



DRILL STEM TEST REPORT

Prepared For: **TDI Inc**

1310 Bison Rd
Hays KS 67601-9696

ATTN: Herb Deines

Rattlesnake #1

12-12s-19w Ellis,KS

Start Date: 2016.06.28 @ 07:02:00

End Date: 2016.06.28 @ 11:46:00

Job Ticket #: 64935 DST #: 1

Trilobite Testing, Inc
PO Box 362 Hays, KS 67601
ph: 785-625-4778 fax: 785-625-5620

Printed: 2016.06.30 @ 08:37:32



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TDI Inc

1310 Bison Rd
Hays KS 67601-9696

ATTN: Herb Deines

12-12s-19w Ellis, KS

Rattlesnake #1

Job Ticket: 64935

DST#: 1

Test Start: 2016.06.28 @ 07:02:00

GENERAL INFORMATION:

Formation: **LKC "C- D"**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 08:29:45

Time Test Ended: 11:46:00

Test Type: Conventional Bottom Hole (Initial)

Tester: Jim Svaty

Unit No: 76

Interval: 3501.00 ft (KB) To 3550.00 ft (KB) (TVD)

Total Depth: 3550.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Fair

Reference Elevations: 2187.00 ft (KB)

2179.00 ft (CF)

KB to GR/CF: 8.00 ft

Serial #: 8289 Inside

Press@RunDepth: 35.46 psig @ 3515.00 ft (KB)

Start Date: 2016.06.28

End Date:

2016.06.28

Start Time: 07:02:02

End Time:

11:46:15

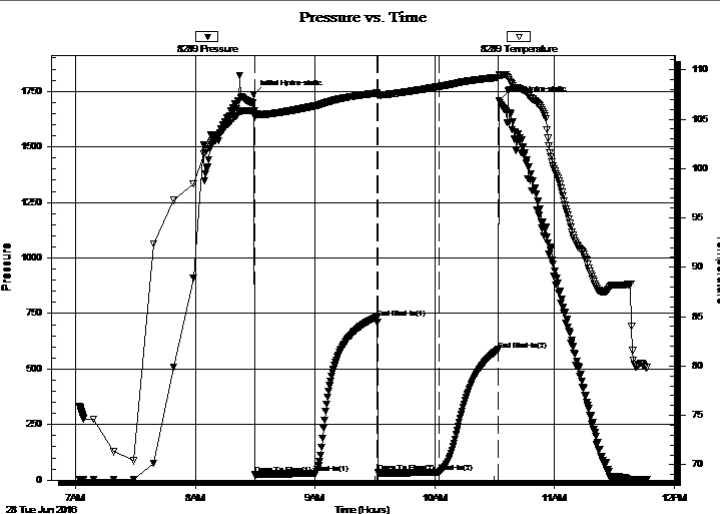
Capacity: 8000.00 psig

Last Calib.: 2016.06.28

Time On Btm: 2016.06.28 @ 08:29:30

Time Off Btm: 2016.06.28 @ 10:32:15

TEST COMMENT: 30-IFP- 1/4" Blow
30-ISIP- No Blow
30-FFP- Weak Surface Blow in 18 min.
30-FSIP- No Blow



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1734.02	105.88	Initial Hydro-static
1	24.34	105.21	Open To Flow (1)
31	29.60	106.35	Shut-In(1)
62	729.98	107.64	End Shut-In(1)
62	33.30	107.39	Open To Flow (2)
93	35.46	108.30	Shut-In(2)
123	587.49	109.23	End Shut-In(2)
123	1709.85	109.53	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
25.00	WCM 45%w 55%m Oil Specks in Too	0.35

Gas Rates

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)
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DRILL STEM TEST REPORT

TDI Inc

1310 Bison Rd
Hays KS 67601-9696

ATTN: Herb Deines

12-12s-19w Ellis, KS

Rattlesnake #1

Job Ticket: 64935

DST#: 1

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Hole Diameter: 7.88 inches Hole Condition: Fair

Reference Elevations: 2187.00 ft (KB)

2179.00 ft (CF)

KB to GR/CF: 8.00 ft

Serial #: 6668 Outside

Press@RunDepth: psig @ 3515.00 ft (KB)

Start Date: 2016.06.28

End Date:

2016.06.28

Start Time: 07:02:02

End Time:

11:46:00

Capacity: 8000.00 psig

Last Calib.:

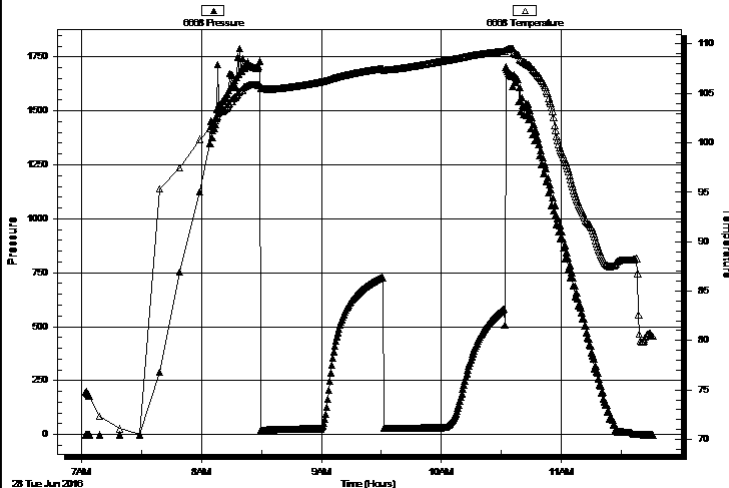
2016.06.28

Time On Btm:

Time Off Btm:

TEST COMMENT: 30-IFP- 1/4" Blow
30-ISIP- No Blow
30-FFP- Weak Surface Blow in 18 min.
30-FSIP- No Blow

Pressure vs. Time



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
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Recovery

Length (ft)	Description	Volume (bbl)
25.00	WCM 45%w 55%m Oil Specks in Too	0.35

Gas Rates

Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)
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**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

TDI Inc

1310 Bison Rd
Hays KS 67601-9696

ATTN: Herb Deines

12-12s-19w Ellis,KS

Rattlesnake #1

Job Ticket: 64935

DST#: 1

Test Start: 2016.06.28 @ 07:02:00

Tool Information

Drill Pipe:	Length:	3512.00 ft	Diameter:	3.80 inches	Volume:	49.26 bbl	Tool Weight:	2500.00 lb
Heavy Wt. Pipe:	Length:	0.00 ft	Diameter:	2.75 inches	Volume:	0.00 bbl	Weight set on Packer:	25000.00 lb
Drill Collar:	Length:	0.00 ft	Diameter:	2.25 inches	Volume:	0.00 bbl	Weight to Pull Loose:	40000.00 lb
					Total Volume:	49.26 bbl	Tool Chased	0.00 ft
Drill Pipe Above KB:		32.00 ft					String Weight: Initial	38000.00 lb
Depth to Top Packer:		3501.00 ft					Final	38000.00 lb
Depth to Bottom Packer:		ft						
Interval between Packers:		49.00 ft						
Tool Length:		70.00 ft						
Number of Packers:		2	Diameter:	6.75 inches				
Tool Comments:								

Tool Description

Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
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Change Over Sub	1.00		3481.00	
Shut In Tool	5.00		3486.00	
Hydraulic tool	5.00		3491.00	
Packer	5.00		3496.00	21.00 Bottom Of Top Packer
Packer	5.00		3501.00	
Stubb	1.00		3502.00	
Perforations	12.00		3514.00	
Change Over Sub	1.00		3515.00	
Recorder	0.00	8289 Inside	3515.00	
Recorder	0.00	6668 Outside	3515.00	
Blank Spacing	31.00		3546.00	
Change Over Sub	1.00		3547.00	
Bullnose	3.00		3550.00	49.00 Bottom Packers & Anchor

Total Tool Length: 70.00



TRILOBITE
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DRILL STEM TEST REPORT

FLUID SUMMARY

TDI Inc

12-12s-19w Ellis,KS

1310 Bison Rd
Hays KS 67601-9696

Rattlesnake #1

Job Ticket: 64935

DST#: 1

ATTN: Herb Deines

Test Start: 2016.06.28 @ 07:02:00

Mud and Cushion Information

Mud Type: Gel Chem

Mud Weight: 9.00 lb/gal

Viscosity: 51.00 sec/qt

Water Loss: 7.18 in³

Resistivity: ohm.m

Salinity: 3400.00 ppm

Filter Cake: 2.00 inches

Cushion Type:

Cushion Length:

Cushion Volume:

Gas Cushion Type:

Gas Cushion Pressure:

Oil API:

deg API

Water Salinity: 20000 ppm

ft

bbl

psig

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
25.00	WCM 45%w 55%m Oil Specks in Tool	0.351

Total Length: 25.00 ft

Total Volume: 0.351 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: .295 @ 79

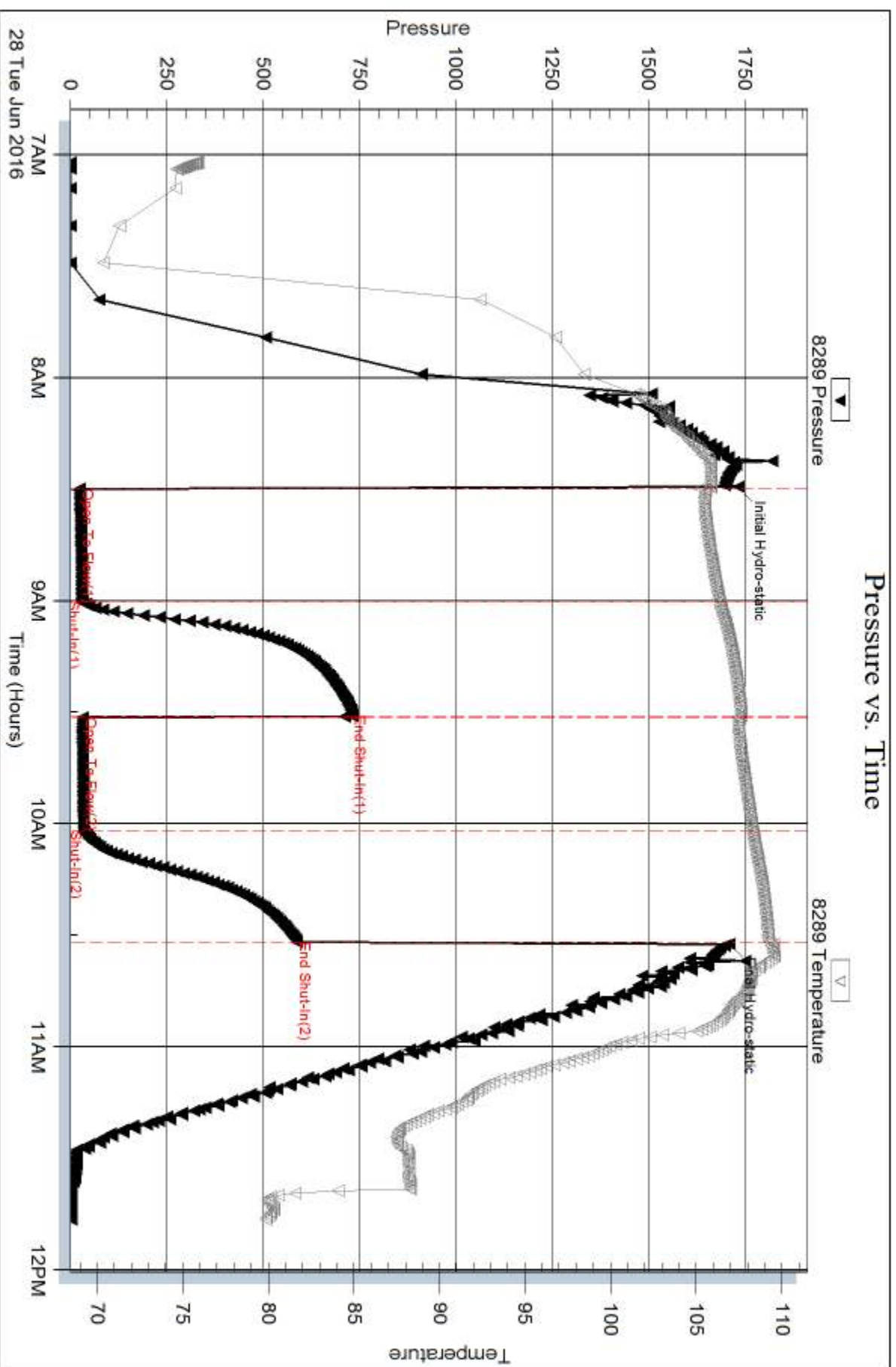
Serial #: 8289

Inside

TDI Inc

Rattlesnake #1

DST Test Number: 1

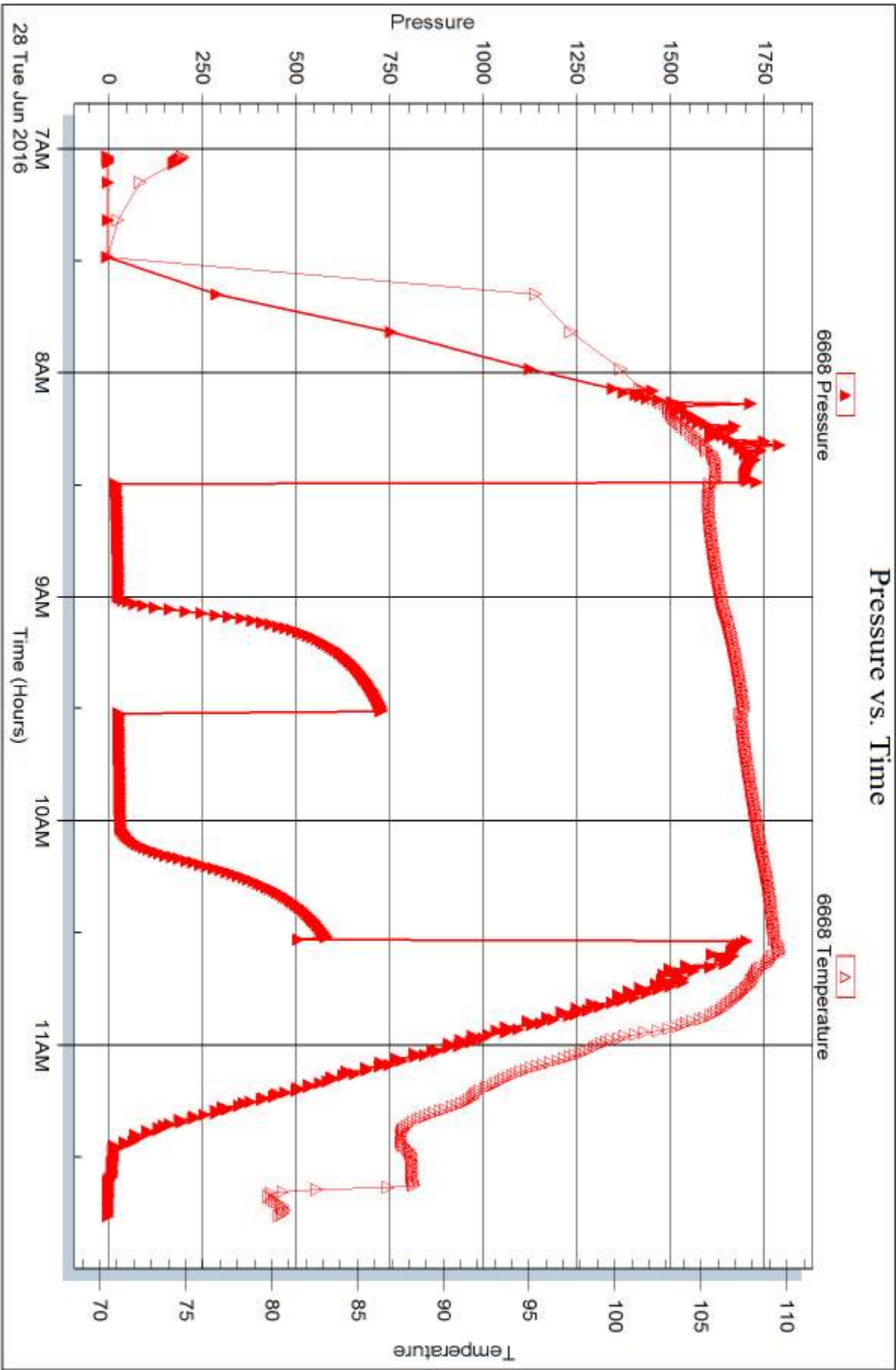


Serial #: 6668

Outside TDI Inc

Rattlesnake #1

DST Test Number: 1





DRILL STEM TEST REPORT

Prepared For: **TDI Inc**

1310 Bison Rd
Hays KS 67601-9696

ATTN: Herb Deines

Rattlesnake #1

12-12s-19w Ellis,KS

Start Date: 2016.06.28 @ 22:37:00

End Date: 2016.06.29 @ 05:22:00

Job Ticket #: 64936 DST #: 2

Trilobite Testing, Inc
PO Box 362 Hays, KS 67601
ph: 785-625-4778 fax: 785-625-5620

Printed: 2016.06.30 @ 08:35:21



TRILOBITE
TESTING, INC.

DRILL STEM TEST REPORT

TDI Inc

1310 Bison Rd
Hays KS 67601-9696

ATTN: Herb Deines

12-12s-19w Ellis, KS

Rattlesnake #1

Job Ticket: 64936

DST#: 2

Test Start: 2016.06.28 @ 22:37:00

GENERAL INFORMATION:

Formation: **LKC " H - K "**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 00:39:30

Time Test Ended: 05:22:00

Test Type: Conventional Bottom Hole (Reset)

Tester: Jim Svaty

Unit No: 76

Interval: 3593.00 ft (KB) To 3693.00 ft (KB) (TVD)

Total Depth: 3693.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Fair

Reference Elevations: 2187.00 ft (KB)

2179.00 ft (CF)

KB to GR/CF: 8.00 ft

Serial #: 8289 Inside

Press@RunDepth: 156.91 psig @ 3607.00 ft (KB)

Start Date: 2016.06.28

End Date:

2016.06.29

Start Time: 22:37:02

End Time:

05:22:00

Capacity: 8000.00 psig

Last Calib.: 2016.06.29

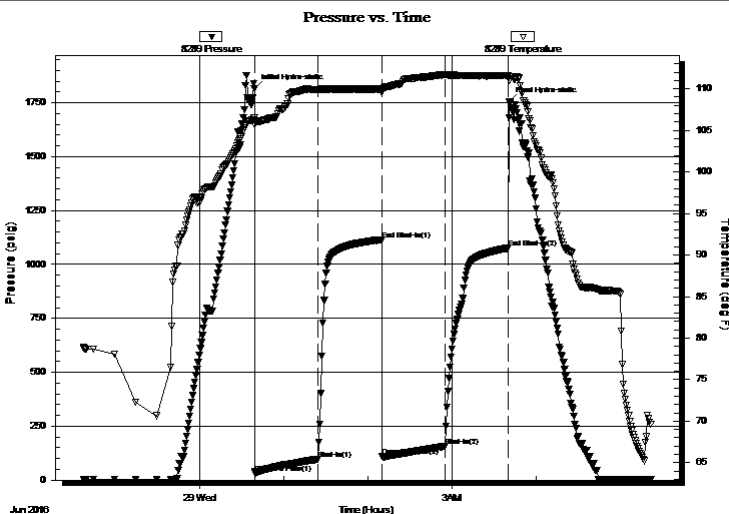
Time On Btm: 2016.06.29 @ 00:39:00

Time Off Btm: 2016.06.29 @ 03:41:15

TEST COMMENT: 45-IFP- BOB in 39 min.
45-ISIP- No Blow
45-FFP- BOB in 45 min.
45-FSIP- No Blow

PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1814.43	106.55	Initial Hydro-static
1	33.75	106.12	Open To Flow (1)
46	97.12	109.93	Shut-In(1)
91	1113.42	109.96	End Shut-In(1)
91	109.24	109.57	Open To Flow (2)
136	156.91	111.71	Shut-In(2)
181	1075.88	111.58	End Shut-In(2)
183	1753.24	111.04	Final Hydro-static



Recovery

Length (ft)	Description	Volume (bbl)
287.00	Oil Speck WCM 1%o 49%w 50%m	4.03

Gas Rates

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)
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* Recovery from multiple tests



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DRILL STEM TEST REPORT

TDI Inc

1310 Bison Rd
Hays KS 67601-9696

ATTN: Herb Deines

12-12s-19w Ellis, KS

Rattlesnake #1

Job Ticket: 64936

DST#: 2

Test Start: 2016.06.28 @ 22:37:00

GENERAL INFORMATION:

Formation: **LKC " H - K "**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 00:39:30

Time Test Ended: 05:22:00

Test Type: Conventional Bottom Hole (Reset)

Tester: Jim Svaty

Unit No: 76

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Total Depth: 3693.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Fair

Reference Elevations: 2187.00 ft (KB)

2179.00 ft (CF)

KB to GR/CF: 8.00 ft

Serial #: 6668 Outside

Press@RunDepth: psig @ 3607.00 ft (KB)

Start Date: 2016.06.28

End Date:

2016.06.29

Start Time: 22:37:02

End Time:

05:22:00

Capacity: 8000.00 psig

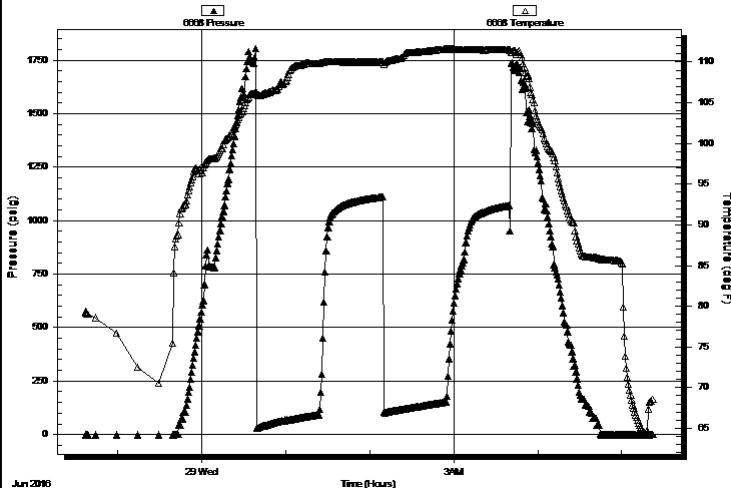
Last Calib.: 2016.06.29

Time On Btm:

Time Off Btm:

TEST COMMENT: 45-IFP- BOB in 39 min.
45-ISIP- No Blow
45-FFP- BOB in 45 min.
45-FSIP- No Blow

Pressure vs. Time



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
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Recovery

Length (ft)	Description	Volume (bbl)
287.00	Oil Speck WCM 1%o 49%w 50%m	4.03

Gas Rates

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)
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* Recovery from multiple tests



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

TDI Inc

1310 Bison Rd
Hays KS 67601-9696

ATTN: Herb Deines

12-12s-19w Ellis,KS

Rattlesnake #1

Job Ticket: 64936

DST#: 2

Test Start: 2016.06.28 @ 22:37:00

Tool Information

Drill Pipe:	Length:	3576.00 ft	Diameter:	3.80 inches	Volume:	50.16 bbl	Tool Weight:	2500.00 lb
Heavy Wt. Pipe:	Length:	0.00 ft	Diameter:	2.75 inches	Volume:	0.00 bbl	Weight set on Packer:	25000.00 lb
Drill Collar:	Length:	0.00 ft	Diameter:	2.25 inches	Volume:	0.00 bbl	Weight to Pull Loose:	40000.00 lb
					Total Volume:	50.16 bbl	Tool Chased	0.00 ft
Drill Pipe Above KB:		4.00 ft					String Weight: Initial	38000.00 lb
Depth to Top Packer:		3593.00 ft					Final	39000.00 lb
Depth to Bottom Packer:		ft						
Interval between Packers:		100.00 ft						
Tool Length:		121.00 ft						
Number of Packers:		2	Diameter:	6.75 inches				
Tool Comments:								

Tool Description

Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
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Change Over Sub	1.00		3573.00	
Shut In Tool	5.00		3578.00	
Hydraulic tool	5.00		3583.00	
Packer	5.00		3588.00	21.00 Bottom Of Top Packer
Packer	5.00		3593.00	
Stubb	1.00		3594.00	
Perforations	12.00		3606.00	
Change Over Sub	1.00		3607.00	
Recorder	0.00	8289 Inside	3607.00	
Recorder	0.00	6668 Outside	3607.00	
Blank Spacing	63.00		3670.00	
Change Over Sub	1.00		3671.00	
Perforations	19.00		3690.00	
Bullnose	3.00		3693.00	100.00 Bottom Packers & Anchor

Total Tool Length: 121.00



**TRILOBITE
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DRILL STEM TEST REPORT

FLUID SUMMARY

TDI Inc

12-12s-19w Ellis,KS

1310 Bison Rd
Hays KS 67601-9696

Rattlesnake #1

Job Ticket: 64936

DST#: 2

ATTN: Herb Deines

Test Start: 2016.06.28 @ 22:37:00

Mud and Cushion Information

Mud Type: Gel Chem

Mud Weight: 9.00 lb/gal

Viscosity: 51.00 sec/qt

Water Loss: 7.18 in³

Resistivity: ohm.m

Salinity: 3400.00 ppm

Filter Cake: 2.00 inches

Cushion Type:

Cushion Length:

Cushion Volume:

Gas Cushion Type:

Gas Cushion Pressure:

Oil API:

deg API

Water Salinity: 48000 ppm

ft

bbl

psig

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
287.00	Oil Speck WCM 1%o 49%w 50%m	4.026

Total Length: 287.00 ft

Total Volume: 4.026 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: .170 @ 66

Serial #: 8289

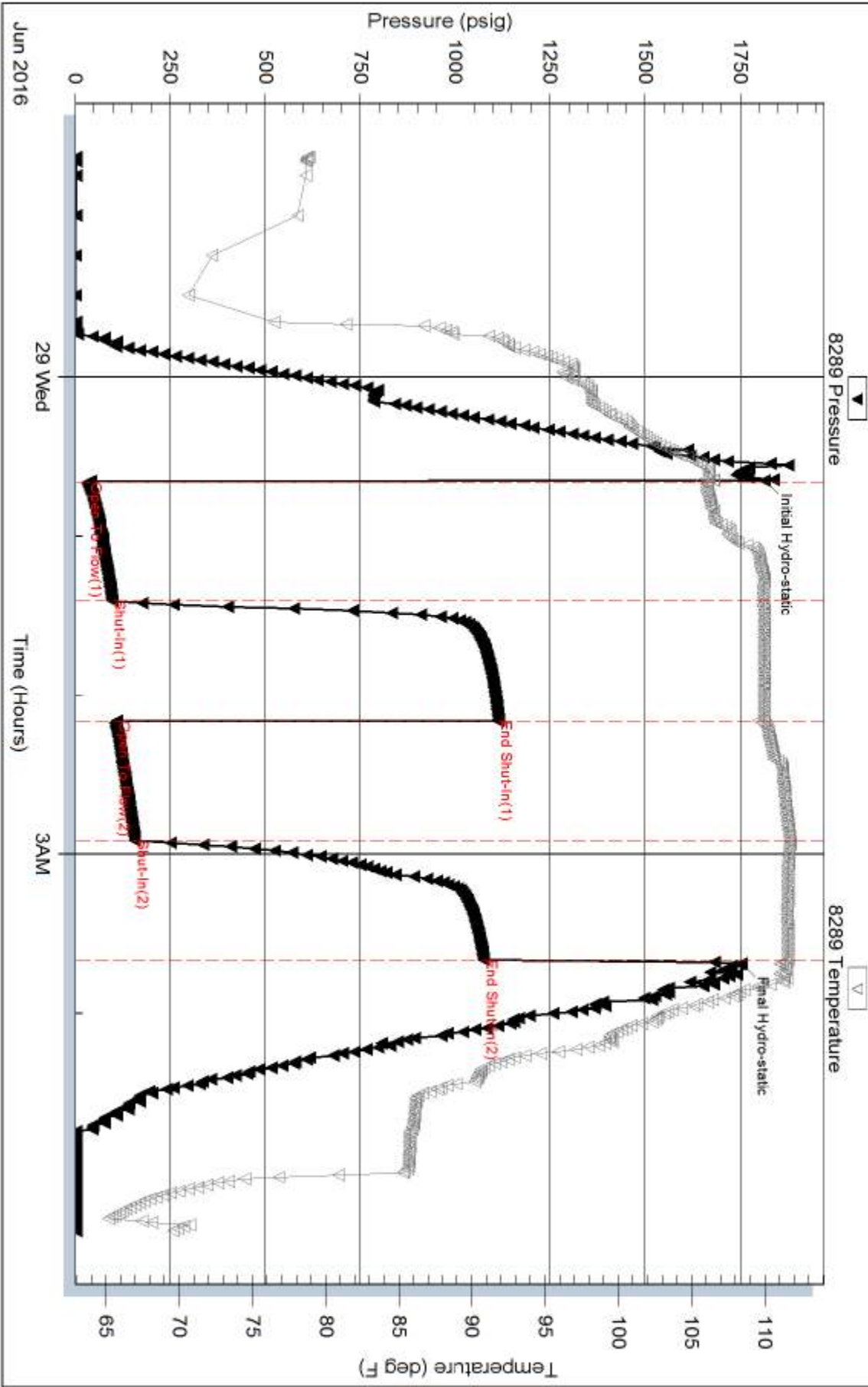
Inside

TDI Inc

Rattlesnake #1

DST Test Number: 2

Pressure vs. Time

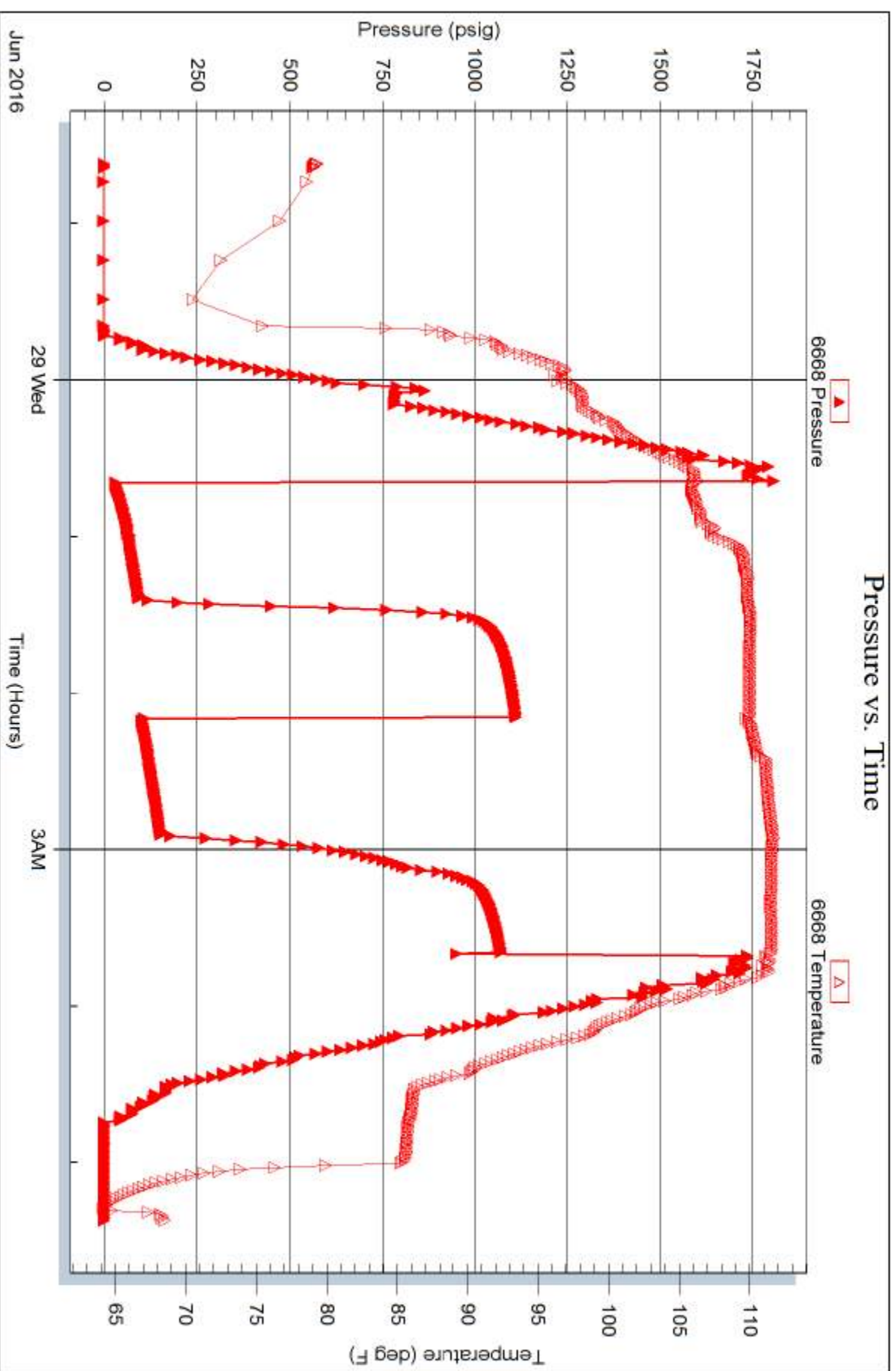


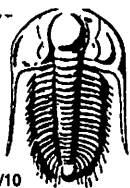
Serial #: 6668

Outside TDI Inc

Rattlesnake #1

DST Test Number: 2





TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 64935

Well Name & No. Rattlesnake #1 Test No. 1 Date 6-28-16
 Company TDI Inc. Elevation 2187 KB 2179 GL
 Address 1310 Bison Rd Hays KS 67601-9696
 Co. Rep / Geo. Herb Deines Rig Southwind #3
 Location: Sec. 12 Twp. 12^s Rge. 19^w Co. Ellis State KS

Interval Tested 3501-3550 Zone Tested LKC * C & D
 Anchor Length 49 Drill Pipe Run 3512 Mud Wt. 9.1
 Top Packer Depth 3496 Drill Collars Run 0 Vis 51
 Bottom Packer Depth 3501 Wt. Pipe Run 0 WL 7.2
 Total Depth 3550 Chlorides 3400 ppm System LCM 2

Blow Description IFP - 1/4 in. Blow
ISIP - No Blow
IFP - Weak Surface Blow in 18 min.
FSIP - No Blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>25</u>	<u>WCM</u>		<u>45</u>	<u>55</u>	
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of <u>Oil Speck in Tool</u>	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 25 BHT 109 Gravity _____ API RW 295 @ 79 °F Chlorides 20000 ppm
 (A) Initial Hydrostatic 1734 ☒ Test 1050 T-On Location 06:22
 (B) First Initial Flow 24 ☐ Jars _____ T-Started 07:02
 (C) First Final Flow 29 ☐ Safety Joint _____ T-Open 08:30
 (D) Initial Shut-In 729 ☐ Circ Sub _____ T-Pulled 10:30
 (E) Second Initial Flow 33 ☐ Hourly Standby _____ T-Out 11:46
 (F) Second Final Flow 35 ☒ Mileage 30 RT 22.50 Comments _____
 (G) Final Shut-In 587 ☐ Sampler _____
 (H) Final Hydrostatic 1709 ☐ Straddle _____
☐ Ruined Shale Packer _____
☐ Ruined Packer _____
☐ Extra Copies _____

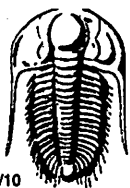
Initial Open 30
 Initial Shut-In 30
 Final Flow 30
 Final Shut-In 30

☐ Shale Packer _____
☐ Extra Packer _____
☐ Extra Recorder _____
☐ Day Standby _____
☐ Accessibility _____
 Sub Total 1072.50
 Total 1072.50
 MP/DST Disc't _____

Approved By _____

Our Representative _____

Triobite 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. 64936

Well Name & No. Rattlesnake #1 Test No. 2 Date 6-28-16
 Company TDI INC. Elevation 2187 KB 2179 GL
 Address 1310 Bison Rd Hays KS, 67601-9696
 Co. Rep / Geo. Herb Deines Rig Southwind #3
 Location: Sec. 12 Twp. 12th Rge. 19th Co. Ellis State KS

Interval Tested 3593-3693 Zone Tested LKC "H-K"
 Anchor Length 100 Drill Pipe Run 3576 Mud Wt. 9.1
 Top Packer Depth 3588 Drill Collars Run 0 Vis 51
 Bottom Packer Depth 3593 Wt. Pipe Run 0 WL 7.2
 Total Depth 3693 Chlorides 3400 ppm System LCM 2

Blow Description IFP-BOB in 39 min.
ISIP- No Blow
FFP-BOB in 45 min.
FSIP- No Blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>287</u>	<u>0.75 Speck WCM</u>	<u>1</u>	<u>49</u>	<u>50</u>	
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 287 BHT 111 Gravity 1.170 @ 66 °F Chlorides 48000 ppm
 (A) Initial Hydrostatic 1814 ☒ Test 1050 T-On Location 22:05
 (B) First Initial Flow 33 ☐ Jars T-Started 22:37
 (C) First Final Flow 97 ☐ Safety Joint T-Open 00:40
 (D) Initial Shut-In 1113 ☐ Circ Sub T-Pulled 03:40
 (E) Second Initial Flow 109 ☐ Hourly Standby T-Out 05:22
 (F) Second Final Flow 156 ☒ Mileage 22.50+23.50 X2 Comments Loaded tools 6/29
 (G) Final Shut-In 1075 ☐ Sampler
 (H) Final Hydrostatic 1753 ☐ Straddle
☐ Shale Packer
☐ Extra Packer
☐ Extra Recorder
☐ Day Standby
☐ Accessibility

Initial Open 45
 Initial Shut-In 45
 Final Flow 45
 Final Shut-In 45
 Sub Total 1095
 MP/DST Disc't

Approved By Our Representative
 Triobite 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.