

# HALLIBURTON

iCem<sup>®</sup> Service

**TERRA ENERGY LTD.**

**For: Terra**

Date: Friday, August 04, 2017

**TR 522-23-597 Production**

Sincerely,

Grand Junction Cement Engineering

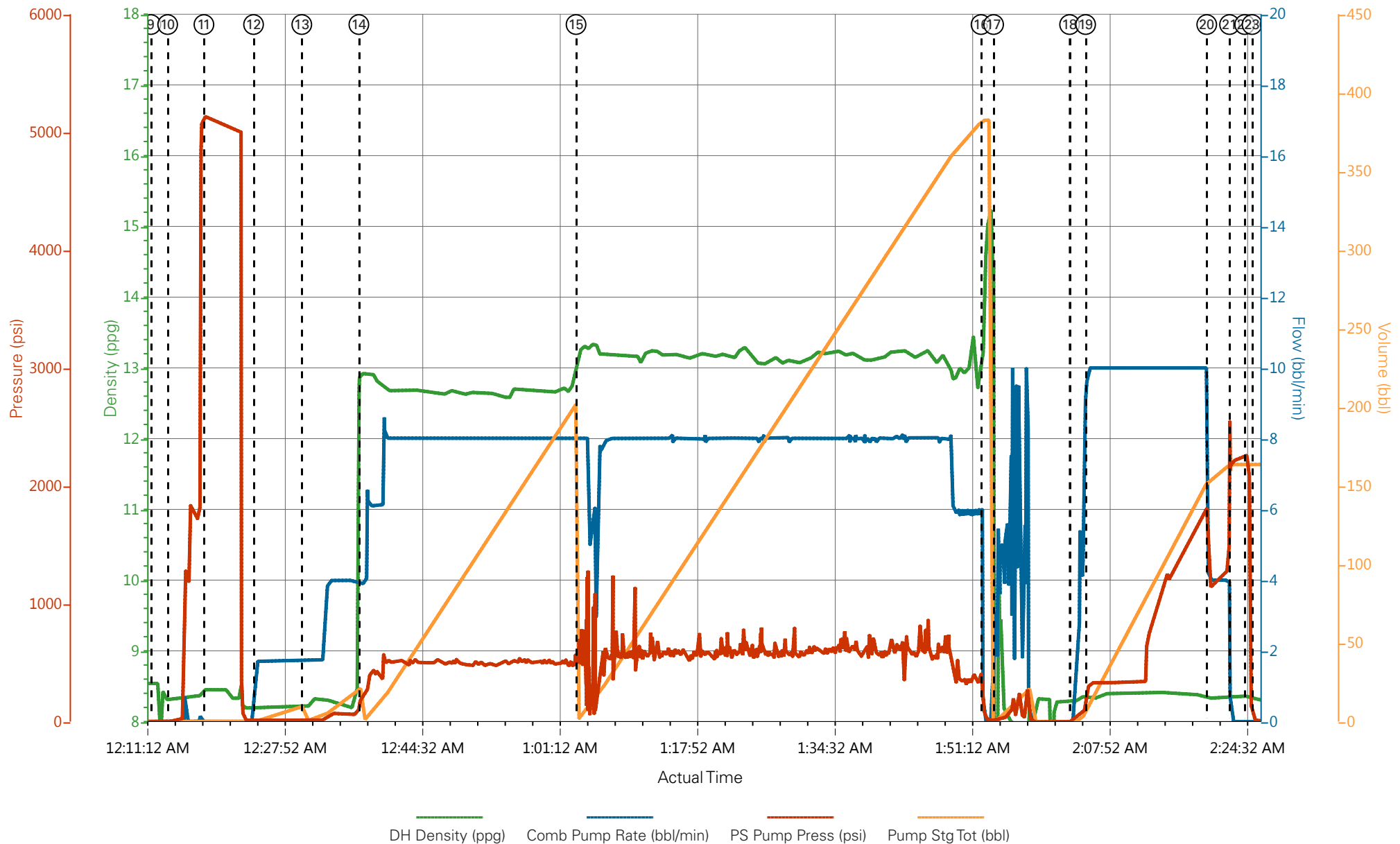
## 1.0 Real-Time Job Summary

## 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	8/3/2017	16:45:00	USER					REQUESTED ON LOCATION @ 2300
Event	2	Pre-Convoy Safety Meeting	8/3/2017	19:00:00	USER					ALL HES PRESENT
Event	3	Crew Leave Yard	8/3/2017	19:05:00	USER					1 F550, 1 PUMP TRUCK & 1 660 BULK TURCK
Event	4	Arrive At Loc	8/3/2017	22:30:00	USER					RIG RUNNING CASING
Event	5	Assessment Of Location Safety Meeting	8/3/2017	22:35:00	USER					MET WITH COMP REP, M.HUDSON, AND WENT OVER NUMBERS AND JOB PROCEDURE. WALKED AROUND LOCATION AND COLLECTED WATER SAMPLE (PH- 7, CHLORIDES- 0, TEMP- 65F). COMP REP WAS OFFERED SDS FOR ALL CHEMICLES USED BY HES.
Event	6	Pre-Rig Up Safety Meeting	8/3/2017	22:45:00	USER					ALL HES PRESENT
Event	7	Rig-Up Equipment	8/3/2017	22:50:00	USER					HES RIGGED UP EQUIPMENT WITHOUT ENTERING RED ZONE.
Event	8	Pre-Job Safety Meeting	8/3/2017	23:55:00	USER					ALL HES AND RIG CREW PRESENT
Event	9	Start Job	8/4/2017	00:12:00	COM6					TD 10140', TP 10131', SJ 33', OH 8.75", CSG 4.5" 11.6#, MUD 8.7 PPG.
Event	10	Prime Pumps	8/4/2017	00:14:02	COM6	30.00	8.31	1.00	2.0	8.33 PPG FRESH WATER
Event	11	Test Lines	8/4/2017	00:18:26	COM6	5128.00	8.35	0.50	0.5	ALL LINES HELD PRESSURE AT 5128 PSI
Event	12	Pump Spacer 1	8/4/2017	00:24:27	COM6	39.00	8.30	4.00	10.0	FRESH WATER (10 BBL), 8.33 PPG
Event	13	Pump Spacer 2	8/4/2017	00:30:18	COM6	77.00	8.41	4.00	20.0	MUD FLUSH III (20 BBL), 8.4 PPG
Event	14	Pump Lead Cement	8/4/2017	00:37:13	COM6	209.00	12.52	8.00	195.9	NEOCEM CEMENT 565 SKS (195 BBLs), 12.5 PPG, 1.94 FT3/SK, 9.58 GAL/SK
Event	15	Pump Tail Cement	8/4/2017	01:03:32	COM6	569.00	13.02	8.00	328.4	NEOCEM HT CEMENT 890 SKS (329 BBLs), 13 PPG, 2.07

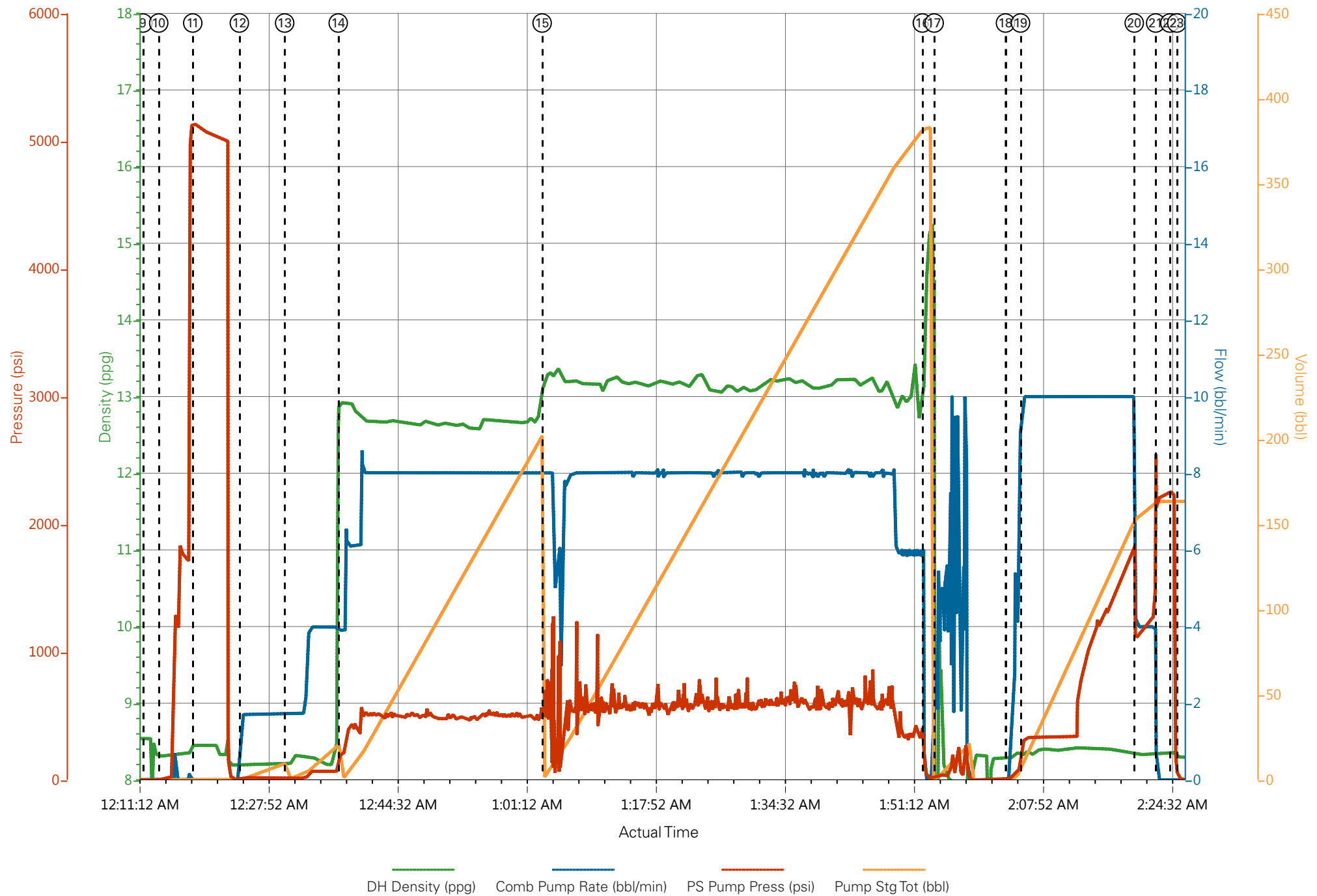
										FT3/SK, 9.43 GAL/SK.
Event	16	Shutdown	8/4/2017	01:52:38	USER					END OF CMT
Event	17	Clean Lines	8/4/2017	01:54:10	USER					WASH UP PUMPS AND LINES
Event	18	Drop Top Plug	8/4/2017	02:03:22	USER					PLUG WENT, VERIFIED BY CO REP.
Event	19	Pump Displacement	8/4/2017	02:05:19	COM6	316.00	8.32	10.00	146..6	8.34 PPG KCL WATER (156.6 BBLS) 1 GAL MMCR & 3 BAGS BE6
Event	20	Slow Rate	8/4/2017	02:20:00	USER	1223.00	8.33	4.00	10.0	SLOW RATE TO 4 BPM PER CO REP TO LAND PLUG
Event	21	Bump Plug	8/4/2017	02:22:46	USER	2216.00	8.36	4.00	156.5	LAND PLUG AT 1230 PSI, BROUGHT UP TO 2216 PSI
Event	22	Check Floats	8/4/2017	02:24:36	USER	2263.00	8.36	0.00	156.5	FLOATS HELD, 1 BBL BACK TO TRUCK
Event	23	End Job	8/4/2017	02:25:30	USER					PIPE WAS NOT RECIPROCATED DURING THE JOB, AIR RAN @ 1500 UNITS FROM START- LAST 40 BBL OF TL CMT, AND THEN TURNED OFF. 0 BBL CEMENT BACK TO SURFACE
Event	24	Post-Job Safety Meeting (Pre Rig-Down)	8/4/2017	02:27:40	USER					ALL HES PRESENT
Event	25	Rig Down Lines	8/4/2017	02:55:00	USER					ALL HES PRESENT
Event	26	Pre-Convoy Safety Meeting	8/4/2017	03:00:00	USER					ALL HES PRESENT
Event	27	Crew Leave Location	8/4/2017	03:05:00	USER					THANK YOU FOR CHOOSING HALLIBURTON CEMENT, CHRIS SMITH AND CREW

# TEP - TR 522-23-597 - 4.5" PRODUCTION



- |   |   |                                     |                              |                               |
|---|---|-------------------------------------|------------------------------|-------------------------------|
| ① Call Out n/a;n/a;n/a;n/a                  | ④ Arrive At Loc n/a;n/a;n/a;n/a                         | ⑦ Rig-Up Equipment n/a;n/a;n/a;n/a  | ⑩ Prime Pumps 8.31;0;0;0     | ⑬ Pump Spacer 2 8.21;1.7;17;0 |
| ② Pre-Convoy Safety Meeting n/a;n/a;n/a;n/a | ⑤ Assessment Of Location Safety Meeting n/a;n/a;n/a;n/a | ⑧ Pre-Job Safety Meeting 8.54;0;1;0 | ⑪ Test Lines 8.45;0;5128;0   | ⑭ Pump Lead Cement 12.92;8;0  |
| ③ Crew Leave Yard n/a;n/a;n/a;n/a           | ⑥ Pre-Rig Up Safety Meeting n/a;n/a;n/a;n/a             | ⑨ Start Job 8.54;0;1;0              | ⑫ Pump Spacer 1 8.2;1.7;19;0 | ⑮ Pump Tail Cement 13.22;8;0  |

# TEP - TR 522-23-597 - 4.5" PRODUCTION



## Job Information

Request/Slurry	2406604/1	Rig Name	H&P 271	Date	31/JUL/2017
Submitted By	Aaron Katz	Job Type	Production Casing	Bulk Plant	Grand Junction
Customer	Terra Energy Partners	Location	Garfield	Well	TR 522-23-597

## Well Information

Casing/Liner Size	4.5 in	Depth MD	10363 ft	BHST	123°C / 254°F
Hole Size	8.75 in	Depth TVD	10210 ft	BHCT	89°C / 192°F
Pressure	6450 psi				

## Drilling Fluid Information

Mud Supplier Name	Baroid	Mud Trade Name	BARADRIL-N	Density	10.4 lbm/gal
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## Cement Information - Lead Design



Conc	UOM	Cement/Additive	Sample Type	Sample Date	Lot No.	Cement Properties		
						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 2406604/1

## Thickening Time - ON-OFF-ON

02/AUG/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)
192	6450	51	4:26	4:41	4:49	9:00	10	61	15	8

Total sks = 565

Composite:

CS1991 TR 8658 420 SKS

CS2000 TR 1972 145 SKS

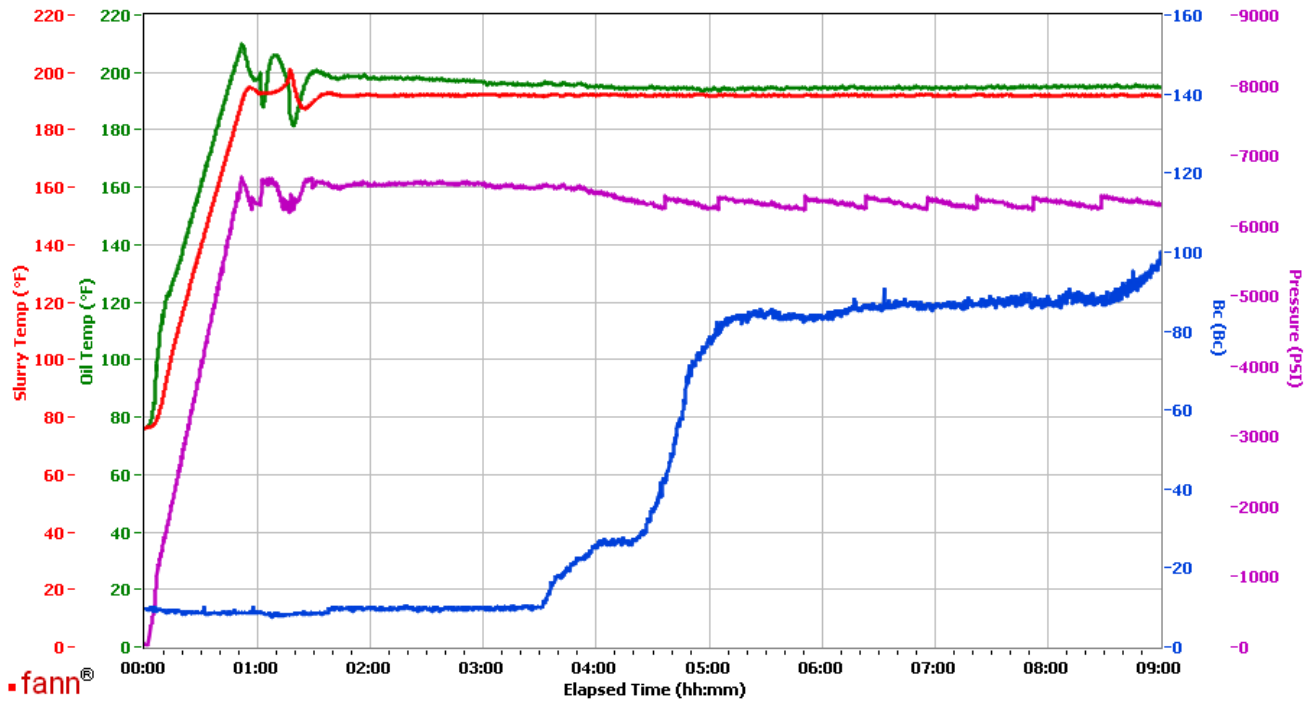
Deflection: 8 - 8

## Grand Junction, Colorado

Fields	Values
Project Name	GJ2406604-1 TERRA PRODUCTION BULK CO
Test ID	34747030
Request ID	GJ2406604-1
Tested by	JASON
Customer	TERRA ENERGY PARTNERS
Well No	TR 522-23-597
Rig	H & P 271
Casing/Liner Size	4.5"

Fields	Values
Job Type	PRODUCTION CASING
Cement Type	HOLCIM TYPE I/II
Cement Weight	Standard
Test Date	08/01/17
Test Time	11:39 PM
Temp. Units	degF
Pressure Units	PSI
SW Version	2.1.0.507

Events	Results
30.00 Bc	04h:26m
40.00 Bc	04h:34m
50.00 Bc	04h:41m
70.00 Bc	04h:49m
100.00 Bc	09h:00m
00h:30m	9.31
01h:00m	9.31
01h:30m	9.31



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Comments COMPOSITE: CS1991 TR 8658 420 SKS CS2000 TR 1972 145 SKS

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# HALLIBURTON

## Rockies, Grand Junction

## Lab Results- Tail

### Job Information

Request/Slurry	2406605/1	Rig Name	H&P 271	Date	31/JUL/2017
Submitted By	Aaron Katz	Job Type	Production Casing	Bulk Plant	Grand Junction
Customer	Terra Energy Partners	Location	Garfield	Well	TR 522-23-597

### Well Information

Casing/Liner Size	4.5 in	Depth MD	10363 ft	BHST	123°C / 254°F
Hole Size	8.75 in	Depth TVD	10210 ft	BHCT	89°C / 192°F
Pressure	6450 psi				

### Drilling Fluid Information

Mud Supplier Name	Baroid	Mud Trade Name	BARADRIL-N	Density	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>	<u>Cement Properties</u>	
						Slurry Density	13 lbm/gal
						Slurry Yield	2.065 ft3/sack
						Water Requirement	9.424 gal/sack
						Total Mix Fluid	9.424 gal/sack
						Water Source	Fresh Water
						Water Chloride	

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# Operation Test Results Request ID 2406605/1

## Thickening Time - ON-OFF-ON

02/AUG/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)
192	6450	51	3:28	3:34	3:40	4:31	13	61	15	24

Total sks 890

Composite:

CS1997 TR#2878 370 SKS

CS1998 TR# MT 195 370 SKS

CS1999 TR 1972 150 SKS

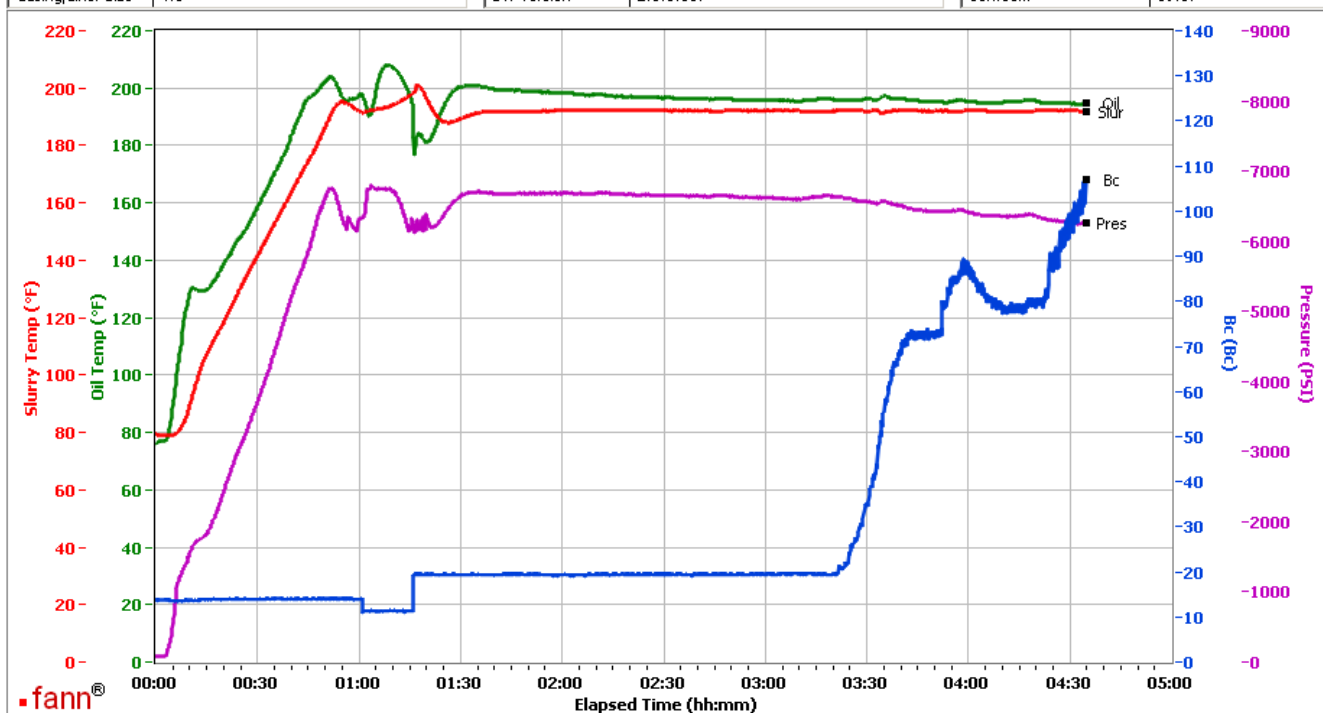
Deflection: 11 - 24 to 19 after one minute

## Grand Junction Colorado

Fields	Values
Project Name	GJ2406605-1 TERRA PRODUCTION BULK CC
Test ID	34747032
Request ID	GJ2406605-1
Tested by	DEBA
Customer	TERRA ENERGY PARTNERS
Well No	TR 522-23-597
Rig	H&P 271
Casing/Liner Size	4.5"

Fields	Values
Job Type	PRODUCTION CASING
Cement Type	HOLCIM TYPE I/II
Cement Weight	Standard
Test Date	08/01/17
Test Time	11:39 PM
Temp. Units	degF
Pressure Units	PSI
SW Version	2.1.0.507

Events	Results
30.00 Bc	03h:28m
40.00 Bc	03h:31m
50.00 Bc	03h:34m
70.00 Bc	03h:40m
100.00 Bc	04h:31m
00h:30m	14.02
01h:00m	14.24
01h:30m	19.17



Data File C:\Documents and Settings\M290\Local Settings\Temporary Internet Files\Content.IE5\K9YZ0P2R\GJ2406605-1 TERRA PRODUCTION BULK COMP. TAIL[1].tdms

Comments COMPOSITE: CS1997 TR#2878 370 SKS, CS198 MT 195 370 SKS AND CS1999 TR#1972 150 SKS

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