



## DRILL STEM TEST REPORT

Prepared For: **Downing-Nelson Oil Co., Inc.**

PO Box 1019  
Hays, KS 67601

ATTN: Marc Downing

### **Heberlein #1-25**

### **25-13S-21W Trego,KS**

Start Date: 2018.06.06 @ 16:48:37

End Date: 2018.06.06 @ 23:50:07

Job Ticket #: 63446                      DST #: 1

Trilobite Testing, Inc  
1515 Commerce Parkway Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2018.06.08 @ 11:05:08



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Dow ning-Nelson Oil Co., Inc.

**25-13S-21W Trego,KS**

PO Box 1019  
Hays, KS 67601

**Heberlein #1-25**

Job Ticket: 63446

**DST#: 1**

ATTN: Marc Dow ning

Test Start: 2018.06.06 @ 16:48:37

## GENERAL INFORMATION:

Formation: **LKC "E"**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 20:06:37

Time Test Ended: 23:50:07

Test Type: Conventional Bottom Hole (Initial)

Tester: Brannan Lonsdale

Unit No: 73

**Interval: 3700.00 ft (KB) To 3714.00 ft (KB) (TVD)**

Reference Elevations: 2335.00 ft (KB)

Total Depth: 3714.00 ft (KB) (TVD)

2327.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition:

KB to GR/CF: 8.00 ft

**Serial #: 6753**

**Outside**

Press@RunDepth: 53.51 psig @ 3701.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2018.06.06

End Date:

2018.06.06

Last Calib.:

2018.06.06

Start Time: 16:48:42

End Time:

23:50:06

Time On Btm:

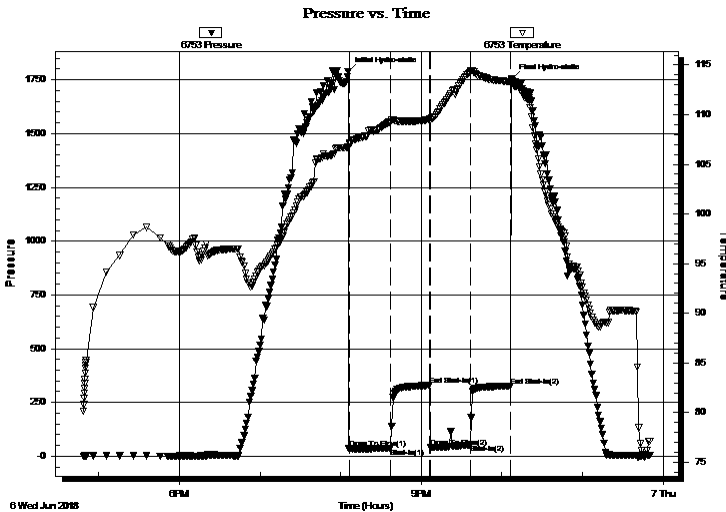
2018.06.06 @ 20:05:37

Time Off Btm:

2018.06.06 @ 22:07:37

**TEST COMMENT:** 30- IF- Surface blow Flushed tool Surface blow  
30- IS- No blow  
30- FF- Surface blow Flushed tool Surface blow  
30- FS- No blow

## PRESSURE SUMMARY



| Time (Min.) | Pressure (psig) | Temp (deg F) | Annotation           |
|-------------|-----------------|--------------|----------------------|
| 0           | 1788.54         | 106.75       | Initial Hydro-static |
| 1           | 36.83           | 107.09       | Open To Flow (1)     |
| 32          | 37.51           | 109.32       | Shut-In(1)           |
| 61          | 329.56          | 109.53       | End Shut-In(1)       |
| 62          | 39.78           | 109.48       | Open To Flow (2)     |
| 91          | 53.51           | 114.33       | Shut-In(2)           |
| 121         | 326.60          | 113.33       | End Shut-In(2)       |
| 122         | 1756.12         | 113.38       | Final Hydro-static   |

## Recovery

| Length (ft) | Description | Volume (bbl) |
|-------------|-------------|--------------|
| 80.00       | M           | 0.84         |
|             |             |              |
|             |             |              |
|             |             |              |
|             |             |              |

## Gas Rates

| Choke (inches) | Pressure (psig) | Gas Rate (Mcf/d) |
|----------------|-----------------|------------------|
|                |                 |                  |





**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Dow ning-Nelson Oil Co., Inc.

**25-13S-21W Trego,KS**

PO Box 1019  
Hays, KS 67601

**Heberlein #1-25**

Job Ticket: 63446

**DST#: 1**

ATTN: Marc Dow ning

Test Start: 2018.06.06 @ 16:48:37

## Tool Information

|                            |                    |                       |                            |                                    |
|----------------------------|--------------------|-----------------------|----------------------------|------------------------------------|
| Drill Pipe:                | Length: 3678.00 ft | Diameter: 3.82 inches | Volume: 52.14 bbl          | Tool Weight: 2000.00 lb            |
| Heavy Wt. Pipe:            | Length: ft         | Diameter: inches      | Volume: - bbl              | Weight set on Packer: 25000.00 lb  |
| Drill Collar:              | Length: 32.00 ft   | Diameter: 2.25 inches | Volume: 0.16 bbl           | Weight to Pull Loose: 90000.00 lb  |
|                            |                    |                       | <u>Total Volume: - bbl</u> | Tool Chased 5.00 ft                |
| Drill Pipe Above KB:       | 30.00 ft           |                       |                            | String Weight: Initial 52000.00 lb |
| Depth to Top Packer:       | 3700.00 ft         |                       |                            | Final 54000.00 lb                  |
| Depth to Bottom Packer:    | ft                 |                       |                            |                                    |
| Interval betw een Packers: | 14.00 ft           |                       |                            |                                    |
| Tool Length:               | 34.00 ft           |                       |                            |                                    |
| Number of Packers:         | 2                  | Diameter: 6.75 inches |                            |                                    |

Tool Comments:

## Tool Description

| Tool Description          | Length (ft)  | Serial No. | Position | Depth (ft) | Accum. Lengths                |
|---------------------------|--------------|------------|----------|------------|-------------------------------|
| Change Over Sub           | 1.00         |            |          | 3681.00    |                               |
| Shut In Tool              | 5.00         |            |          | 3686.00    |                               |
| Hydraulic tool            | 5.00         |            |          | 3691.00    |                               |
| Packer                    | 5.00         |            |          | 3696.00    | 20.00 Bottom Of Top Packer    |
| Packer                    | 4.00         |            |          | 3700.00    |                               |
| Stubb                     | 1.00         |            |          | 3701.00    |                               |
| Recorder                  | 0.00         | 6771       | Inside   | 3701.00    |                               |
| Recorder                  | 0.00         | 6753       | Outside  | 3701.00    |                               |
| Perforations              | 10.00        |            |          | 3711.00    |                               |
| Bullnose                  | 3.00         |            |          | 3714.00    | 14.00 Bottom Packers & Anchor |
| <b>Total Tool Length:</b> | <b>34.00</b> |            |          |            |                               |



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Dow ning-Nelson Oil Co., Inc.

**25-13S-21W Trego,KS**

PO Box 1019  
Hays, KS 67601

**Heberlein #1-25**

Job Ticket: 63446

**DST#: 1**

ATTN: Marc Dow ning

Test Start: 2018.06.06 @ 16:48:37

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 52.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.98 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 4800.00 ppm

Filter Cake: inches

## Recovery Information

Recovery Table

| Length<br>ft | Description | Volume<br>bbbl |
|--------------|-------------|----------------|
| 80.00        | M           | 0.838          |

Total Length: 80.00 ft      Total Volume: 0.838 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

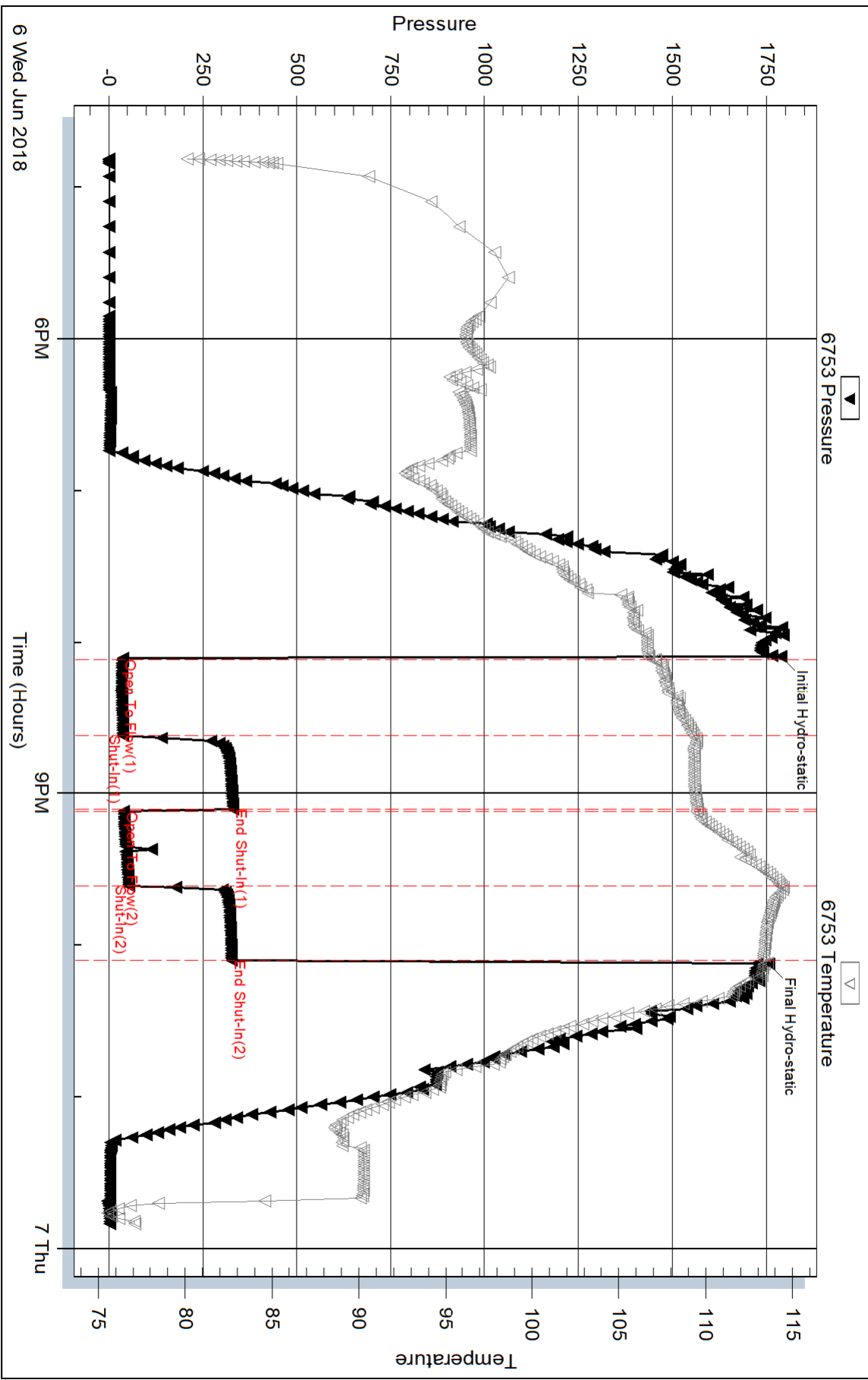
Serial #: 6753

Outside Dow nting-Nelson Oil Co., Inc.

Heberlein #1-25

DST Test Number: 1

### Pressure vs. Time



Trilobite Testing, Inc

Ref. No: 63446

Printed: 2018.06.08 @ 11:05:09

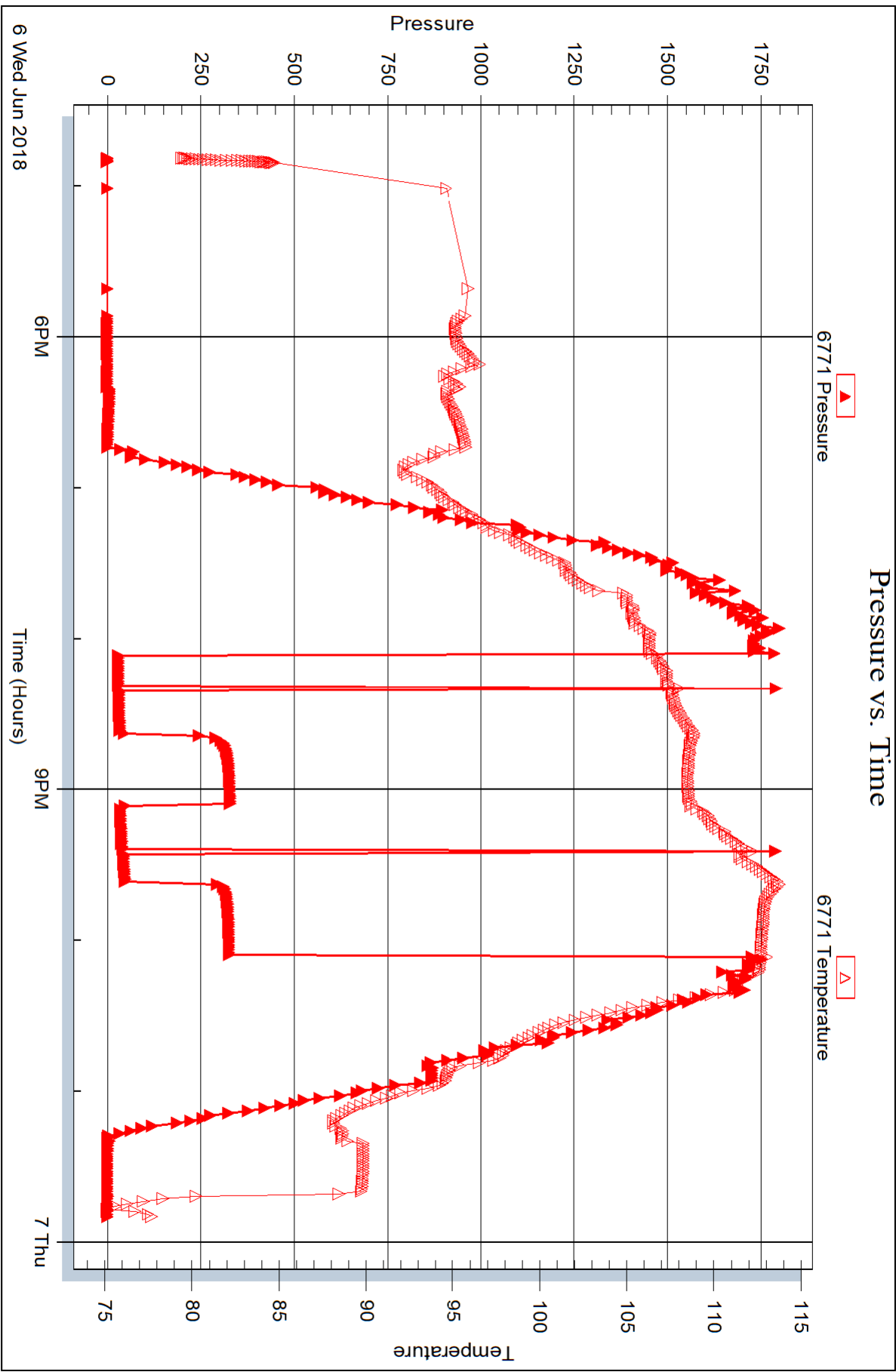
Serial #: 6771

Inside

Dow nung-Nelson Oil Co., Inc.

Heberlein #1-25

DST Test Number: 1





## DRILL STEM TEST REPORT

Prepared For: **Downing-Nelson Oil Co., Inc.**

PO Box 1019  
Hays, KS 67601

ATTN: Marc Downing

### **Heberlein #1-25**

### **25-13S-21W Trego,KS**

Start Date: 2018.06.08 @ 04:23:19

End Date: 2018.06.08 @ 10:25:49

Job Ticket #: 63447                      DST #: 2

Trilobite Testing, Inc  
1515 Commerce Parkway Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2018.06.08 @ 11:03:40





**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Dow ning-Nelson Oil Co., Inc.

**25-13S-21W Trego,KS**

PO Box 1019  
Hays, KS 67601

**Heberlein #1-25**

Job Ticket: 63447

**DST#: 2**

ATTN: Marc Dow ning

Test Start: 2018.06.08 @ 04:23:19

## GENERAL INFORMATION:

Formation: **Arbuckle**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 05:58:19

Time Test Ended: 10:25:49

Test Type: Conventional Bottom Hole (Reset)

Tester: Brannan Lonsdale

Unit No: 73

**Interval: 3986.00 ft (KB) To 4025.00 ft (KB) (TVD)**

Reference Elevations: 2335.00 ft (KB)

Total Depth: 4025.00 ft (KB) (TVD)

2327.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 8.00 ft

**Serial #: 6753 Outside**

Press@RunDepth: 546.65 psig @ 3987.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2018.06.08

End Date:

2018.06.08

Last Calib.:

2018.06.08

Start Time:

04:23:24

End Time:

10:25:48

Time On Btm:

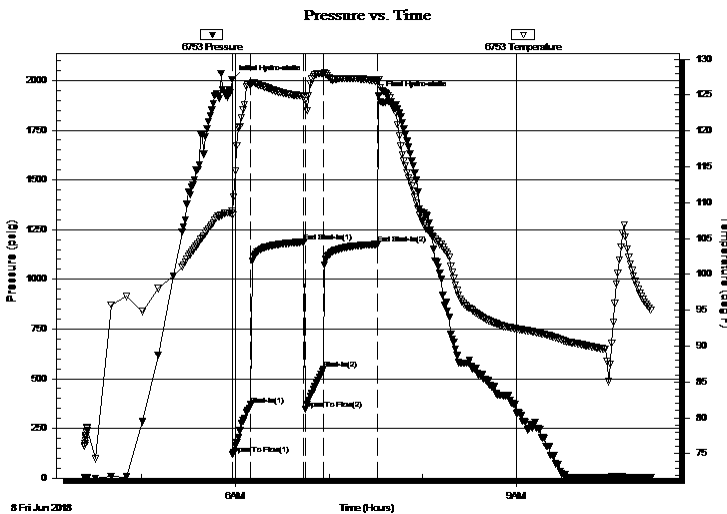
2018.06.08 @ 05:57:49

Time Off Btm:

2018.06.08 @ 07:31:49

TEST COMMENT: 15- IF- BOB 1 min (75")  
30- IS- No blow  
15- FF- BOB 2 mins (57")  
30- FSI- No blow

## PRESSURE SUMMARY



| Time (Min.) | Pressure (psig) | Temp (deg F) | Annotation           |
|-------------|-----------------|--------------|----------------------|
| 0           | 2005.62         | 108.78       | Initial Hydro-static |
| 1           | 119.88          | 108.31       | Open To Flow (1)     |
| 12          | 369.38          | 126.54       | Shut-In(1)           |
| 46          | 1187.27         | 124.82       | End Shut-In(1)       |
| 47          | 347.89          | 124.21       | Open To Flow (2)     |
| 59          | 546.65          | 128.00       | Shut-In(2)           |
| 93          | 1176.32         | 126.90       | End Shut-In(2)       |
| 94          | 1924.55         | 127.11       | Final Hydro-static   |

## Recovery

| Length (ft) | Description                | Volume (bbl) |
|-------------|----------------------------|--------------|
| 1236.00     | GWMCO, 15%G 30%W 15%M 40%O | 17.22        |
| 0.00        | 95' GIP                    | 0.00         |
|             |                            |              |
|             |                            |              |
|             |                            |              |

## Gas Rates

| Choke (inches) | Pressure (psig) | Gas Rate (Mcf/d) |
|----------------|-----------------|------------------|
|                |                 |                  |

\* Recovery from multiple tests





**TRILOBITE  
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# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Dow ning-Nelson Oil Co., Inc.

**25-13S-21W Trego,KS**

PO Box 1019  
Hays, KS 67601

**Heberlein #1-25**

Job Ticket: 63447

**DST#: 2**

ATTN: Marc Dow ning

Test Start: 2018.06.08 @ 04:23:19

## Tool Information

|                            |                    |                       |                            |                                    |
|----------------------------|--------------------|-----------------------|----------------------------|------------------------------------|
| Drill Pipe:                | Length: 3963.00 ft | Diameter: 3.82 inches | Volume: 56.18 bbl          | Tool Weight: 2000.00 lb            |
| Heavy Wt. Pipe:            | Length: ft         | Diameter: inches      | Volume: - bbl              | Weight set on Packer: 25000.00 lb  |
| Drill Collar:              | Length: 32.00 ft   | Diameter: 2.25 inches | Volume: 0.16 bbl           | Weight to Pull Loose: 63000.00 lb  |
|                            |                    |                       | <u>Total Volume: - bbl</u> | Tool Chased 0.00 ft                |
| Drill Pipe Above KB:       | 29.00 ft           |                       |                            | String Weight: Initial 59000.00 lb |
| Depth to Top Packer:       | 3986.00 ft         |                       |                            | Final 61000.00 lb                  |
| Depth to Bottom Packer:    | ft                 |                       |                            |                                    |
| Interval betw een Packers: | 39.00 ft           |                       |                            |                                    |
| Tool Length:               | 59.00 ft           |                       |                            |                                    |
| Number of Packers:         | 2                  | Diameter: 6.75 inches |                            |                                    |

Tool Comments:

## Tool Description

| Tool Description | Length (ft) | Serial No. | Position | Depth (ft) | Accum. Lengths                |
|------------------|-------------|------------|----------|------------|-------------------------------|
| Change Over Sub  | 1.00        |            |          | 3967.00    |                               |
| Shut In Tool     | 5.00        |            |          | 3972.00    |                               |
| Hydraulic tool   | 5.00        |            |          | 3977.00    |                               |
| Packer           | 5.00        |            |          | 3982.00    | 20.00 Bottom Of Top Packer    |
| Packer           | 4.00        |            |          | 3986.00    |                               |
| Stubb            | 1.00        |            |          | 3987.00    |                               |
| Recorder         | 0.00        | 6771       | Inside   | 3987.00    |                               |
| Recorder         | 0.00        | 6753       | Outside  | 3987.00    |                               |
| Perforations     | 2.00        |            |          | 3989.00    |                               |
| Change Over Sub  | 1.00        |            |          | 3990.00    |                               |
| Drill Pipe       | 31.00       |            |          | 4021.00    |                               |
| Change Over Sub  | 1.00        |            |          | 4022.00    |                               |
| Bullnose         | 3.00        |            |          | 4025.00    | 39.00 Bottom Packers & Anchor |

**Total Tool Length: 59.00**



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Downing-Nelson Oil Co., Inc.

**25-13S-21W Trego, KS**

PO Box 1019  
Hays, KS 67601

**Heberlein #1-25**

Job Ticket: 63447

**DST#: 2**

ATTN: Marc Downing

Test Start: 2018.06.08 @ 04:23:19

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

32 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

14000 ppm

Viscosity: 53.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 9.58 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 6000.00 ppm

Filter Cake: inches

## Recovery Information

Recovery Table

| Length<br>ft | Description                | Volume<br>bbbl |
|--------------|----------------------------|----------------|
| 1236.00      | GWMCO, 15%G 30%W 15%M 40%O | 17.225         |
| 0.00         | 95' GIP                    | 0.000          |

Total Length: 1236.00 ft      Total Volume: 17.225 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: RW: .46@73deg

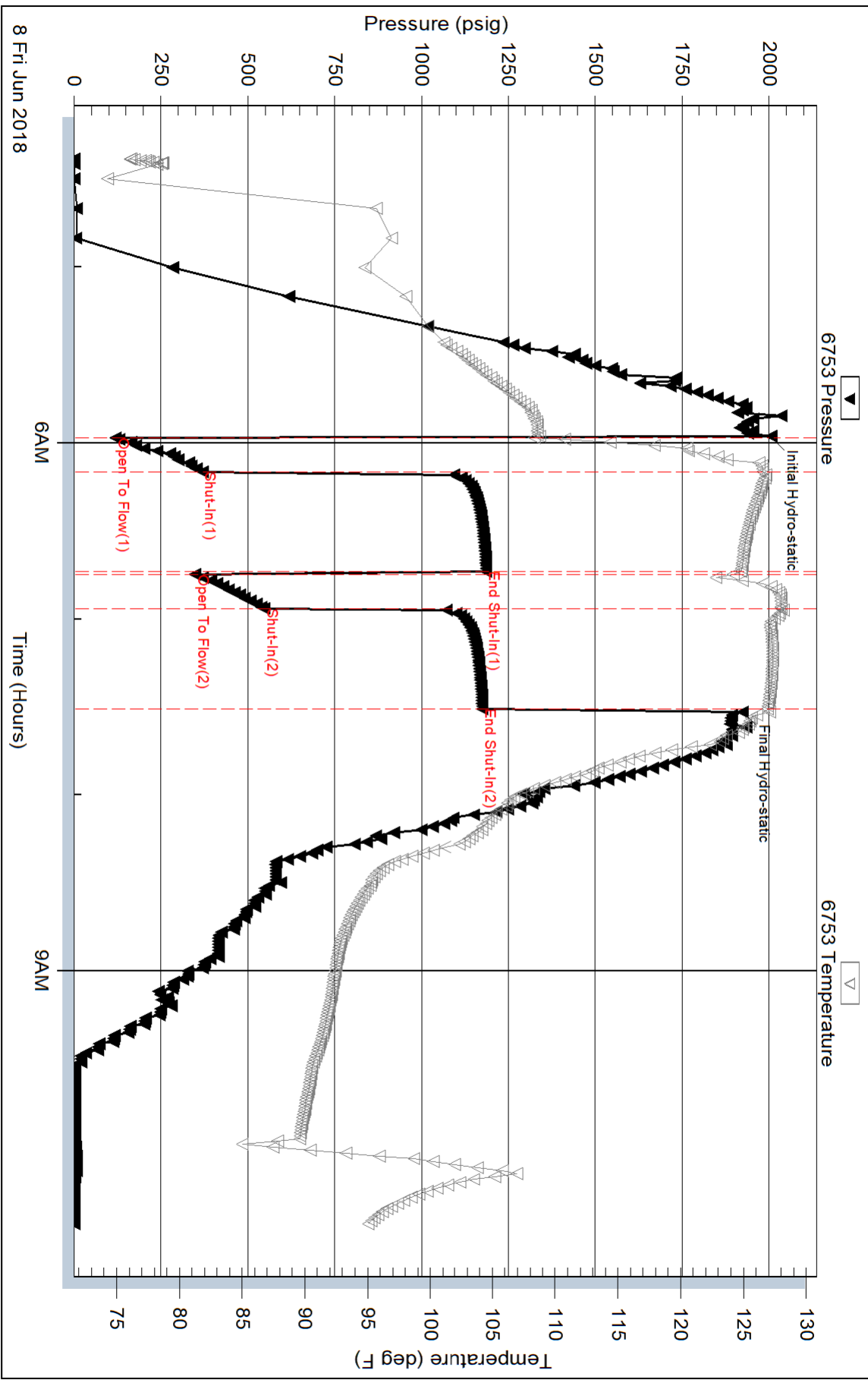
Serial #: 6753

Outside Dow nting-Nelson Oil Co., Inc.

Heberlein #1-25

DST Test Number: 2

### Pressure vs. Time



Trilobite Testing, Inc

Ref. No: 63447

Printed: 2018.06.08 @ 11:03:41

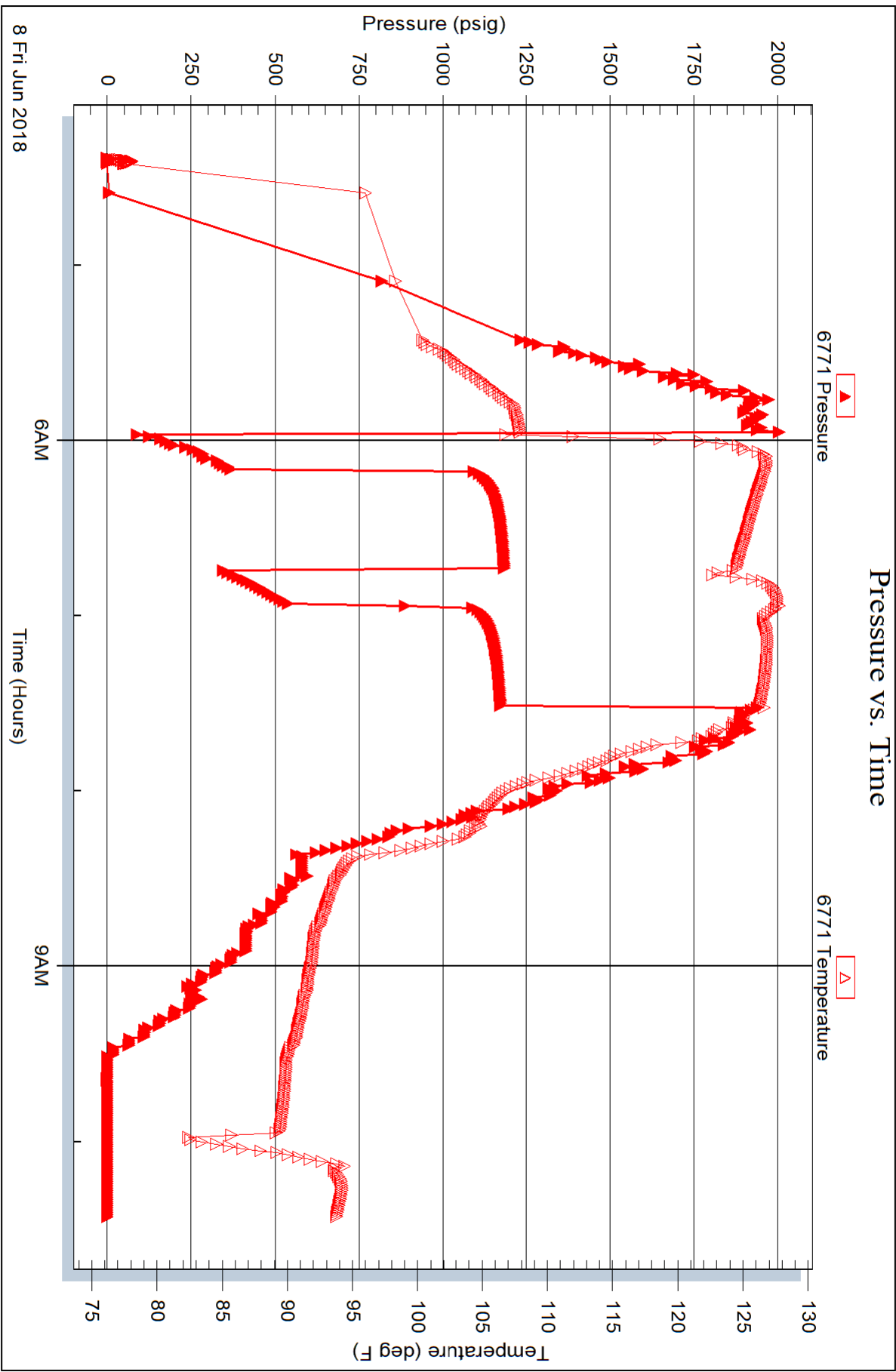
Serial #: 6771

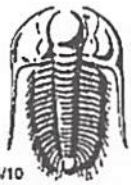
Inside

Dow nina-Nelson Oil Co., Inc.

Heberlein #1-25

DST Test Number: 2





# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 63446

Well Name & No. Heberlein #1-25 Test No. 1 Date 6/6/18  
 Company Downing-Nelson Oil Co, Inc. Elevation 2335 KB 2327 GL  
 Address PO Box 1019 Hays, KS 67601  
 Co. Rep / Geo. Marc Downing Rig Discovery #4  
 Location: Sec. 25 Twp 13 S Rge. 21 W Co. Trego State KS

Interval Tested 3700-3714 Zone Tested LKC "E"  
 Anchor Length 14' Drill Pipe Run 2678 Mud Wt. 8.8  
 Top Packer Depth 2695 Drill Collars Run 32 Vis 52  
 Bottom Packer Depth 3700 Wt. Pipe Run --- WL 8.0  
 Total Depth 3714 Chlorides 4,800 ppm System LCM 1#

Blow Description IF - Surface blow Flushed tool Surface blow  
ISI - No blow  
FF - Surface blow Flushed tool Surface blow  
FSI - No blow

| Rec       | Feet of  | %gas | %oil | %water | %mud |
|-----------|----------|------|------|--------|------|
| <u>80</u> | <u>M</u> |      |      |        |      |
| Rec       | Feet of  | %gas | %oil | %water | %mud |
| Rec       | Feet of  | %gas | %oil | %water | %mud |
| Rec       | Feet of  | %gas | %oil | %water | %mud |
| Rec       | Feet of  | %gas | %oil | %water | %mud |

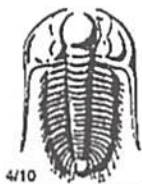
Rec Total 80' BHT 113° Gravity --- API RW --- @ --- °F Chlorides --- ppm

|                                     |   |                           |
|-------------------------------------|---|---------------------------|
| (A) Initial Hydrostatic <u>1789</u> | <input checked="" type="checkbox"/> Test <u>1050</u>        | T-On Location <u>1540</u> |
| (B) First Initial Flow <u>37</u>    | <input type="checkbox"/> Jars <u>---</u>                    | T-Started <u>1648</u>     |
| (C) First Final Flow <u>38</u>      | <input type="checkbox"/> Safety Joint <u>---</u>            | T-Open <u>2005</u>        |
| (D) Initial Shut-In <u>330</u>      | <input type="checkbox"/> Circ Sub <u>---</u>                | T-Pulled <u>2205</u>      |
| (E) Second Initial Flow <u>40</u>   | <input type="checkbox"/> Hourly Standby <u>---</u>          | T-Out <u>2350</u>         |
| (F) Second Final Flow <u>54</u>     | <input checked="" type="checkbox"/> Mileage <u>50 RT</u> 50 | Comments <u>---</u>       |
| (G) Final Shut-In <u>327</u>        | <input type="checkbox"/> Sampler <u>---</u>                 | <u>---</u>                |
| (H) Final Hydrostatic <u>1756</u>   | <input type="checkbox"/> Straddle <u>---</u>                | <u>---</u>                |

|                           |   |
|---------------------------|---|
| Initial Open <u>30</u>    | <input type="checkbox"/> Ruined Shale Packer <u>---</u> |
| Initial Shut-In <u>30</u> | <input type="checkbox"/> Ruined Packer <u>---</u>       |
| Final Flow <u>30</u>      | <input type="checkbox"/> Extra Copies <u>---</u>        |
| Final Shut-In <u>30</u>   | Sub Total <u>0</u>                                      |
|                           | Total <u>1100</u>                                       |
|                           | MP/DST Disc't <u>---</u>                                |
| Sub Total <u>1100</u>     |   |

Approved By \_\_\_\_\_ Our Representative Brannan Lonsdale  
 Trilobite Testing Inc. shall not be liable for damaged of any kind of the property or personnel of the one for whom a test is made, or for any loss suffered or sustained, directly or indirectly, through the use of its equipment, or its statements or opinion concerning the results of any test, tools lost or damaged in the hole shall be paid for at cost by the party for whom the test is made.





# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 63447

Well Name & No. Heberlein #1-25 Test No. 2 Date 6/8/18  
 Company Downing-Nelson Oil Co., Inc. Elevation 2335 KB 2327 GL  
 Address PO Box 1019 Hays, KS 67601  
 Co. Rep / Geo. Marc Downing Rig Discovery #4  
 Location: Sec. 25 Twp 13 S Rge. 21 W Co. Trego State KS

Interval Tested 3986-4025 Zone Tested Arbuckle  
 Anchor Length 39' Drill Pipe Run 3963 Mud Wt. 9.2  
 Top Packer Depth 3981 Drill Collars Run 32 Vis 53  
 Bottom Packer Depth 3986 Wt. Pipe Run --- WL 9.6  
 Total Depth 4025 Chlorides 6,000 ppm System LCM 1#  
 Blow Description IF-BOB 1 min (75")  
ISI- No blow  
FF-BOB 2 mins (57")  
FST- No blow

| Rec         | Feet of                | %gas      | %oil      | %water    | %mud      |
|-------------|------------------------|-----------|-----------|-----------|-----------|
| <u>1236</u> | <u>4 W/MCO</u>         | <u>15</u> | <u>40</u> | <u>30</u> | <u>15</u> |
| Rec         | Feet of <u>95' QIP</u> | %gas      | %oil      | %water    | %mud      |
| Rec         | Feet of                | %gas      | %oil      | %water    | %mud      |
| Rec         | Feet of                | %gas      | %oil      | %water    | %mud      |
| Rec         | Feet of                | %gas      | %oil      | %water    | %mud      |

Rec Total 1236 BHT 127° Gravity 32 API RW .46 @ 73 °F Chlorides 14,000 ppm  
 (A) Initial Hydrostatic 2006  Test 1150 T-On Location 0400  
 (B) First Initial Flow 120  Jars \_\_\_\_\_ T-Started 0423  
 (C) First Final Flow 369  Safety Joint \_\_\_\_\_ T-Open 0558  
 (D) Initial Shut-In 1187  Circ Sub \_\_\_\_\_ T-Pulled 0728  
 (E) Second Initial Flow 348  Hourly Standby \_\_\_\_\_ T-Out 1626  
 (F) Second Final Flow 547  Mileage 50 RT 50 Comments \_\_\_\_\_  
 (G) Final Shut-In 1176  Sampler \_\_\_\_\_  
 (H) Final Hydrostatic 1925  Straddle \_\_\_\_\_  Ruined Shale Packer \_\_\_\_\_  
 Shale Packer \_\_\_\_\_  Ruined Packer \_\_\_\_\_  
 Extra Packer \_\_\_\_\_  Extra Copies \_\_\_\_\_  
 Initial Open 15  Extra Recorder \_\_\_\_\_ Sub Total 0  
 Initial Shut-In 30  Day Standby \_\_\_\_\_ Total 1200  
 Final Flow 15  Accessibility \_\_\_\_\_ MP/DST Disc't \_\_\_\_\_  
 Final Shut-In 30 Sub Total 1200

Approved By \_\_\_\_\_ Our Representative Brennan Lonsdale

Trilobite Testing Inc. shall not be liable for damaged of any kind of the property or personnel of the one for whom a test is made, or for any loss suffered or sustained, directly or indirectly, through the use of its equipment, or its statements or opinion concerning the results of any test, tools lost or damaged in the hole shall be paid for at cost by the party for whom the test is made.