

Confidentiality Requested:

Yes No

**KANSAS CORPORATION COMMISSION
OIL & GAS CONSERVATION DIVISION**

Form ACO-1

January 2018

Form must be Typed

Form must be Signed

All blanks must be Filled

**WELL COMPLETION FORM
WELL HISTORY - DESCRIPTION OF WELL & LEASE**

OPERATOR: License # _____

Name: _____

Address 1: _____

Address 2: _____

City: _____ State: _____ Zip: _____ + _____

Contact Person: _____

Phone: (_____) _____

CONTRACTOR: License # _____

Name: _____

Wellsite Geologist: _____

Purchaser: _____

Designate Type of Completion:

New Well Re-Entry Workover

Oil WSW SWD

Gas DH EOR

OG GSW

CM (Coal Bed Methane)

Cathodic Other (Core, Expl., etc.): _____

If Workover/Re-entry: Old Well Info as follows:

Operator: _____

Well Name: _____

Original Comp. Date: _____ Original Total Depth: _____

Deepening Re-perf. Conv. to EOR Conv. to SWD

Plug Back Liner Conv. to GSW Conv. to Producer

Commingled Permit #: _____

Dual Completion Permit #: _____

SWD Permit #: _____

EOR Permit #: _____

GSW Permit #: _____

Spud Date or _____ Date Reached TD _____ Completion Date or
Recompletion Date _____ Recompletion Date _____

API No.: _____

Spot Description: _____

_____ - _____ - _____ Sec. _____ Twp. _____ S. R. _____ East West

_____ Feet from North / South Line of Section

_____ Feet from East / West Line of Section

Footages Calculated from Nearest Outside Section Corner:

NE NW SE SW

GPS Location: Lat: _____, Long: _____
(e.g. xx.xxxxx) (e.g. -xxx.xxxxx)

Datum: NAD27 NAD83 WGS84

County: _____

Lease Name: _____ Well #: _____

Field Name: _____

Producing Formation: _____

Elevation: Ground: _____ Kelly Bushing: _____

Total Vertical Depth: _____ Plug Back Total Depth: _____

Amount of Surface Pipe Set and Cemented at: _____ Feet

Multiple Stage Cementing Collar Used? Yes No

If yes, show depth set: _____ Feet

If Alternate II completion, cement circulated from: _____

feet depth to: _____ w/ _____ sx cmt.

Drilling Fluid Management Plan

(Data must be collected from the Reserve Pit)

Chloride content: _____ ppm Fluid volume: _____ bbls

Dewatering method used: _____

Location of fluid disposal if hauled offsite: _____

Operator Name: _____

Lease Name: _____ License #: _____

Quarter _____ Sec. _____ Twp. _____ S. R. _____ East West

County: _____ Permit #: _____

AFFIDAVIT

I am the affiant and I hereby certify that all requirements of the statutes, rules and regulations promulgated to regulate the oil and gas industry have been fully complied with and the statements herein are complete and correct to the best of my knowledge.

Submitted Electronically

KCC Office Use ONLY

Confidentiality Requested

Date: _____

Confidential Release Date: _____

Wireline Log Received Drill Stem Tests Received

Geologist Report / Mud Logs Received

UIC Distribution

ALT I II III Approved by: _____ Date: _____

Operator Name: _____ Lease Name: _____ Well #: _____

Sec. _____ Twp. _____ S. R. _____ East West County: _____

INSTRUCTIONS: Show important tops of formations penetrated. Detail all cores. Report all final copies of drill stems tests giving interval tested, time tool open and closed, flowing and shut-in pressures, whether shut-in pressure reached static level, hydrostatic pressures, bottom hole temperature, fluid recovery, and flow rates if gas to surface test, along with final chart(s). Attach extra sheet if more space is needed.

Final Radioactivity Log, Final Logs run to obtain Geophysical Data and Final Electric Logs must be emailed to kcc-well-logs@kcc.ks.gov. Digital electronic log files must be submitted in LAS version 2.0 or newer AND an image file (TIFF or PDF).

Drill Stem Tests Taken <input type="checkbox"/> Yes <input type="checkbox"/> No <i>(Attach Additional Sheets)</i> Samples Sent to Geological Survey <input type="checkbox"/> Yes <input type="checkbox"/> No Cores Taken <input type="checkbox"/> Yes <input type="checkbox"/> No Electric Log Run <input type="checkbox"/> Yes <input type="checkbox"/> No Geologist Report / Mud Logs <input type="checkbox"/> Yes <input type="checkbox"/> No List All E. Logs Run:	<input type="checkbox"/> Log Formation (Top), Depth and Datum <input type="checkbox"/> Sample Name Top Datum
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CASING RECORD <input type="checkbox"/> New <input type="checkbox"/> Used							
Report all strings set-conductor, surface, intermediate, production, etc.							
Purpose of String	Size Hole Drilled	Size Casing Set (In O.D.)	Weight Lbs. / Ft.	Setting Depth	Type of Cement	# Sacks Used	Type and Percent Additives

ADDITIONAL CEMENTING / SQUEEZE RECORD				
Purpose:	Depth Top Bottom	Type of Cement	# Sacks Used	Type and Percent Additives
<input type="checkbox"/> Perforate <input type="checkbox"/> Protect Casing <input type="checkbox"/> Plug Back TD <input type="checkbox"/> Plug Off Zone				

1. Did you perform a hydraulic fracturing treatment on this well? Yes No *(If No, skip questions 2 and 3)*
2. Does the volume of the total base fluid of the hydraulic fracturing treatment exceed 350,000 gallons? Yes No *(If No, skip question 3)*
3. Was the hydraulic fracturing treatment information submitted to the chemical disclosure registry? Yes No *(If No, fill out Page Three of the ACO-1)*

Date of first Production/Injection or Resumed Production/Injection:	Producing Method: <input type="checkbox"/> Flowing <input type="checkbox"/> Pumping <input type="checkbox"/> Gas Lift <input type="checkbox"/> Other <i>(Explain)</i> _____				
Estimated Production Per 24 Hours	Oil Bbls.	Gas Mcf	Water Bbls.	Gas-Oil Ratio	Gravity

DISPOSITION OF GAS: <input type="checkbox"/> Vented <input type="checkbox"/> Sold <input type="checkbox"/> Used on Lease <i>(If vented, Submit ACO-18.)</i>	METHOD OF COMPLETION: <input type="checkbox"/> Open Hole <input type="checkbox"/> Perf. <input type="checkbox"/> Dually Comp. <input type="checkbox"/> Commingled <i>(Submit ACO-5)</i> <i>(Submit ACO-4)</i>	PRODUCTION INTERVAL: Top Bottom
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Shots Per Foot	Perforation Top	Perforation Bottom	Bridge Plug Type	Bridge Plug Set At	Acid, Fracture, Shot, Cementing Squeeze Record <i>(Amount and Kind of Material Used)</i>

TUBING RECORD:	Size:	Set At:	Packer At:	
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RITCHIE

EXPLORATION, INC.
Wichita, Kansas

#1 Wing Trust 23A

2010' FNL & 2280' FEL

30' S & 30' E of W/2 SW NE Section 23-15S-36W

Logan County, Kansas

API# 15-109-21452-0000

Elevation: GL: 3287', KB: 3292'

Sample Tops			Ref. Well
Anhydrite	2551'	+741	+6
B/Anhydrite	2571'	+721	+4
Heebner	3984'	-692	+4
Toronto	4004'	-712	+6
Lansing	4035'	-743	+2
Muncie Shale	4208'	-916	Flat
Stark Shale	4300'	-1008	+2
Hush	4346'	-1054	+1
BKC	4390'	-1098	-7
Altamont	4441'	-1149	-6
Pawnee	4522'	-1230	-1
Myrick Station	4564'	-1272	-7
Fort Scott	4580'	-1288	-8
Cherokee Shale	4608'	-1316	-8
Johnson	4690'	-1398	-6
Morrow Shale	4742'	-1450	-8
Mississippian	4816'	-1524	-7
RTD	4900'	-1608	



CONSOLIDATED
Oil Well Services, LLC

PO Box 884, Chanute, KS 66720
620-431-9210 or 800-467-8676

5144
5051
Invoice # 806840
FIELD TICKET & TREATMENT REPORT
CEMENT

TICKET NUMBER 49630
LOCATION Oakley, KS
FOREMAN Kelly Gabel
Miles Shaw

DATE	CUSTOMER #	WELL NAME & NUMBER	SECTION	TOWNSHIP	RANGE	COUNTY
1-14-16	2123	Wing Trust 1-23A	23	15	36W	Logan
CUSTOMER Ritchie			Leoti, KS			
MAILING ADDRESS			Dakota Rd 3E 5+ E into			
CITY	STATE	ZIP CODE	TRUCK #	DRIVER	TRUCK #	DRIVER
			753	Cody		
			566	Keith		
			646			
			563			

JOB TYPE Prod HOLE SIZE 7 7/8 HOLE DEPTH 4900 CASING SIZE & WEIGHT 5 1/2 15.5 #
 CASING DEPTH 4895 DRILL PIPE _____ TUBING PC Serial # 150692 OTHER PC @ 2535
 SLURRY WEIGHT 142 SLURRY VOL _____ WATER gal/sk _____ CEMENT LEFT in CASING 21
 DISPLACEMENT 116 DISPLACEMENT PSI 1100 MIX PSI 1700 RATE _____

REMARKS: Safety meeting, rigged up on w/w #2, ran float equip on JT #5
 + turbolizer 5-shoe, markers at 12, 15, 18, 22, 56, 58 baskets 10, 57, 75, 79, 103
 PC top # 57, ran pipe to bottom & circulated for 45 mins, mixed mud flush
 mixed 30 sks RH, mixed 200 sks OWC down center, washed up
 released plug & displaced with 11 1/4 bbl water lift pressure 1000 #
 Plug landed @ 1700 # released pressure float held
 @ 11:10 AM

Thank You
Kelly, Miles & crew

ACCOUNT CODE	QUANTITY or UNITS	DESCRIPTION of SERVICES or PRODUCT	UNIT PRICE	TOTAL
CE0454	1	PUMP CHARGE	3900.00	3900.00
CE0002	415 mi	MILEAGE	7.15	321.75
CE0710	10.81	Ton mileage delivery	1.75	851.39
7183 CC5762	230	OWC	26.00	5980.00
CC6077	1150 #	Kol-seal	.50	575.00
CC6185	32 #	CAF-38 (defoamer)	10.20	326.40
CC6000	50 #	CDC-26	7.85	392.50
CP8576	8	5 1/2 turbolizer (w)	110.00	880.00
CP8629	5	5 1/2 basket (w)	385.00	1925.00
CP8485	1	5 1/2 AF4 floatshoe (w)	585.00	585.00
CP8254	1	5 1/2 latendown Assy/w Plug (w)	400.00	400.00
CP8776	1	5 1/2 part collar (E)	2850.00	2850.00
7496 CC6125	500 gal	mud flush	.65	325.00
		Sub		19,311.94
		Less 3590		6759.98
		Total		12,552.76
		SALES TAX		740.42
		ESTIMATED TOTAL		13293.19

Revin 3737

AUTHORIZATION [Signature] TITLE _____

DATE 1-14-16

I acknowledge that the payment terms, unless specifically amended in writing on the front of the form or in the customer's account records, at our office, and conditions of service on the back of this form are in effect for services identified on this form.



CONSOLIDATED
Oil Well Services, LLC

PO Box 884, Chanute, KS 66720
620-431-9210 or 800-467-8676

5164
5071

TICKET NUMBER 49649
LOCATION Clark, KS
FOREMAN Jerry Y
Miles 5

FIELD TICKET & TREATMENT REPORT

CEMENT Invoice # 806859

DATE	CUSTOMER #	WELL NAME & NUMBER	SECTION	TOWNSHIP	RANGE	COUNTY
1-2016	7173	Wing Trust 1-23A	23	15	36w	Logan
CUSTOMER			KS			
MAILING ADDRESS			TRUCK #	DRIVER	TRUCK #	DRIVER
Ritchie Exp			731	Cory D		
CITY			528 7129	Rob S		
STATE			714			
ZIP CODE			563			

JOB TYPE Dept Collier HOLE SIZE _____ HOLE DEPTH _____ CASING SIZE & WEIGHT 5 1/2 15 1/2
 CASING DEPTH _____ DRILL PIPE _____ TUBING 2 7/8 OTHER PC @ 25
 SLURRY WEIGHT 12.5 SLURRY VOL 6.59 WATER gal/sk _____ CEMENT LEFT in CASING _____
 DISPLACEMENT 14661 DISPLACEMENT PSI _____ MIX PSI _____ RATE _____

REMARKS: Safety meeting & rig upon Alliance Well Street plug @ 1200 #
drilling rate 4 1/2 bpm @ 600# mix 3.75 sks Litchland VI wash up & displace
with 14661 close tool test to 1200# set 5 min run 5 ft's & reverse clean with
30661 fresh water

60/40 6% gel 1/4 # flo-seal

Thank you
Jerry & crew

ACCOUNT CODE	QUANTITY or UNITS	DESCRIPTION of SERVICES or PRODUCT	UNIT PRICE	TOTAL
CE0451	1	PUMP CHARGE	1900.00	1900.00
CE0002	45	MILEAGE	7.15	321.75
CE0710	16.13	ton mileage delivery	175	1270.24
CC5830	375 sks	Litchland VI	16.75	6281.25
CC6075	94 #	flo seal	2.00	188.00
CC6080	500 #	cotton seed hulls	.50	250.00
CC5326	100 #	salt	1.10	110.00
			subtotal	10211.24
			less 35%	3573.93
			subtotal	6637.31
			SALES TAX	349.40
			ESTIMATED TOTAL	6986.71

AUTHORIZATION [Signature] TITLE _____ DATE _____

I acknowledge that the payment terms, unless specifically amended in writing on the front of the form or in the customer's account records, at our office, and conditions of service on the back of this form are in effect for services identified on this form.

John Goldsmith Wellsite Service

Cell and Home Phone:
316-640-0236

427 Roosevelt St.
Cheney, KS 67025

Scale 1:240 (5"=100') Imperial Measured Depth Log

Well Name: #1 Wing Trust 23A

API: 15-109-21452

Location: 2010' FNL, 2280' FEL, SEC 23-15S-36W, W2 SW NE

License Number:

Region: Logan County

Spud Date: 01/04/2016

Drilling Completed: 01/13/2016

Surface Coordinates: LAT 38.7391681

LONG -101.2881625

Bottom Hole Vertical hole

Coordinates:

Ground Elevation (ft): 3287'

K.B. Elevation (ft): 3292'

Logged Interval (ft): 3700' To: RTD

Total Depth (ft): 4900

Formation: Mississippian at RTD

Type of Drilling Fluid: Chemical

Printed by MUD.LOG from WellSight Systems 1-800-447-1534 www.WellSight.com

OPERATOR

Company: Ritchie Exploration, Inc.

Address: 8100 E 22nd St N #700

Wichita, KS 67226

(316) 691-9500

GEOLOGIST

Name: John Goldsmith

Company: John Goldsmith Wellsite Service

Address: 427 Roosevelt St

Cheney, KS 67025

(316) 640-0236

COMMENTS

Contractor: WW Drilling Rig #2

Pusher: Lonnie (785) 259-3864

Surface Casing: 6 joints of 8 5/8" set at 255'

Production Casing: 5.5" Production Casing was installed.

Mud by: MudCo

DST's by: Trilobite Testing

Logs by: Casedhole Solutions (DIL, CN-CD, ML)

RTD=4900'

LTD=4899'

FORMATION TOPS

FORMATION	SAMPLE TOPS		LOG TOPS	
	Depth	Datum	Depth	Datum
Heebner Shale	3984'	-692	3984'	-692
Toronto	3998'	-706	3998'	-706
Lansing	4022'	-730	4022'	-730
Muncie Creek Shale	4206'	-914	4206'	-914
Stark Shale	4304'	-1012	4306'	-1014
Hushpuckney Shale	4347'	-1055	4350'	-1058
Base of KC	4384'	-1092	4386'	-1094
Marmaton	4428'	-1136	4429'	-1137
Altamont	4442'	-1150	4444'	-1152
Pawnee	4521'	-1229	4521'	-1229
Little Osage Shale	4555'	-1263	4554'	-1262
Excello Shale	4576'	-1284	4573'	-1281
Cherokee Shale	4608'	-1316	4605'	-1313
Johnson Zone	4690'	-1398	4689'	-1397
Morrow	4740'	-1448	4740'	-1448
Mississippian	4816'	-1524	4816'	-1524
RTD	4900'	-1608		
LTD			4899'	-1607

DSTs

DST #1 3980'-4020' "Toronto" 01/08/2016 30-45-45-60

1st Blow: 1/4" Blw blt to BOB in 23" (No BB)

2nd Blow: 1/2" Blw blt to BOB in 29" (No BB)

IFP: 24-101# ISIP: 1017# FFP: 110-182# FSIP: 982#

HYDP: 2060-2019#

382' Total Fluid, 41' GO (70% Oil), 93' GOCM (30% Oil, 10% Gas), 124' OCWM (5% Oil, 35% Wtr), 124' MCW (90% Wtr).

DST #2 4200'-4300' "H/I/J" 01/09/2016 30-45-45-60

1st Blow: BOB in 10" (No BB)

2nd Blow: BOB in 10" (No BB)

IFP: 34-178# ISIP: 1217# FFP: 186-326# FSIP: 1215#

HYDP: 2216-2051#

670' Total Fluid, 236' Mud, 248' WCM (20% Wtr), 186' MW (50% Wtr).

DST #3 4400'-4459' "Altamont A" 01/10/2016 30-45-45-60

1st Blow: BOB in 7" (No BB)

2nd Blow: BOB in 10" (No BB)

IFP: 84-256# ISIP: 1272# FFP: 261-414# FSIP: 1270#

HYDP: 2464-2218#

930' Total Fluid, 310' OCWM (20% Oil, 10% Wtr), 310' GOCMW (10% Oil, 50% Wtr, 30% Mud), 186' GOCMW (40% Oil, 30% Wtr, 10% Mud), 124' OCMW (10% Oil, 80% Wtr).

DST #4 4459'-4482' "Altamont B" 01/11/2016 30-45-45-60

1st Blow: BOB in 18" (BB blt to 2 1/4")

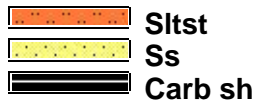
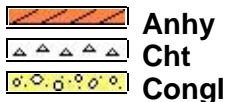
2nd Blow: BOB in 23" (BB blt to 1")

IFP: 20-83# ISIP: 500# FFP: 88-143# FSIP: 492#

HYDP: 2349-2268#

Total Rec: 341', 155' GO (50% Oil), 124' OCWM (10% Oil, 10% Wtr), 62' OCMW (5% Oil, 75% Wtr).

ROCK TYPES



ACCESSORIES

EVENTS



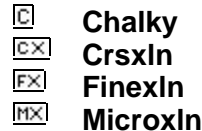
FOSSIL



MINERAL

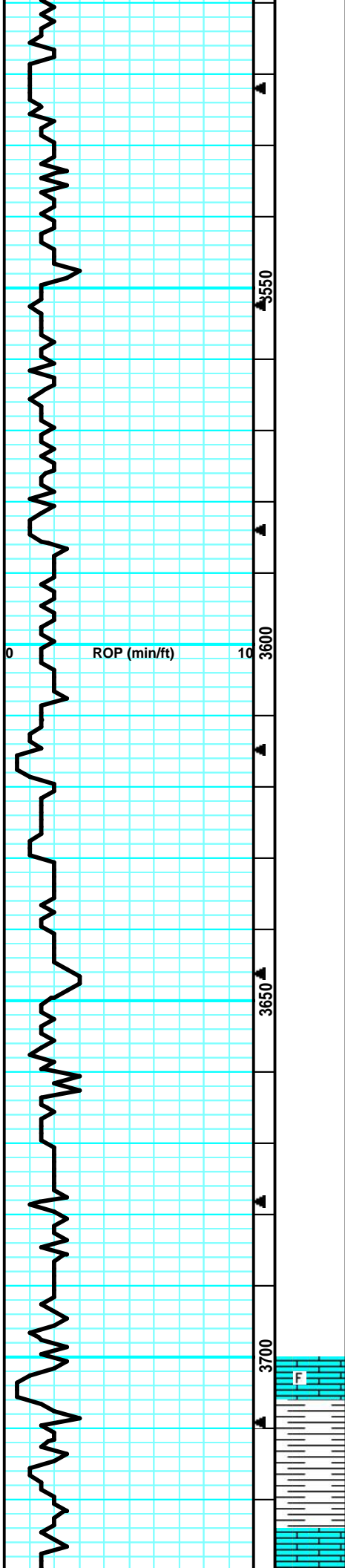


TEXTURE



ROP (min/ft)	Depth	Lithology	Oil Shows	Geological Descriptions	Remarks
0	0				
10	10				
	2300			<p>Morning Report Depth/Activity</p> <p>01/04/2016, Spud 01/05/16, drill @610' 01/06/16, drill @2600' 01/07/16, drill @3440' 01/08/16, drill @4152' 01/09/16, drill @4300' 01/10/16, drill @4459' 01/11/16, drill @4639' 01/12/16, drill @4820' 01/13/16, drill @4900'</p>	<p>Mud-Co Check #1 @ 0' 12/21/15</p> <p>Survey @255' = 3/4 Degree</p>
	2550	Anhydrite			<p>Anhydrite @ 2550' (+742)</p>
	2572	B/Anhydrite			<p>B/Anhydrite @ 2572' (+720)</p> <p>Mud-Co Check #2 @ 1077' 01/05/15 wt vis pH 8.7 27 7.5 Filt chr LCM NC 300 Tr</p>
	2680				<p>Mud-Co Check #3 @ 2750' 01/06/15 wt vis pH 9.7 30 7.5 Filt chr LCM NC 54K 1#</p>
	3500			<p>ROP Data begin @ 3500' on 01/07/2016</p>	<p>Mud-Co Check #4 @ 3535' 01/07/16</p>

wt	vis	pH
8.7	67	11.5
Filt	chr	LCM
7.6	5.4K	2#

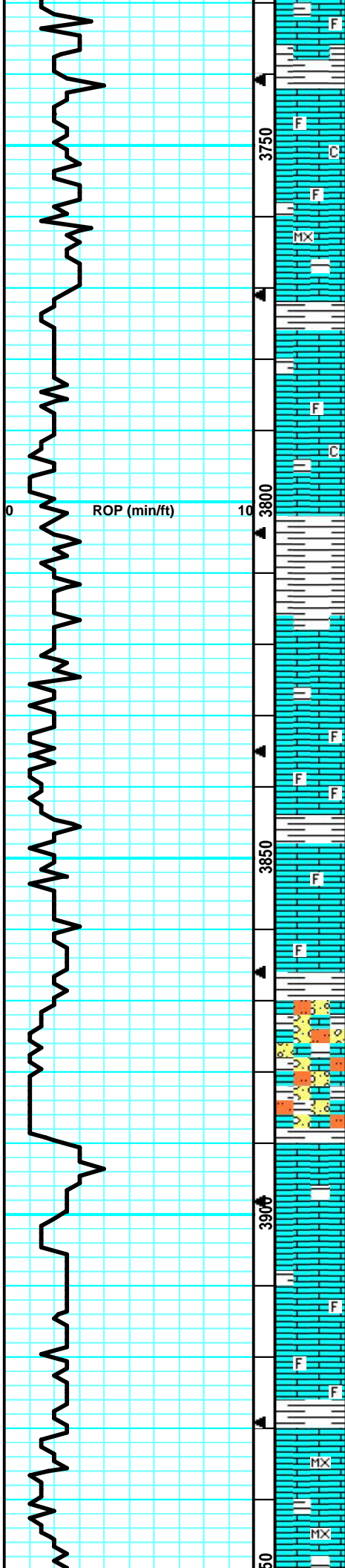


Sample began @ 3700' on 01/07/2016

LS: gry/tan, slight mott in prt, fn xln, fw foss frags, many dense, sub-chlky in prt, tr-nvp, fw pcs pur chlk, no cup odr, ns.

LS: lt gry/tan, slight mott, fn xln, fw foss frags, sm flakey/mealy, fw gritty, tr-nvp, fw pcs SH- brn, silty, no cup odr, ns.

LS: lt tan/lt gry, sing, fn xln, mostly dense, sm brittle, fw sub-chlky in prt, tr-nvp, svrl pcs pur chlk, no cup odr, ns.



LS: lt tan/lt gry, slight mott, fn xln, fw foss frags, sm dense, fw brittle, tr-nvp, fw pcs pur chlk, no cup odr, ns.

LS: gry/lt tan, mott in prt, fn xln, sm foss, sm dense, sm brittle, tr-nvp, fw pcs pur chlk, sm SHt gry/grn, silty, no cup odr, ns.

LS: lt tan/lt gry, slight mott in prt, fn xln, fw foss frags, many dense, sm brittle, tr-nvp, fw pcs pur chlk, fw SHt gry/brn, silty, no cup odr, ns.

LS: lt tan/lt gry, sing, micro-fn xln, mostly dense, many brittle, sub-chlky in prt, tr-nvp, fw pcs pur chlk, no cup odr, ns.

LS: lt tan/lt gry, sing, fn xln, mostly dense, many brittle, sub-chlky in prt, tr-nvp, fw pcs pur chlk, no cup odr, ns.

LS: lt tan, slight mott in prt, fn xln, fw foss frags, mostly dense, sm brittle, sub-chlky in prt, tr-nvp, fw pcs pur chlk, no cup odr, ns.

LS: lt tan, slight mott, fn xln, sm dense, sm brittle, sub-chlky in prt, tr-nvp, fw pcs pur chlk, no cup odr, ns.

LS: gry/lt tan, slight mott, fn xln, mostly dense, sm brittle, fw sub-chlky, tr-nvp, fw pcs w/ drk min stns, no fluor, no cup odr, nsfo.

LS: lt tan, mostly sing, fn xln, many dense, sm brittle, sub-chlky, tr-nvp, sm pur chlk, v fw SHt gry/brn, silty, no cup odr, ns.

LS: lt tan, sing, micro-fn xln, mostly dense, sm brittle, sub-chlky, tr-nvp, fw pcs pur chlk, fw SHt brn/gry, silty, fw fissile, no cup odr, ns.

LS: lt tan/lt gry, mott in prt, fn xln, fw foss frags, many brittle, sub-chlky in prt, tr-nvp, sm pur chlk, no cup odr, ns.

LS: tan/lt gry, mott in prt, fn xln, sm v foss, many brittle, sm flakey like, tr-pr inbxdn por in fw, svrl pcs pur chlk, no cup odr, ns.

LS: lt tan, slight mott in prt, fn xln, fw foss frags, many brittle, fw grainy, tr-nvp, sm pur chlk, no cup odr, ns.

LS: lt tan, mostly sing, fn xln, v fw foss frags, mostly brittle, fw gritty like, tr-nvp, fw pcs pur chlk, no cup odr, ns.

LS: lt tan, slight mott, fn xln, fw foss frags, sm dense, sm flakey/mealy, tr-nvp, fw SHt brn/gry, silty, soft, no cup odr, ns.

LS: gry/tan, slight mott, fn xln, mostly dense, sm firm, fw flakey/mealy, tr-nvp, sm SHt brn, silty, fw StStn: lt brn, soft, gritty, friable, np cup odr, ns.

LS: gry/tan, mott, fn xln, many dense, sm flakey/mealy, tr-nvp, sm SHt brn, silty, soft, fw StStn: brn, gritty, friab, no cup odr, ns.

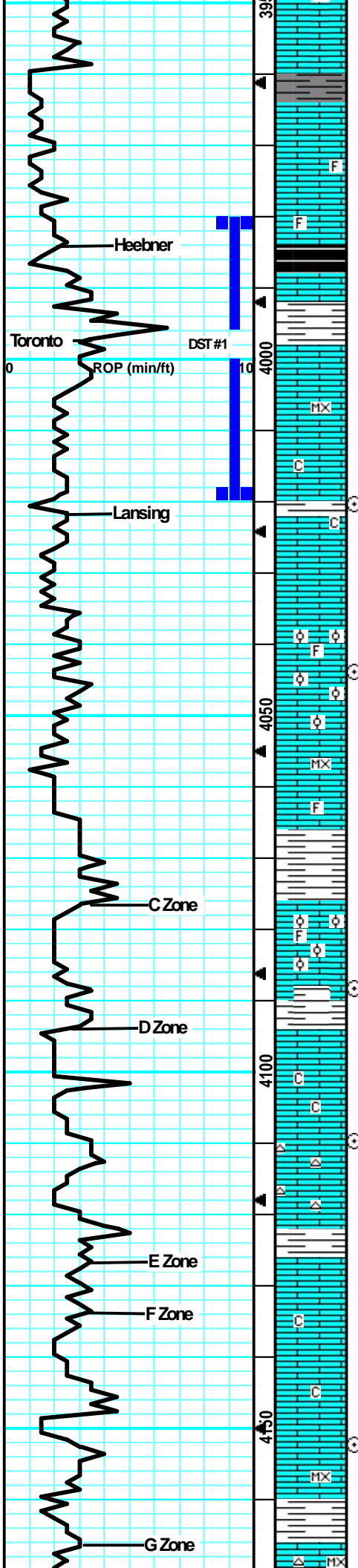
LS: gry/tan, slight mott, fn xln, many dense, sm firm, fw flakey/mealy, tr-nvp, sm SHt brn, silty, soft, muddy, fw StStn: brn, gritty, friab, no cup odr, ns.

LS: lt gry/lt tan, slight mott, fn xln, sm foss, sm dense, sm brittle, tr-nvp, sm SHt gry/brn, silty, soft, no cup odr, ns.

LS: crm/lt gry, mott, fn xln, sm v foss, many flakey, brittle, sm friab, tr-pr inbxdn por in sm, fw SHt brn/gry, silty, no cup odr, ns.

LS: crm/lt tan, sing, micro-fn xln, mostly dense, many brittle, chlky in prt, tr-nvp, sm pur chlk, no cup odr, ns.

LS: crm/lt tan, sing, micro-fn xln, mostly dense, many brittle, chlky, tr-nvp, svrl pcs pur chlk, no cup odr, ns.



LS: lt tan, sing, fn xln, many dense, mostly brittle, chlky in prt, tr-nvp, sm pur chl, no cup odr, ns.

LS: tan/lt gry, mostly sing, fn xln, many dense, sm brittle, sub-chlky in prt, tr-nvp, 1 pc LS: gry, mott, vuggy por, drk brn stns in por, drk hvy tarry oil, wk fluor, gd cut, no cup odr, vssfo.

LS: tan/lt gry, slight mott, fn xln, fw foss frags, many dense, sm brittle, tr-nvp, fw SH: drk gry, silty, no cup odr, ns.

LS: gry/tan, slight mott, fn xln, v fw foss frags, fw dense, many brittle, tr-nvp, fw pcs pur chl, svrl SH: blk, carb, soft, no cup odr, ns.

SH: gry, soft, silty, muddy, fw LS: tan, mott in prt, fn xln, dense, fw brittle, sub-chlky, tr-nvp, no cup odr, ns.

LS: tan/lt tan, sing, micro-fn xln, dense, brittle, sm fr intxn por, sm slight vuggy, drk brn stns in por, gd fluor, strm cut, gd cup odr, ssfo.

LS: gry/tan, mott in prt, fn xln, fw dense, many brittle, sm fr-gd intxn por, slight buggy, hvy drk stns in por, gd fluor, strm cut, gd-strng cup odr, fr sfo.

LS: tan/lt tan, sing, fn xln, mostly brittle, sm gritty like, chlky, tr-nvp, abund pur chl, sm SH: gry/brn, silty, no cup odr, ns.

LS: tan/lt gry, sing, fn xln, mostly brittle, fw dense, mostly chlky, tr-nvp, abund pur chl, fw SH: drk gry, silty, no cup odr, ns.

LS: gry/tan, slight mott, fn xln, fw foss/ool, sm dense, fw brittle, tr-nvp, abund pur chl, svrl SH: brn/gry, silty, no cup odr, ns.

LS: tan/lt gry, slight mott, fn xln, sm dense, sm brittle, sub-chlky in prt, tr-nvp, svrl SH: gry/brn, silty, no cup odr, ns.

LS: lt gry/lt tan, sing, fn xln, micro-fn xln, mostly dense, chlky, tr-nvp, 1-2 pcs w/ drk min stns, no fluor/cut, abund pur chl, no cup odr, ns.

LS: gry/tan, mott in prt, fn xln, fw foss frags, mostly dense, sm brittle, sub-chlky in prt, tr-nvp, svrl SH: gry/brn, silty, no cup odr, ns.

LS: gry/tan, slight mott, fn xln, many dense, sm brittle, fw flakey/mealy, sub-chlky, tr-nvp, svrl pcs pur chl, fw SH: brn/gry, silty, no cup odr, ns.

LS: lt tan/lt gry, slight mott, fn xln, fw foss/ool sm brittle, fw dense, sub-chlky, tr-pr intxn por in fw pcs, 1-2 pcs w/ patchy brn stns, gd fluor, pos cut, vssfo, faint-? cup odr.

LS: tan/lt tan, sing, fn xln, mostly dense, sm brittle, sub-chlky, tr-nvp, 1 pcs w/ spttd brn stns, pr por on edge, gd fluor, gd cut, vssfo on brk, no cup odr.

LS: tan/lt gry, sing, fn xln, mostly dense, many brittle, many chlky, tr-nvp, with fr intxn por on edge, sml sphr of oil clng to rx chp, strm cut, faint-wk cup odr, ssfo.

LS: lt gry/lt tan, sing, fn xln, mostly dense, many brittle, sub-chlky in part, uniform, fw pcs pur chl, fw Chert: gry/smokey, sharp, no odr, ns.

LS: tan/gry, slight mott, fn xln, mostly dense, sm brittle, fw flakey, tr-nvp, 1 pcs w/ lght brn stn on edge, wk flour, no cut, nsfo, no cup odr.

LS: gry/tan, slight mott in prt, fn xln, sm dense, sm brittle, fw flakey, sub-chlky in prt, tr-nvp, fw SH: gry/grn, silty, no cup odr, ns.

LS: tan/lt gry, slight mott, fn xln, sm dense, many brittle, many flakey/mealy, tr-nvp, fw SH: gry/blu, 1 pcs w/ pos lght brn spttd stn, ? flour no cut, nsfo, no cup odr. 60" Smpl: much of same lrg infix of SH: gry/brn, silty.

LS: crm/lt tan, sing, micro-fn xln, dense, sm brittle, sm sub-chlky in prt, tr-nvp, fw pcs pur chl, fw SH: gry/brn, silty, no cup odr, ns.

LS: lt tan, sing, micro-fn xln, mostly dense, sm firm, fw brittle, sub-chlky in fw, tr-nvp, fw Chert: wht/opaque, sharp, no cup odr, ns.

Heebner @ 3984' (-692)

Toronto @ 3998' (-706)

Survey @ 4020' = 3/4 Degree

CFS @ 4020' (30"/60")

Lansing @ 4022' (-730)

CFS @ 4044' (30"/60")

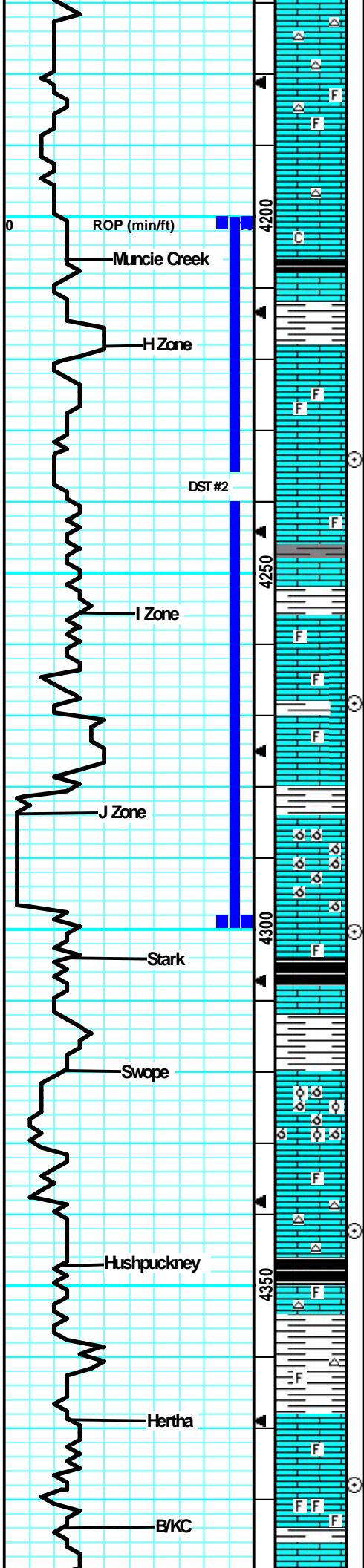
DST #1 3980'-4020' "Toronto"
 01/08/2016 30-45-45-60
 1st Blow: 1/4" Blwblt to BOB in 23" (No BB)
 2nd Blow: 1/2" Blwblt to BOB in 29" (No BB)
 IFP: 24-101# ISIP: 1017# FFP: 110-182#
 FSP: 982#
 HYDP: 2060-2019#
 382' Total Fluid, 41' GO (70% Oil), 93' GOCM (30% Oil, 10% Gas), 124' OCWM (5% Oil, 35% Wtr), 124' MCW (90% Wtr).

CFS @ 4088' (30"/60")

CFS @ 4110' (30"/60")

CFS @ 4152' (30"/60")

DST #2 4200'-4300' "HWJ"
 01/08/2016 30-45-45-60



sharp, no cup odr, ns.
 LS: lt tan/lt gry, sing, fn xln, mostly dense, sm firm, fw brittle, fw sub-chlky, tr-nvp, fw pur chlk, fw Chert: wht/opaque, sharp, no odr, ns.
 LS: tan/lt gry, slight mott, fn xln, fw foss frags, many dense, sm brittle, sub-chlky in prt, fw Chert: wht/opaque, sharp, no cup odr, ns.
 LS: gry/lt tan, mostly sing, fn xln, many dense, sm brittle, sub-chlky in prt, tr-nvp, infix SH: drk gry/brn, silty, no cup odr, ns.
 LS: gry/tan, slight mott, fn xln, sm dense, sm brittle, many flakey/mealy, tr-nvp, SH: blk/drk gry/brn, silty, fw carb, no cup odr, ns.
 LS: gry/lt tan, slight mott, fn xln, sm dense, many brittle, fw flakey, tr-nvp, sm SH: gry/brn, silty, soft, no cup odr, ns.
 LS: gry/tan, mott in prt, fn xln, fw foss frags, sm dense, many flakey/mealy, tr-ppt por, 2 pcs spstd stns, dul yel flour, strm cup, vssfo, faint-? odr.
 LS: crm/lt tan, slight mott, fn xln, many dense, fw brittle, 4 pcs w/ fr inbdn por, spstd stns, gd fluor, strm cut, ssfo, faint-? cup odr.
 LS: tan/lt tan, sing, fn xln, mostly dense, fw firm, sub-chlky, tr-nvp, fw pcs pur chlk, fw SH: drk gry, silty, no cup odr, ns.
 LS: tan/gry, slight mott, fn xln, fw foss frags, mostly dense, sm firm, fw flakey/mealy, tr-nvp, fw SH: gry, silty, no cup odr, ns.
 LS: gry/lt tan, slight mott, fn xln, many dense, sm firm, flakey/mealy, tr-nvp, infix of SH: blk, carb, soft, no cup odr, ns.
 LS: tan/gry, mott in prt, fn xln, sm foss, mostly dense, many flakey/mealy, firm, 2 pcs w/ fr scat vuggy por, drk hvy stns in por, gd flour, strm cut, no cup odr, ssfo.
 LS: gry/tan, slight mott, fn xln, sm foss in prt, sm brittle, sub-chlky, sm flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: brn/gry, fissile, no odr, ns.
 LS: gry/lt brn, mott in prt, fn xln, fw foss frags, mostly dense, sm flakey, fw firm, tr-nvp, fw SH: brn/gry, silty, no cup odr, ns.
 LS: gry/lt tan, slight mott, fn xln, profuss ool, mostly brittle, gd oolcast por, svrl pcs pur chlk, no cup odr, ns.
 LS: lt gry/lt tan, slight mott, fn xln, sm profus ool, brittle, sm fr oolcast/vuggy por in sm, fw pcs pur chlk, no odr, ns.
 LS: gry/tan, mott in prt, fn xln, fw foss frags, sm dense, sm flakey/mealy, tr-nvp, abund SH: gry/brn/blk, silty, sm carb, soft, no odr, ns.
 LS: gry/lt brn, mott in prt, fn xln, fw foss frags, mostly dense, fw flakey, tr-nvp, fw pcs w/ drk brn stns, no fluor, no cut, pos drk dead oil, no odr, ns.
 LS: gry/tan, mott in prt, fn xln, sm ool, sm dense, pr oolcast/vuggy por in fw pcs, abund SH: drk gry/brn, silty, no cup odr, ns.
 LS: gry/lt brn, mott in prt, fn xln, fw foss frags, many flakey/mealy, firm, tr-nvp, abund SH: gry/brn, silty, no cup odr, ns.
 60" Smpl: much of the same mott LS: fn xln, flakey, tr-nvp, svrl SH: brn/gry, silty, no odr, ns.
 LS: gry/lt tan, slight mott, fn xln, many dense, flakey/mealy, tr-nvp, sm Chert: gry, sharp, svrl SH: blk, silty, carb, soft, no cup odr, ns.
 LS: gry/lt brn, slight mott, fn xln, fw foss, svrl flakey/mealy, sm firm, tr-nvp, fw Chert: gry/crm, sharp, no cup odr, ns.
 LS: gry/tan, slight mott, fn xln, fw foss frags, many flakey/mealy, sm firm, tr-nvp, fw SH: gry/brn, silty, no cup odr, ns.
 LS: gry/lt gry, mott in prt, fn xln, fw foss frags, mostly flakey/mealy, sm firm, tr-nvp, sm SH: gry/drk gry, silty, no cup odr, ns.
 LS: gry/lt gry, mott, fn xln, svrl foss in prt, sub-chlky, brittle, fw flakey like, tr-nvp, svrl pcs pur chlk, no cup odr, ns.
 LS: gry/lt gry, mott, fn xln, fw foss frags, mostly

01/09/2016 3043-42300
 1st Blow: BOB in 10" (No BB)
 2nd Blow: BOB in 10" (No BB)
 IFF: 34-178# ISIP: 1217# FFP:
 186-326# FSIP: 1215#
 HYDP: 2216-2051#
 670' Total Fluid, 236' Mud, 248'
 WCM (20% Wtr), 186' MW (50%
 Wtr).

Muncie Creek @ 4206' (-914)

Mud-Co Check #6 @
 4226' 01/09/16

wt	vis	pH
9.2	66	10.0
Filt	chl	LCM
8.8	7K	2#

CFS @ 4230'
 (30"/60")

CFS @ 4268'
 (30"/60")

CFS @ 4300'
 (30"/60")

Stark @ 4304' (-1012)

Mud-Co Check #7 @
 4310' 01/10/16

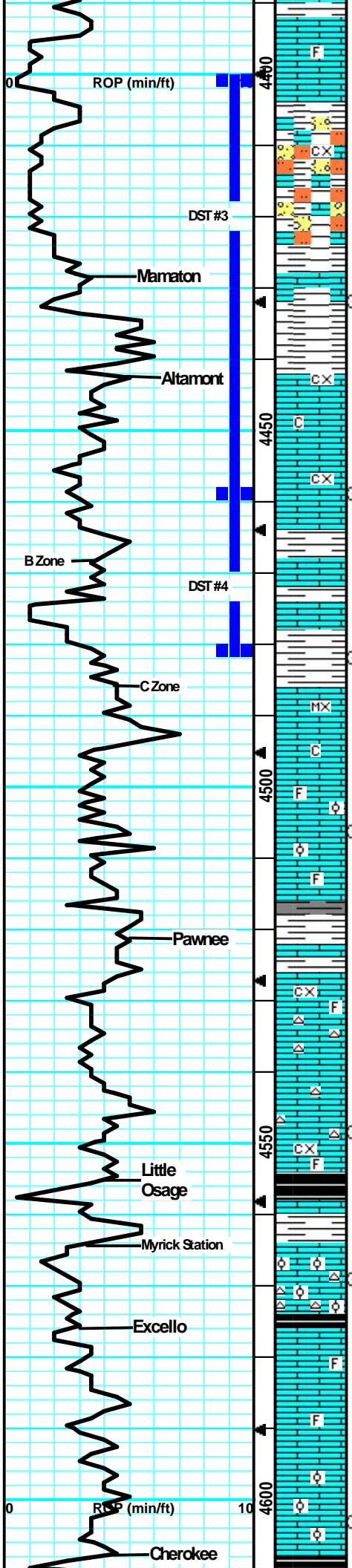
wt	vis	pH
9.3	59	10.5
Filt	chl	LCM
9.6	7.4K	2#

CFS @ 4342'
 (30"/60")

Hushpuckney @ 4347' (-1055)

CFS @ 4378'
 (30"/60")

B/KC @ 4384' (-1092)



flakey/mealy, firm, sub-chlky, tr-nvp, sm SH: gry/bm, silty, no cup odr, ns.

LS: tan/lt gry, slight mott in prt, fn xln, fw flakey like, svrl gritty/grainy, tr-pr intxn por in sm, svrl pcs pur chl, no cup odr, ns.

LS: gry/tan, mott in prt, fn xln, sm dense, many brittle, tr-nvp, abund SH: gry/bm, silty, sm soft, no cup odr, ns.

LS: gry/tan, mott in prt, fn-crs xln, many flakey/mealy, sm brittle, tr-nvp, svrl SH: gry/bm, silty, soft, fw StStr: brn/gry, gritty, frib, muddy like, no cup odr, ns.

LS: gry/tan, slight mott in prt, fn xln, mostly dense, sm firm, sub-chlky in fw, tr-ppr intxn por in fw lght brn patchy stns, dul yel flour, strmcut, only sml sphr of oil on brk, faint cup odr, v dense/tight.

SH: gry/bm, silty, soft, fw LS: gry/tan, slight mott, fn xln, flakey/mealy, dense, many firm, tr-nvp, no cup odr, ns.

LS: tan/lt gry, mott in prt, fn-crs xln, fw flakey, many firm, sub-chlky in prt, tr-nvp, fw SH: gry/bm, silty, no cup odr, ns.

LS: tan, slight mott, fn xln, mostly dense, sm firm, 2-3 pcs w lght brn patchy stns, gd flour, strmcut on brk, ssfo on brk, wk cup odr.

LS: tan/lt tan, slight mott, fn-crs xln, sm flakey/mealy, 4-5 pcs w patchy stns, sphr of oil cling to rx chp, gd cup odr, gd flour, strmcut, fr sfo on brk.

LS: tan/lt tan, slight mott, fn xln, chlky in prt, many brittle, sm fr-gd intxn por, slight brn stns, sml sphr of oil on rx chp, fw gas bub on brk, faint cup odr, fr sfo in svrl pcs.

LS: tan/lt gry, slight mott, micro-fn xln, sm dense, svrl chlky/brittle, spstd salt/pep stns, sml sphr of oil on rx chp, ssfo in 6-8 pcs, faint-? cup odr.

LS: crm/lt tan, slight mott, fn xln, mostly chlky/brittle, fw pcs ool, fr por in ool pcs 2-3 pcs w brn patchy stns, gd flour, pos cut resid, ssfo on brk, no cup odr.

SH: gry/bm/gm, silty, soft, sm waxy, fw LS: gry/tan, slight mott, fn xln, many dense, tr-nvp, no cup odr, ns.

LS: lt tan/lt gry, sing, micro-fn xln, mostly dense, many firm, tr-nvp, abund SH: gry/gm/bm, silty, soft, fw fissile, no cup odr, ns.

LS: gry/tan, slight mott, fn xln, mostly dense, sm firm, sub-chlky in prt, many flakey/mealy, tr-nvp, svrl SH: gry/gm/bm, silty, soft, no cup odr, ns.

LS: gry/tan, slight mott, fn xln, v fw foss/ool, many dense, firm, flakey, tr-nvp, fw SH: gry/gm, silty, no cup odr, ns.

LS: gry/tan, slight mott, fn xln, fw ool, sm firm, many flakey/mealy, sub-chlky in prt, tr-nvp, svrl SH: drk gry/gm, silty, no cup odr, ns.

SH: gry/blu/blk, silty, sm soft, fw carb, gritty, fw muddy like, v fw LS: tan, fn xln, dense, flakey, hard, tr-nvp, no cup odr, ns.

LS: gry/lt brn, mott in prt, fn-crs xln, many flakey/mealy, sm hard, fw lrg nodul, tr-nvp, fw SH: gry, silty, no cup odr, ns.

LS: gry/tan, mott in prt, fn-crs xln, sm foss, flakey, firm, tr-nvp, 2 pcs w lght brn min stns, faint-? flour, no cut, nsfo, no cup odr.

LS: gry/tan, mott in prt, fn xln, many flakey/mealy, fw dense, hard, tr-nvp, fw Chert: drk gry, smokey, foss, sharp, no cup odr, ns.

LS: gry/tan, slight mott, fn xln, dense, firm, svrl flakey, tr-nvp, fw Chert: drk gry, foss, sharp, fw SH: drk gry, silty, soft, no cup odr, ns.

LS: gry/tan, slight mott, fn-crs xln, many firm/hard, mostly flakey/mealy, tr-nvp, svrl SH: gry/blk, silty, soft, many carb, no cup odr, ns.

LS: gry/lt brn, mott in prt, fn xln, sm foss, many dense, sm hard, tr-nvp, fw pcs pur chl, no cup odr, ns.

LS: gry/tan, mott in prt, fn xln, v ool, many brittle, tr-pr intool por in fw, sm Chert: wht/opaque, foss, sharp, no cup odr, ns.

LS: gry/tan, mott, in prt, fn xln, sm v ool, many dense/firm, tr-nvp, sm SH: drk gry/blk, silty, soft, sm carb, no cup odr, ns.

LS: tan/gry, slight mott, fn xln, fw foss frags, many dense, sm flakey/mealy, firm, tr-nvp, no cup odr, ns.

LS: gry/tan, slight mott, fn xln, mostly dense, sm flakey/mealy, firm, tr-nvp, sm SH: gry/lt brn, silty, no cup odr, ns.

LS: tan/lt gry, mott in prt, fn xln, sm ool, many dense, sm flakey/mealy, tr-nvp, svrl SH: gry/bm, silty, no cup odr, ns.

SH: gry/blk/bm, silty, soft, sm carb, fw LS: gry/lt brn, mott in prt, fn xln, many flakey/mealy, hard, tr-nvp, no

Mud-Co Check #8 @ 4482' 01/11/16

wt	vis	pH
8.9	53	10.0
Flt	chr	LCM
8.8	7K	2#

Marmaton @ 4428' (-1136)

CFS @ 4432' (30"/60")

Altamont @ 4442' (-1150)

CFS @ 4459' (30"/60")

DST #3 4400'-4459' "Altamont A"
 01/10/2016 30-45-45-60
 1st Blow: BOB in 7" (No BB)
 2nd Blow: BOB in 10" (No BB)
 IFP: 84-256# ISIP: 1272# FFP: 261-414#
 FSIP: 1270#
 HYDP: 2464-2218#
 930' Total Fluid, 310' OCWM (20% Oil, 10% Wtr), 310' GOCMW (10% Oil, 50% Wtr, 30% Mud), 186' GOCMW (40% Oil, 30% Wtr, 10% Mud), 124' OCWM (10% Oil, 80% Wtr).

CFS @ 4506' (30"/60")

Pawnee @ 4521' (-1229)

DST #4 4459'-4482' "Altamont B"
 01/11/2016 30-45-45-60
 1st Blow: BOB in 18" (BB bit to 2 1/4")
 2nd Blow: BOB in 23" (BB bit to 1")
 IFP: 20-83# ISIP: 500# FFP: 88-143# FSIP: 492#
 HYDP: 2349-2268#
 Total Rec: 341', 155' GO (50% Oil), 124' OCWM (10% Oil, 10% Wtr), 62' OCWM (5% Oil, 75% Wtr).

CFS @ 4548' (30"/60")

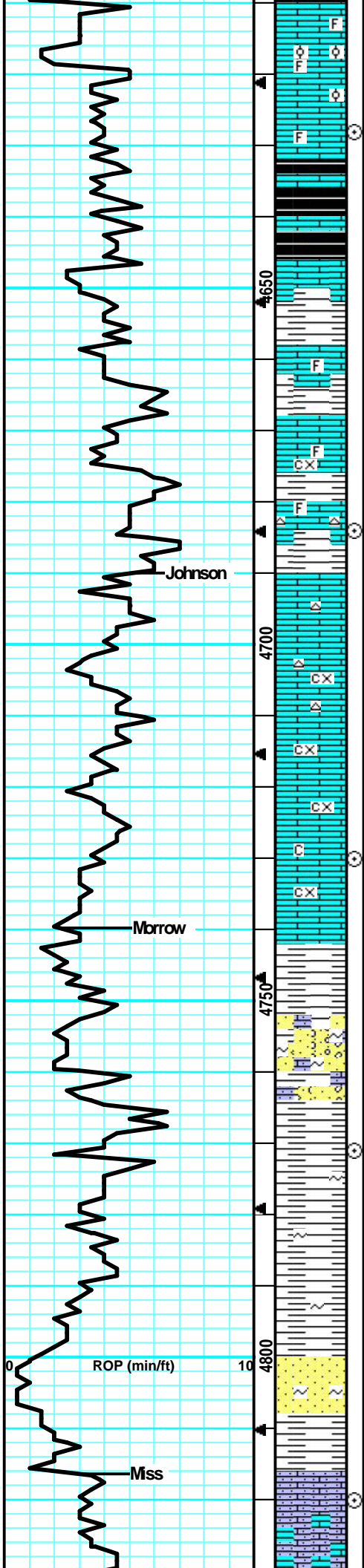
Little Osage @ 4555' (-1263)

CFS @ 4569' (30"/60")

Excello @ 4576' (-1284)

CFS @ 4603' (30"/60")

Cherokee @ 4608' (-1316)



cup odr, ns.
 Gry/tan, slight mott, fn xln, sm foss, many flakey/mealy, fw brittle, tr-nvp, fw SHt gry/brn, silty, no cup odr, ns.
 LS: tan/gry, slight mott, fn xln, sm foss/ool, mostly brittle, sub-chlky in prt, tr-nvp, svrl SHt gry/brn, silty, no cup odr, ns.
 LS: gry/tan, slight mott in prt, fn xln, fw foss frags, mostly dense, sm firm, tr-nvp, svrl SHt gry/brn/blk, fw carb, sm fissile, no cup odr, ns.
 LS: gry/lt brn, mott in prt, fn xln, many flakey, mostly firm, fw lrg calc nod, fw SHt gry/brn, silty, no cup odr, ns.
 LS: gry/tan/lt brn, mott in prt, fn xln, mostly flakey, many firm, tr-nvp, svrl SHt gry/brn, silty, no cup odr, ns.
 LS: gry/tan, mott in prt, fn xln, fw foss frags, many flakey/mealy, fw brittle, tr-nvp, svrl SHt gry/brn/blk, silty, no cup odr, ns.
 LS: gry/tan, slight mott, fn xln, sm flakey/brittle, sub-chlky, others dense/firm, tr-nvp, svrl SHt brn/gry/blk, silty, soft, fw carb, no cup odr, ns.
 LS: tan/lt brn, slight mott, fn-crs xln, sm foss in prt, many flakey/mealy, brittle, pr intxln por in sm, fw SHt gry/brn, silty, no cup odr, ns.
 LS: tan/lt brn, slight mott, fn xln, dense, hard, lrg calc nod, many are flakey/mealy, tr-nvp, fw Chert: brn/gry, foss, sharp, no cup odr, ns.
 LS: gry/lt brn, mott in prt, fn xln, flakey/mealy, many firm, tr-nvp, svrl SHt gry, silty, soft, no cup odr, ns.
 LS: gry/tan, slight mott, fn-crs xln, sm dense, mostly flakey/mealy, sub-chlky in prt, fw firm, tr-nvp, fw Chert: gry, smokey, no cup odr, ns.
 LS: gry/lt gry, mott, fn-crs xln, flakey/mealy, sm hard, sm por intxln por in fw, svrl SHt drk gry silty, soft, no cup odr, ns.
 LS: gry/lt brn, slight mott, fn-crs xln, sm flakey/mealy, svrl hard, tr-nvp, svrl SHt gry/brn, silty, sm fissile, no cup odr, ns.
 LS: gry/lt brn, slight mott, fn-crs xln, sm dense, many flakey, svrl firm, fw sub-chlky/brittle, tr-nvp, no cup odr, ns.
 SHt gry/brn/blu, silty, sm v soft, friable, fw fissile, fw LS: gry/lt brn, slight mott, fn xln, fw flakey, many dense, tr-nvp, no cup odr, ns.
 SHt gry/brn/yel, soft, sm wthrd, fw waxy, fw SS: gry/tan, fn gm, sub-rnd, arg, chlky, friable, tr-nvp, fw LS: gry, fn-crs xln, flakey, tr-nvp, no odr, ns.
 LS: gry/lt tan, mott in prt, fn xln, sandy/grainy, sm flakey, brittle in prt, tr-nvp, sm SS: gry/lt tan, fn gm sub-rnd, arg, chlky, friable, tr-nvp, abund SHt gry/gm/brn, silty, soft, no cup odr, ns.
 SHt gry/drk brn/gm/yel, sm soft, sm wthrd, fw waxy, fw LS: gry/tan, slight mott, fn xln, mostly dense, tr-nvp, no cup odr, ns.
 SHt gry/brn/yel/gm, silty, soft, fw waxy, sm wthrd, fw LS: gry/tan, slight mott, dense, firm, flakey, tr-nvp, no cup odr, ns.
 SHt gry/brn/yel, sm soft, fw waxy, sm wthrd, fw LS: gry/tan, slight mott, fn xln, sm dense, flakey, tr-nvp, fw SS: gry, arg, sub-rnd, glauc, tr-nvp, no odr, ns.
 SS: crm/lt tan, fn gm, sub-rnd, sil cem, arg, slight frib, tr-nvp, abund SHt drk gry, silty, fissile, no cup odr, ns.
 SHt gry/drk gry/brn, silty, soft, fw fissile, fw waxy, sm LS: crm/lt tan, sandy/gritty, firm, sm friable, fw SS: crm/lt tan, fn-gm, slight arg, sil cem, tr-nvp, no cup odr, ns.
 LS: crm/lt tan, sing, fn xln, mostly sandy/gritty, firm, fw friable, tr-nvp, svrl SHt drk gry/gm, silty, no cup odr, ns.

CFS @ 4628'
 (30"/60")

Mud-Co Check #9 @
 4620' 01/12/16
 wt vis pH
 9.3 62 10.5
 Filr chlr LCM
 9.2 6.6K 2#

CFS @ 4684'
 (30"/60")

Johnson @ 4690' (-1398)

CFS @ 4730'
 (30"/60")

Morrow @ 4740' (-1448)

CFS @ 4771'
 (30"/60")

Mississippi @ 4816' (-1524)
 CFS @ 4820'
 (30"/60")

Abund of Shale Slough ----->

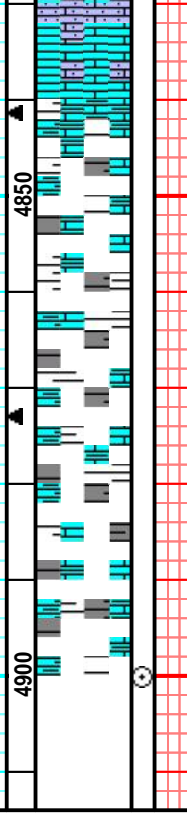
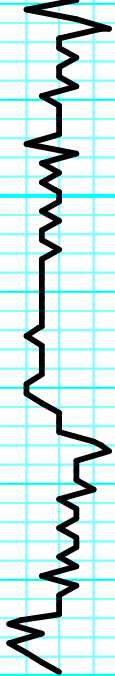
LS: crm/lt tan, sing, fn xln, sandy/gritty, chlky, sm friable, mostly brittle, tr-nvp, svrl SH: gry/grn, silty, soft, fw fissile, no cup odr, ns.

LS: crm/lt tan, sing, fn xln, sm sandy/gritty, sm dense, tr-nvp, huge influx of SH: 90% gry/brn, silty, fissile, no cup odr, ns.

Sample Quality was bad. Nothing but abound of Shale w/ sml amounts of Miss LS.

Mud-Co Check #10 @
 4890' 01/13/16
 wt vis pH
 9.3 54 10.0
 Filt chlr LCM
 8.8 5K 2#

CFS @ 4900'
(30"/60")



RTD 4900' (-1608)
LTD 4899' (-1607)



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Ritchie Exploration

23-15s-36w Logan Ks

8100 E 22nd st N 700
Wichita, Ks 67278

Wing Trust 23 A #1

ATTN: John Goldsmith

Job Ticket: 64530

DST#: 1

Test Start: 2016.01.08 @ 11:00:55

GENERAL INFORMATION:

Formation: **Toronto**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 12:51:55

Time Test Ended: 18:04:55

Test Type: Conventional Bottom Hole (Initial)

Tester: Brandon Turley

Unit No: 79

Interval: 3980.00 ft (KB) To 4020.00 ft (KB) (TVD)

Reference Elevations: 3292.00 ft (KB)

Total Depth: 4020.00 ft (KB) (TVD)

3287.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 5.00 ft

Serial #: 8166 Outside

Press@RunDepth: 182.61 psig @ 3981.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2016.01.08

End Date: 2016.01.08

Last Calib.: 2016.01.08

Start Time: 11:01:00

End Time: 18:04:54

Time On Btm: 2016.01.08 @ 12:50:55

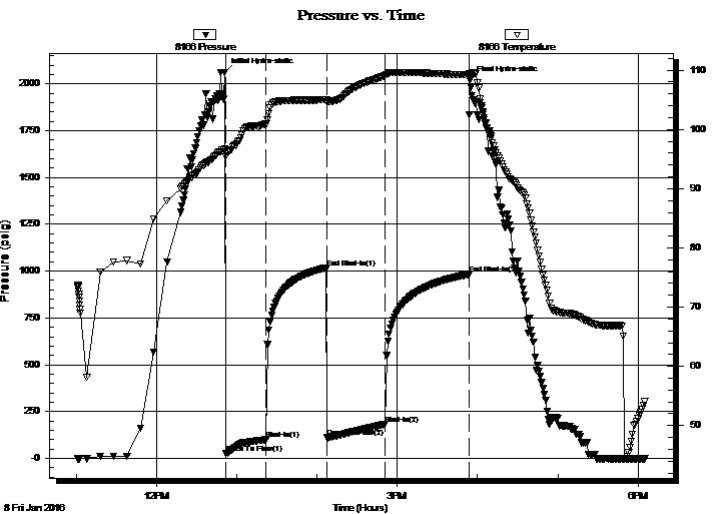
Time Off Btm: 2016.01.08 @ 15:54:25

TEST COMMENT: IF: 1/4 blow BOB in 23 min.

IS: No return.

FF: BOB in 29 min.

FS: No return.



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2060.07	96.67	Initial Hydro-static
1	24.72	95.40	Open To Flow (1)
31	101.24	100.88	Shut-In(1)
76	1017.83	104.98	End Shut-In(1)
77	110.66	104.67	Open To Flow (2)
120	182.61	109.10	Shut-In(2)
183	982.87	109.20	End Shut-In(2)
184	2019.02	108.65	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
124.00	mcw 90%w 10%m	0.67
124.00	ocw m 5%o 35%w 60%m	1.74
93.00	gocm 10%g 30%o 60%m	1.30
41.00	go 30%g 70%o	0.58

Gas Rates

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



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration

23-15s-36w Logan Ks

8100 E 22nd st N 700
Wichita, Ks 67278

Wing Trust 23 A #1

Job Ticket: 64530

DST#: 1

ATTN: John Goldsmith

Test Start: 2016.01.08 @ 11:00:55

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

0 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

6000 ppm

Viscosity: 67.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.60 in³

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 5400.00 ppm

Filter Cake: 1.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
124.00	mcw 90%w 10%m	0.674
124.00	ocw m 5%o 35%w 60%m	1.739
93.00	gocm 10%g 30%o 60%m	1.305
41.00	go 30%g 70%o	0.575

Total Length: 382.00 ft

Total Volume: 4.293 bbl

Num Fluid Samples: 0

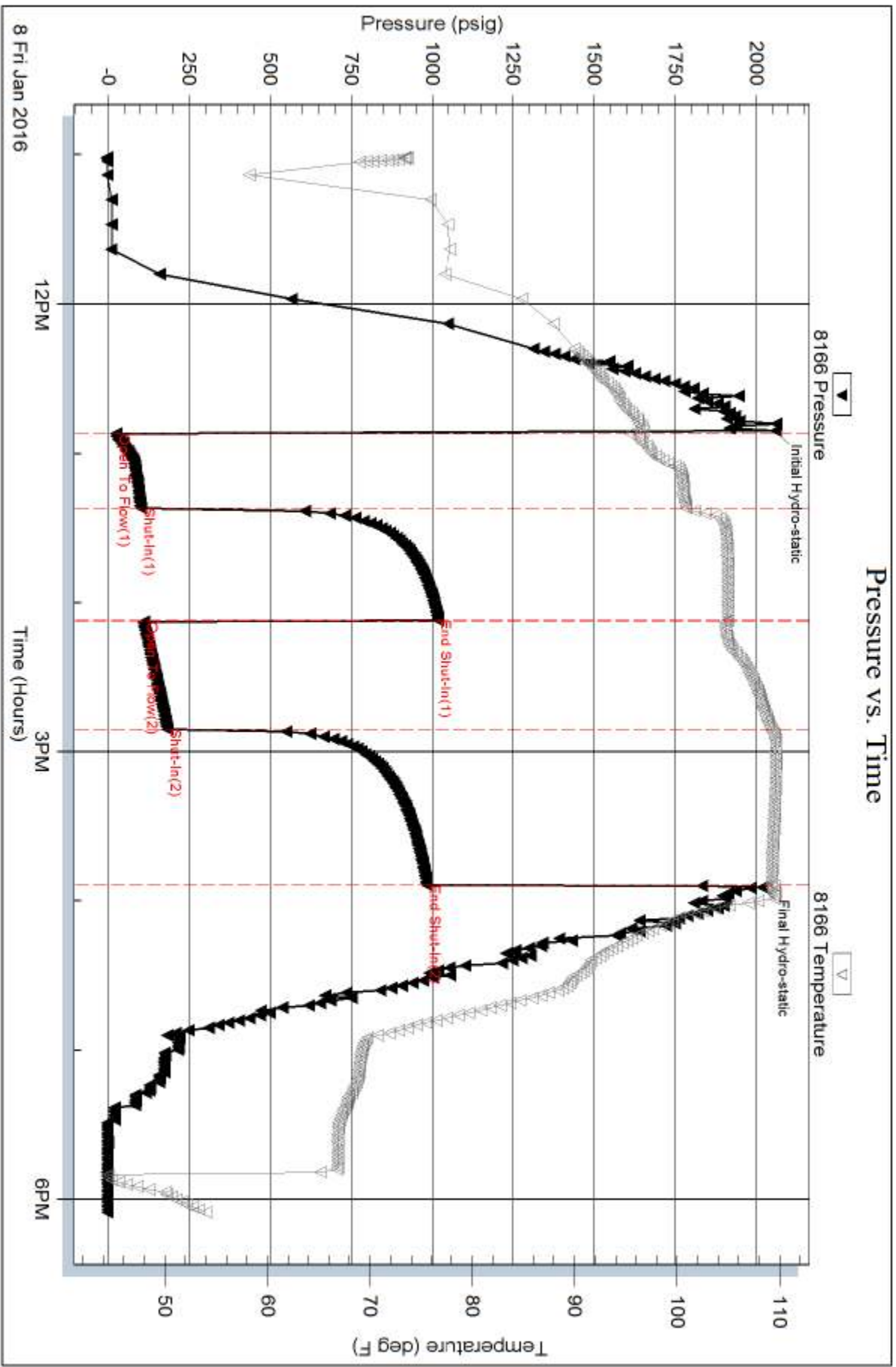
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: 1.4@63=6000



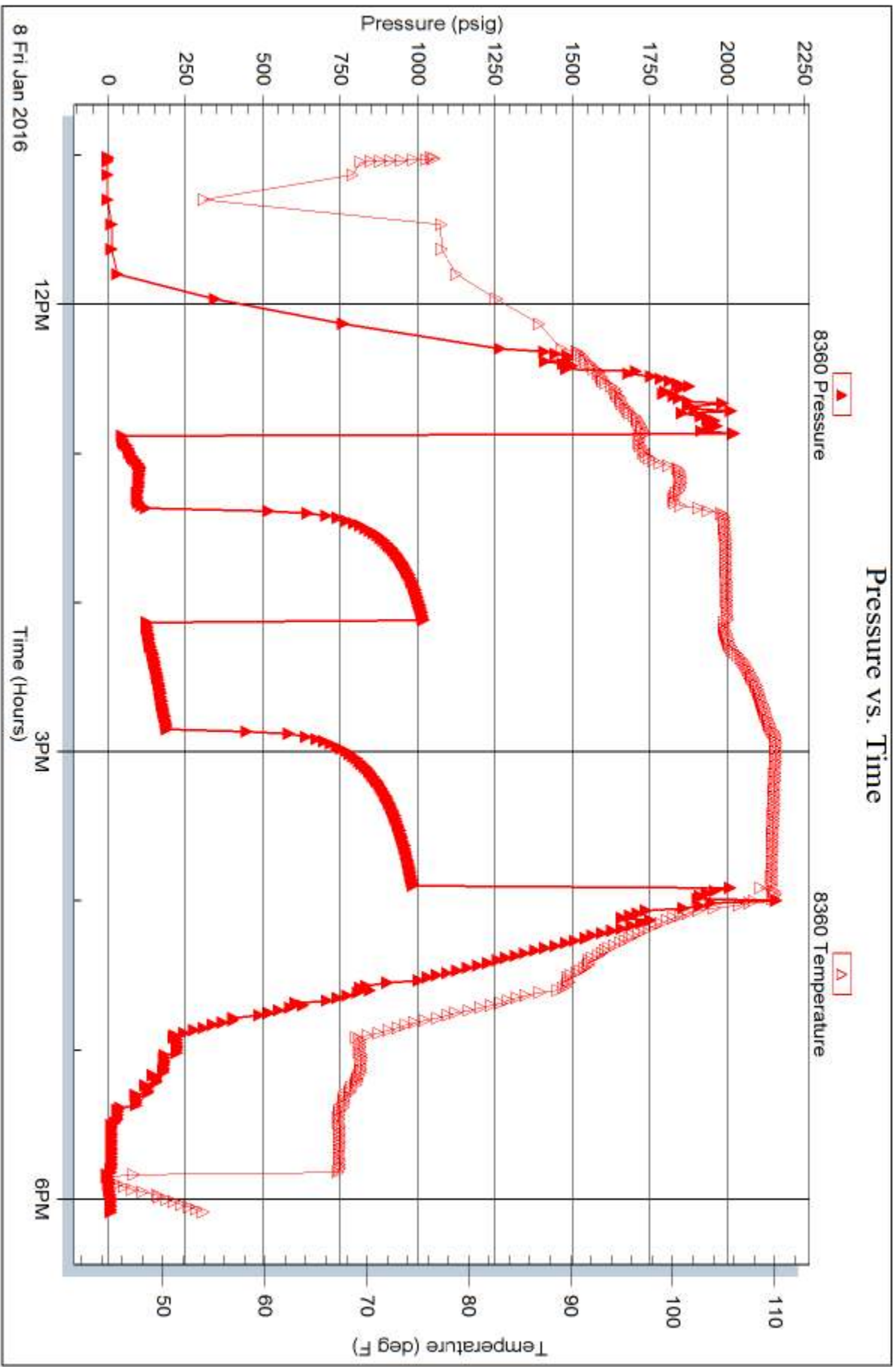
Serial #: 8360

Inside

Richie Exploration

Wing Trust 23 A #1

DST Test Number: 1



Trilobite Testing, Inc

Ref. No: 64530

Printed: 2016.01.08 @ 18:57:46



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Ritchie Exploration

23-15s-36w Logan Ks

8100 E 22nd st N 700
Wichita, Ks 67278

Wing Trust 23 A #1

ATTN: John Goldsmith

Job Ticket: 64530

DST#: 1

Test Start: 2016.01.08 @ 11:00:55

GENERAL INFORMATION:

Formation: **Toronto**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 12:51:55

Time Test Ended: 18:04:55

Test Type: Conventional Bottom Hole (Initial)

Tester: Brandon Turley

Unit No: 79

Interval: 3980.00 ft (KB) To 4020.00 ft (KB) (TVD)

Reference Elevations: 3292.00 ft (KB)

Total Depth: 4020.00 ft (KB) (TVD)

3287.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 5.00 ft

Serial #: 8166 Outside

Press@RunDepth: 182.61 psig @ 3981.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2016.01.08

End Date: 2016.01.08

Last Calib.: 2016.01.08

Start Time: 11:01:00

End Time: 18:04:54

Time On Btm: 2016.01.08 @ 12:50:55

Time Off Btm: 2016.01.08 @ 15:54:25

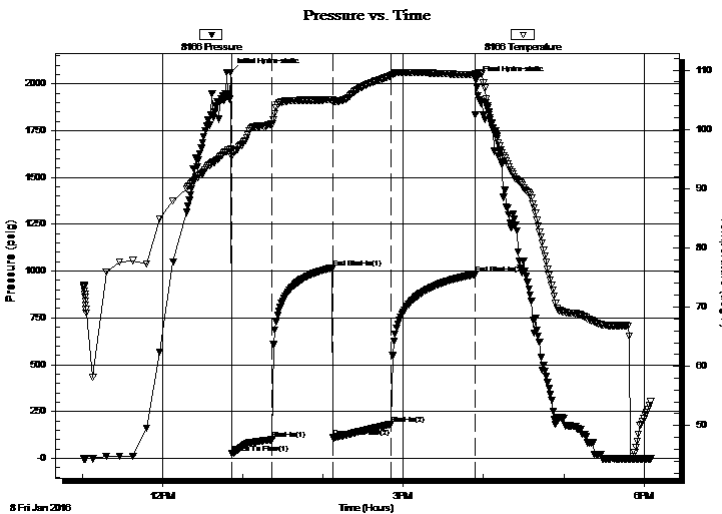
TEST COMMENT: IF: 1/4 blow BOB in 23 min.

IS: No return.

FF: BOB in 29 min.

FS: No return.

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2060.07	96.67	Initial Hydro-static
1	24.72	95.40	Open To Flow (1)
31	101.24	100.88	Shut-In(1)
76	1017.83	104.98	End Shut-In(1)
77	110.66	104.67	Open To Flow (2)
120	182.61	109.10	Shut-In(2)
183	982.87	109.20	End Shut-In(2)
184	2019.02	108.65	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
124.00	mcw 90%w 10%m	0.67
124.00	ocw m 5%o 35%w 60%m	1.74
93.00	gocm 10%g 30%o 60%m	1.30
41.00	go 30%g 70%o	0.58

Gas Rates

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



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration

23-15s-36w Logan Ks

8100 E 22nd st N 700
Wichita, Ks 67278

Wing Trust 23 A #1

Job Ticket: 64530

DST#: 1

ATTN: John Goldsmith

Test Start: 2016.01.08 @ 11:00:55

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

0 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

6000 ppm

Viscosity: 67.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.60 in³

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 5400.00 ppm

Filter Cake: 1.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
124.00	mcw 90%w 10%m	0.674
124.00	ocw m 5%o 35%w 60%m	1.739
93.00	gocm 10%g 30%o 60%m	1.305
41.00	go 30%g 70%o	0.575

Total Length: 382.00 ft

Total Volume: 4.293 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

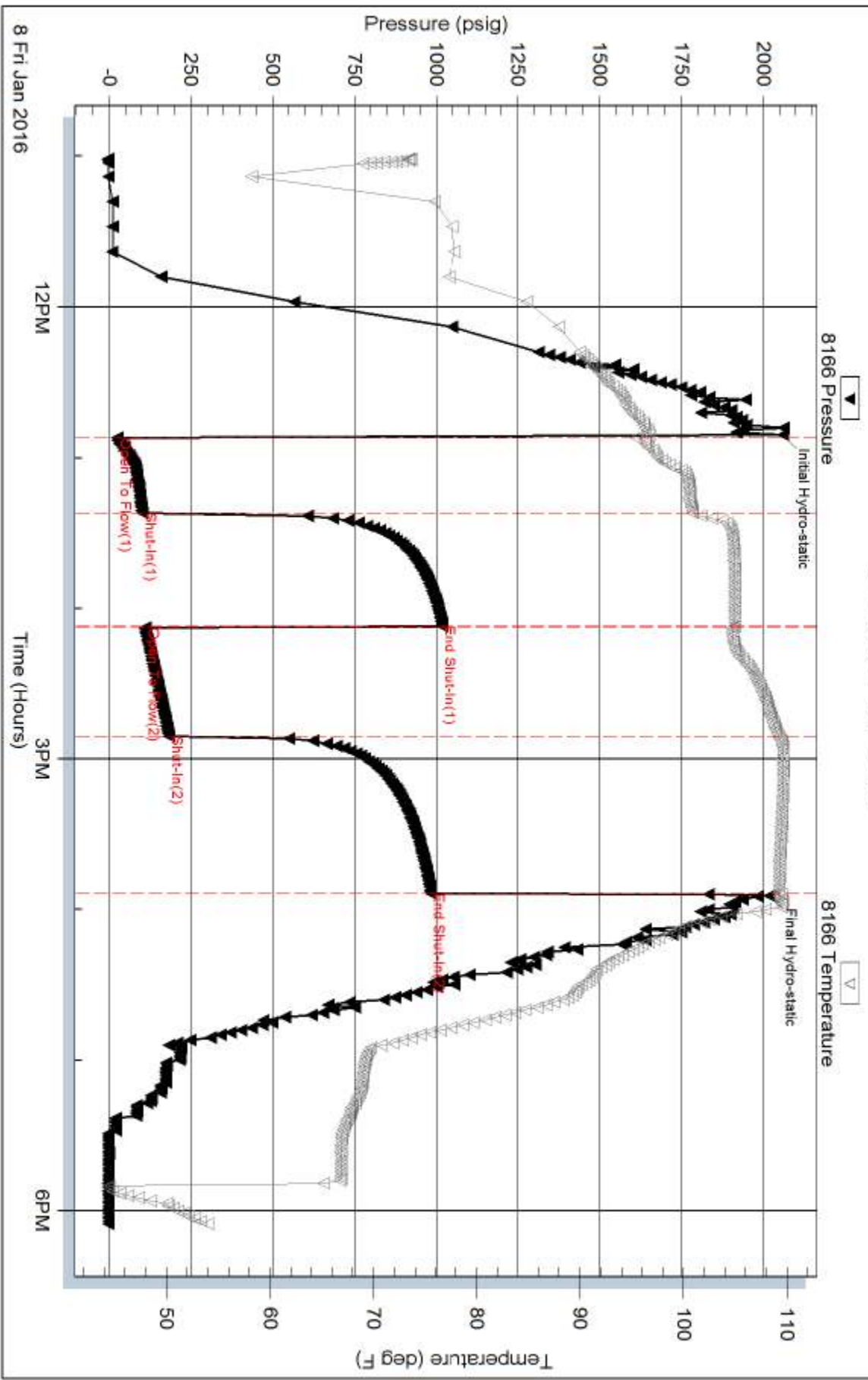
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: 1.4@63=6000

Pressure vs. Time



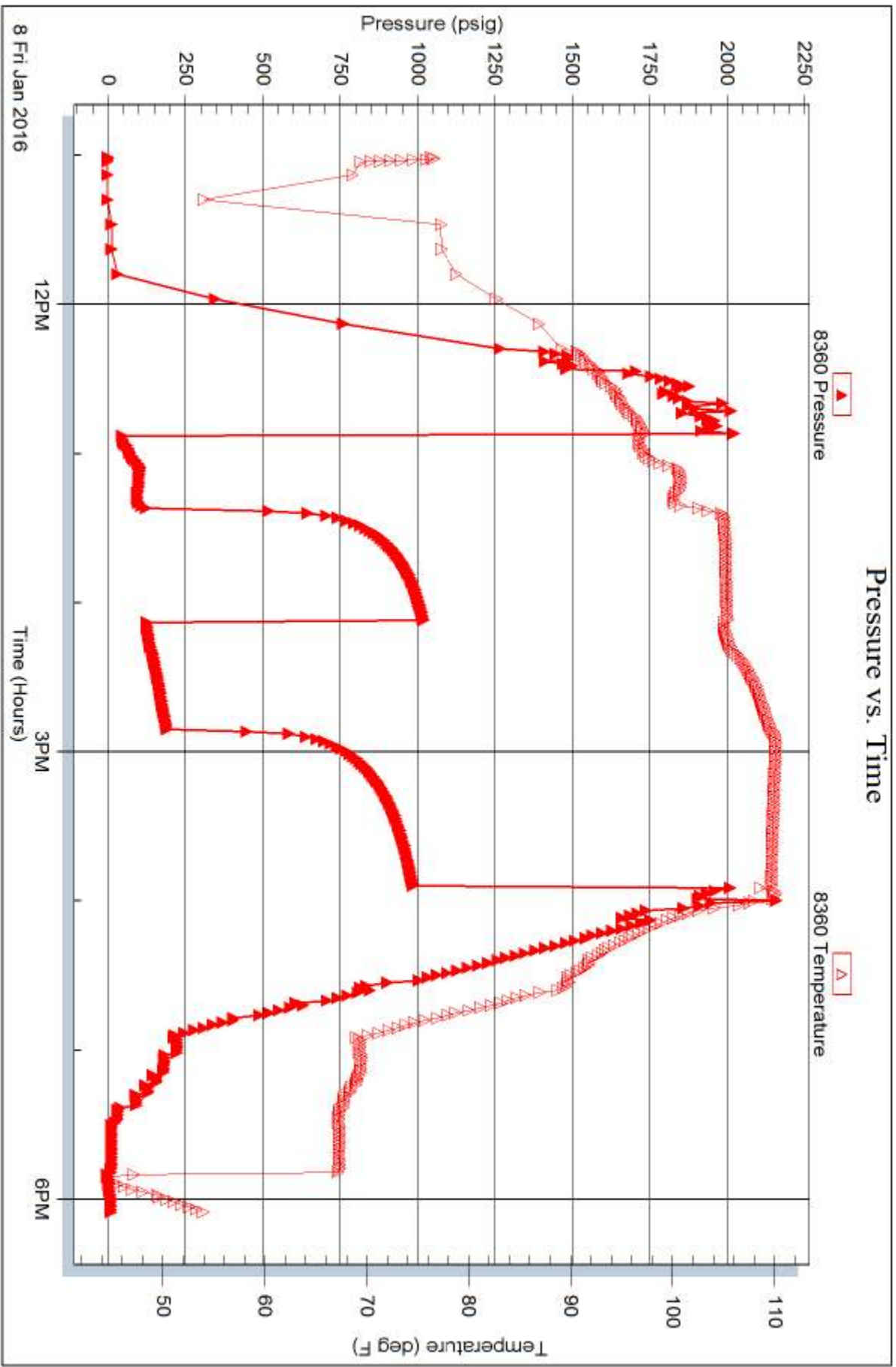
Serial #: 8360

Inside

Richie Exploration

Wing Trust 23 A #1

DST Test Number: 1





**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

Ritchie Exploration

23-15s-36w Logan Ks

8100 E 22nd st N 700
Wichita, Ks 67278

Wing Trust 23 A #1

ATTN: John Goldsmith

Job Ticket: 64531

DST#: 2

Test Start: 2016.01.09 @ 22:15:17

GENERAL INFORMATION:

Formation: **HIJ**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 00:35:17
 Time Test Ended: 05:46:47
 Interval: **4200.00 ft (KB) To 4300.00 ft (KB) (TVD)**
 Total Depth: 4300.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Good
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Brandon Turley
 Unit No: 79
 Reference Elevations: 3292.00 ft (KB)
 3287.00 ft (CF)
 KB to GR/CF: 5.00 ft

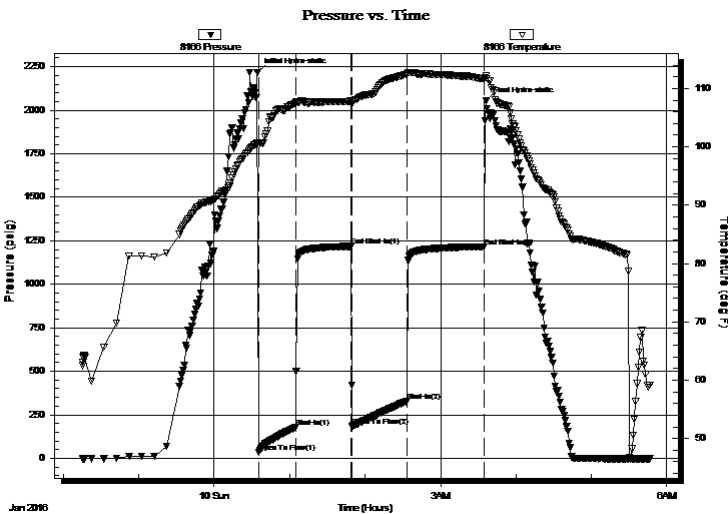
Serial #: 8166

Outside

Press@RunDepth: 326.63 psig @ 4201.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2016.01.09 End Date: 2016.01.10 Last Calib.: 2016.01.10
 Start Time: 22:15:22 End Time: 05:46:46 Time On Btm: 2016.01.10 @ 00:34:17
 Time Off Btm: 2016.01.10 @ 03:36:17

TEST COMMENT: IF: BOB in 10 min.
 IS: No return.
 FF: BOB in 10 min.
 FS: No return.

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2216.91	100.59	Initial Hydro-static
1	34.41	100.26	Open To Flow (1)
31	178.61	107.43	Shut-In(1)
75	1217.92	107.80	End Shut-In(1)
76	186.14	107.62	Open To Flow (2)
119	326.63	112.47	Shut-In(2)
181	1215.84	111.62	End Shut-In(2)
182	2051.88	112.15	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
186.00	mw 50%w 50%m	1.54
248.00	w cm 20%w 80%m	3.48
236.00	mud 100%m	3.31

* Recovery from multiple tests

Gas Rates

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



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration

23-15s-36w Logan Ks

8100 E 22nd st N 700
Wichita, Ks 67278

Wing Trust 23 A #1

Job Ticket: 64531

DST#: 2

ATTN: John Goldsmith

Test Start: 2016.01.09 @ 22:15:17

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

0 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

25000 ppm

Viscosity: 66.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 8.79 in³

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 7000.00 ppm

Filter Cake: 1.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
186.00	mw 50%w 50%m	1.543
248.00	w cm 20%w 80%m	3.479
236.00	mud 100%m	3.310

Total Length: 670.00 ft Total Volume: 8.332 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: .33@57=25000



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Ritchie Exploration

23-15s-36w Logan Ks

8100 E 22nd st N 700
Wichita, Ks 67278

Wing Trust 23 A #1

ATTN: John Goldsmith

Job Ticket: 64532

DST#: 3

Test Start: 2016.01.10 @ 22:28:34

GENERAL INFORMATION:

Formation: **Altamont**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 00:29:34

Time Test Ended: 05:53:04

Test Type: Conventional Bottom Hole (Reset)

Tester: Brandon Turley

Unit No: 79

Interval: 4400.00 ft (KB) To 4459.00 ft (KB) (TVD)

Reference Elevations: 3292.00 ft (KB)

Total Depth: 4459.00 ft (KB) (TVD)

3287.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 5.00 ft

Serial #: 8166 Outside

Press@RunDepth: 414.69 psig @ 4401.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2016.01.10

End Date:

2016.01.11

Last Calib.:

2016.01.11

Start Time: 22:28:39

End Time:

05:53:03

Time On Btm:

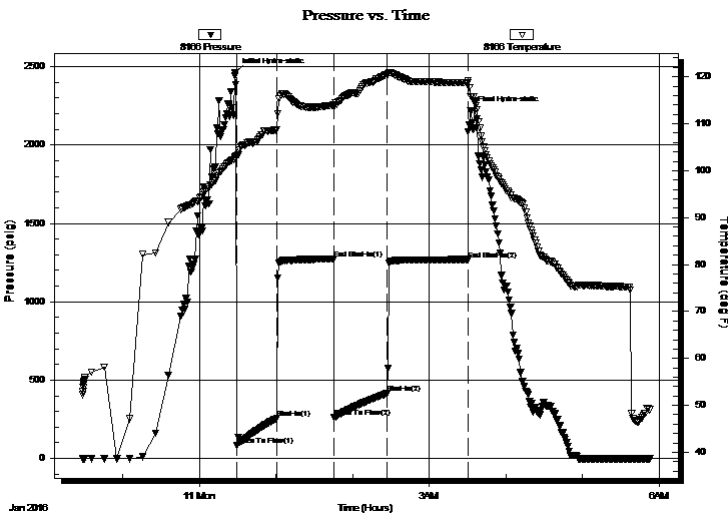
2016.01.11 @ 00:28:04

Time Off Btm:

2016.01.11 @ 03:32:34

TEST COMMENT: IF: BOB in 7 min.
IS: No return.
FF: BOB in 10 min.
FS: No return.

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2464.29	103.00	Initial Hydro-static
2	84.48	103.12	Open To Flow (1)
33	256.84	108.65	Shut-In(1)
77	1272.31	113.93	End Shut-In(1)
78	261.89	113.52	Open To Flow (2)
119	414.69	120.49	Shut-In(2)
182	1270.09	118.77	End Shut-In(2)
185	2218.32	115.80	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
124.00	ocmw 10%o 80%w 10%m	0.67
186.00	gocmw 20%g 40%o 30%w 10%m	2.61
310.00	gocw m 10%g 10%o 50%w 30%m	4.35
310.00	ocw m 20%o 10%w 70%m	4.35

Gas Rates

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

* Recovery from multiple tests



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration

23-15s-36w Logan Ks

8100 E 22nd st N 700
Wichita, Ks 67278

Wing Trust 23 A #1

Job Ticket: 64532

DST#: 3

ATTN: John Goldsmith

Test Start: 2016.01.10 @ 22:28:34

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

0 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

19000 ppm

Viscosity: 59.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 9.59 in³

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 7400.00 ppm

Filter Cake: 1.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
124.00	ocmw 10%o 80%w 10%m	0.674
186.00	gocmw 20%g 40%o 30%w 10%m	2.609
310.00	gocw m 10%g 10%o 50%w 30%m	4.348
310.00	ocw m 20%o 10%w 70%m	4.348

Total Length: 930.00 ft Total Volume: 11.979 bbl

Num Fluid Samples: 0

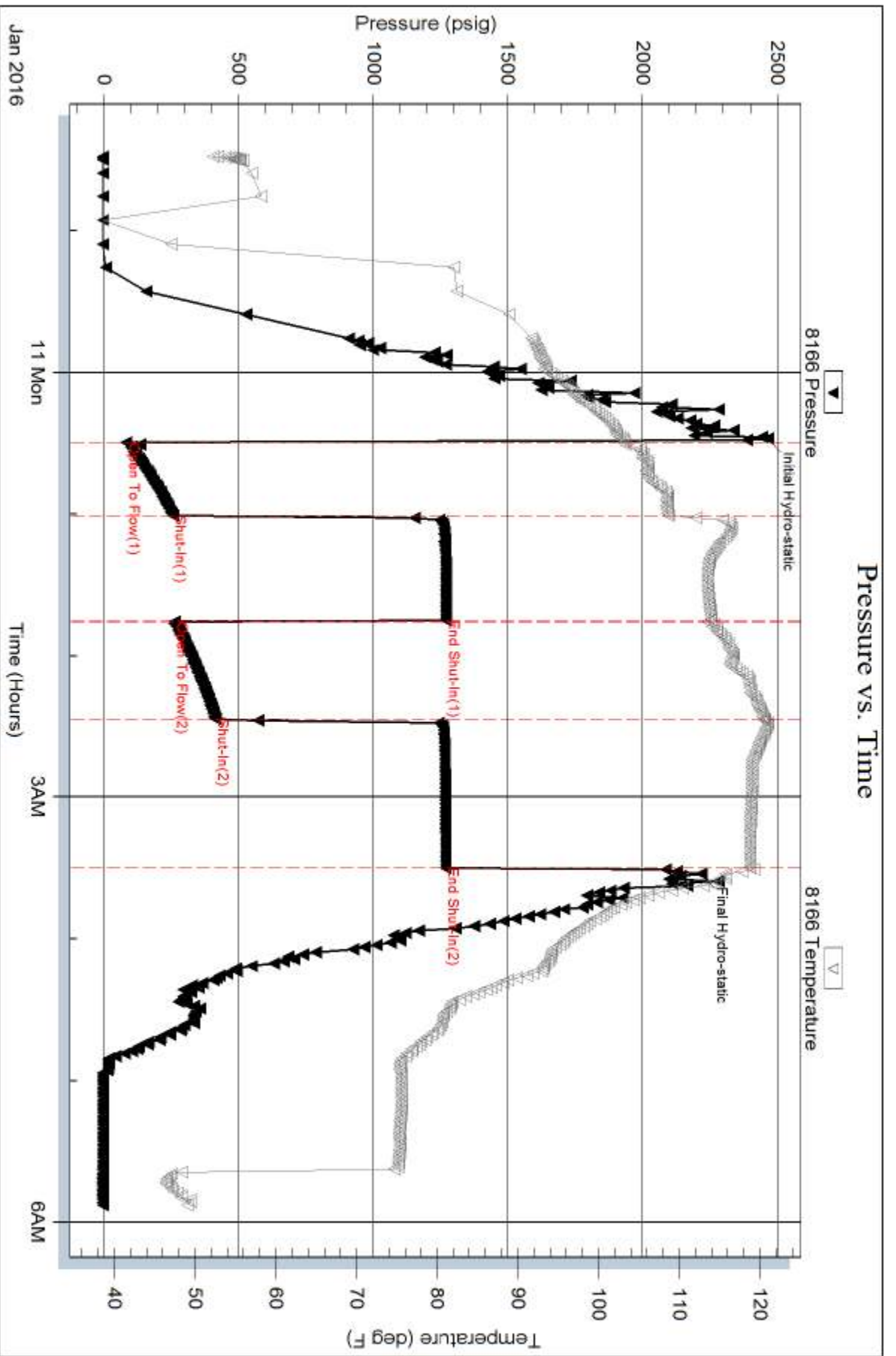
Num Gas Bombs: 0

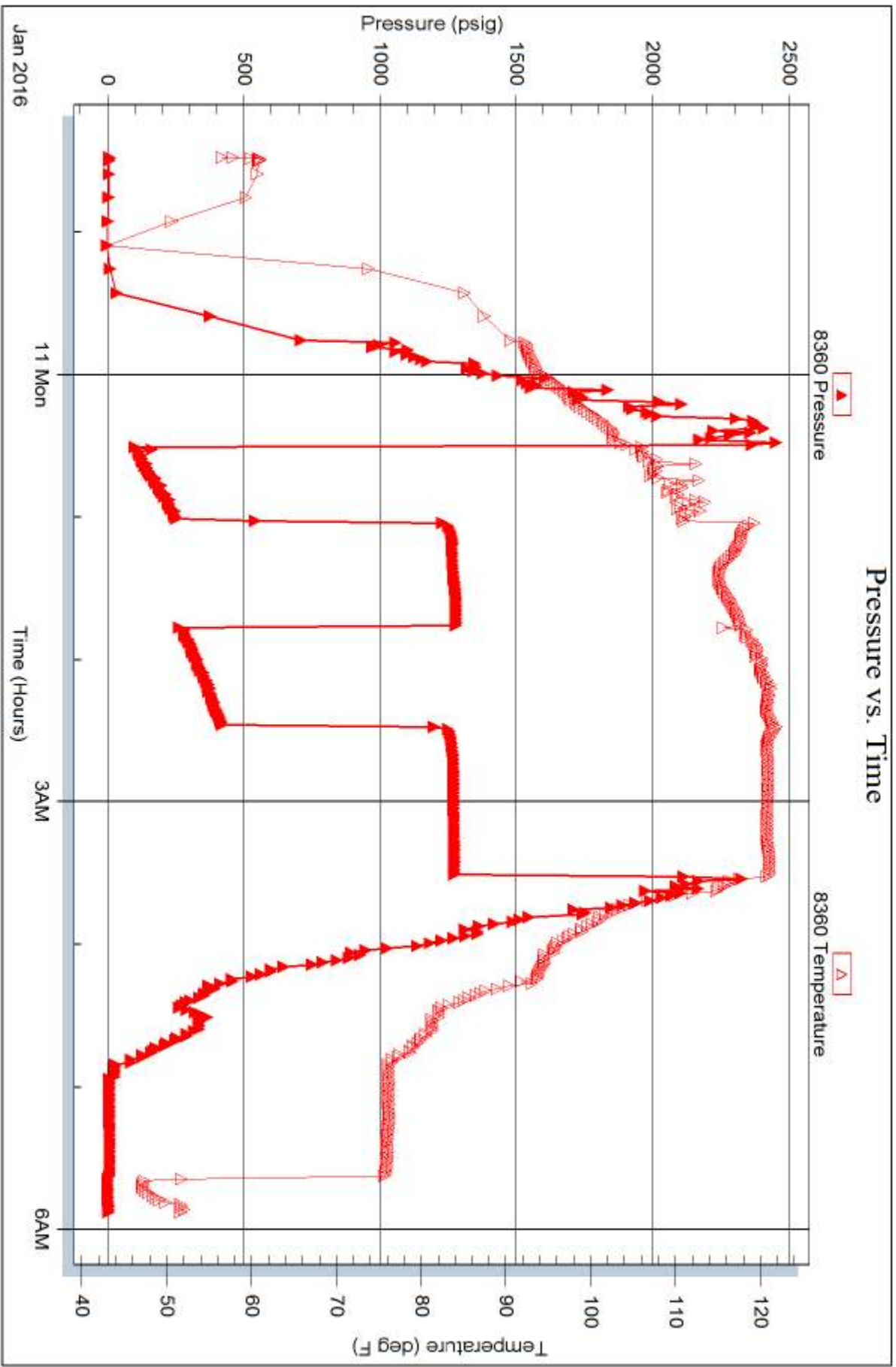
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: .44@56=19000







**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Ritchie Exploration

23-15s-36w Logan Ks

8100 E 22nd st N 700
Wichita, Ks 67278

Wing Trust 23 A #1

ATTN: John Goldsmith

Job Ticket: 64533

DST#: 4

Test Start: 2016.01.11 @ 13:11:45

GENERAL INFORMATION:

Formation: **Altamont B**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 15:57:45

Time Test Ended: 19:53:45

Test Type: Conventional Bottom Hole (Reset)

Tester: Brandon Turley

Unit No: 79

Interval: 4459.00 ft (KB) To 4482.00 ft (KB) (TVD)

Reference Elevations: 3292.00 ft (KB)

Total Depth: 4482.00 ft (KB) (TVD)

3287.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 5.00 ft

Serial #: 8166 Outside

Press @ Run Depth: 143.89 psig @ 4460.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2016.01.11

End Date:

2016.01.11

Last Calib.:

2016.01.11

Start Time: 13:11:50

End Time:

19:53:44

Time On Btm:

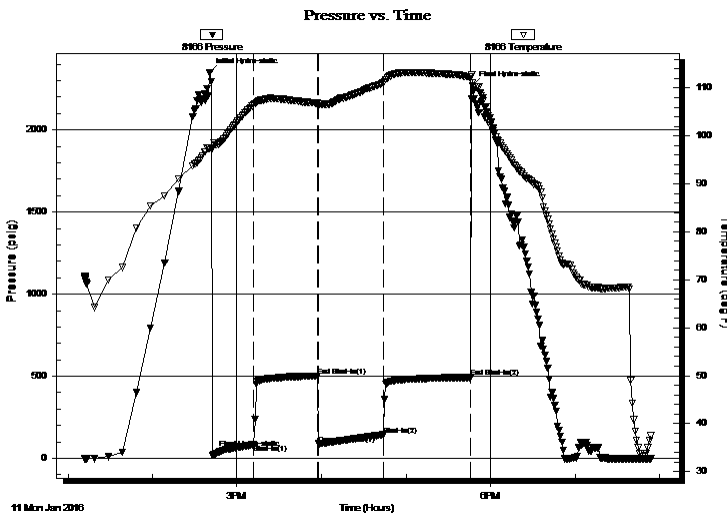
2016.01.11 @ 14:40:45

Time Off Btm:

2016.01.11 @ 14:42:45

TEST COMMENT: IF: BOB in 18 min.
IS: Surface blow built to 2 1/4.
FF: BOB in 23 min.
FS: Surface blow built to 1.

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2349.18	97.41	Initial Hydro-static
2	20.76	97.36	Final Hydro-static
31	83.49	106.46	Shut-In(1)
77	500.91	106.85	End Shut-In(1)
77	88.84	106.63	Open To Flow (1)
123	143.89	111.02	Shut-In(2)
185	492.43	112.27	End Shut-In(2)
187	2268.87	111.01	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
62.00	ocmw 5%o 75%w 20%m	0.30
124.00	ocw m 10%o 10%w 80%m	1.24
155.00	go 50%g 50%o	2.17
0.00	279 GIP	0.00

Gas Rates

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

* Recovery from multiple tests



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration

23-15s-36w Logan Ks

8100 E 22nd st N 700
Wichita, Ks 67278

Wing Trust 23 A #1

Job Ticket: 64533

DST#: 4

ATTN: John Goldsmith

Test Start: 2016.01.11 @ 13:11:45

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

33 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

26500 ppm

Viscosity: 53.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 8.79 in³

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 7000.00 ppm

Filter Cake: 1.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
62.00	ocmw 5%o 75%w 20%m	0.305
124.00	ocw m 10%o 10%w 80%m	1.238
155.00	go 50%g 50%o	2.174
0.00	279 GIP	0.000

Total Length: 341.00 ft

Total Volume: 3.717 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

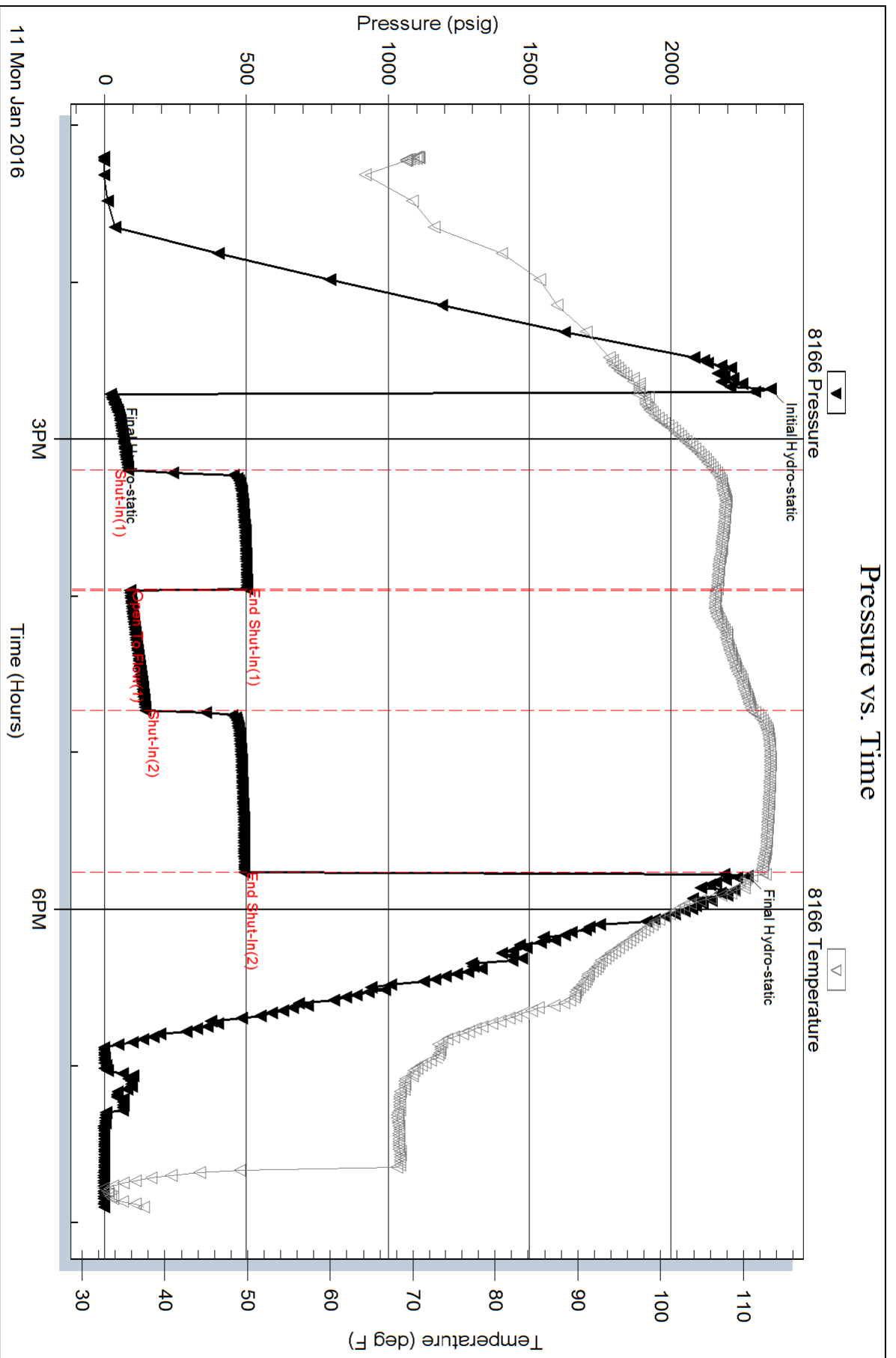
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: 31@40=33

.30@60=26500



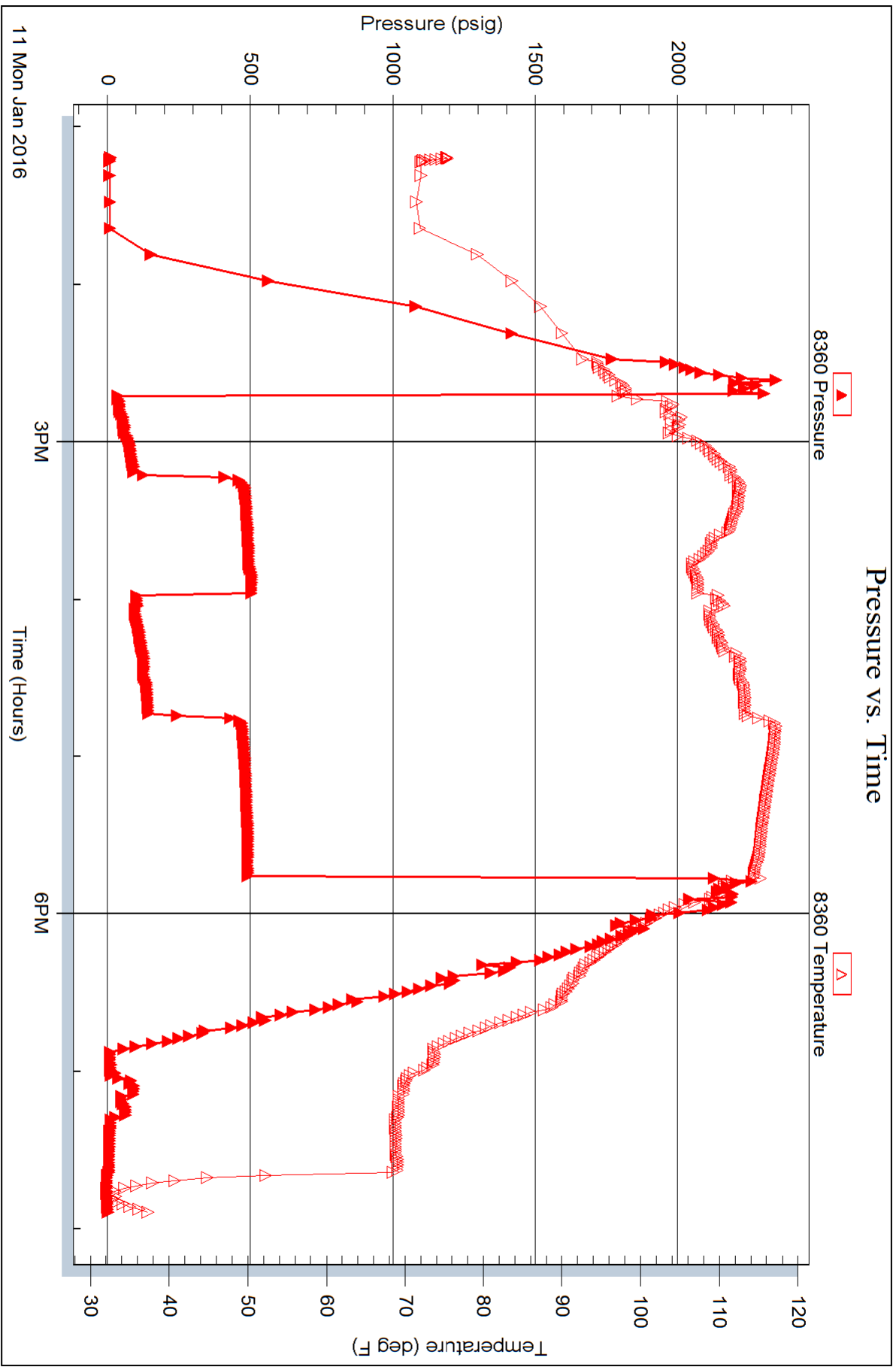
Serial #: 8360

Inside

Ritchie Exploration

Wing Trust 23 A #1

DST Test Number: 4



Trilobite Testing, Inc

Ref. No: 64533

Printed: 2016.01.11 @ 20:13:50