

# HALLIBURTON

iCem<sup>®</sup> Service

## **TERRA ENERGY PARTNERS-EBUS**

United States of America, COLORADO

Date: Wednesday, March 13, 2019

## **TRAIL RIDGE 624-22-597 Production**

Terra Trail Ridge 624-22-597 Production

API# 05-045-23701-00

Job Date: Wednesday, February 27, 2019

Sincerely,

**Grand Junction Cement Engineering**

## 1.0 Real-Time Job Summary

## 1.1 Job Event Log

Type	Seq. No.	Graph Label	Date	Time	Source	PS Pump Press (psi)	DH Density (ppg)	Comb Pump Rate (bbl/min)	Pump Stg Tot (bbl)	Comments
Event	1	Call Out	2/27/2019	02:00:00	USER					CREW CALLED OUT TO H&P 271 TEP PRODUCTION JOB. REQUESTED ON LOCATION AT 10:00.
Event	2	Pre-Convoy Safety Meeting	2/27/2019	04:45:00	USER					WITH ALL HES PERSONNEL
Event	3	Crew Leave Yard	2/27/2019	05:00:00	USER					
Event	4	Arrive at Location	2/27/2019	09:00:00	USER					RIG WAS RUNNING CASING UPON HES ARRIVAL
Event	5	Assessment of Location Safety Meeting	2/27/2019	09:05:00	USER					WITH ALL HES PERSONNEL
Event	6	Spot Equipment	2/27/2019	09:10:00	USER					SPOT EQUIPMENT
Event	7	Pre-Rig Up Safety Meeting	2/27/2019	09:20:00	USER					WITH ALL HES PERSONNEL
Event	8	Rig-Up Equipment	2/27/2019	09:30:00	USER					1-RCM ELITE PUMP TRUCK, 2- 1,700 FT3 SILOS, 1-660 FT3 BULK TRUCK, 1-PICKUP TRUCK
Event	9	Rig-Up Completed	2/27/2019	10:30:00	USER					RIG UP COMPLETED. WAIT FOR RIG TO FINISH RUNNING CASING.
Event	10	Pre-Job Safety Meeting	2/27/2019	13:40:00	USER	5.00	0.00	0.00	2.60	WITH ALL PERSONNEL ON LOCATION
Event	11	Check Weight	2/27/2019	14:10:00	USER	8.00	8.30	0.00	0.00	PRESSURIZED MUD SCALES CALIBRATED USING FRESH WATER PRIOR TO JOB. ALL FLUID DENSITIES VERIFIED USING PRESSURIZED MUD SCALES THROUGHOUT JOB.
Event	12	Start Job	2/27/2019	14:12:00	USER	7.00	8.30	0.00	0.00	
Event	13	Pump Water	2/27/2019	14:13:50	USER	36.00	8.35	0.00	0.00	PUMP 2 BBL H2O AHEAD TO PRIME LINES. PUMPED AT 2 BPM WITH 115 PSI
Event	14	Shutdown	2/27/2019	14:14:50	USER	76.00	8.32	0.00	2.00	SHUTDOWN TO LINE OUT VALVES ON MANIFOLD FOR PRESSURE TEST

Event	15	Pressure Test	2/27/2019	14:21:55	USER	6386.00	8.32	0.00	2.00	SET KICKOUTS TO 500 PSI FOR LOW TEST TO ENSURE KICKOUTS ARE FUNCTIONING PROPERLY. BROUGHT PRESSURE UP TO 6,000 PSI FOR HIGH TEST.
Event	16	Pump Spacer	2/27/2019	14:25:02	USER	14.00	8.25	0.80	0.10	PUMP 10 BBL H2O SPACER. PUMPED AT 2 BPM WITH 75 PSI
Event	17	Pump Mud Flush III Spacer	2/27/2019	14:30:00	USER	73.00	8.33	2.10	0.20	PUMP 20 BBL MUD FLUSH III SPACER. PUMPED AT 4 BPM WITH 120 PSI. USED 80 LBS MUD FLUSH III FOR SPACER.
Event	18	Pump Lead Cement	2/27/2019	14:36:15	USER	123.00	8.32	4.00	20.10	PUMP 196.9 BBL NEOCEM GJ2 LEAD CEMENT. 570 SKS AT 12.5 PPG, 1.94 FT3/SK, 9.6 GAL/SK. PUMPED AT 8 BPM WITH 700 PSI
Event	19	Pump Tail Cement	2/27/2019	15:04:50	USER	552.00	13.07	6.90	0.10	PUMP 293.1 BBL NEOCOM HT TAIL CEMENT. 795 SKS AT 13.5 PPG, 2.07 FT3/SK, 9.43 GAL/SK. PUMPED AT 8 BPM WITH 720 PSI
Event	20	Shutdown	2/27/2019	15:49:10	USER	152.00	13.19	0.00	328.10	SHUTDOWN TO DROP TOP PLUG.
Event	21	Clean Lines	2/27/2019	15:50:00	USER	20.00	3.51	0.00	328.10	WASH PUMPS AND LINES TO PIT.
Event	22	Drop Top Plug	2/27/2019	15:55:00	USER	13.00	0.02	0.00	0.00	DROP THIRD PARTY TOP LATCH DOWN PLUG. PLUG LAUNCHED. WITNESSED BY CUSTOMER REP.
Event	23	Pump Displacement	2/27/2019	15:56:22	USER	17.00	8.30	0.00	0.00	PUMP 136.9 BBL KCL DISPLACEMENT AT 10 BPM WITH 2,170 PSI. 3 LBS BE-6 IN FIRST 30 BBL, 1 GAL MMCR IN FIRST 10 BBL.
Event	24	Slow Rate	2/27/2019	16:11:50	USER	2101.00	8.42	6.50	145.70	SLOW RATE TO 4 BPM 10 BBL PRIOR TO CALCULATED DISPLACEMENT TO BUMP PLUG.
Event	25	Bump Plug	2/27/2019	16:13:55	USER	3018.00	8.37	3.90	154.20	PLUG BUMPED AT 4 BPM. FCP-1,750 PSI. BROUGHT PRESSURE UP TO 3,100 PSI. TOTAL DISPLACEMENT-146.9 BBL
Event	26	Check Floats	2/27/2019	16:17:00	USER	3144.00	8.39	0.00	154.20	FLOATS HOLDING. RETURNED 1.5 BBL FLUID TO TRUCK
Event	27	End Job	2/27/2019	16:19:00	USER	24.00	8.31	0.00	154.20	PIPE WAS STATIC DURING CEMENT AND RECIPROCATED WHILE PUMPING DISPLACEMENT. RIG PUMPED 1,500 SCF OF AIR DOWN PARASITE STRING WHILE CEMENTING. AIR WAS SHUT OFF AT 90 BBL DISPLACEMENT AWAY. GOOD CIRCULATION THROUGHOUT JOB UNTIL AIR DOWN PARASITE STRING WAS SHUT OFF. NO CIRCULATION AFTER AIR WAS SHUT OFF.
Event	28	Pre-Rig Down Safety Meeting	2/27/2019	16:25:00	USER	14.00	0.02	0.00	0.00	WITH ALL HES PERSONNEL
Event	29	Rig-Down Equipment	2/27/2019	16:30:00	USER	130.00	8.30	4.40	13.60	
Event	30	Rig-Down Completed	2/27/2019	17:20:00	USER					

Event	31	Pre-Convoy Safety Meeting	2/27/2019	17:25:00	USER	WITH ALL HES PERSONNEL
Event	32	Crew Leave Location	2/27/2019	17:30:00	USER	
Event	33	Well Info	2/27/2019	17:31:00	USER	TD-9,514', TP-9,506.63', SHOE-30.33', HOLE 8 3/4", MUD-9.3 PPG WBM, CSG-4 1/2" 11.6 LB/FT P-110, PREV CSG SET AT 2,743' 9 5/8" 36 LB/FT
Event	34	Rig Info	2/27/2019	17:32:00	USER	RIG ON BOTTOM AT 12:30, CIRCULATED AT 10.5 BPM WITH 1,000 SCF AIR DOWN CASING AND 1,500 SCF AIR DOWN PARASITE STRING, 1,100 PSI, CIRCULATED 740 BBL.
Event	35	Job Info	2/27/2019	17:33:00	USER	CALCULATED TOP OF TAIL CEMENT-4,158', CALCULATED TOP OF LEAD CEMENT-668', RETURNED 5 BBL MUD FLUSH III TO SURFACE. USED 80 LBS MUDFLUSH III, 3 LBS BE-6, 1 GALLON MMCR FOR JOB. THIRD PARTY TOP PLUG WAS USED FOR JOB. HES TOP PLUG WAS RETURNED TO WAREHOUSE.
Event	36	Comment	2/27/2019	17:34:00	USER	THANK YOU FOR USING HALLIBURTON CEMENT DEPARTMENT. JEREMY YOUNG AND CREW.

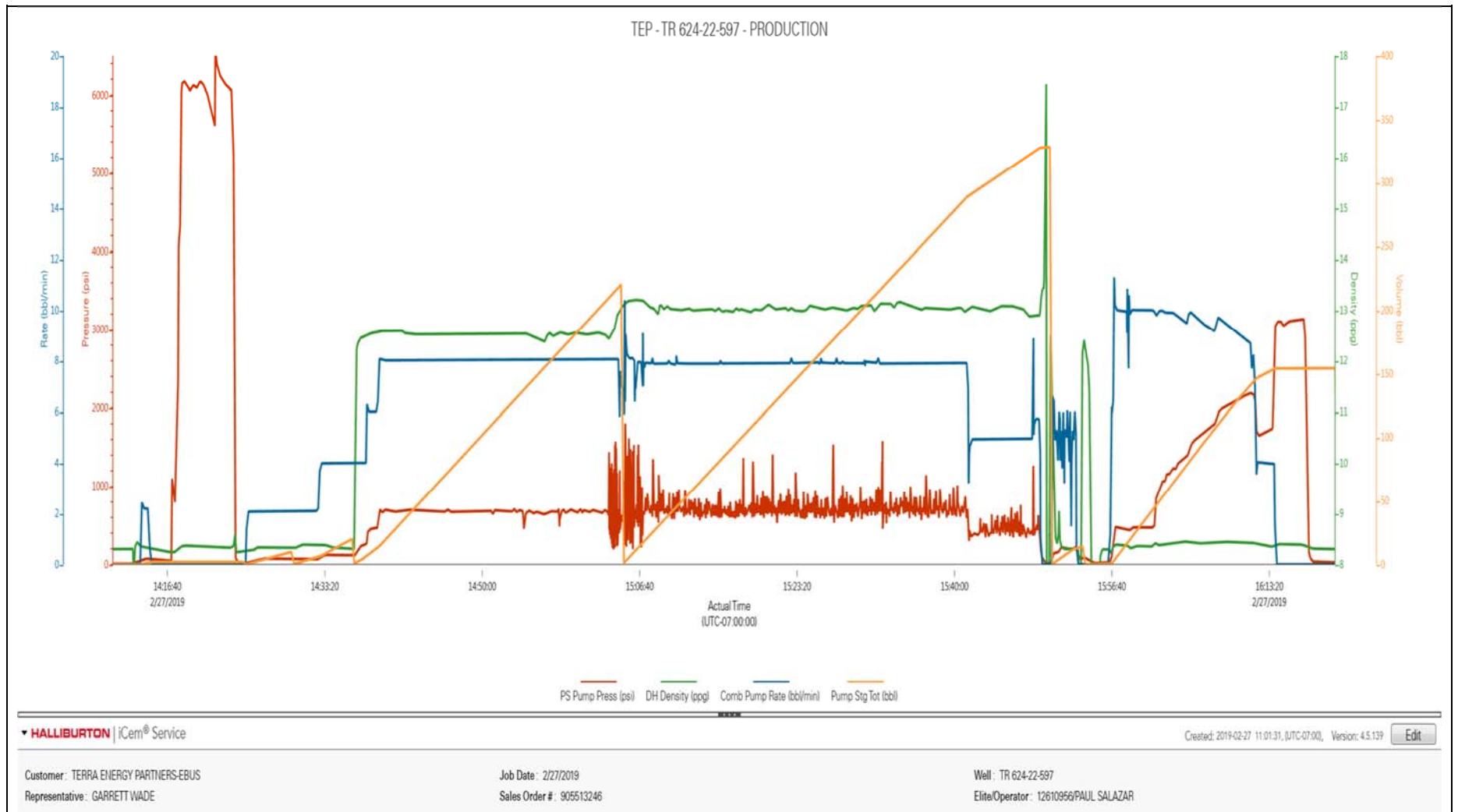
## 2.0 Attachments

### 2.1 TEP TR 624-22-597 PRODUCTION-WITH EVENTS.png





## 2.2 TEP TR 624-22-597 PRODUCTION-WITHOUT EVENTS.png



## Job Information

Request/Slurry	2537204/1	Rig Name	H&P 271	Date	22/FEB/2019
Submitted By	Connor Matthews	Job Type	Production Casing	Bulk Plant	Grand Junction
Customer	Terra Energy Partners	Location	Garfield	Well	TR 624-22-597

## Well Information

Casing/Liner Size	4.5 in	Depth MD	9545 ft	BHST	115°C / 239°F
Hole Size	8.75 in	Depth TVD	9374 ft	BHCT	76°C / 169°F
Pressure	5862 psi				

## Drilling Fluid Information

Mud Supplier Name	Baroid	Mud Trade Name	BARADRIL-N	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	1.94	ft3/sack
							Water Requirement	9.62	gal/sack
							Total Mix Fluid	9.62	gal/sack
							Water Source	Fresh Water	
							Water Chloride		

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## Operation Test Results Request ID 2537204/1

### Thickening Time - ON-OFF-ON, Request Test ID:36259687

25/FEB/2019

Test Temp (degF)	Pressure (psi)	Reached in (min)	30 Bc (hh:mm)	50 Bc (hh:mm)	70 Bc (hh:mm)	Start Bc	Stirring before stop (mins)	Static Period (min)	Peak reading (BC)	Termination time (hh:mm)	Termination Bc
169	5862	47	5:25	5:25	6:00	5	57	15	8	17:18	30

Total sks = 570

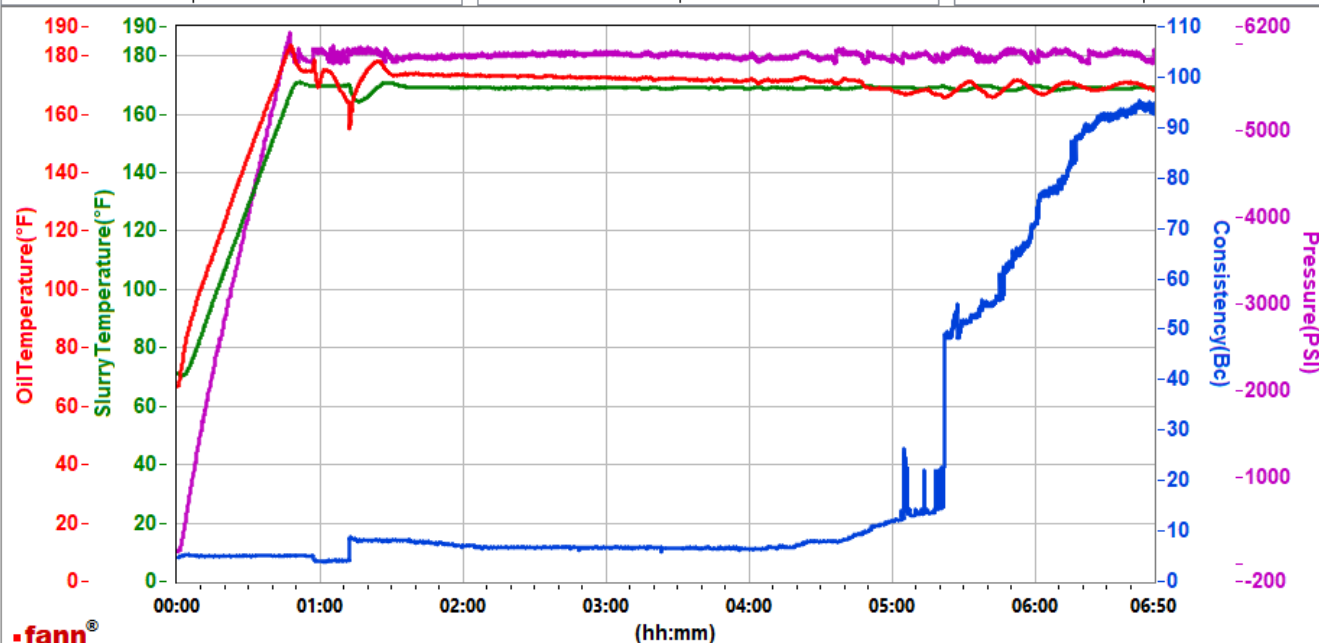
CS0246 TR#4549 150 SKS

CS0247 TR#8677 420 SKS

Deflected 5-- > 8. Got as high as 95 Bc at 6:49 before it started spinning in cup. Heat of hydration started around 4:48.

### GRAND JUNCTION

Fields	Values	Fields	Values	Events	Results
Project Name	GJ2537204-1 Terra Prodi	Rig	H&P271	30 Bc	5:25
SW Version	1.0	Casing/Liner Size	4.5 INCH	50 Bc	5:25
Test ID	36259687- TT	Job Type	PRODUCTION CASING	70 Bc	6:00
Request ID	2537204-1	Cement Weight	GCC TYPE I-II	100 Bc	0:00
Tested by	DEBA	Comments	Light Weight		
Customer	TERRA ENERGY PARTN	Date Time	2/24/2019 08:20:06.362		
Well No	TR 624-22-597	Temp. Units	degF		



Data File N:\01 Test Graphs\GJ2537204-1 TERRA PRODUCTION BULK LEAD.tdms

Comments Light Weight

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# HALLIBURTON

## Rockies, Grand Junction

## Lab Results- Tail

### Job Information

Request/Slurry	2537205/1	Rig Name	H&P 271	Date	22/FEB/2019
Submitted By	Connor Matthews	Job Type	Production Casing	Bulk Plant	Grand Junction
Customer	Terra Energy Partners	Location	Garfield	Well	TR 624-22-597

### Well Information

Casing/Liner Size	4.5 in	Depth MD	9545 ft	BHST	115°C / 239°F
Hole Size	8.75 in	Depth TVD	9374 ft	BHCT	76°C / 169°F
Pressure	5862 psi				

### Drilling Fluid Information

Mud Supplier Name	Baroid	Mud Trade Name	BARADRIL-N	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>	<b>Cement Properties</b>		
							Slurry Density	13	lbm/gal
							Slurry Yield	2.07	ft3/sack
							Water Requirement	9.42	gal/sack
							Total Mix Fluid	9.42	gal/sack
							Water Source	Fresh Water	
							Water Chloride		

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## Operation Test Results Request ID 2537205/1

### Thickening Time - ON-OFF-ON, Request Test ID:36259689

25/FEB/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)
169	5862	47	2:29	2:38	2:43	3:02	10	57	15	8

Total sks 795

CS0249 TR#8678 350 SKS

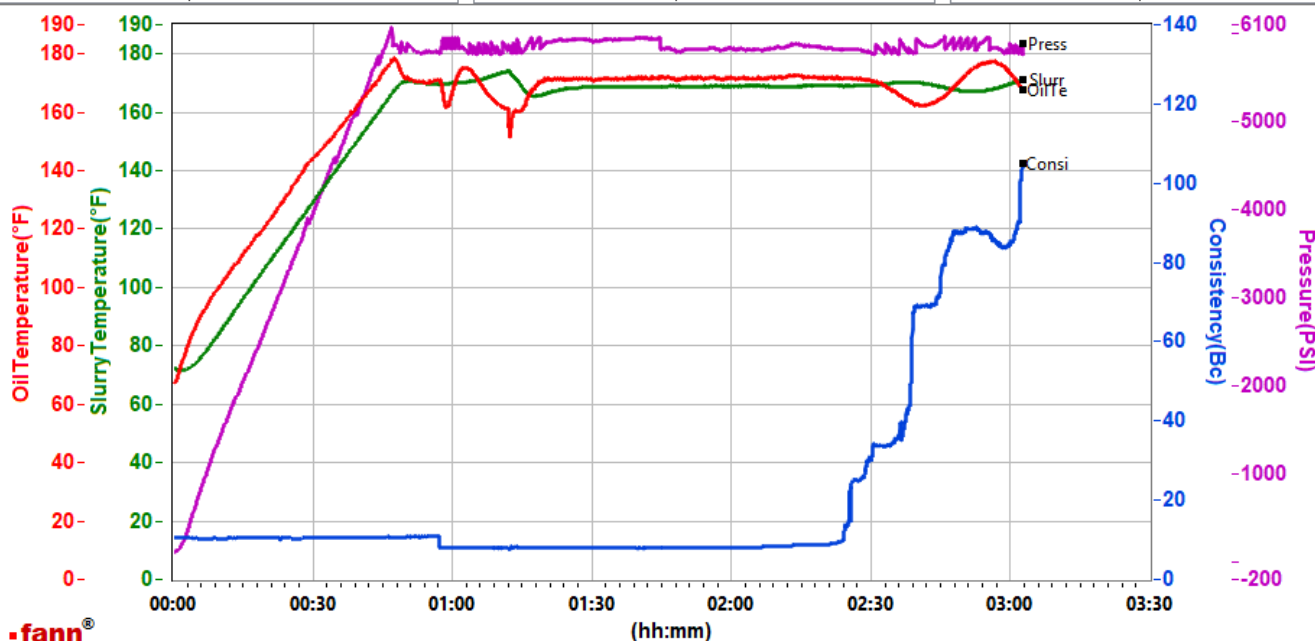
CS0250 TR#2878 350 SKS

CS0251 TR#4549 95 SKS front

No deflection. Please note heat of hydration started around 2:33. 50% of slurry was core set and balled up around paddle.

### GRAND JUNCTION

Fields	Values	Fields	Values	Events	Results
Project Name	GJ2537205-1 Terra Prodi	Rig	H&P271	30 Bc	2:29
SW Version	1.0	Casing/Liner Size	4.5 INCHE	50 Bc	2:38
Test ID	36259689-TT	Job Type	PRODUCTION CASING	70 Bc	2:43
Request ID	2537205-1	Cement Weight	GCC TYPE I-II	100 Bc	3:02
Tested by	DS	Comments	Light Weight		
Customer	TERRA ENERGY PARTN	Date Time	2/24/2019 12:10:18.277		
Well No	TR 624-22-597	Temp. Units	degF		



Data File N:\01 Test Graphs\GJ2537205-1 TERRA PRODUCTION BULK TAIL.tdms

Comments Light Weight

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