

# HALLIBURTON

iCem<sup>®</sup> Service

## **TERRA ENERGY PARTNERS**

**For: Terra**

Date: Saturday, June 01, 2019

**RWF 512-17 Production PJR**

API# 05-045-24038-00

Sincerely,

**Grand Junction Cement Engineering**

## 2.0 Real-Time Job Summary

## 2.1 Job Event Log

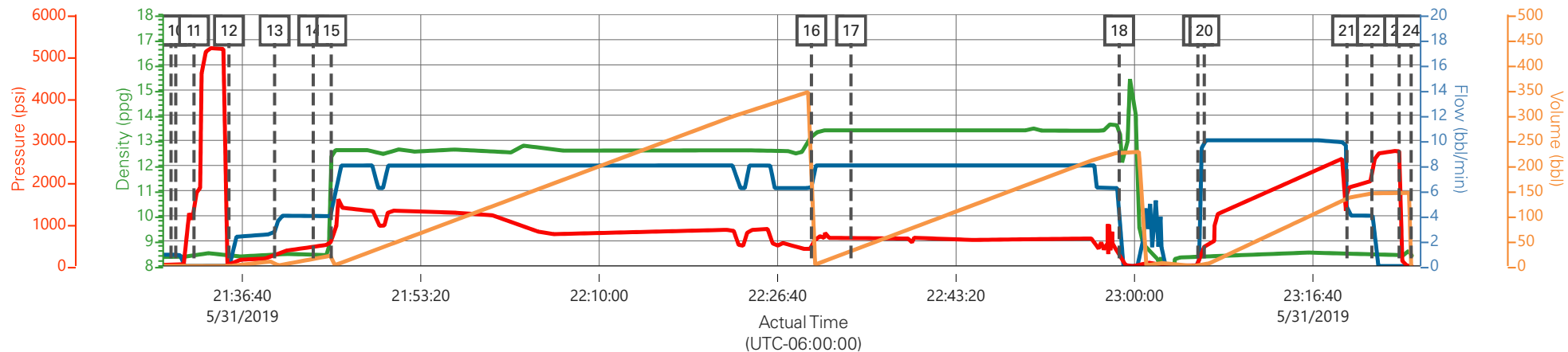
Type	Seq. No.	Graph Label	Date	Time	Source	DH Density (ppg)	Comb Pump Rate (bbl/min)	PS Pump Press (psi)	Pump Stg Tot (bbl)	Comments
Event	1	Call Out	5/31/2019	06:00:00	USER					REQUESTED ON LOCATION @ 12:00
Event	2	Pre-Convoy Safety Meeting	5/31/2019	08:00:00	USER					ALL HES PRESENT
Event	3	Crew Leave Yard	5/31/2019	08:15:00	USER					1 HT 400 PUMP TRUCK, 1 660 BULK TRUCK, 1 550 SERVICE PICKUP
Event	4	Arrive At Loc	5/31/2019	10:20:00	USER					RIG RUNNING CASING WHEN HES ARRIVED AT LOCATION
Event	5	Assessment Of Location Safety Meeting	5/31/2019	10:30:00	USER					MET WITH COMP REP, AND WENT OVER NUMBERS AND JOB PROCEDURE. WALKED AROUND LOCATION AND COLLECTED WATER SAMPLE (PH-7.0, CHLORIDES-500, TEMP-60F). COMP REP WAS OFFERED SDS FOR ALL CHEMICALS USED BY HES. CALIBRATED MUD SCALES ON WATER.
Event	6	Pre-Rig Up Safety Meeting	5/31/2019	10:45:00	USER					ALL HES PRESENT
Event	7	Rig-Up Equipment	5/31/2019	11:20:00	USER					HES RIGGED UP 1 HT 400 PUMP TRUCK, 1 660 BULK TRUCK, 2 CEMENT SILOS, 2" DISCHARGE IRON, AND 4" SUCTION HOSE WITHOUT ENTERING RED ZONE.
Event	8	Pre-Job Safety Meeting	5/31/2019	21:00:00	USER					ALL HES EMPLOYEES AND RIG CREW PRESENT. RIG CIRCULATED @ 10 BPM PRIOR TO JOB. PRESSURE WAS 680PSI. 480 UNITS OF GAS.

TD 8973', TP 8965', SJ 32.77', SURFACE CSG 9  
5/8" 36# J55 SET @ 1137' PRODUCTION CSG 4 1/2"  
11.6# P-110, OH 8 3/4", MUD 11.6 PPG

Event	9	Start Job	5/31/2019	21:30:00	COM4					
Event	10	Prime Lines	5/31/2019	21:30:27	USER	8.33	2	65	3	FRESH WATER
Event	11	Test Lines	5/31/2019	21:32:09	COM4			5200		ALL LINES HELD PRESSURE AT 5200 PSI
Event	12	Pump H2O Spacer	5/31/2019	21:35:25	COM4	8.33	4	238	10	10BBLS FRESH WATER
Event	13	Mud Flush	5/31/2019	21:39:41	COM4	8.4	4	496	20	20BBLS MUD FLUSH
Event	14	Check Weight	5/31/2019	21:43:17	USER					WEIGHT VERIFIED VIA PRESSUREIZED MUD SCALES
Event	15	Pump Lead Cement	5/31/2019	21:44:58	COM4	12.5	8	1370	326	910 SKS NEOCEM CMT 12.5PPG, 2.01 FT3/SK, 10.32 GAL/SK.
Event	16	Pump Tail Cement	5/31/2019	22:29:49	COM4	13.3	8	650	208	655 SKS THERMACEM CMT 13.3PPG, 1.78 FT3/SK, 8.39 GAL/SK.
Event	17	Check Weight	5/31/2019	22:33:31	USER					WEIGHT VERIFIED VIA PRESSUREIZED MUD SCALES
Event	18	Shutdown	5/31/2019	22:58:34	USER					END OF CEMENT. CLEAN PUMPS AND LINES TO PIT.
Event	19	Pump Displacement	5/31/2019	23:05:55	COM4	8.4	10	2500	138.5	1 GAL MMCR IN FIRST 10 BBLS, 3 LBS BE-6 IN FIRST 30 BBLS, 1 50 LB. BAG KCL THROUGHOUT DISPLACEMENT
Event	20	Drop Top Plug	5/31/2019	23:06:31	USER					VERIFIED BY FLAG INDICATOR
Event	21	Slow Rate	5/31/2019	23:19:51	USER	8.4	4	1902	128.5	SLOW RATE TO 4 BPM TO BUMP PLUG
Event	22	Bump Plug	5/31/2019	23:22:10	USER	8.4	4	2040	138.5	LANDED PLUG AT 2040 PSI, BROUGHT UP TO 2755 PSI
Event	23	Check Floats	5/31/2019	23:24:43	USER					FLOATS HELD, 1.5BBLS BACK TO TRUCK
Event	24	End Job	5/31/2019	23:25:50	COM4					HAD GOOD RETURNS THROUGHOUT JOB. PIPE WAS RECIPRICATED. NO SUGAR USED.

Event	25	Post-Job Safety Meeting (Pre Rig-Down)	5/31/2019	23:35:00	USER	ALL HES PRESENT
Event	26	Rig-Down Equipment	5/31/2019	23:45:00	USER	ALL HES PRESENT
Event	27	Pre-Convoy Safety Meeting	6/1/2019	01:00:00	USER	ALL HES PRESENT
Event	28	Crew Leave Location	6/1/2019	01:15:00	USER	THANK YOU FOR CHOOSING HALLIBURTON CEMENT, SHAWN BLOSSOM AND CREW.

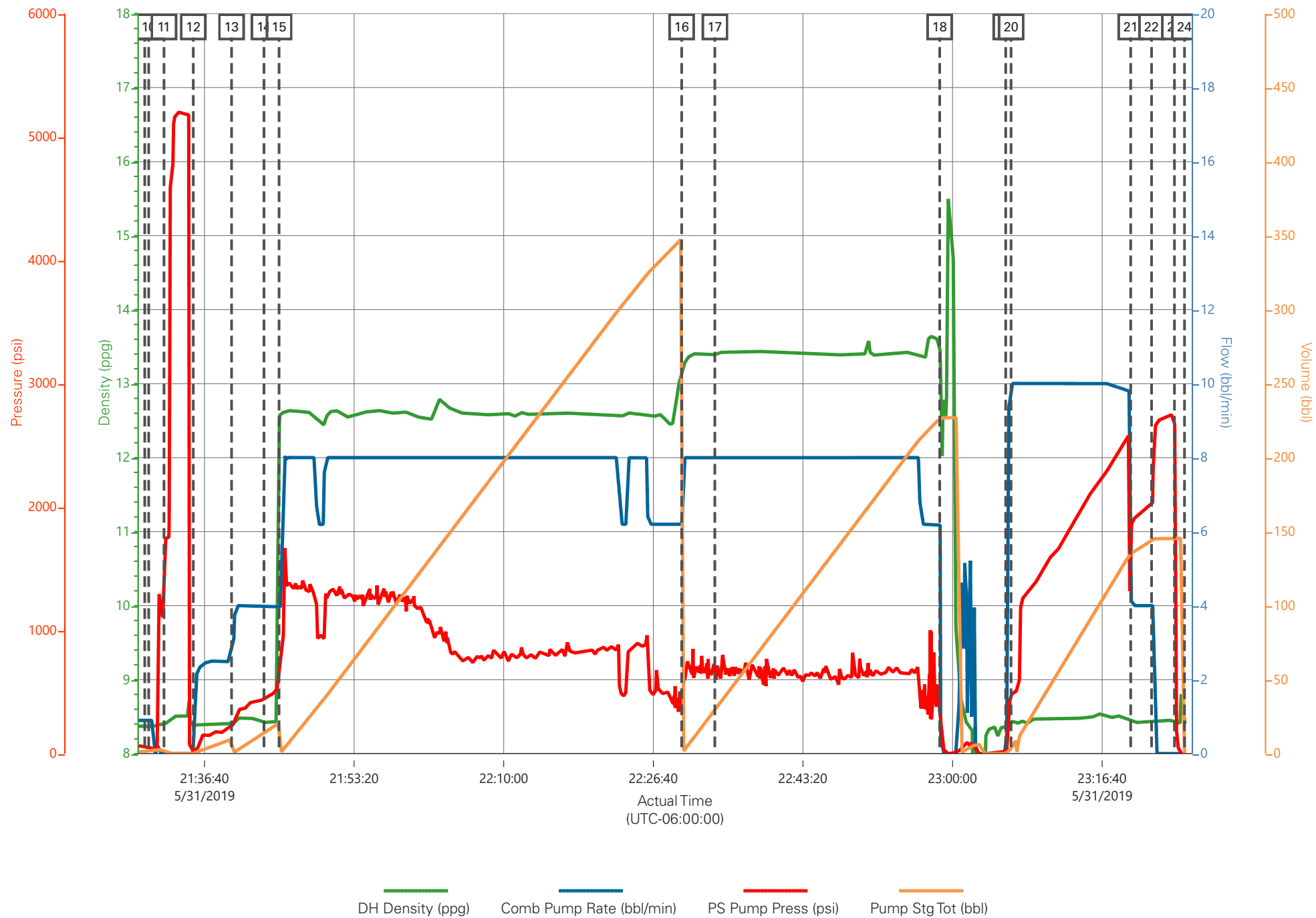
# TERRA RWF 512-17, 4.5" PRODUCTION



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

Description	Actual Time (UTC-06:00:00)	DH Density (ppg)	Comb Pump Rate (bbl/min)	PS Pump Press (psi)	Pump Stg Tot (bbl)
9 Start Job	21:30:00	8.37	0.90	53.00	1.90
10 Prime Lines	21:30:27	8.37	0.90	50.00	2.30
11 Test Lines	21:32:09	8.40	0.00	1766.00	2.70
12 Pump H2O Spacer	21:35:25	8.39	0.00	8.00	0.00
13 Mud Flush	21:39:41	8.41	2.70	233.00	0.00
14 Check Weight	21:43:17	8.42	4.00	443.00	14.00
15 Pump Lead Cement	21:44:58	12.20	3.90	632.00	0.00
16 Pump Tail Cement	22:29:49	13.13	6.20	430.00	347.90
17 Check Weight	22:33:31	13.39	8.00	640.00	29.60
18 Shutdown	22:58:34	13.61	6.20	258.00	226.40
19 Pump Displacement	23:05:55	8.36	0.00	1.00	0.00
20 Drop Top Plug	23:06:31	8.46	10.00	472.00	3.50
21 Slow Rate	23:19:51	8.43	4.50	1785.00	135.10
22 Bump Plug	23:22:10	8.43	4.00	2027.00	144.50
23 Check Floats	23:24:43	8.45	0.00	2758.00	145.40
24 End Job	23:25:50	8.42	0.00	-8.00	0.00

# TERRA RWF 512-17, 4.5" PRODUCTION



## Job Information

Request/Slurry	2559102/2	Rig Name	H&P 318	Date	27/MAY/2019
Submitted By	Patrick Ealey	Job Type	Production Casing	Bulk Plant	Grand Junction
Customer	Terra Energy Partners	Location	Garfield	Well	RWF 512-17

## Well Information

Casing/Liner Size	4.5 in	Depth MD	9056 ft	BHST	111°C / 232°F
Hole Size	8.75 in	Depth TVD	8928 ft	BHCT	72°C / 162°F
Pressure	5550 psi				

## Drilling Fluid Information

Mud Supplier Name	Mud Trade Name	Density
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## Cement Information - Lead Design



<u>Conc</u>	<u>UOM</u>	<u>Cement/Additive</u>	<u>MP</u>	<u>Sample Type</u>	<u>Sample Date</u>	<u>Lot No.</u>	Cement Properties		
							Slurry Density	12.5	lbm/gal
							Slurry Yield	2.01	ft3/sack
							Water Requirement	10.34	gal/sack
							Total Mix Fluid	10.34	gal/sack
							Water Source	Fresh Water	
							Water Chloride		

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# **Operation Test Results Request ID 2559102/2**

## **Thickening Time - ON-OFF-ON, Request Test ID:36532573**

**30/MAY/2019**

Test Temp (degF)	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)
162	5550	45	4:56	5:17	5:52	11:15	10	55	15	10

Total sks = 910

CS0630 TR#4053 110 SKS

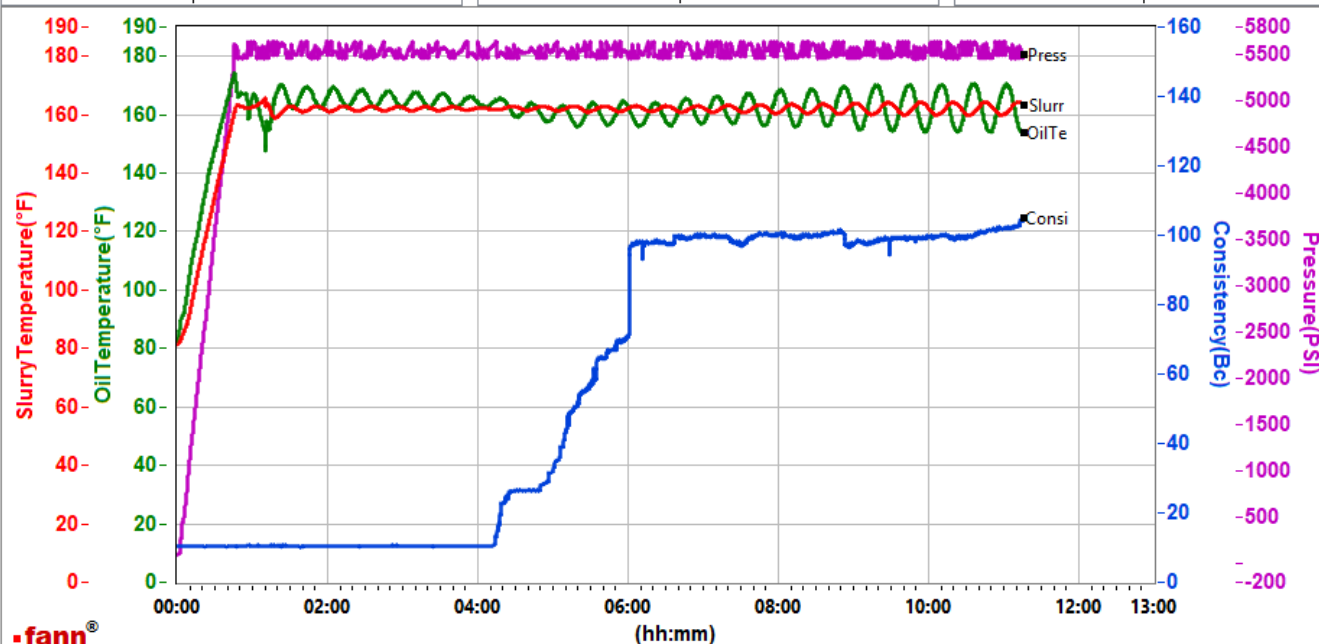
Deflection: 10 - 10

### **GRAND JUNCTION**

Fields	Values
Project Name	2559102-2 Terra Bulk Pro
SW Version	1.0
Test ID	36532573-TT
Request ID	2559102-2
Tested by	DEBA
Customer	TERRA ENERGY PARTN
Well No	RWF 512-17

Fields	Values
Rig	H&P 318
Casing/Liner Size	4.5 INCH
Job Type	PRODUCTION
Cement Weight	GCC TYPE I-II
Comments	Light Weight
Date Time	5/29/2019 07:38:16.251
Temp. Units	degF

Events	Results
30 BC	4:56
50 BC	5:17
70 BC	5:52
100 BC	11:15



Data File C:\Users\h185329\Desktop\000 Graphs\GJ2559102-2 TERRA PRODUCTION BULK LEAD.tdms

Comments Light Weight

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# **Operation Test Results Request ID 2559102/1**

**Thickening Time - ON-OFF-ON, Request Test ID:36526622**

**29/MAY/2019**

Test Temp (degF)	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)
162	5550	45	4:54	5:09	5:19	6:15	8	55	15	8

Total sks = 910

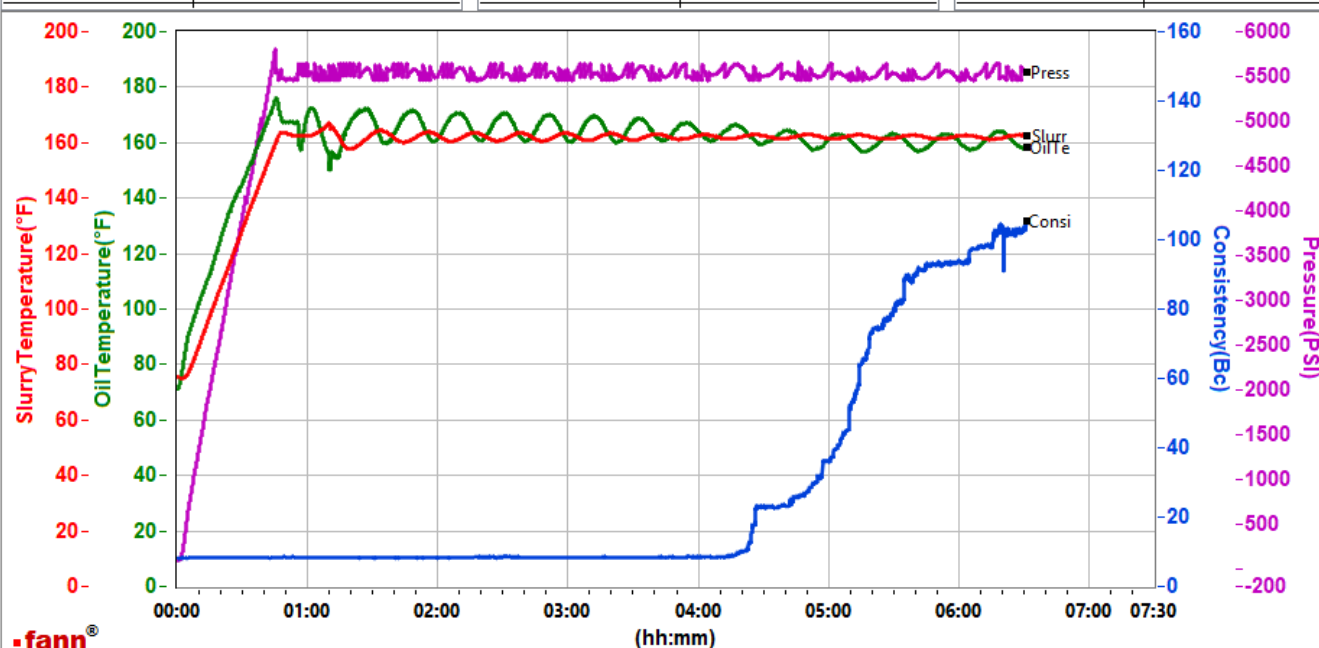
CS0624 TR 1656 400 SKS

CS0625 TR 1513 400 SKS

Deflection: 8 - 8

## **GRAND JUNCTION**

Fields	Values	Fields	Values	Events	Results
Project Name	2559102-1 Terra Bulk Pro	Rig	H&P 318	30 BC	4:54
SW Version	1.0	Casing/Liner Size	4.5 INCH	50 BC	5:09
Test ID	36526622-TT	Job Type	PRODUCTION	70 BC	5:19
Request ID	2559102-1	Cement Weight	GCC TYPE I-II	100 BC	6:15
Tested by	JASON	Comments	Light Weight		
Customer	TERRA ENERGY PARTN	Date Time	5/28/2019 08:25:22.326		
Well No	RWF 512-17	Temp. Units	degF		



Data File C:\Users\h185329\Desktop\000 Graphs\GJ2559102-1 TERRA PRODUCTION BULK LEAD.tdms

Comments Light Weight

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# HALLIBURTON

## Rockies, Grand Junction

## Lab Results- Tail

### Job Information

Request/Slurry	2559103/1	Rig Name	H&P 318	Date	27/MAY/2019
Submitted By	Patrick Ealey	Job Type	Production Casing	Bulk Plant	Grand Junction
Customer	Terra Energy Partners	Location	Garfield	Well	RWF 512-17

### Well Information

Casing/Liner Size	4.5 in	Depth MD	9056 ft	BHST	111°C / 232°F
Hole Size	8.75 in	Depth TVD	8928 ft	BHCT	72°C / 162°F
Pressure	5550 psi				

### Drilling Fluid Information

Mud Supplier Name	Mud Trade Name	Density
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### Cement Information - Tail Design



<u>Conc</u>	<u>UOM</u>	<u>Cement/Additive</u>	<u>MP</u>	<u>Sample Type</u>	<u>Sample Date</u>	<u>Lot No.</u>	Cement Properties		
							Slurry Density	13.3	lbm/gal
							Slurry Yield	1.78	ft3/sack
							Water Requirement	8.38	gal/sack
							Total Mix Fluid	8.38	gal/sack
							Water Source	Fresh Water	
							Water Chloride		

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# **Operation Test Results Request ID 2559103/1**

**Thickening Time - ON-OFF-ON, Request Test ID:36526624**

**29/MAY/2019**

Test Temp (degF)	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)
162	5550	45	3:18	3:30	3:33	5:38	8	55	15	8

Total sks = 655

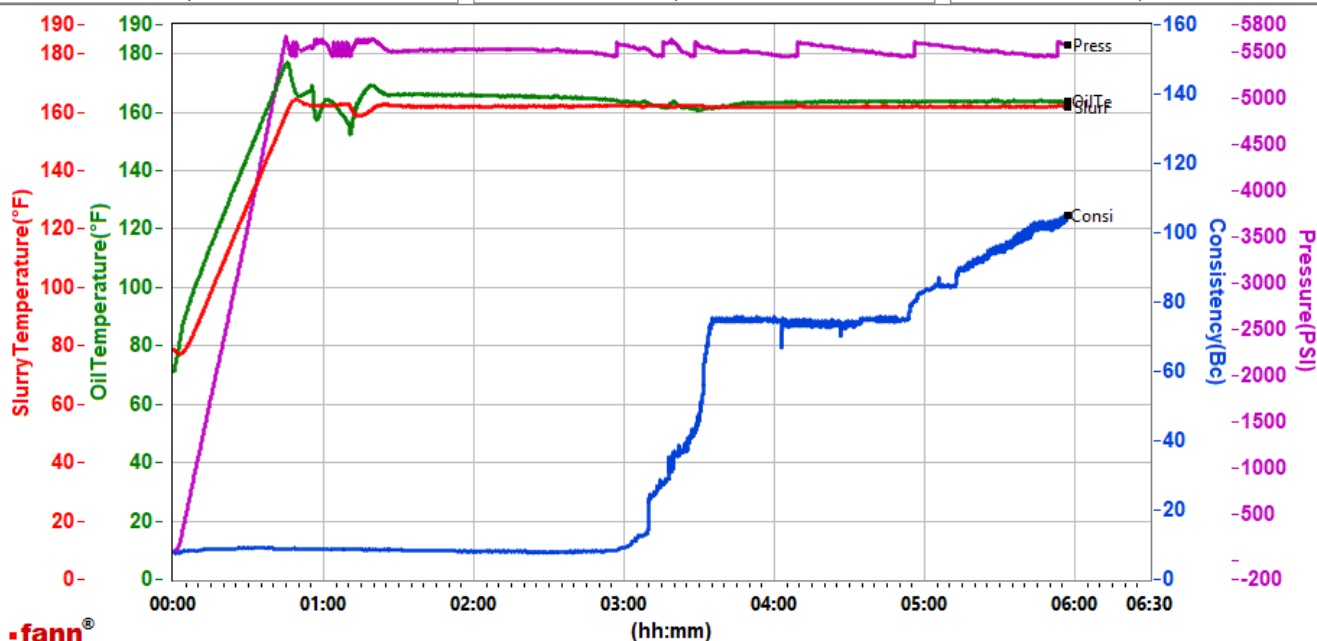
CS0626 TR#0813 400 SKS

CS-627 TR#1972 255 SKS

Deflection: 8 – 8

## **GRAND JUNCTION**

Fields	Values	Fields	Values	Events	Results
Project Name	2559103-1 Terra Bulk Pro	Rig	H&P 318	30 BC	3:18
SW Version	1.0	Casing/Liner Size	4.5 INCH	50 BC	3:30
Test ID	36526624-TT	Job Type	PRODUCTION	70 BC	3:33
Request ID	2559103-1	Cement Weight	MOUNTAIN G	100 BC	5:38
Tested by	DS	Comments	Light Weight		
Customer	TERRA ENERGY PARTN	Date Time	5/28/2019 10:43:58.810		
Well No	RWF 512-17	Temp. Units	degF		



Data File C:\Users\h185329\Desktop\000 Graphs\GJ2559103-1 TERRA PRODUCTION BULK TAIL.tdms

Comments Light Weight

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