

# HALLIBURTON

iCem<sup>®</sup> Service

## **TERRA ENERGY PARTNERS**

United States of America, COLORADO

Date: Thursday, March 7, 2019

### **GM 312-8 Production**

Terra GM 312-8 Production

API# 05-045-24024-00

Job Date : Sunday, January 27, 2019

Sincerely,

**Grand Junction Cement Engineering**

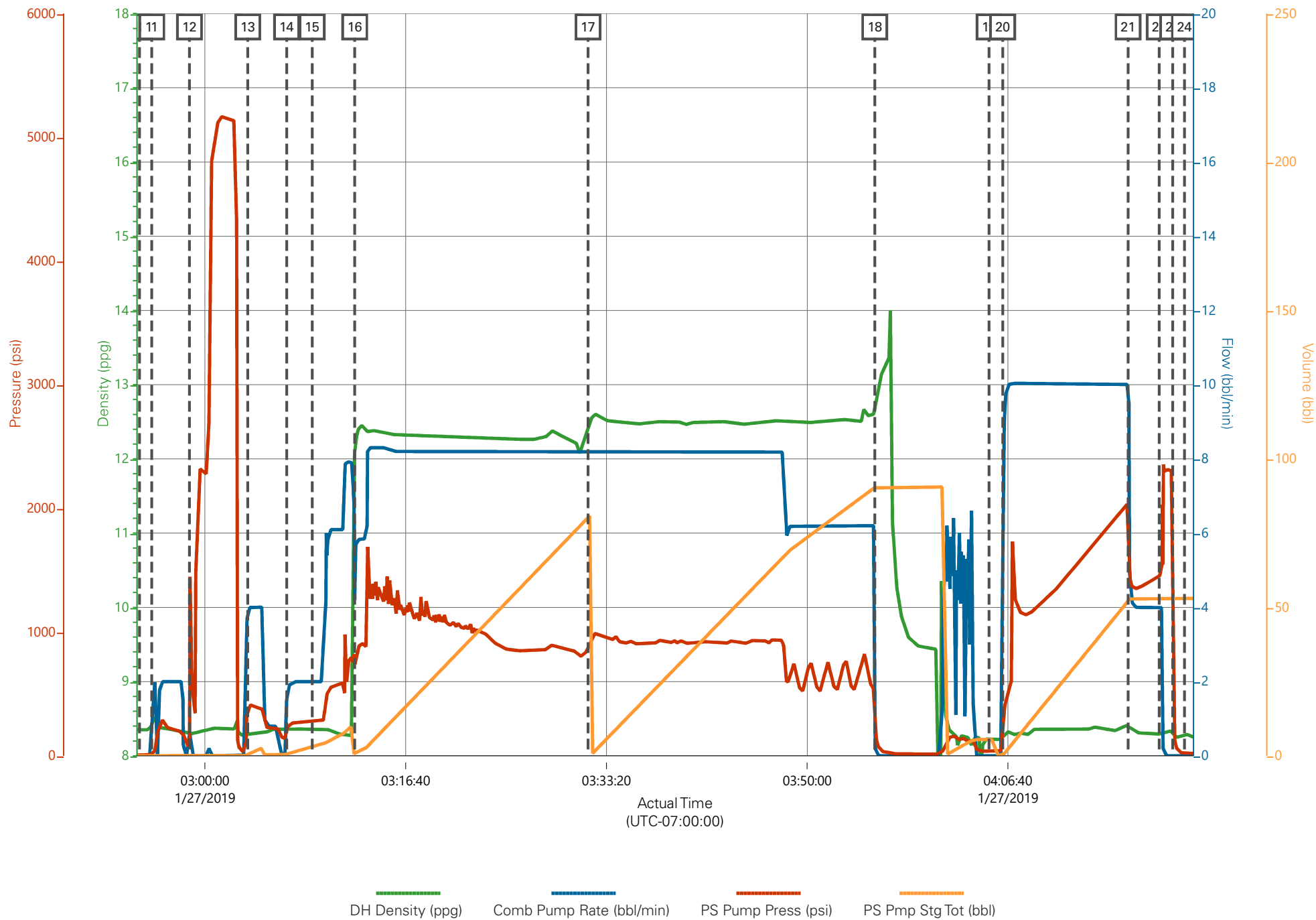
## 1.0 Real-Time Job Summary

## 1.1 Job Event Log

| Type  | Seq. No. | Graph Label                           | Date      | Time     | Source | DH Density<br>(ppg) | Comb Pump Rate<br>(bbl/min) | PS Pump Press<br>(psi) | PS Pmp Stg Tot<br>(bbl) | Comments   |
|-------|----------|---------------------------------------|-----------|----------|--------|---------------------|-----------------------------|------------------------|-------------------------|--|
| Event | 1        | Call Out                              | 1/26/2019 | 20:00:00 |        |                     |                             |                        |                         | Requested on Location @ 02:30  |
| Event | 2        | Pre-Convoy Safety Meeting             | 1/26/2019 | 21:50:00 |        |                     |                             |                        |                         |  |
| Event | 3        | Crew Leave Yard                       | 1/26/2019 | 22:00:00 |        |                     |                             |                        |                         | 1 Elite, 1 660, 1 pickup   |
| Event | 4        | Arrive At Loc                         | 1/27/2019 | 01:00:00 |        |                     |                             |                        |                         | Rig running casing   |
| Event | 5        | Assessment Of Location Safety Meeting | 1/27/2019 | 01:20:00 |        |                     |                             |                        |                         | JSA completed - Customer offered/received SDS - water test pH 7.0, CI <200, temp 83 degrees                          |
| Event | 6        | Pre-Rig Up Safety Meeting             | 1/27/2019 | 01:30:00 |        |                     |                             |                        |                         |  |
| Event | 7        | Rig-Up Equipment                      | 1/27/2019 | 01:40:00 |        |                     |                             |                        |                         | DME iron to ground manifold, standpipe. Water hoses to both uprights, bulk hoses to Silo and 660's.                  |
| Event | 8        | Other                                 | 1/27/2019 | 02:00:00 |        |                     |                             |                        |                         | Rig Circulated 1 hr. prior to cement job at 10 bpm 1013 psi. Mud scales calibrated to drinking water prior to job.   |
| Event | 9        | Pre-Job Safety Meeting                | 1/27/2019 | 02:10:00 |        |                     |                             |                        |                         | All HES personnel, rig crew, and company rep.  |
| Event | 10       | Start Job                             | 1/27/2019 | 02:54:34 |        |                     |                             |                        |                         | TD 7125', TP 7118.73', SJ 31.91', OH 8.75", Csg 4.5" 11.6 lb/ft P-110 Prev. Csg. 13.375" 54.5# @ 1039', Mud 9.5 ppg. |
| Event | 11       | Fill Lines                            | 1/27/2019 | 02:55:35 |        | 8.33                | 2                           | 425                    | 5                       | Fresh Water  |
| Event | 12       | Test Lines                            | 1/27/2019 | 02:58:43 |        |                     |                             | 5171                   |                         | No Leaks   |
| Event | 13       | Pump Spacer                           | 1/27/2019 | 03:03:33 |        | 8.33                | 4                           | 415                    | 5                       | Fresh Water  |
| Event | 14       | Pump Spacer                           | 1/27/2019 | 03:06:47 |        | 8.4                 | 4                           | 546                    | 20                      | 80 lbs. Mud Flush III  |
| Event | 15       | Check Weight                          | 1/27/2019 | 03:08:54 |        |                     |                             |                        |                         | Density verified via mud cup   |

|       |    |                             |           |          |      |    |      |       |  |
|-------|----|-----------------------------|-----------|----------|------|----|------|-------|--|
| Event | 16 | Pump Lead Cement            | 1/27/2019 | 03:12:26 | 12.3 | 8  | 1300 | 135.8 | 370 sks, 12.3 ppg, 2.06 yield, 10.14 gal/sk                    |
| Event | 17 | Pump Tail Cement            | 1/27/2019 | 03:31:48 | 12.8 | 8  | 940  | 162.3 | 465 sks, 12.5 ppg, 1.96 Yield, 9.4 gal/sk                      |
| Event | 18 | Shutdown                    | 1/27/2019 | 03:55:37 |      |    |      |       | Wash lines to pit  |
| Event | 19 | Drop Top Plug               | 1/27/2019 | 04:05:06 |      |    |      |       | Co-Rep Verify Plug   |
| Event | 20 | Pump Displacement           | 1/27/2019 | 04:06:14 | 8.4  | 10 | 2045 | 109.9 | 3 lbs BE-6, 1 gal MMCR, 2% KCl                                 |
| Event | 21 | Slow Rate                   | 1/27/2019 | 04:16:38 | 8.4  | 4  | 1490 | 99    | Slow Rate 10 bbls to Calculated Displacement                   |
| Event | 22 | Bump Plug                   | 1/27/2019 | 04:19:13 | 8.4  |    | 2335 |       | Plug Bumped at 1490 psi, Brought up to 2335 psi                |
| Event | 23 | Check Floats                | 1/27/2019 | 04:20:21 |      |    |      |       | Floats held – 1 bbl back to the truck                          |
| Event | 24 | End Job                     | 1/27/2019 | 04:21:19 |      |    |      |       | Good returns throughout job. Pipe was reciprocated during job. |
| Event | 25 | Pre-Rig Down Safety Meeting | 1/27/2019 | 04:42:11 |      |    |      |       | No sugar, HES top plug used, 0 add hours                       |
| Event | 26 | Rig-Down Equipment          | 1/27/2019 | 04:43:56 |      |    |      |       |  |
| Event | 27 | Pre-Convoy Safety Meeting   | 1/27/2019 | 05:09:29 |      |    |      |       |  |
| Event | 28 | Crew Leave Location         | 1/27/2019 | 05:11:47 |      |    |      |       | Thanks for using Halliburton Cement, Chris Martinez and crew.  |

# Terra, GM 312-8, 4 1/2" Production



## Job Information

|                |                       |          |                   |            |                |
|----------------|-----------------------|----------|-------------------|------------|----------------|
| Request/Slurry | 2530020/1             | Rig Name | H&P 271           | Date       | 22/JAN/2019    |
| Submitted By   | Treenuch Saksawad     | Job Type | Production Casing | Bulk Plant | Grand Junction |
| Customer       | Terra Energy Partners | Location | Garfield          | Well       | GM 312-8       |

## Well Information

|                   |          |           |         |      |              |
|-------------------|----------|-----------|---------|------|--------------|
| Casing/Liner Size | 4.5 in   | Depth MD  | 7167 ft | BHST | 89°C / 192°F |
| Hole Size         | 8.75 in  | Depth TVD | 6576 ft | BHCT | 53°C / 127°F |
| Pressure          | 3903 psi |           |         |      |              |

## Drilling Fluid Information

|                   |        |                |            |         |             |
|-------------------|--------|----------------|------------|---------|-------------|
| Mud Supplier Name | Baroid | Mud Trade Name | BARADRIL-N | Density | 9.9 lbm/gal |
|-------------------|--------|----------------|------------|---------|-------------|

## 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    | 12.3        | lbm/gal  |
|             |            |                        |           |                    |                    |                | Slurry Yield      | 2.06        | ft3/sack |
|             |            |                        |           |                    |                    |                | Water Requirement | 10.17       | gal/sack |
|             |            |                        |           |                    |                    |                | Total Mix Fluid   | 10.17       | gal/sack |
|             |            |                        |           |                    |                    |                | Water Source      | Fresh Water |          |
|             |            |                        |           |                    |                    |                | Water Chloride    |             |          |

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# **Operation Test Results Request ID 2530020/1**

## **Thickening Time - ON-OFF-ON, Request Test ID:36166384**

**24/JAN/2019**

| Test Temp<br>(degF) | Pressure<br>(psi) | Reached in<br>(min) | 30 Bc<br>(hh:mm) | 50 Bc<br>(hh:mm) | 70 Bc<br>(hh:mm) | 100 Bc<br>(hh:mm) | Start Bc | Stirring<br>before stop<br>(mins) | Static<br>Period<br>(min) | Peak<br>reading<br>(BC) |
|---------------------|-------------------|---------------------|------------------|------------------|------------------|-------------------|----------|-----------------------------------|---------------------------|-------------------------|
| 129                 | 3903              | 36                  | 4:50             | 5:02             | 5:12             | 5:23              | 6        | 46                                | 15                        | 8                       |

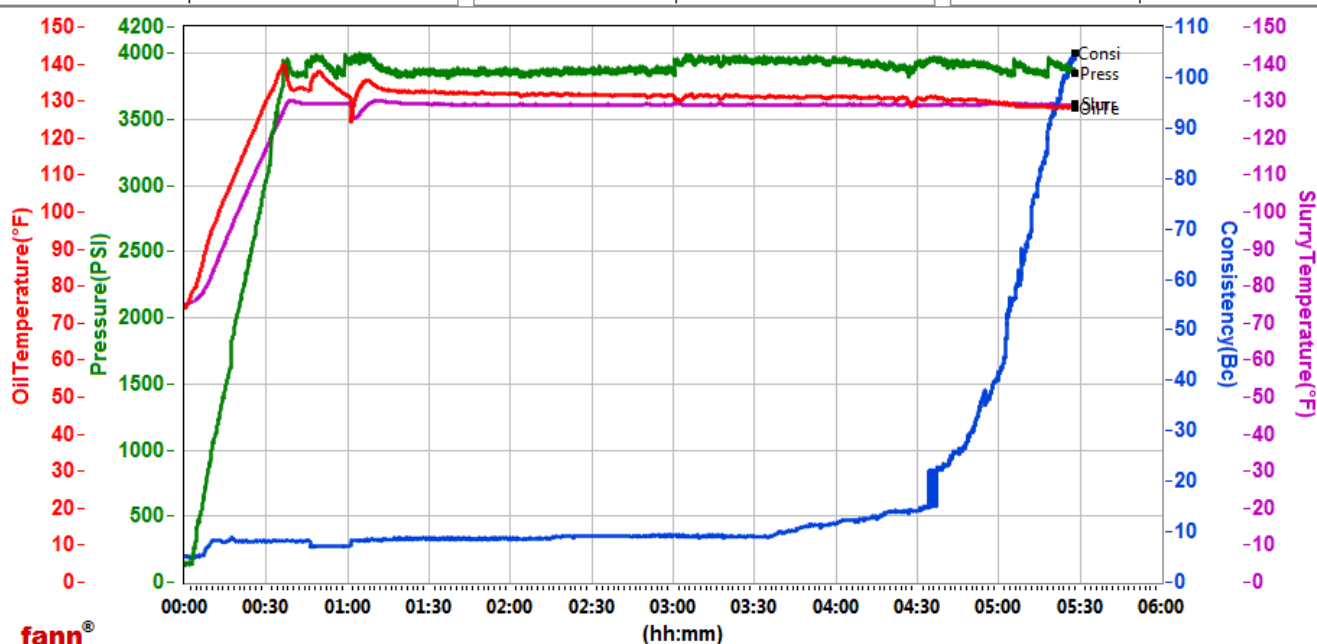
Total Sks = 370

CS0123, Trailer 2878, 370 sks

deflected from 7Bc--- > 8Bc

### **GRAND JUNCTION**

| Fields       | Values             | Fields            | Values                 | Events | Results |
|--------------|--------------------|-------------------|------------------------|--------|---------|
| Project Name | TempTest           | Rig               | H&P 271                |        |         |
| SW Version   | 1.0                | Casing/Liner Size | 4.5 INCH               |        |         |
| Test ID      | 36166383 - TT      | Job Type          | PRODUCTION CASING      |        |         |
| Request ID   | 2530020-1          | Cement Weight     | GCC TYPE I-II          |        |         |
| Tested by    | CT                 | Comments          | Standard               |        |         |
| Customer     | TERRA ENERGY PARTN | Date Time         | 1/24/2019 05:45:14.661 |        |         |
| Well No      | GM 312-8           | Temp. Units       | degF                   |        |         |



Data File C:\Users\hx25273\Desktop\HPHT Graphs\GJ2530020-1 TERRA BULK PRODUCTION LEAD .tdms

Comments Standard

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# HALLIBURTON

## Rockies, Grand Junction

## Lab Results- Tail

### Job Information

|                       |                       |                 |                   |                   |                |
|-----------------------|-----------------------|-----------------|-------------------|-------------------|----------------|
| <b>Request/Slurry</b> | 2530021/2             | <b>Rig Name</b> | H&P 271           | <b>Date</b>       | 22/JAN/2019    |
| <b>Submitted By</b>   | Treenuch Saksawad     | <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>       | GM 312-8       |

### Well Information

|                          |          |                  |         |             |              |
|--------------------------|----------|------------------|---------|-------------|--------------|
| <b>Casing/Liner Size</b> | 4.5 in   | <b>Depth MD</b>  | 7167 ft | <b>BHST</b> | 89°C / 192°F |
| <b>Hole Size</b>         | 8.75 in  | <b>Depth TVD</b> | 6576 ft | <b>BHCT</b> | 53°C / 127°F |
| <b>Pressure</b>          | 3903 psi |                  |         |             |              |

### Drilling Fluid Information

|                          |        |                       |            |                |             |
|--------------------------|--------|-----------------------|------------|----------------|-------------|
| <b>Mud Supplier Name</b> | Baroid | <b>Mud Trade Name</b> | BARADRIL-N | <b>Density</b> | 9.9 lbm/gal |
|--------------------------|--------|-----------------------|------------|----------------|-------------|

### 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           | 12.5        | lbm/gal  |
|             |            |                        |           |                    |                    |                | Slurry Yield             | 1.96        | ft3/sack |
|             |            |                        |           |                    |                    |                | Water Requirement        | 9.43        | gal/sack |
|             |            |                        |           |                    |                    |                | Total Mix Fluid          | 9.43        | gal/sack |
|             |            |                        |           |                    |                    |                | Water Source             | Fresh Water |          |
|             |            |                        |           |                    |                    |                | Water Chloride           |             |          |

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# Operation Test Results Request ID 2530021/2

## Thickening Time - ON-OFF-ON, Request Test ID:36175996

25/JAN/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) |
|------------------|----------------|------------------|---------------|---------------|---------------|----------------|----------|-----------------------------|---------------------|-------------------|
| 129              | 3903           | 36               | 2:50          | 3:04          | 3:16          | 3:30           | 9        | 46                          | 15                  | 25                |

Total SKS = 465

CS0126, Trailer 4549, 100 sks

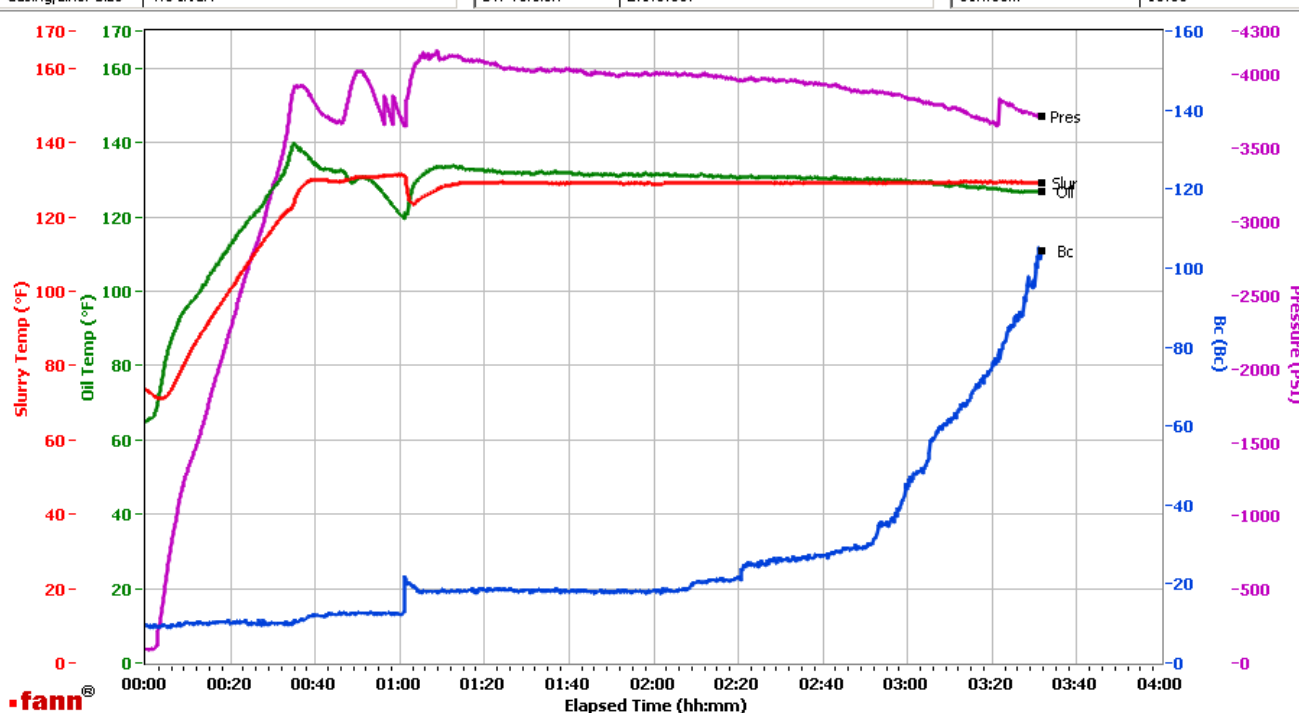
Deflection: 12 - 25 to 20 after one minute

## Grand Junction, Colorado

| Fields            | Values                               |
|-------------------|--------------------------------------|
| Project Name      | GJ2530021-2 TERRA BULK PRODUCTION TA |
| Test ID           | 36175996 - TT                        |
| Request ID        | 2530021-2                            |
| Tested by         | CT                                   |
| Customer          | TERRA ENERGY                         |
| Well No           | GM 312-8                             |
| Rig               | H&P 271                              |
| Casing/Liner Size | 4.5 INCH                             |

| Fields         | Values            |
|----------------|-------------------|
| Job Type       | PRODUCTION CASING |
| Cement Type    | GCC TYPE I-II     |
| Cement Weight  | Standard          |
| Test Date      | 01/25/19          |
| Test Time      | 12:56 PM          |
| Temp. Units    | degF              |
| Pressure Units | PSI               |
| SW Version     | 2.1.0.507         |

| Events    | Results |
|-----------|---------|
| 30.00 Bc  | 02h:50m |
| 40.00 Bc  | 02h:58m |
| 50.00 Bc  | 03h:04m |
| 70.00 Bc  | 03h:16m |
| 100.00 Bc | 03h:30m |
| 00h:30m   | 10.11   |
| 01h:00m   | 12.43   |
| 01h:30m   | 18.60   |



Data File C:\Documents and Settings\M290\Local Settings\Temporary Internet Files\Content.IE5\K9YZ0P2R\GJ2530021-2 TERRA BULK PRODUCTION TAIL[1].tdms

Comments CS0126, TRAILER 4549, 100 SKS

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# **Operation Test Results Request ID 2530021/1**

**Thickening Time - ON-OFF-ON, Request Test ID:36166386**

**24/JAN/2019**

| Test Temp<br>(degF) | Pressure<br>(psi) | Reached in<br>(min) | 30 Bc<br>(hh:mm) | 50 Bc<br>(hh:mm) | 70 Bc<br>(hh:mm) | 100 Bc<br>(hh:mm) | Start Bc | Stirring<br>before stop<br>(mins) | Static<br>Period<br>(min) | Peak<br>reading<br>(BC) |
|---------------------|-------------------|---------------------|------------------|------------------|------------------|-------------------|----------|-----------------------------------|---------------------------|-------------------------|
| 129                 | 3903              | 36                  | 3:41             | 3:48             | 4:25             | 4:25              | 6        | 46                                | 15                        | 6                       |

Total Sks =465

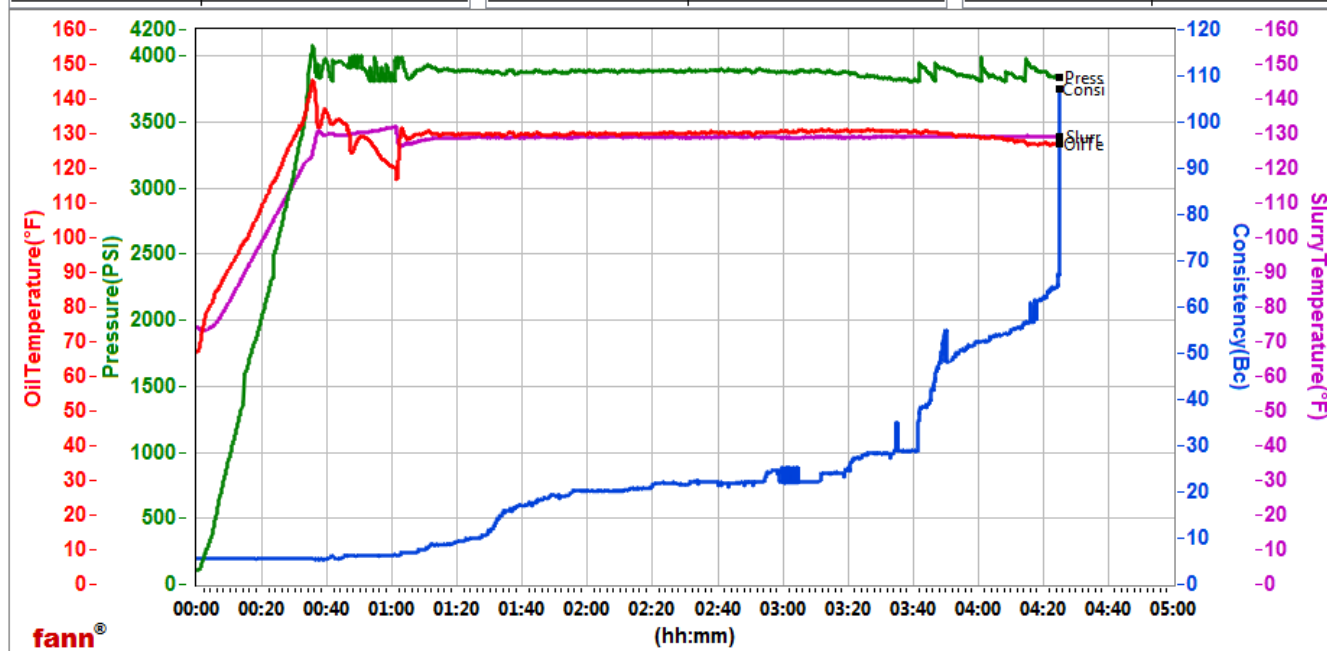
CS0124, Trailer 1513, 365 sks

no deflections, 6Bc---6Bc

Heat of hydration at 4:08

## **GRAND JUNCTION**

| Fields       | Values             | Fields            | Values                 | Events | Results |
|--------------|--------------------|-------------------|------------------------|--------|---------|
| Project Name | TempTest           | Rig               | H&P 271                |        |         |
| SW Version   | 1.0                | Casing/Liner Size | 4.5 INCH               |        |         |
| Test ID      | 36166386 - TT      | Job Type          | PRODUCTION CASING      |        |         |
| Request ID   | 2530021-1          | Cement Weight     | GCC TYPE I-II          |        |         |
| Tested by    | CT                 | Comments          | Standard               |        |         |
| Customer     | TERRA ENERGY PARTN | Date Time         | 1/24/2019 07:10:44.762 |        |         |
| Well No      | GM 312-8           | Temp. Units       | degF                   |        |         |



Data File C:\Users\hx25273\Desktop\HPHT Graphs\GJ2530021-1 TERRA BULK PRODUCTION TAIL.tdms

Comments Standard

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