



DRILL STEM TEST REPORT

Prepared For: **Black Oak Exploration**

1474 S St Paul
Denver CO 80210

ATTN: Clayton Camozzi

Henningsen #1-9

9-3s-31w Rawlins,KS

Start Date: 2019.08.10 @ 16:31:00

End Date: 2019.08.11 @ 00:23:30

Job Ticket #: 66026 DST #: 1

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

Printed: 2019.08.13 @ 15:02:50

Black Oak Exploration

9-3s-31w Rawlins,KS

Henningsen #1-9

DST # 1

Toronto - LKC A

2019.08.10



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Black Oak Exploration

9-3s-31w Rawlins,KS

1474 S St Paul
Denver CO 80210

Henningsen #1-9

Job Ticket: 66026

DST#: 1

ATTN: Clayton Camozzi

Test Start: 2019.08.10 @ 16:31:00

GENERAL INFORMATION:

Formation: **Toronto - LKC A**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 19:06:00

Time Test Ended: 00:23:30

Test Type: Conventional Bottom Hole (Initial)

Tester: Shawn Wheelbarger

Unit No: 76

Interval: 3947.00 ft (KB) To 3964.00 ft (KB) (TVD)

Reference Elevations: 2934.00 ft (KB)

Total Depth: 3964.00 ft (KB) (TVD)

2929.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 5.00 ft

Serial #: 8355 Outside

Press@RunDepth: 55.70 psig @ 3948.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2019.08.10

End Date:

2019.08.11

Last Calib.:

2019.08.11

Start Time: 16:31:01

End Time:

00:23:30

Time On Btm:

2019.08.10 @ 19:05:20

Time Off Btm:

2019.08.10 @ 22:33:30

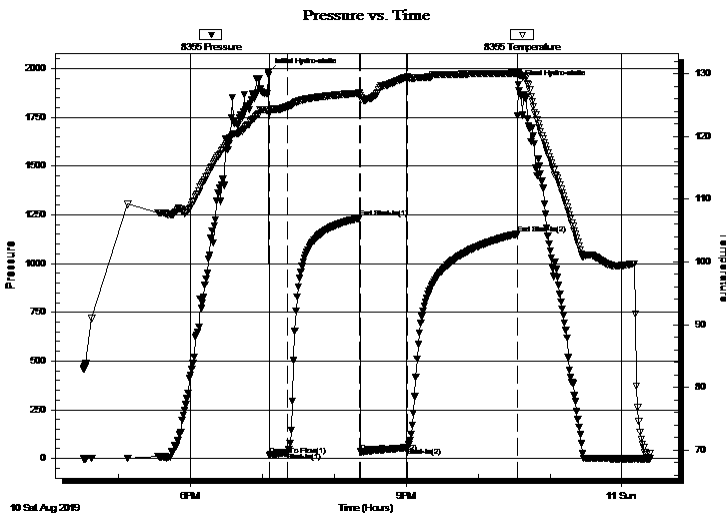
TEST COMMENT: 15-IF-1/8" Blow @ open built to 1 1/2"

60-ISI-No blow back

40-FF-Blow built to 1 3/4"

90-FSI-No blow

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1981.08	124.22	Initial Hydro-static
1	17.57	123.61	Open To Flow (1)
16	29.55	124.76	Shut-In(1)
76	1233.42	126.92	End Shut-In(1)
77	33.96	126.47	Open To Flow (2)
116	55.70	129.48	Shut-In(2)
208	1152.87	130.11	End Shut-In(2)
209	1917.60	130.07	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
59.00	OCMW 15%O, 50%W, 35%M	0.29
10.00	100% Oil	0.05

Gas Rates

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



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9-3s-31w Rawlins,KS

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Denver CO 80210

Henningsen #1-9

Job Ticket: 66026

DST#: 1

ATTN: Clayton Camozzi

Test Start: 2019.08.10 @ 16:31:00

GENERAL INFORMATION:

Formation: **Toronto - LKC A**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 19:06:00

Time Test Ended: 00:23:30

Test Type: Conventional Bottom Hole (Initial)

Tester: Shawn Wheelbarger

Unit No: 76

Interval: 3947.00 ft (KB) To 3964.00 ft (KB) (TVD)

Reference Elevations: 2934.00 ft (KB)

Total Depth: 3964.00 ft (KB) (TVD)

2929.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 5.00 ft

Serial #: 8645

Inside

Press@RunDepth: psig @ 3948.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2019.08.10

End Date: 2019.08.11

Last Calib.: 2019.08.11

Start Time: 16:31:01

End Time: 00:13:32

Time On Btm:

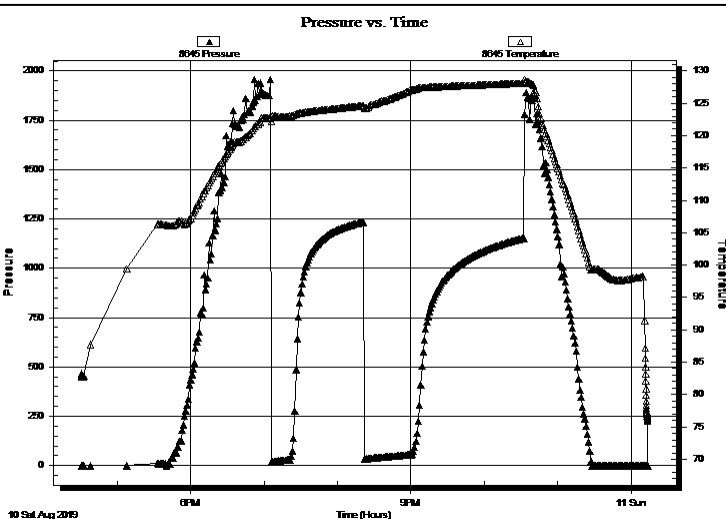
Time Off Btm:

TEST COMMENT: 15-IF-1/8" Blow @ open built to 1 1/2"

60-ISI-No blow back

40-FF-Blow built to 1 3/4"

90-FSI-No blow



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
59.00	OCMW 15%O, 50%W, 35%M	0.29
10.00	100% Oil	0.05

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Black Oak Exploration

9-3s-31w Rawlins,KS

1474 S St Paul
Denver CO 80210

Henningsen #1-9

Job Ticket: 66026

DST#: 1

ATTN: Clayton Camozzi

Test Start: 2019.08.10 @ 16:31:00

Tool Information

Drill Pipe:	Length: 3765.00 ft	Diameter: 3.80 inches	Volume: 52.81 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: 177.00 ft	Diameter: 2.25 inches	Volume: 0.87 bbl	Weight to Pull Loose: 70000.00 lb
			<u>Total Volume: 53.68 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	23.00 ft			String Weight: Initial 60000.00 lb
Depth to Top Packer:	3947.00 ft			Final 60000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	17.00 ft			
Tool Length:	45.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description

Length (ft) Serial No. Position Depth (ft) Accum. Lengths

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			3920.00	
Shut In Tool	5.00			3925.00	
Hydraulic tool	5.00		Inside	3930.00	
Jars	5.00			3935.00	
Safety Joint	2.00			3937.00	
Packer	5.00			3942.00	28.00 Bottom Of Top Packer
Packer	5.00			3947.00	
Packer - Shale	0.00			3947.00	
Stubb	1.00			3948.00	
Recorder	0.00	8355	Outside	3948.00	
Recorder	0.00	8645	Inside	3948.00	
Perforations	13.00			3961.00	
Bullnose	3.00			3964.00	17.00 Bottom Packers & Anchor

Total Tool Length: 45.00



**TRILOBITE
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DRILL STEM TEST REPORT

FLUID SUMMARY

Black Oak Exploration

9-3s-31w Rawlins,KS

1474 S St Paul
Denver CO 80210

Henningsen #1-9

Job Ticket: 66026

DST#: 1

ATTN: Clayton Camozzi

Test Start: 2019.08.10 @ 16:31:00

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

21.9 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

17000 ppm

Viscosity: 59.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 6.38 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 700.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
59.00	OCMW 15%O, 50%W, 35%M	0.290
10.00	100% Oil	0.049

Total Length: 69.00 ft Total Volume: 0.339 bbl

Num Fluid Samples: 0

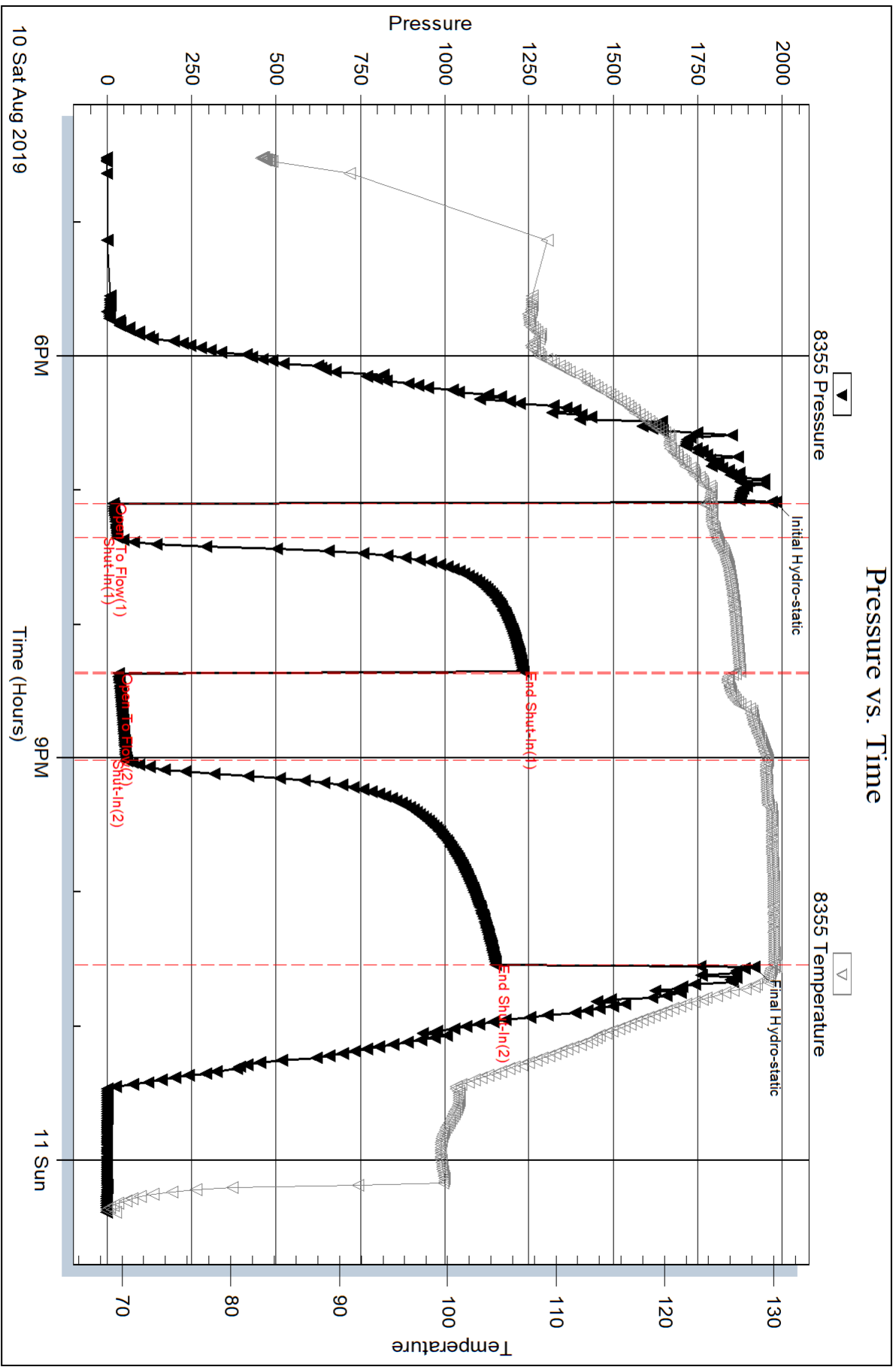
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: 22.2@ 90 DEG F Adjusted to 21.9@ 60 DEG F
RW .416 @ 69.5 DEG F



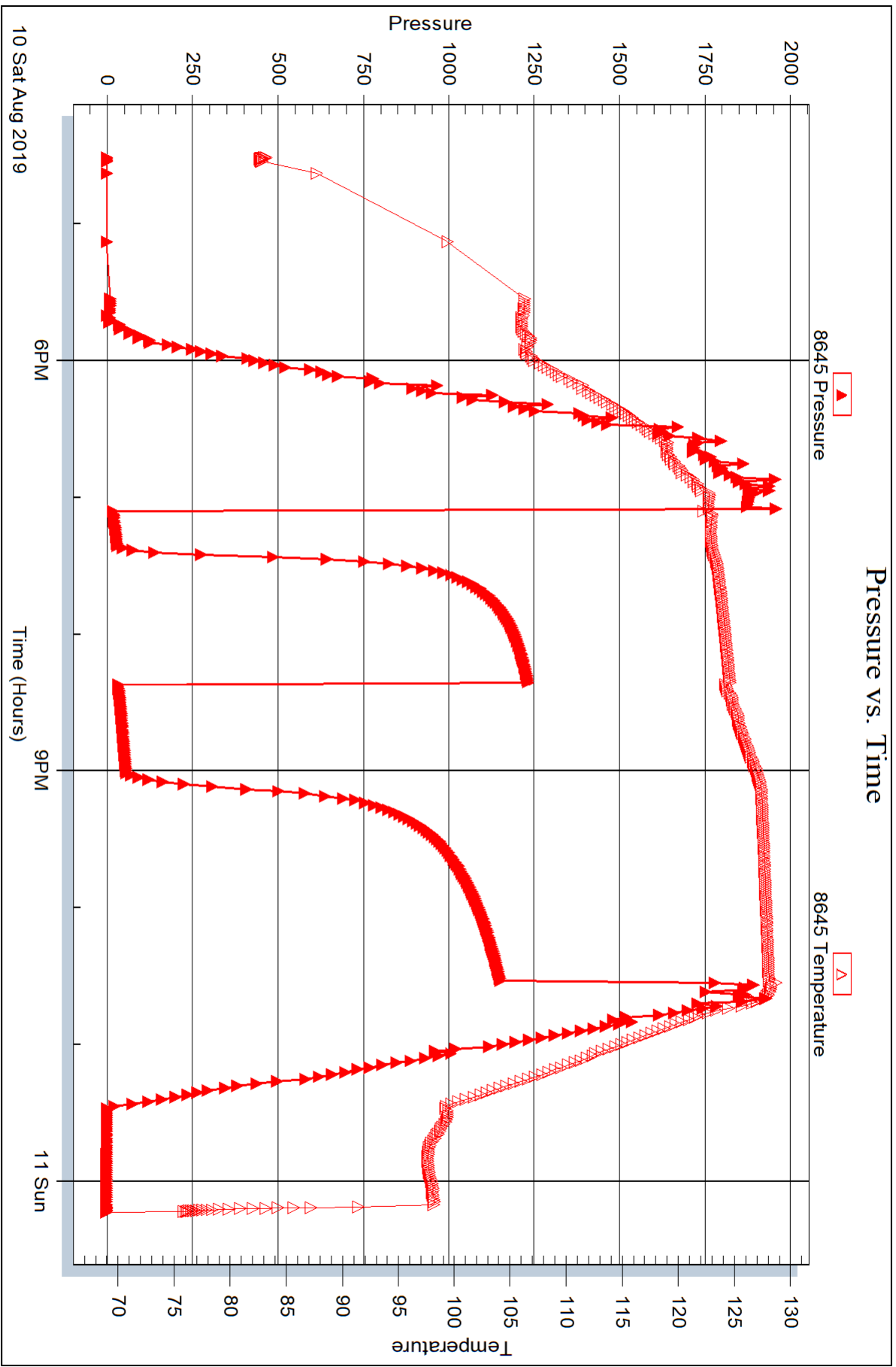
Serial #: 8645

Inside

Black Oak Exploration

Henningsen #1-9

DST Test Number: 1





DRILL STEM TEST REPORT

Prepared For: **Black Oak Exploration**

1474 S St Paul
Denver CO 80210

ATTN: Clayton Camozzi

Henningsen #1-9

9-3s-31w Rawlins,KS

Start Date: 2019.08.11 @ 13:06:00

End Date: 2019.08.11 @ 20:22:42

Job Ticket #: 66027 DST #: 2

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

Printed: 2019.08.13 @ 15:02:13



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Black Oak Exploration

9-3s-31w Rawlins,KS

1474 S St Paul
Denver CO 80210

Henningsen #1-9

Job Ticket: 66027

DST#: 2

ATTN: Clayton Camozzi

Test Start: 2019.08.11 @ 13:06:00

GENERAL INFORMATION:

Formation: **LKC G - H**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 14:47:52

Time Test Ended: 20:22:42

Test Type: Conventional Bottom Hole (Reset)

Tester: Shawn Wheelbarger

Unit No: 76

Interval: 4012.00 ft (KB) To 4090.00 ft (KB) (TVD)

Reference Elevations: 2934.00 ft (KB)

Total Depth: 4090.00 ft (KB) (TVD)

2929.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 5.00 ft

Serial #: 8355 Outside

Press@RunDepth: 277.98 psig @ 4013.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2019.08.11 End Date: 2019.08.11

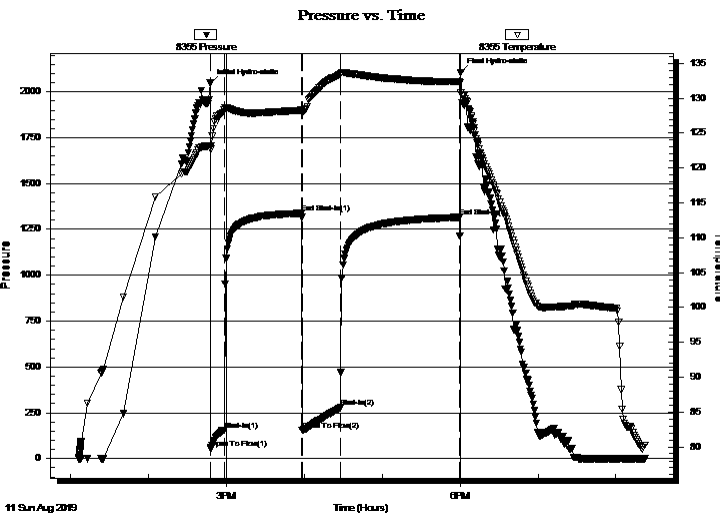
Last Calib.: 2019.08.11

Start Time: 13:06:01 End Time: 20:22:41

Time On Btm: 2019.08.11 @ 14:47:12

Time Off Btm: 2019.08.11 @ 18:00:32

TEST COMMENT: 10-IF-3" Blow @ open BOB @ 7 mins 15 secs Built to 15"
60-ISI-1/4" of blow declined after 13 mins
30-FF1 BOB @ 12 mins 30 secs Built to 29"
90-FSI-Blow built to 1/2" @ 16 mins Died @ 55 mins



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2047.27	123.21	Initial Hydro-static
1	55.52	122.68	Open To Flow (1)
11	156.92	128.39	Shut-In(1)
71	1337.67	128.27	End Shut-In(1)
71	155.80	127.89	Open To Flow (2)
101	277.98	133.43	Shut-In(2)
193	1316.06	132.35	End Shut-In(2)
194	2105.93	130.75	Final Hydro-static

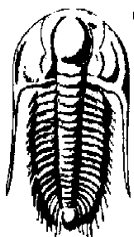
Recovery

Length (ft)	Description	Volume (bbl)
433.00	SOCMW 8%O, 59%W, 33%M	4.46
128.00	OCM 15%O, 85%M	1.80
5.00	Oil 100%	0.07

* Recovery from multiple tests

Gas Rates

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



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Black Oak Exploration

9-3s-31w Rawlins,KS

1474 S St Paul
Denver CO 80210

Henningsen #1-9

Job Ticket: 66027 **DST#: 2**

ATTN: Clayton Camozzi

Test Start: 2019.08.11 @ 13:06:00

GENERAL INFORMATION:

Formation: **LKC G - H**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 14:47:52

Time Test Ended: 20:22:42

Test Type: Conventional Bottom Hole (Reset)

Tester: Shawn Wheelbarger

Unit No: 76

Interval: 4012.00 ft (KB) To 4090.00 ft (KB) (TVD)

Reference Elevations: 2934.00 ft (KB)

Total Depth: 4090.00 ft (KB) (TVD)

2929.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 5.00 ft

Serial #: 8645

Inside

Press@RunDepth: psig @ 4013.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2019.08.11 End Date: 2019.08.11

Last Calib.: 2019.08.11

Start Time: 12:57:30 End Time: 20:22:19

Time On Btm:

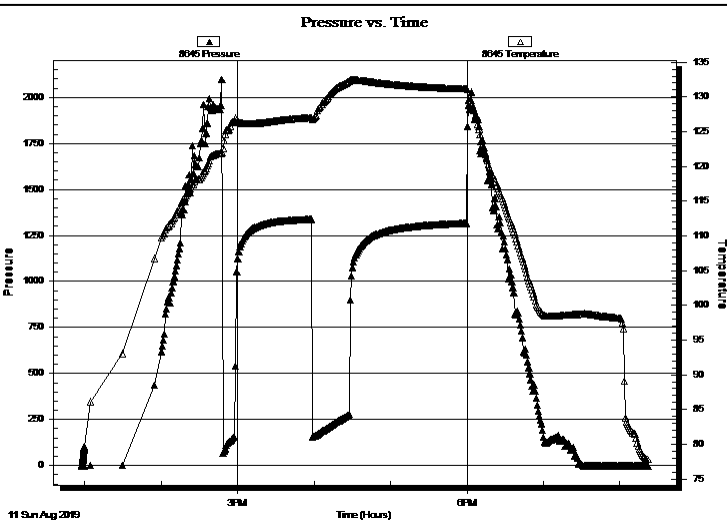
Time Off Btm:

TEST COMMENT: 10-IF-3" Blow @ open BOB @ 7 mins 15 secs Built to 15"

60-ISI-1/4" of blow declined after 13 mins

30-FF1 BOB @ 12 mins 30 secs Built to 29"

90-FSI-Blow built to 1/2" @ 16 mins Died @ 55 mins



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
433.00	SOCMW 8%O, 59%W, 33%M	4.46
128.00	OCM 15%O, 85%M	1.80
5.00	Oil 100%	0.07

Gas Rates

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

* Recovery from multiple tests



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Black Oak Exploration

9-3s-31w Rawlins,KS

1474 S St Paul
Denver CO 80210

Henningsen #1-9

Job Ticket: 66027

DST#: 2

ATTN: Clayton Camozzi

Test Start: 2019.08.11 @ 13:06:00

Tool Information

Drill Pipe:	Length: 3827.00 ft	Diameter: 3.80 inches	Volume: 53.68 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: 177.00 ft	Diameter: 2.25 inches	Volume: 0.87 bbl	Weight to Pull Loose: 74000.00 lb
			<u>Total Volume: 54.55 bbl</u>	Tool Chased 15.00 ft
Drill Pipe Above KB:	20.00 ft			String Weight: Initial 62000.00 lb
Depth to Top Packer:	4012.00 ft			Final 64000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	78.00 ft			
Tool Length:	106.00 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			3985.00	
Shut In Tool	5.00			3990.00	
Hydraulic tool	5.00		Inside	3995.00	
Jars	5.00			4000.00	
Safety Joint	2.00			4002.00	
Packer	5.00			4007.00	28.00 Bottom Of Top Packer
Packer	5.00			4012.00	
Packer - Shale	0.00			4012.00	
Stubb	1.00			4013.00	
Recorder	0.00	8355	Outside	4013.00	
Recorder	0.00	8645	Inside	4013.00	
Perforations	8.00			4021.00	
Change Over Sub	1.00			4022.00	
Drill Pipe	64.00			4086.00	
Change Over Sub	1.00			4087.00	
Bullnose	3.00			4090.00	78.00 Bottom Packers & Anchor
Total Tool Length:	106.00				



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Black Oak Exploration

9-3s-31w Rawlins,KS

1474 S St Paul
Denver CO 80210

Henningsen #1-9

Job Ticket: 66027

DST#: 2

ATTN: Clayton Camozzi

Test Start: 2019.08.11 @ 13:06:00

Mud and Cushion Information

Mud Type: Gel Chem	Cushion Type:	Oil API: 30 deg API
Mud Weight: 9.00 lb/gal	Cushion Length: ft	Water Salinity: 47000 ppm
Viscosity: 60.00 sec/qt	Cushion Volume: bbl	
Water Loss: 6.39 in ³	Gas Cushion Type:	
Resistivity: ohm.m	Gas Cushion Pressure: psig	
Salinity: 700.00 ppm		
Filter Cake: 2.00 inches		

Recovery Information

Recovery Table

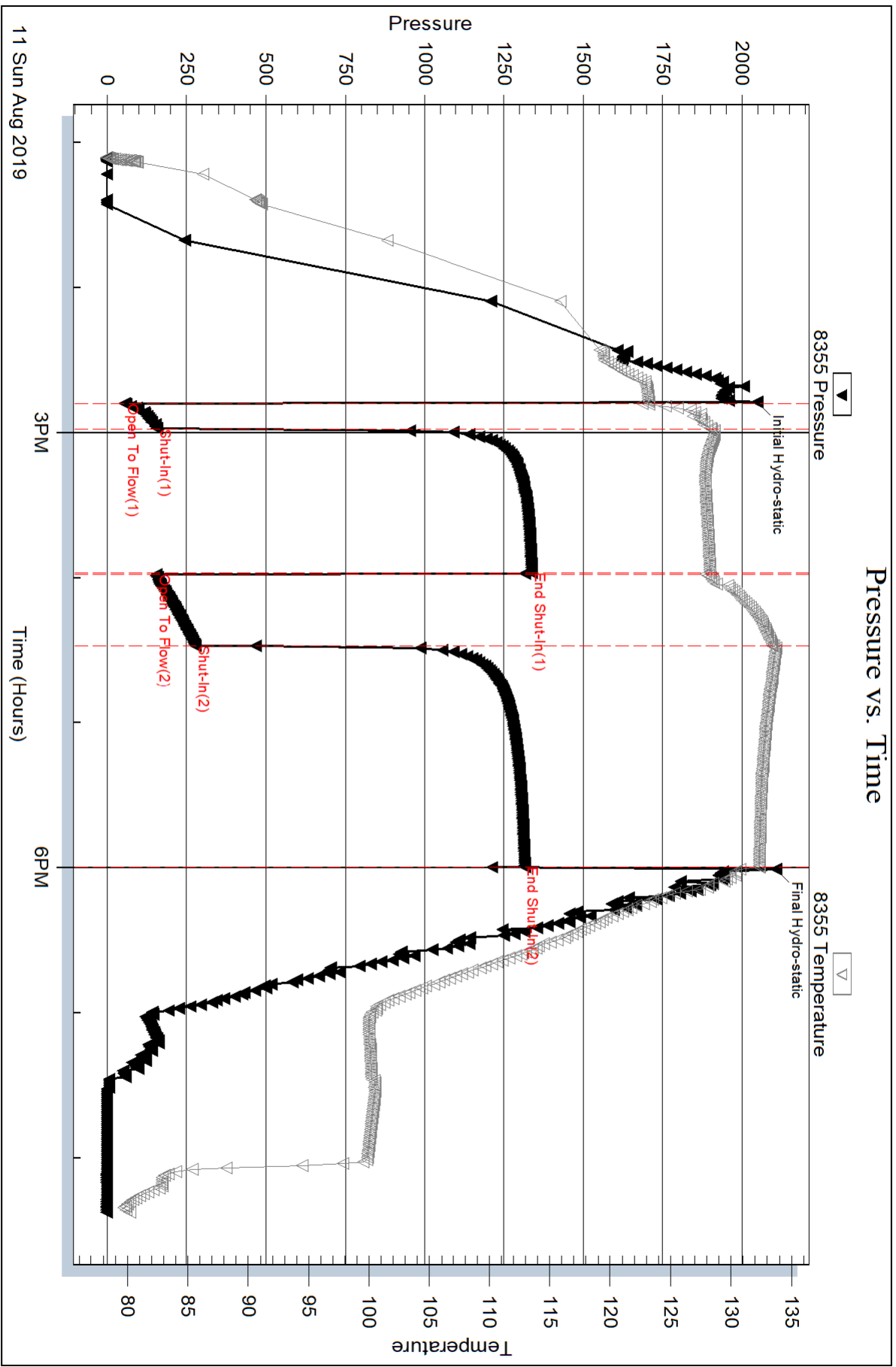
Length ft	Description	Volume bbl
433.00	SOCMW 8%O, 59%W, 33%M	4.461
128.00	OCM 15%O, 85%M	1.796
5.00	Oil 100%	0.070

Total Length: 566.00 ft Total Volume: 6.327 bbl

Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:

Laboratory Name: Laboratory Location:

Recovery Comments: Oil API 32.2 @ 82 Deg F Adjusted to 30 @ 60 Deg F
RW .146 @ 74.7 Deg F 47000 PPM



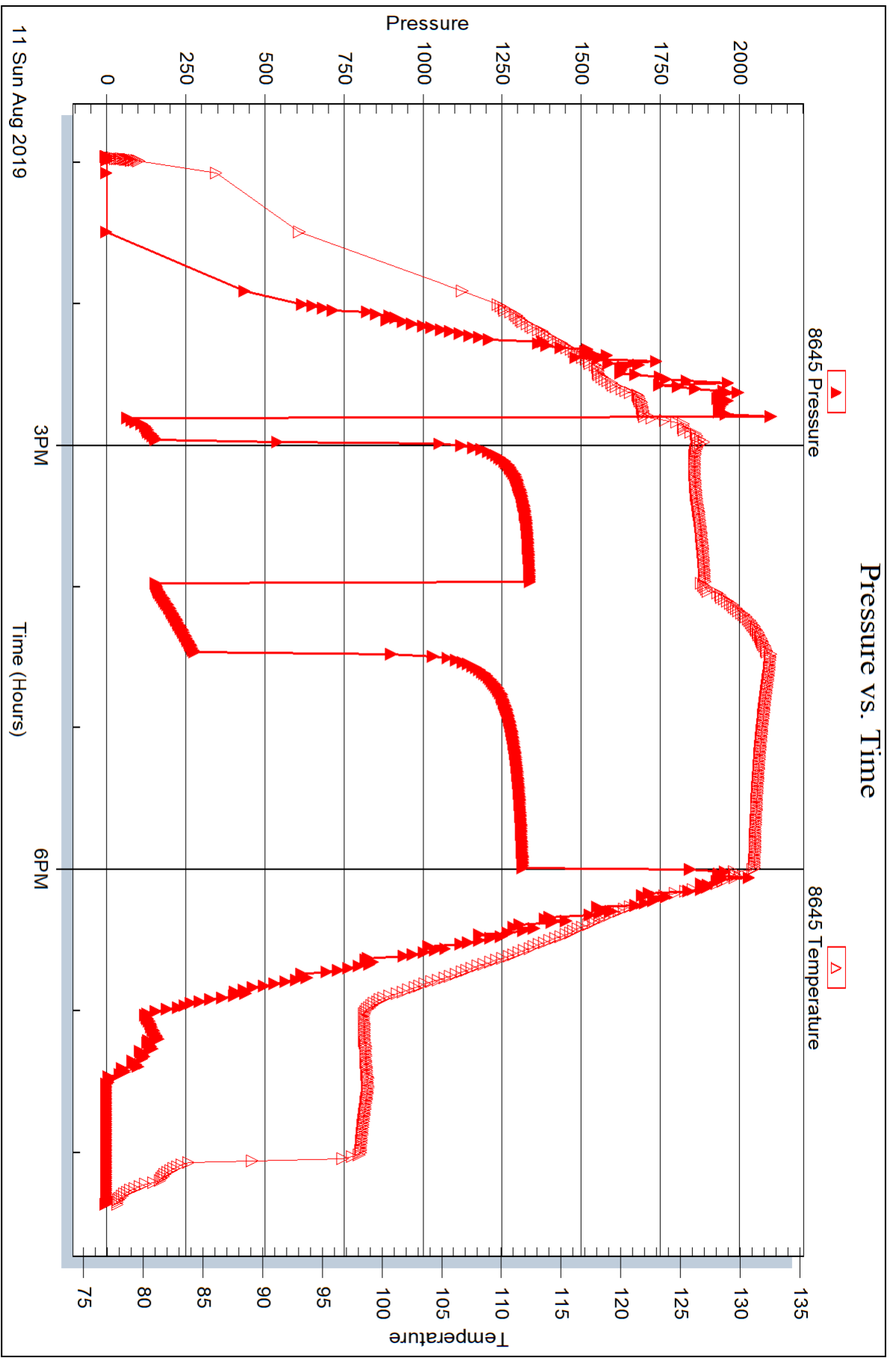
Serial #: 8645

Inside

Black Oak Exploration

Henningsen #1-9

DST Test Number: 2





DRILL STEM TEST REPORT

Prepared For: **Black Oak Exploration**

1474 S St Paul
Denver CO 80210

ATTN: Clayton Camozzi

Henningsen #1-9

9-3s-31w Rawlins,KS

Start Date: 2019.08.12 @ 06:09:00

End Date: 2019.08.12 @ 11:56:12

Job Ticket #: 66028 DST #: 3

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

Printed: 2019.08.13 @ 15:01:17



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Black Oak Exploration

9-3s-31w Rawlins,KS

1474 S St Paul
Denver CO 80210

Henningsen #1-9

Job Ticket: 66028

DST#: 3

ATTN: Clayton Camozzi

Test Start: 2019.08.12 @ 06:09:00

GENERAL INFORMATION:

Formation: **LKC J**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 08:05:02

Time Test Ended: 11:56:12

Test Type: Conventional Bottom Hole (Reset)

Tester: Shawn Wheelbarger

Unit No: 76

Interval: 4089.00 ft (KB) To 4134.00 ft (KB) (TVD)

Reference Elevations: 2934.00 ft (KB)

Total Depth: 4134.00 ft (KB) (TVD)

2929.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 5.00 ft

Serial #: 8355 Outside

Press@RunDepth: 19.35 psig @ 4090.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2019.08.12

End Date:

2019.08.12

Last Calib.: 2019.08.12

Start Time: 06:09:01

End Time:

11:56:11

Time On Btm: 2019.08.12 @ 08:04:12

Time Off Btm: 2019.08.12 @ 10:16:12

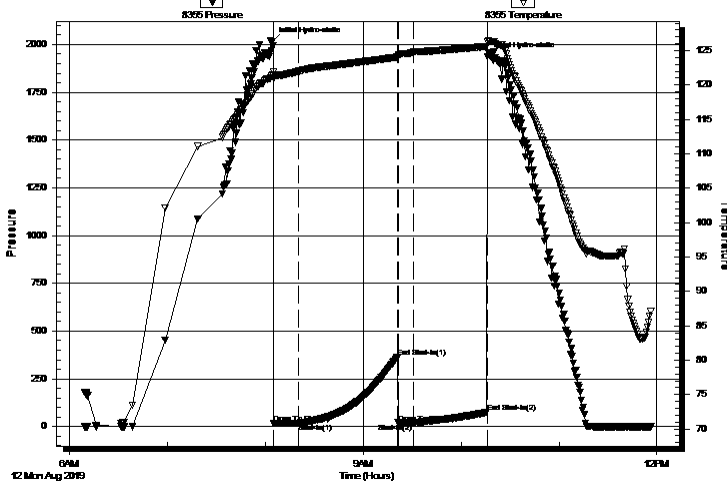
TEST COMMENT: 15-IF-1/4" Blow @ open built to 1/2"

60-ISI-No blow back

10-FF-No blow

45-FSI-No blow

Pressure vs. Time



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2017.21	121.54	Initial Hydro-static
1	15.75	120.99	Open To Flow (1)
17	17.23	122.00	Shut-In(1)
77	362.58	124.04	End Shut-In(1)
77	19.15	124.09	Open To Flow (2)
87	19.35	124.75	Shut-In(2)
132	74.31	125.61	End Shut-In(2)
132	1937.15	126.29	Final Hydro-static

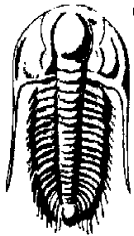
Recovery

Length (ft)	Description	Volume (bbl)
5.00	Mud W/ Oil spots 100%M	0.02

* Recovery from multiple tests

Gas Rates

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



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TESTING, INC.**

DRILL STEM TEST REPORT

Black Oak Exploration

1474 S St Paul
Denver CO 80210

ATTN: Clayton Camozzi

9-3s-31w Rawlins,KS

Henningsen #1-9

Job Ticket: 66028

DST#: 3

Test Start: 2019.08.12 @ 06:09:00

GENERAL INFORMATION:

Formation: **LKC J**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 08:05:02

Time Test Ended: 11:56:12

Interval: 4089.00 ft (KB) To 4134.00 ft (KB) (TVD)

Total Depth: 4134.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Fair

Test Type: Conventional Bottom Hole (Reset)

Tester: Shawn Wheelbarger

Unit No: 76

Reference Elevations: 2934.00 ft (KB)

2929.00 ft (CF)

KB to GR/CF: 5.00 ft

Serial #: 8645 Inside

Press@RunDepth: psig @ 4090.00 ft (KB)

Start Date: 2019.08.12 End Date: 2019.08.12

Start Time: 06:02:41 End Time: 11:55:40

Capacity: 8000.00 psig

Last Calib.: 2019.08.12

Time On Btm:

Time Off Btm:

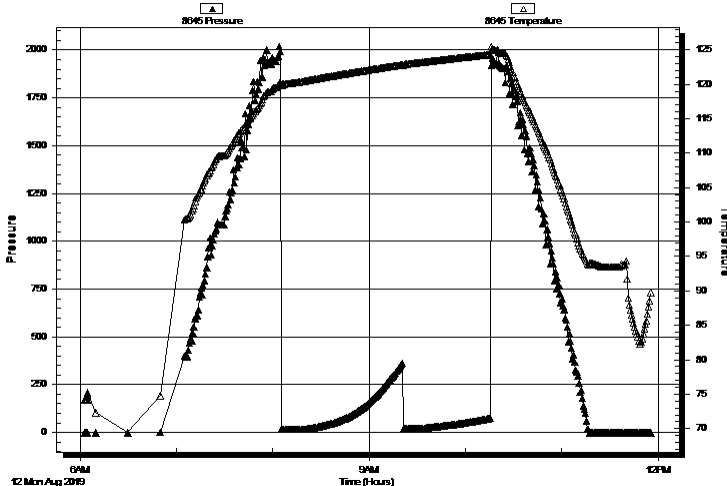
TEST COMMENT: 15-IF-1/4" Blow @ open built to 1/2"

60-ISI-No blow back

10-FF-No blow

45-FSI-No blow

Pressure vs. Time



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
5.00	Mud W/ Oil spots 100%M	0.02

Gas Rates

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

* Recovery from multiple tests



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Black Oak Exploration

9-3s-31w Rawlins,KS

1474 S St Paul
Denver CO 80210

Henningsen #1-9

Job Ticket: 66028

DST#: 3

ATTN: Clayton Camozzi

Test Start: 2019.08.12 @ 06:09:00

Tool Information

Drill Pipe:	Length: 3891.00 ft	Diameter: 3.80 inches	Volume: 54.58 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: 177.00 ft	Diameter: 2.25 inches	Volume: 0.87 bbl	Weight to Pull Loose: 90000.00 lb
			<u>Total Volume: 55.45 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	7.00 ft			String Weight: Initial 64000.00 lb
Depth to Top Packer:	4089.00 ft			Final 64000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	45.00 ft			
Tool Length:	73.00 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			4062.00	
Shut In Tool	5.00			4067.00	
Hydraulic tool	5.00		Inside	4072.00	
Jars	5.00			4077.00	
Safety Joint	2.00			4079.00	
Packer	5.00			4084.00	28.00 Bottom Of Top Packer
Packer	5.00			4089.00	
Packer - Shale	0.00			4089.00	
Stubb	1.00			4090.00	
Recorder	0.00	8355	Outside	4090.00	
Recorder	0.00	8645	Inside	4090.00	
Perforations	8.00			4098.00	
Change Over Sub	1.00			4099.00	
Drill Pipe	31.00			4130.00	
Change Over Sub	1.00			4131.00	
Bullnose	3.00			4134.00	45.00 Bottom Packers & Anchor
Total Tool Length:	73.00				



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Black Oak Exploration

9-3s-31w Rawlins,KS

1474 S St Paul
Denver CO 80210

Henningsen #1-9

Job Ticket: 66028

DST#: 3

ATTN: Clayton Camozzi

Test Start: 2019.08.12 @ 06:09:00

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: 57.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 6.39 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 1200.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
5.00	Mud W/ Oil spots 100%M	0.025

Total Length: 5.00 ft Total Volume: 0.025 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

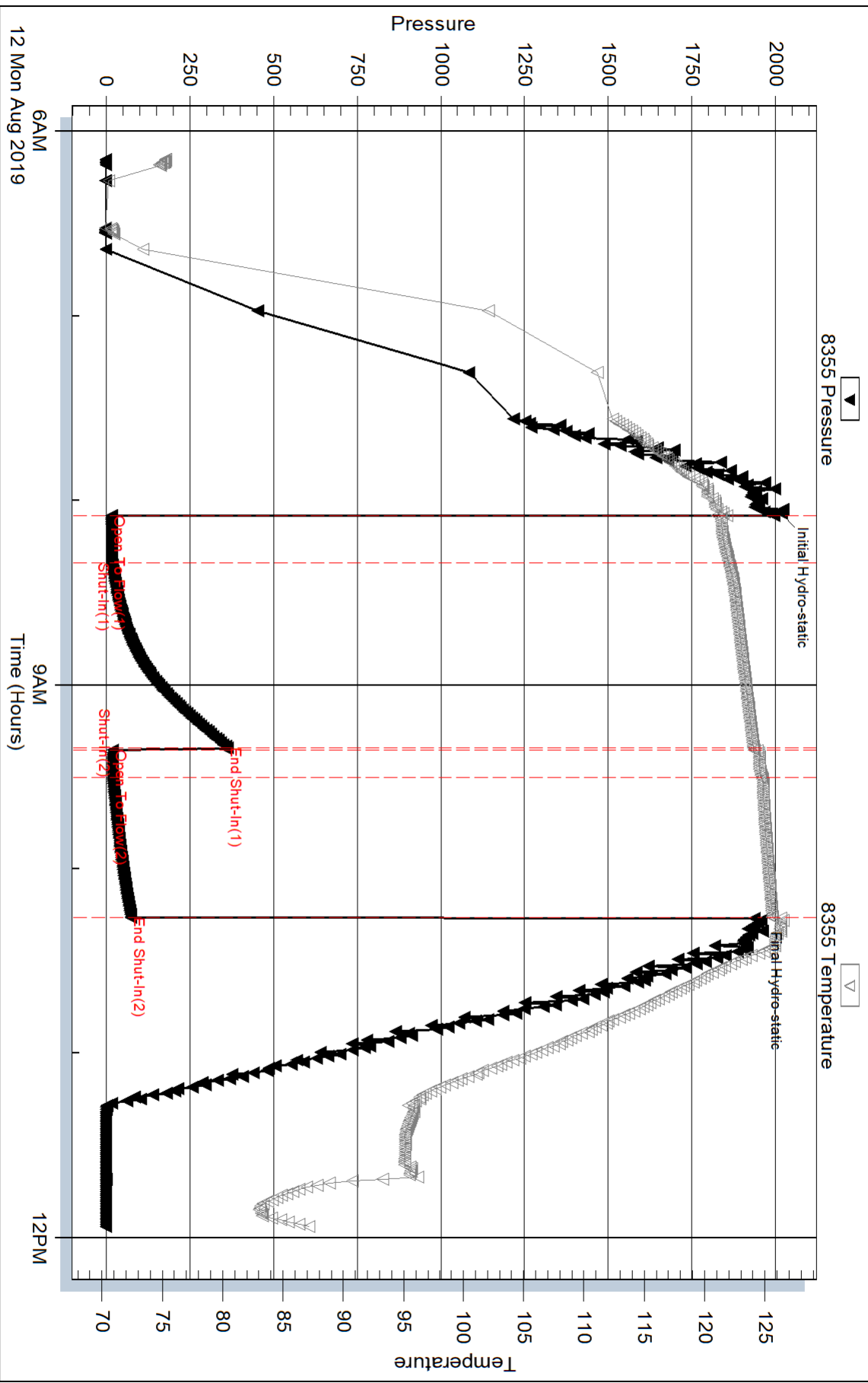
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

Pressure vs. Time



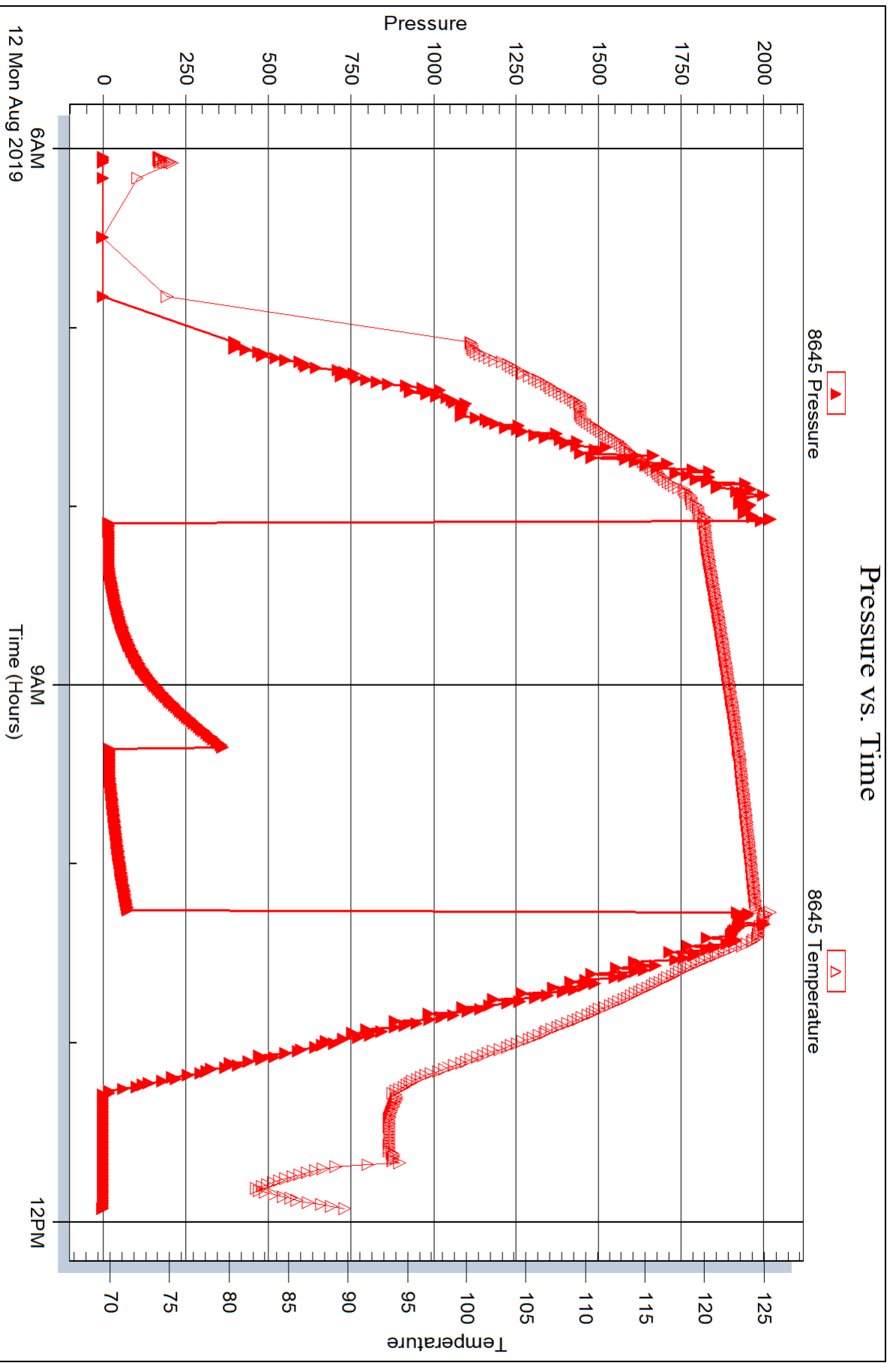
Serial #: 8645

Inside

Black Oak Exploration

Henningsen #1-9

DST Test Number: 3





DRILL STEM TEST REPORT

Prepared For: **Black Oak Exploration**

1474 S St Paul
Denver CO 80210

ATTN: Clayton Camozzi

Henningsen #1-9

9-3s-31w Rawlins,KS

Start Date: 2019.08.12 @ 20:12:00

End Date: 2019.08.13 @ 03:53:50

Job Ticket #: 66029 DST #: 4

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

Printed: 2019.08.13 @ 15:00:45



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Black Oak Exploration

9-3s-31w Rawlins,KS

1474 S St Paul
Denver CO 80210

Henningsen #1-9

Job Ticket: 66029

DST#: 4

ATTN: Clayton Camozzi

Test Start: 2019.08.12 @ 20:12:00

GENERAL INFORMATION:

Formation: **LKC G**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 22:09:20

Time Test Ended: 03:53:50

Test Type: Conventional Bottom Hole (Reset)

Tester: Shawn Wheelbarger

Unit No: 76

Interval: 4013.00 ft (KB) To 4061.00 ft (KB) (TVD)

Reference Elevations: 2934.00 ft (KB)

Total Depth: 4178.00 ft (KB) (TVD)

2929.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 5.00 ft

Serial #: 8355 Outside

Press@RunDepth: 185.77 psig @ 4014.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2019.08.12

End Date:

2019.08.13

Last Calib.: 2019.08.13

Start Time: 20:12:01

End Time:

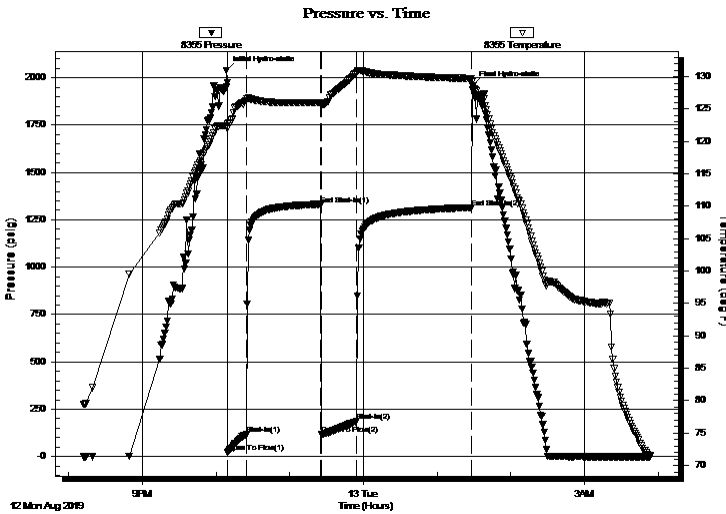
03:53:50

Time On Btm: 2019.08.12 @ 22:08:20

Time Off Btm: 2019.08.13 @ 01:28:50

TEST COMMENT: 15-IF-1/2" Blow @ open Built to 10"
60-ISI-No blow back
30-FF-BOB in 21 mins Blow built to 15 3/4"
90-FSI-No Blow

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2038.39	122.45	Initial Hydro-static
1	21.42	121.93	Open To Flow (1)
17	115.16	126.30	Shut-In(1)
77	1330.57	126.04	End Shut-In(1)
78	115.35	125.68	Open To Flow (2)
106	185.77	130.58	Shut-In(2)
200	1314.65	129.72	End Shut-In(2)
201	1958.74	129.25	Final Hydro-static

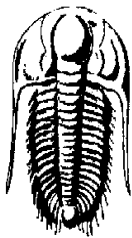
Recovery

Length (ft)	Description	Volume (bbl)
367.00	SGOCWM 5%G 8%O 38%W 49%M	3.54

Gas Rates

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

* Recovery from multiple tests



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Black Oak Exploration
1474 S St Paul
Denver CO 80210
ATTN: Clayton Camozzi

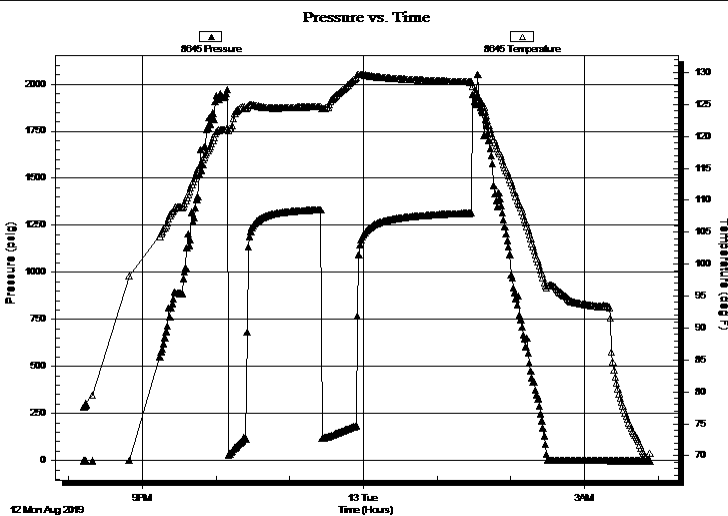
9-3s-31w Rawlins,KS
Henningsen #1-9
Job Ticket: 66029 DST#: 4
Test Start: 2019.08.12 @ 20:12:00

GENERAL INFORMATION:

Formation: LKC G
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 22:09:20
Time Test Ended: 03:53:50
Interval: 4013.00 ft (KB) To 4061.00 ft (KB) (TVD)
Total Depth: 4178.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Fair
Reference Elevations: 2934.00 ft (KB)
2929.00 ft (CF)
KB to GR/CF: 5.00 ft

Serial #: 8645 Inside
Press@RunDepth: psig @ 4014.00 ft (KB) Capacity: 8000.00 psig
Start Date: 2019.08.12 End Date: 2019.08.13 Last Calib.: 2019.08.13
Start Time: 20:12:01 End Time: 03:53:10 Time On Btm:
Time Off Btm:

TEST COMMENT: 15-IF-1/2" Blow @ open Built to 10"
60-ISI-No blow back
30-FF-BOB in 21 mins Blow built to 15 3/4"
90-FSI-No Blow



PRESSURE SUMMARY

Table with 4 columns: Time (Min.), Pressure (psig), Temp (deg F), Annotation.

Recovery

Table with 3 columns: Length (ft), Description, Volume (bbl). Row 1: 367.00, SGOCWM 5%G 8%O 38%W 49%M, 3.54

Gas Rates

Table with 4 columns: Choke (inches), Pressure (psig), Gas Rate (Mcf/d)

* Recovery from multiple tests



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Black Oak Exploration

9-3s-31w Rawlins,KS

1474 S St Paul
Denver CO 80210

Henningsen #1-9

Job Ticket: 66029

DST#: 4

ATTN: Clayton Camozzi

Test Start: 2019.08.12 @ 20:12:00

Tool Information

Drill Pipe:	Length: 3828.00 ft	Diameter: 3.80 inches	Volume: 53.70 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: 177.00 ft	Diameter: 2.25 inches	Volume: 0.87 bbl	Weight to Pull Loose: 72000.00 lb
			<u>Total Volume: 54.57 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	20.00 ft			String Weight: Initial 64000.00 lb
Depth to Top Packer:	4013.00 ft			Final 64000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	165.00 ft			
Tool Length:	193.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description

Length (ft) Serial No. Position Depth (ft) Accum. Lengths

Change Over Sub	1.00			3986.00	
Shut In Tool	5.00			3991.00	
Hydraulic tool	5.00		Inside	3996.00	
Jars	5.00			4001.00	
Safety Joint	2.00			4003.00	
Packer	5.00			4008.00	28.00 Bottom Of Top Packer
Packer	5.00			4013.00	
Stubb	1.00			4014.00	
Recorder	0.00	8355	Outside	4014.00	
Recorder	0.00	8645	Inside	4014.00	
Perforations	5.00			4019.00	
Change Over Sub	1.00			4020.00	
Drill Pipe	31.00			4051.00	
Change Over Sub	1.00			4052.00	
Perforations	4.00			4056.00	
Blank Off Sub	1.00			4057.00	
Blank Spacing	4.00			4061.00	
Packer - Shale	0.00			4061.00	
Stubb	1.00			4062.00	
Recorder	0.00	8791	Below	4062.00	
Perforations	16.00			4078.00	
Change Over Sub	1.00			4079.00	
Drill Pipe	95.00			4174.00	
Change Over Sub	1.00			4175.00	
Bullnose	3.00			4178.00	165.00 Bottom Packers & Anchor

Total Tool Length: 193.00



TRILOBITE
TESTING, INC.

DRILL STEM TEST REPORT

FLUID SUMMARY

Black Oak Exploration

9-3s-31w Rawlins,KS

1474 S St Paul
Denver CO 80210

Henningsen #1-9

Job Ticket: 66029

DST#: 4

ATTN: Clayton Camozzi

Test Start: 2019.08.12 @ 20:12:00

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:

53000 ppm

Viscosity: 58.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 6.39 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 1200.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
367.00	SGOCWM 5%G 8%O 38%W 49%M	3.536

Total Length: 367.00 ft Total Volume: 3.536 bbl

Num Fluid Samples: 0

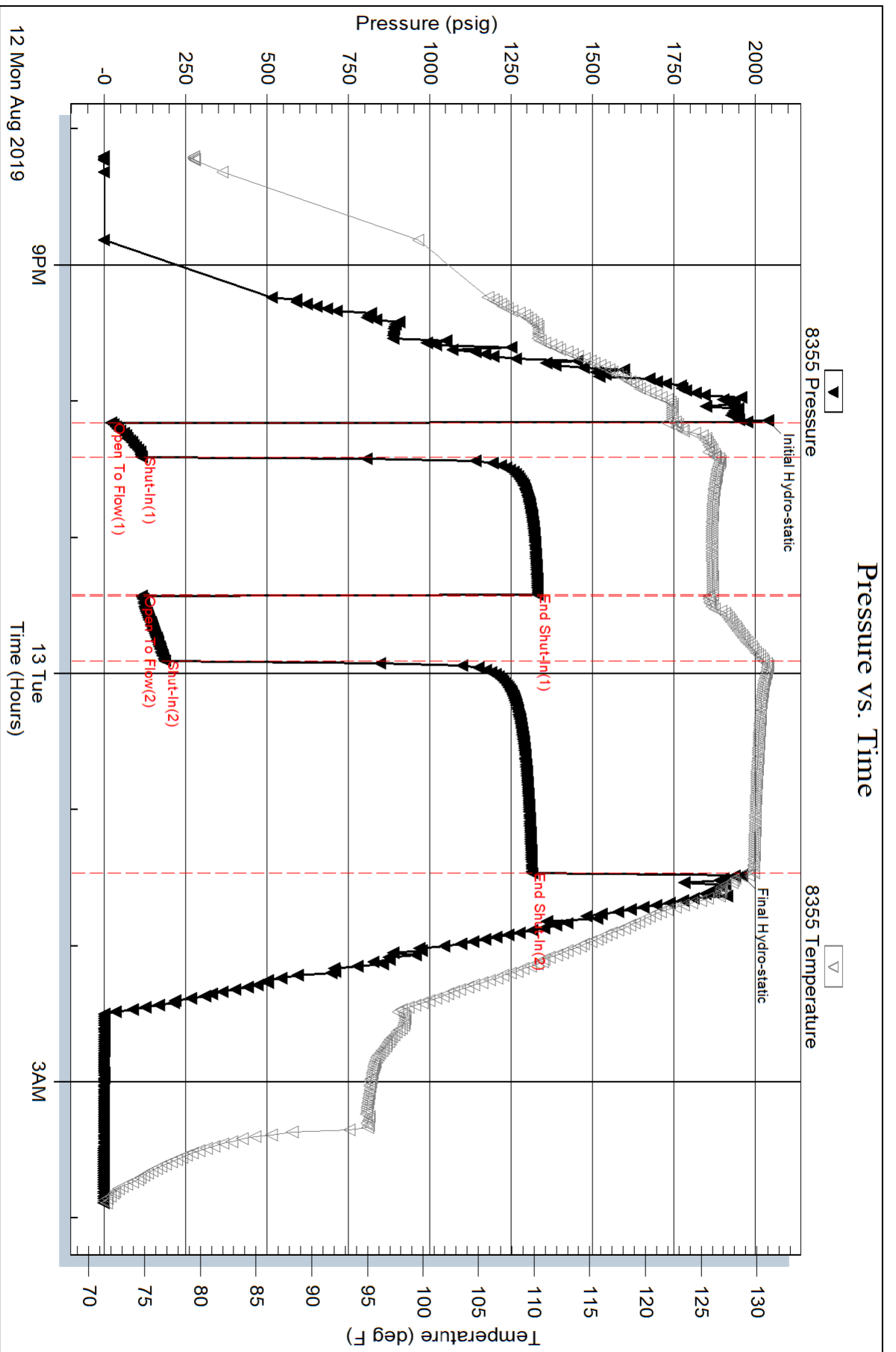
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: RW .144 @ 65.3 Deg F Chlorides 53000



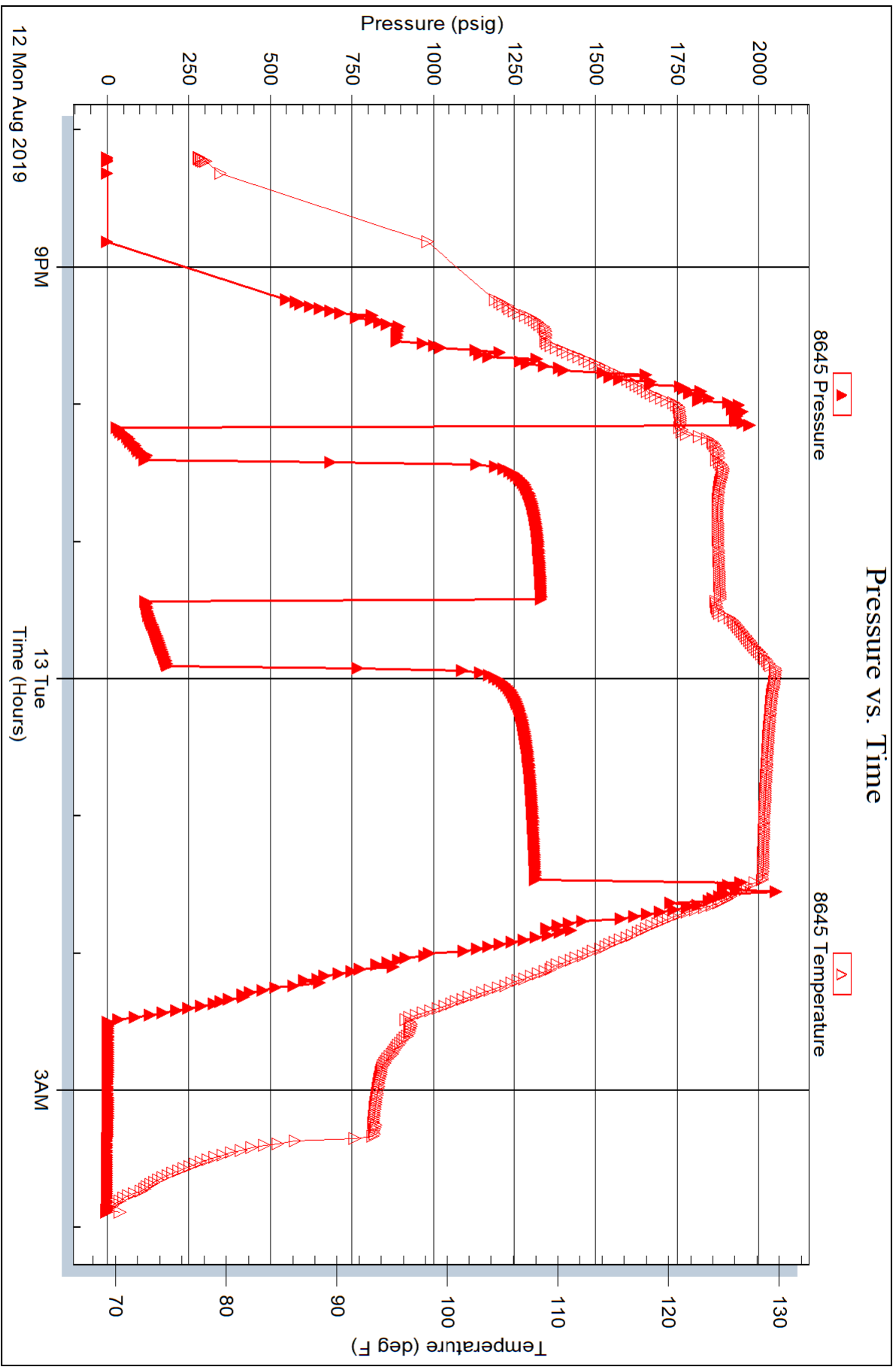
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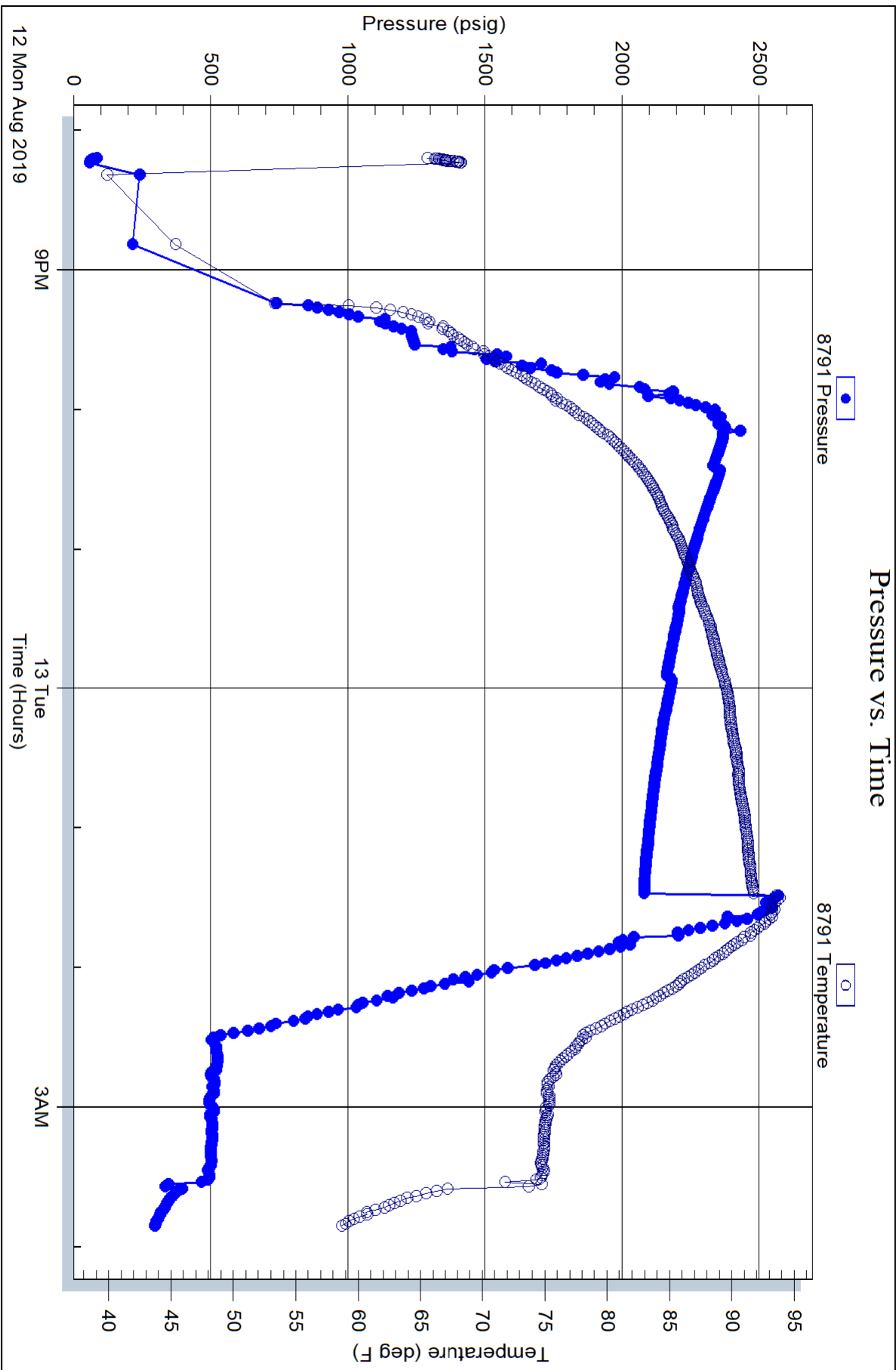
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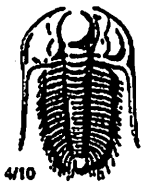
Black Oak Exploration

Henningsen #1-9

DST Test Number: 4







TRIOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket 66026

NO.

Well Name & No. Henningsen #1-9 Test No. 1 Date 8-10-19
 Company Black Oak Exploration Elevation 2934 KB 2929 GL
 Address 1474 S St Paul Denver CO 80210
 Co. Rep / Geo. Clayton Camozzi Rig Murfin #3
 Location: Sec. 9 Twp 35 Rge. 3/W Co. Rawlins State KS

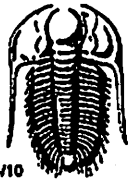
Interval Tested 3947 - 3964 Zone Tested Toronto Lens A
 Anchor Length 17 Drill Pipe Run 3765 Mud Wt. 8.8
 Top Packer Depth 3942 Drill Collars Run 177 Vis 59
 Bottom Packer Depth 3947 Wt. Pipe Run - WL 6.4
 Total Depth 3964 Chlorides 700 ppm System LCM 4
 Blow Description IF 1/8" Blow @ open built to 1 1/2"
ISI No blow back
FE Blow built to 1 3/4"
FSI No blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>10</u>	<u>Oil</u>		<u>100</u>		
<u>59</u>	<u>SOLMW</u>	<u>15</u>	<u>50</u>	<u>35</u>	

Rec Total 69 BHT 130 Gravity 21.9 API RW 416 @ 69.5 F Chlorides 17000 ppm

(A) Initial Hydrostatic <u>1981</u>	<input checked="" type="checkbox"/> Test <u>1200</u>	T-On Location <u>15:25</u>
(B) First Initial Flow <u>18</u>	<input checked="" type="checkbox"/> Jars <u>250</u>	T-Started <u>16:31</u>
(C) First Final Flow <u>30</u>	<input checked="" type="checkbox"/> Safety Joint <u>75</u>	T-Open <u>19:06</u>
(D) Initial Shut-In <u>1233</u>	<input type="checkbox"/> Circ Sub	T-Pulled <u>22:31</u>
(E) Second Initial Flow <u>34</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>00:20</u>
(F) Second Final Flow <u>56</u>	<input checked="" type="checkbox"/> Mileage <u>41 RT</u> 41	Comments
(G) Final Shut-In <u>1153</u>	<input type="checkbox"/> Sampler	
(H) Final Hydrostatic <u>1918</u>	<input type="checkbox"/> Straddle	
	<input checked="" type="checkbox"/> Shale Packer <u>250</u>	<input type="checkbox"/> EM Tool
	<input type="checkbox"/> Extra Packer	<input type="checkbox"/> Ruined Shale Packer
	<input type="checkbox"/> Extra Recorder	<input type="checkbox"/> Ruined Packer
	<input type="checkbox"/> Day Standby	<input type="checkbox"/> Extra Copies
	<input type="checkbox"/> Accessibility	Sub Total <u>0</u>
	Sub Total <u>1816</u>	Total <u>1816</u>

Approved By _____ Our Representative Shawn Wheelberger
 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 66027

NO.

Well Name & No. Henningsen #1-9 Test No. 2 Date 8-11-19
 Company Black Oak Exploration Elevation 2934 KB 2929 GL
 Address 1474 S St Paul Denver CO 80210
 Co. Rep / Geo. Clayton Cumozzi Rig Murfin #3
 Location: Sec. 9 Twp 3s Rge. 31W Co. Rawlins State KS

Interval Tested 4012-4090 Zone Tested Lans G-H
 Anchor Length 78 Drill Pipe Run 3827 Mud Wt. 9
 Top Packer Depth 4007 Drill Collars Run 177 Vis 60
 Bottom Packer Depth 4012 Wt. Pipe Run - WL 6.4
 Total Depth 4090 Chlorides 700 ppm System LCM 4

Blow Description IF 3" Blow @ open BOB @ 7 mins 15 secs built to 15"
ISI 1/4" of blow declined after 1.3 mins
FF 1/2" of Blow built to BOB @ 12 mins 30 secs built to 29"
FSI Blow built to 1/2" @ 16 mins declined to 0 @ 55 mins

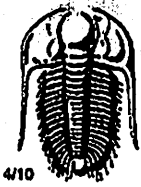
Rec	Feet of	%gas	%oil	%water	%mud
<u>5</u>	<u>Oil</u>	<u>100</u>			
<u>128</u>	<u>OLM</u>	<u>15</u>		<u>85</u>	
<u>433</u>	<u>SOLMW</u>	<u>8</u>	<u>59</u>	<u>33</u>	

Rec Total 566 BHT 131 Gravity 30 API RW .146 @ 74.7 °F Chlorides 47000 ppm

(A) Initial Hydrostatic 2047 Test 1300 T-On Location 12:50
 (B) First Initial Flow 56 Jars 250 T-Started 13:06
 (C) First Final Flow 157 Safety Joint 75 T-Open 14:56
 (D) Initial Shut-In 1338 Circ Sub _____ T-Pulled 18:06
 (E) Second Initial Flow 156 Hourly Standby _____ T-Out 20:23
 (F) Second Final Flow 279 Mileage 41 RT 41 Comments Tool slid 15 ft
 (G) Final Shut-In 1316 Sampler _____ to bottom
 (H) Final Hydrostatic 2106 Straddle _____

Initial Open 10 Shale Packer 250 EM Tool _____
 Initial Shut-In 60 Extra Packer _____ Ruined Shale Packer _____
 Final Flow 30 Extra Recorder _____ Ruined Packer _____
 Final Shut-In 90 Day Standby _____ Extra Copies _____
 Sub Total 1916 Accessibility _____ Sub Total 0
 Total 1916 MP/DST Disc't _____

Approved By _____ Our Representative Shawn Wheelbarger
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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket 66028

NO.

Well Name & No. Henninason #1-9 Test No. 3 Date 8-12-19
 Company Black Oak Exploration Elevation 2934 KB 2929 GL
 Address 1474 S St Paul Denver CO 80210
 Co. Rep / Geo. Clayton Camozzi Rig Murfin #3
 Location: Sec. 9 Twp 3s Rge. 31w Co. Rawlins State KS

Interval Tested 4084-4134 Zone Tested Lans J
 Anchor Length 45 Drill Pipe Run 3891 Mud Wt. 8.9
 Top Packer Depth 4084 Drill Collars Run 177 Visc. 57
 Bottom Packer Depth 4089 Wt. Pipe Run - Wt. 6.4
 Total Depth 4134 Chlorides 1200 ppm System LCM 4
 Blow Description IF 1/4" Blow @ open built to 1/2"
ISI No blow back
FF No blow
FSI No blow

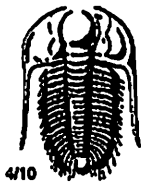
Rec	Feet of	%gas	%oil	%water	%mud
<u>5</u>	<u>Mud w/oil spots</u>			<u>100</u>	
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 5 BHT 126 Gravity - API RW - @ - ° F Chlorides - ppm

(A) Initial Hydrostatic 2017 Test 1300 T-On Location 6:00
 (B) First Initial Flow 16 Jars 250 T-Started 6:07
 (C) First Final Flow 17 Safety Joint 75 T-Open 8:02
 (D) Initial Shut-In 363 Circ Sub _____ T-Pulled 10:22
 (E) Second Initial Flow 19 Hourly Standby _____ T-Out 11:55
 (F) Second Final Flow 19 Mileage 41 RT 41 Comments _____
 (G) Final Shut-In 74 Sampler _____
 (H) Final Hydrostatic 1937 Straddle _____

Initial Open 15 Shale Packer 250 EM Tool _____
 Initial Shut-In 60 Extra Packer _____ Ruined Shale Packer _____
 Final Flow 10 Extra Recorder _____ Ruined Packer _____
 Final Shut-In 45 Day Standby _____ Extra Copies _____
 Sub Total 1916 Accessibility _____ Sub Total 0
 Total 1916 MP/DST Disc't _____

Approved By _____ Our Representative Shawn Heelbasger
 Triobite Testing Inc. shall not be liable for damaged or 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 66029

NO.

Well Name & No. Henningsen #1-9 Test No. 4 Date 8-12-19
 Company Black Oak Exploration Elevation 2934 KB 2929 GL
 Address 1474 S st Paul Denver CO 80210
 Co. Rep / Geo. Clayton Camozzi Rig Murfin #3
 Location: Sec. 9 Twp 35 Rge. 3/W Co. Rawlins State KS

Interval Tested 4013-4061 Zone Tested Lansing G
 Anchor Length 48-117 Tail Drill Pipe Run 3828 Mud Wt. 8.9
 Top Packer Depth 4008-4013 Drill Collars Run 177 Vis 58
 Bottom Packer Depth 4061 Wt. Pipe Run - WL 6.4
 Total Depth 4178 Chlorides 1200 ppm System LCM 4

Blow Description IF 1/2" Blow @ open built to 10"
FSI No blow back
FF BOB in 21 mins blow built to 15 3/4"
FSI No blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>367</u>	<u>SGOCUM</u>	<u>5</u>	<u>8</u>	<u>38</u>	<u>49</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 367 BHT 129 Gravity - API RW 144 @ 65.3°F Chlorides 53000 ppm

- (A) Initial Hydrostatic 2038
- (B) First Initial Flow 21
- (C) First Final Flow 115
- (D) Initial Shut-In 1331
- (E) Second Initial Flow 115
- (F) Second Final Flow 186
- (G) Final Shut-In 1315
- (H) Final Hydrostatic 1959

- Test 1300
- Jars 250
- Safety Joint 75
- Circ Sub
- Hourly Standby
- Mileage 41 RT 41
- Sampler
- Straddle 600
- Shale Packer 250
- Extra Packer
- Extra Recorder
- Day Standby
- Accessibility
- Sub Total 2516

T-On Location 19:05
 T-Started 20:12
 T-Open 22:10
 T-Pulled 1:25 8-13
 T-Out 4:10 8-13

Comments _____
 EM Tool _____
 Ruined Shale Packer _____
 Ruined Packer _____
 Extra Copies _____
 Sub Total 0
 Total 2516
 MP/DST Disc't _____

Initial Open 15
 Initial Shut-In 60
 Final Flow 30
 Final Shut-In 90

Approved By _____ Our Representative Shawn Heckberger

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