57	15	13

Total sks = 765  
 CS0800 TR 8677 332.5 SKS  
 CS0801 TR 1513 332.5 SKS  
 Composite  
 No deflection

### Grand Junction Colorado

Fields	Values	Fields	Values	Events	Results
Project Name	GJ2379821-1 TEP PRODUCTION BULK TAIL	Job Type	PRODUCTION	30.00 Bc	02h:50m
Test ID	34465419	Cement Type	NEOCEM	40.00 Bc	02h:52m
Request ID	GJ2379821-1 TEP PRODUCTION BULK TAIL	Cement Weight	Light Weight	50.00 Bc	02h:54m
Tested by	JASON	Test Date	04/14/17	70.00 Bc	03h:05m
Customer	TEP	Test Time	01:40 PM	100.00 Bc	03h:07m
Well No	TR 413-21-597	Temp. Units	degF	00h:30m	13.56
Rig	H8P 271	Pressure Units	PSI	01h:00m	12.68
Casing/Liner Size	4.5	SW Version	2.1.0.507	01h:30m	13.74



Data File C:\Documents and Settings\M290\Local Settings\Temporary Internet Files\Content.IE5\K9YZ0P2R\GJ2379821-1 TEP PRODUCTION BULK TAIL COMP.[1].tdms  
 Comments CS0800 TR 8677 332.5 SKS CS0801 TR 1513 332.5 SKS

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