

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

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) (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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WIFT



P. O. Box 466
Ness City, KS 67560
Off: 785-798-2300



Invoice

DATE	INVOICE #
11/13/2019	32869

BILL TO
D K Operating, Inc. 621 Benton Street Jetmore, KS 67854

11-25-19
CK# 3942

- Acidizing
- Cement
- Tool Rental

TERMS	Well No.	Lease	County	Contractor	Well Type	Well Category	Job Purpose	Operator
Net 30	#1-12	Hays-Waterh...	Hodgeman	Pickrell	Oil	Development	5 1/2 Longstring	Gideon
PRICE REF.	DESCRIPTION				QTY	UM	UNIT PRICE	AMOUNT
575D	Mileage - 1 Way				30	Miles	5.00	150.00
578D-L	Pump Charge - Long String				1	Job	1,400.00	1,400.00
404-5	5 1/2" Port Collar				1	Each	2,500.00	2,500.00T
403-5	5 1/2" Cement Basket				2	Each	275.00	550.00T
406-5	5 1/2" Latch Down Plug & Baffle				1	Each	250.00	250.00T
407-5	5 1/2" Insert Float Shoe With Auto Fill				1	Each	325.00	325.00T
409-5	5 1/2" Turbolizer				6	Each	90.00	540.00T
325	Standard Cement				175	Sacks	13.50	2,362.50T
284	Calseal				8	Sack(s)	40.00	320.00T
283	Salt				900	Lb(s)	0.25	225.00T
292	Halad 322				100	Lb(s)	8.50	850.00T
276	Flocele				50	Lb(s)	3.00	150.00T
281	Mud Flush				500	Gallon(s)	1.50	750.00T
221	Liquid KCL (Clayfix)				2	Gallon(s)	25.00	50.00
290	D-Air				2	Gallon(s)	42.00	84.00T
581D	Service Charge Cement				175	Sacks	1.85	323.75
583D	Drayage				275	Ton Miles	0.95	261.25
	Subtotal							11,091.50
	Sales Tax Hodgeman County						7.65%	681.35
We Appreciate Your Business!							Total	\$11,772.85



PO Box 466
Ness City, KS 67560
Off: 785-798-2300

TICKET CONTINUATION

TICKET No. 032869

Hays-Whitewater

PRICE REFERENCE	SECONDARY REFERENCE/ PART NUMBER	ACCOUNTING			TIME	DESCRIPTION	WELL				DATE	UNIT PRICE	AMOUNT		
		LOC	ACCT	DF			QTY	U/M	QTY	U/M					
385						Standard CMT						13	32	2362	
284						Calseal						8	50	320	
283						Salt						900	25	225	
292						Holed - 300						100	8	800	
276						Fluocel						3	50	150	
281						Mud Flush						500	1	500	
291						Liquid RCL						2	25	50	
290						D-Air						2	21	42	
581												1	85	85	
583												0	95	0	
MILEAGE CHARGE							CMT								
TOTAL WEIGHT							18300								
LOADED MILES							30								
CUBIC FEET							175								
TON MILES							275								
CONTINUATION TOTAL												5376	50		

JOB LOG

SWIFT Services, Inc.

DATE 11-13-19 PAGE NO. 1

CUSTOMER		WELL NO.		LEASE		JOB TYPE		TICKET NO.	
DK Operating		1-10		Hays - Waterhouse		Long String 5 1/2		032869	
CHART NO.	TIME	RATE (BPM)	VOLUME (BBL) (GAL)	PUMPS		PRESSURE (PSI)		DESCRIPTION OF OPERATION AND MATERIALS	
				T	C	TUBING	CASING		
	1530								On Location 5 1/2" 1716/ft RTD: 4452 PC: #69 1524' TP: 4457 Turbo: 1, 2, 3, 4, 5, 70 Baskets: 68, 69
	1615								Start 5 1/2" 1716/ft Casing in Well
	1840								Drop Ball - Circulate
	1946	6 1/2	12		✓				Pump 500 gal Mud Flush
		6 1/2	20		✓				Pump 20 bbl KCL Spacer
	2000	2	7		✓	0			Plug RH [30]
	2006	4	42		✓	300			Mix 145 sks of EA-2 @ 15.36ppg
	2020								Wash P+L Release latch down Plug
	2025	6 1/2	0		✓	300			Start Displacement
		6 1/2	75		✓	400			Lift Pressure
		6 1/2	101		✓	800			MAX Lift Pressure
	2045	5 1/2	102		✓	1600			Land Latch down Plug - Release Pressure * Hold *
	2050								Wash up Trk #115
									Job Complete
									Thank You,
									175 sks of EA-2 used
									Bidean, Preston, Kirby

Quality Well Service, Inc.

**PO Box 468
Pratt, KS 67124**

11-18-19
CK# 3930

Invoice

Date	Invoice #
11/7/2019	C-2187

Bill To
DK Operating Inc. 621 Benton Jetmore, KS 67854-5311

P.O. No.	Terms	Lease Name
		Hays-Waterhouse #1-12

Description	Qty	Rate	Amount
Common	170	15.50	2,635.00
Gel	320	0.22	70.40
Calcium	480	1.20	576.00
Flo-Seal	85	3.70	314.50
SFC 0-500'	1	600.00	600.00
Handling	183	2.10	384.30
.08 * sacks * miles	6,771	0.08	541.68
Service Supervisor	1	150.00	150.00
LMV	37	3.75	138.75
Heavy Equipment Mileage	75	8.00	600.00
Customer Discount		-1,502.65	-1,502.65
Discount Expires after 30 days from the date of the invoice		0.00	0.00
Hays-Waterhouse #1-12 Hodgeman Co.			

Thank You for your business!	Subtotal	\$4,507.98
	Sales Tax (7.65%)	\$0.00
	Total	\$4,507.98

QUALITY WELL SERVICE, INC.

7266

Federal Tax I.D. # 481187368
 Home Office 30060 N. Hwy 281, Pratt, KS 67124
 Mailing Address P.O. Box 468

Office 620-727-3410
 Fax 620-672-3663

Rich's Cell 620-727-3409
 Brady's Cell 620-727-6964

Date	11-5-19	Sec.	12	Twp.	21S	Range	23W	County	Hodgeman	State	Ks	On Location		Finish	
Lease	HAYS-WATERHOUSE			Well No.	1-12			Location	MESSCHY KS S to Rd X						
Contractor	Pickrell Orlg B.G. # 10							Owner	5 1/2 E S. 10						
Type Job	378							To Quality Well Service, Inc. You are hereby requested to rent cementing equipment and furnish cementer and helper to assist owner or contractor to do work as listed.							
Hole Size	12 1/4		T.D.	227'		Charge To									
Csg.	85 1/2		Depth	226'		INK OPERATING, INC.									
Tbg. Size			Depth			Street									
Tool			Depth			City State									
Cement Left in Csg.	20'		Shoe Joint	20'		The above was done to satisfaction and supervision of owner agent or contractor.									
Meas Line			Displace	13.4 Bbl		Cement Amount Ordered 170 x Common									
EQUIPMENT								2 1/2" CEL 3 1/2" CC 1/2" PS							
Pumptrk	8	No.						Common 170 x							
Bulktrk	10	No.						Poz. Mix							
Bulktrk		No.						Gel. 320 #							
Pickup		No.						Calcium 400 #							
JOB SERVICES & REMARKS								Hulls							
Rat Hole								Salt							
Mouse Hole								Flowseal 35 #							
Centralizers								Kol-Seal							
Baskets								Mud CLR 48							
D/V or Port Collar								CFL-117 or CD110 CAF 38							
START 5 H's 378 20' Csg Set								Sand							
START Csg Csg on Bottom								Handling 103							
Hook up to Csg & Break circ w/ris								Mileage 371 6771							
START Pumping 10 Bbls H2O								FLOAT EQUIPMENT							
START Mix: Pump 170 x Common								Guide Shoe							
2 1/2" CEL 3 1/2" CC 1/2" PS @ 14.8" / ENL								Centralizer							
START Disp								Baskets							
Close Valve on Csg 150 #								AFU Inserts							
13.4 Bbls total								Float Shoe							
Good circ then JOB								Latch Down							
Circ out to PET								SERVICE Spv 1 EA							
								LMV 37'							
THANK YOU								Pumptrk Charge SURFACE							
PLEASE CALL AGAIN								Mileage 75							
TOOO TO JOKE															
X Signature <i>Mary Ruel</i>								Tax							
								Discount							
								Total Charge							



12-23-19
CK# 3966

Invoice

Date	Invoice #
11/20/2019	10662

1308 Schwaller Ave.
Hays, KS 67601
785-625-3531

Bill To
D K Operating Inc 621 Benton Jetmore, KS 67854

Delivery #	Terms	Due Date	Contractor	Credit #	Lease	Legal
1758	Net 30	12/20/2019	Pickr	1195	Hays-Wat#1-12	Hodgeman 12-21-...
Quantity	Serviced	Item Code	Description	Price Each	Amount	
265	11/5/2019	Premium Gel	Premium Gel - 100 pound bag	20.20	5,353.00	
63		Cottonseed ...	Cottonseed Hulls	24.20	1,524.60	
16		Soda Ash	Soda Ash	30.00	480.00	
10		Caustic Soda	Caustic Soda	82.55	825.50	
7		Lignite	Lignite	26.25	183.75	
3		Lime	Lime	13.20	39.60	
1		Drispac	Drispac	368.25	368.25	
2		PHPA	PH Polymer	280.25	560.50	
		Discount	15% Discount	-1,400.28	-1,400.28	
		Trucking	Trucking	1,195.00	1,195.00	
Thank you for your business.					Total	\$9,129.92



Engineer DENNIS RECTOR

E-Mail drector.tuffmudder@gmail.com

Phone 785-625-3531 Office
785-656-3039 Cell 620-617-3039

DRILLING MUD REPORT

REPORT NO.	4	DATE	11/13/2019	DEPTH	4452
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OPERATOR	DK OPERATING	CONTRACTOR	PICKRELL DRLG	RIG NO.	# 10
ADDRESS	Company	ADDRESS	Rig	SPUD DATE	11/5/2019
REPORT FOR	JASON ALM(GEO)	REPORT FOR	DOUG BUDIG	SEC,TWN,RNG	12-21S-23W
WELL NAME AND NO.	HAYS-WATERHOUSE # 1-12	COUNTY AREA	HODGEMAN	STATE	Kansas

DRILLING ASSEMBLY				CASING		MUD VOLUME (BBL)	
Bit Size	7 7/8	No. Bits	2	Surface		Hole	330.5 Pits
Drill Pipe Size	4 1/2	Weight on Bit	30,000	8 5/8 @	226 ft.	Total Circulating Volume	730.5
Type	XH	Flowing Temp.		Intermediate		Mud Up Depth	3447
Drill Collar Size	6 1/4			@	ft.	Mud Type	Chemical-Pac
Bit RPM	60			Production		Activity	CIRC/CASING
Sample from flowline	X	Pit		@	ft.	Pits Used	3

MUD PROPERTIES				CIRCULATION DATA			
Time Sample Taken	10:00 AM			Pump Size	6X14		
Depth (ft.)	4452			Pump Model	Assumed Eff.	90%	DP
Weight (ppg)	9.3			Bbl/Stroke	0.139	Stroke/Min.	60
Mud Gradient (psi/ft.)	0.4836			Bbl/Min	8.34	Gal/Min.	350
Funnel Viscosity (sec/qt.)	53			Elevation	2280		
Plastic Viscosity	12			Annular Vel (Ft/Min)			
Yield Point (lb./100 sq. ft.)	26			DP	197	DC	356
Gel Strength (lb./100 sq. ft.) 10 sec./10 min.	12/22			Circulation Pressure (PSI)	800		
pH (Strip)	9			Bottoms Up (Min.)	39.6		
Filtrate API (ml./30 min.)	9.2			Total Circ Time (Min.)	87.6		
API HP-HT Filtrate (ml./30 min.)	XXX			Daily Cost	\$486.00	Total	\$8,897.70
Cake Thickness 32nd in. API	1/32			Product	On Hand	Add Del.	Used
Alkalinity, Mud (Pm)	1.2			Premium Gel	50		10
Alkalinity, Filtrate (Pf/Mf)	.9/---			Hulls	44		6
Chlorides (ppm)	6000			Soda Ash	13		1
Calcium (ppm)	12			Caustic	7		1
Sand Content (% by Vol.)	TR			Lignite	4		1
Solids Content (% by Vol.)	6.7			Lime	2		0
Oil Content (% by Vol.)	XXX			Driscac	4		0
Water Content (% by Vol.)	93.3			Desco	2		0
LCM, #/bbl	1#			PHPA	1		0
Methylene Blue Capacity	XXX			Barite			
				Cedar Fiber			
				Pol-E-Flake			

REMARKS		Weight	< 9.4	Viscosity	52-56	Filtrate	8-10 cc
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REMARKS		RECOMMENDED TOUR TREATMENT					
*Short trip prior to DST and Log circulate hole clean!!		Keep 50+ vis. with Gel					
**KEEP HOLE FULL AT ALL TIMES!!		Keep 2# to 3# of LCM in system to help prevent loss circulation.					
*Set pit marker to monitor potential fluid loss.		Keep weight 9.4 or less run a 1/2" stream of water at flowline to control weight!					
*Workover Pits to keep mud from channeling.		IF NEEDED VISCOSITY USE PIT MUD UNLESS WEIGHT ABOVE 9.3, THEN USE FRESH WATER & MIX FOLLOWING: KEEP PREMIX ON HAND & USE AS NEEDED.					
Call with any issues: 785-656-2887		Premix: 20-22 Gel					
		2 Soda					
		1 Caustic					
		1 Lig					
		1/3 Pac					
		1-3 Hulls (LCM as necessary)					
		~allow tank to roll 30-45 minutes, add tank to system over 45 minutes.					

Reserve Pit Chlorides=	82,000ppm.	Calcium=	680 ppm.	Volume=	750bbbls.
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The recommendations made hereon shall not be construed as authorizing the infringement of any valid patent, and are made without assumption of any liability by Andy's Mud & Chemical Co., LLC or its agents, and are statements of opinion only.

1308 SCHWALLER AVE
HAYS, KANSAS 67601
785-625-3531



RETURN TICKET

1195

OPERATOR (PURCHASED BY) JK Operators
CONTRACTOR Pickrell Sub #10
WELL NAME Hay-Waterhouse #1-12 DATE 11-19-19
COUNTY Adge-man SEC 2 TWP 2 RGE 23 TO WAREHOUSE

QTY	HM	PRODUCT	SIZE	UNIT PRICE	AMOUNT
30		PREMIUM GEL	100 lb.		
42		BAGS COTTONSEED HULLS	50 lb.		
14		BAGS SODA ASH	50 lb.		
5	X	CORROSIVE, UN 1823, 8, PG 111 CAUSTIC SODA BEADS	50 lb.		
5		LIGNITE	50 lb.		
2		BAGS LIME	50 lb.		
4		DRISPAC	50 lb.		
2		DESCO	25 lb.		
		PHPA	5 gal.		
		POLY PLUS RD	50 lb.		
		SALT GEL	50 lb.		
		BAGS DRILLSTARCH	50 lb.		
		CEDAR FIBER	40 lb.		
		POL-E- FLAKE	25 lb.		
		BAR	100 lb.		
		SOAP STICKS			

RECEIVED BY _____

1308 SCHWALLER AVE
HAYS, KANSAS 67601
785-625-3531



DELIVERY TICKET

1758

OPERATOR (PURCHASED BY) DK Operating
CONTRACTOR Pickrell #10 DELIVERY CHARGE: SEMI P/U NONE
WELL NAME Hays-Waterhouse #1-12 DATE 11-5-19
COUNTY Hodgeman SEC 12 TWP 21 RGE 23 TO WAREHOUSE _____

QTY	HM	PRODUCT	SIZE	UNIT PRICE	AMOUNT
315		PREMIUM GEL	100 lb.		
105		BAGS COTTONSEED HULLS	50 lb.		
30		BAGS SODA ASH	50 lb.		
15	x	CORROSIVE, UN 1823, 8, PG 111 CAUSTIC SODA BEADS	50 lb.		
12		LIGNITE	50 lb.		
5		BAGS LIME	50 lb.		
5		DRISPAC	50 lb.		
2		DESCO	25 lb.		
2		PHPA	5 gal.		
		POLY PLUS RD	50 lb.		
		SALT GEL	50 lb.		
		BAGS DRILLSTARCH	50 lb.		
		CEDAR FIBER	40 lb.		
		POL-E- FLAKE	25 lb.		
		BAR	100 lb.		
		SOAP STICKS			

RECEIVED BY _____

Geological Report

Hays-Waterhouse #1-12
2451' FSL & 2238' FEL
Sec. 12 T21s R23w
Hodgeman County, Kansas



DK Operating, Inc.

General Data

Well Data: DK Operating, Inc.
Hays-Waterhouse #1-12
2541' FSL & 2238' FEL
Sec. 12 T21s R23w
Hodgeman County, Kansas
API # 15-083-21974-0000

Drilling Contractor: Pickrell Drilling Co. Inc. Rig #10

Geologist: Jason T Alm

Spud Date: November 5, 2019

Completion Date: November 13, 2019

Elevation: 2280' Ground Level
2287' Kelly Bushing

Directions: Jetmore KS, North to X rd. East 5.5 mi. South into location

Casing: 227' 8 5/8" surface casing
4451' 5 1/2" production casing

Samples: 10' wet and dry, 4050' to RTD

Drilling Time: 3600' to RTD

Electric Logs: None

Drillstem Tests: One, Trilobite Testing, Inc. "Brandon Turley"

Problems: None

Remarks: None

Formation Tops

Formation	DK Operating, Inc. Hays-Waterhouse #1-12 Sec. 12 T21s R23w 2541' FSL & 2238' FEL
Anhydrite	1471' +816
Base	1500' +787
Heebner	3776' -1489
Lansing	3826' -1539
BKC	4158' -1871
Pawnee	4276' -1989
Fort Scott	4338' -2051
Cherokee	4364' -2077
Mississippian	4428' -2141
Osage	4442' -2155
RTD	4452' -2165

Sample Zone Descriptions

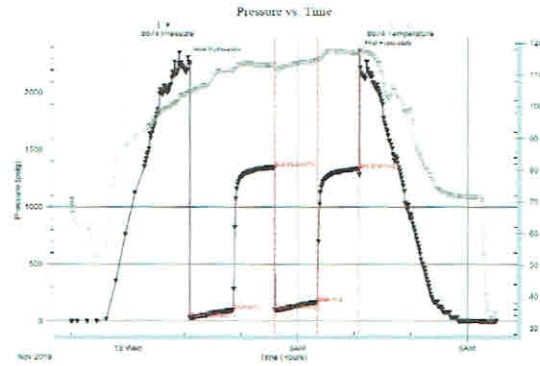
Fort Scott	<p>(4338' -2051): Not Tested Ls – Fine crystalline with poor scattered inter-crystalline porosity, light to fair spotted oil stain in porosity, slight show of free oil when broken, no odor, dull yellow fluorescents, chalky in part.</p>
Miss Osage	<p>(4442', -2155): Covered in DST #1 Dolo – Δ – Fine sucrosic crystalline with fair to good scattered inter-crystalline porosity, very heavy triptolic chert, weathered with good vuggy and scattered inter-granular porosity, good even brown oil stain, good saturation in por, fair show of free oil, good odor, bright yellow fluorescents.</p>

Drill Stem Tests
Trilobite Testing, Inc.
"Brandon Turley"

DST #1 Mississippian Osage

Interval (4379' – 4452') Anchor Length 73'

IHP – 2307 #
IFP – 45" – B.O.B. 27 min. 25-96 #
ISI – 45" – W.S.B. 1349 #
FFP – 45" – B.O.B. 20 min. 99-164 #
FSI – 45" – W.S.B. 1335 #
FHP – 2362 #
BHT – 117°F



Recovery: 169' GIP
 83' GCO 80% Oil
 126' GOCM 30% Oil
 126' GOCM 10% Oil

Structural Comparison

	DK Operating, Inc. Hays-Waterhouse #1-12 Sec. 12 T21s R23w 2541' FSL & 2238' FEL	Beardmore Oil Co Hays #1 Sec. 12 T21s R23w C NW SE		TILCO Inc Waterhouse #1 Sec. 12 T21s R23w SW NE	
Formation					
Anhydrite	1471' +816	1474' +806	(+10)	1484' +803	(+13)
Base	1500' +787	NA	NA	1516' +771	(+16)
Heebner	3776' -1489	3766' -1486	(-3)	3784' -1497	(+8)
Lansing	3826' -1539	3816' -1536	(-3)	3834' -1547	(+8)
BKC	4158' -1871	4147' -1867	(-4)	4170' -1883	(+12)
Pawnee	4276' -1989	4267' -1987	(-2)	4288' -2001	(+12)
Fort Scott	4338' -2051	4335' -2055	(+4)	4360' -2073	(+18)
Cherokee	4364' -2077	4358' -2078	(+1)	4385' -2098	(+19)
Mississippian	4428' -2141	4422' -2142	(+1)	4470' -2183	(+42)
Osage	4442' -2155	4444' -2164	(+9)	4494' -2207	(+52)

Summary

The location for the Hays-Waterhouse #1-12 was found via 3-D seismic survey. The new well ran structurally as expected via the survey. One Drill Stem Test was conducted which recovered commercial amounts of oil from the Mississippian Osage Formation. After all gathered data had been examined the decision was made to run 5 ½ inch production casing to further evaluate the Hays-Waterhouse #1-12 well.

Recommended Perforations

Primary:

Mississippian Osage 4442' – 4452' DST #1

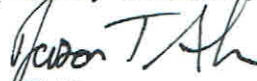
Secondary:

Mississippian Warsaw 4429' – 4439' DST #1

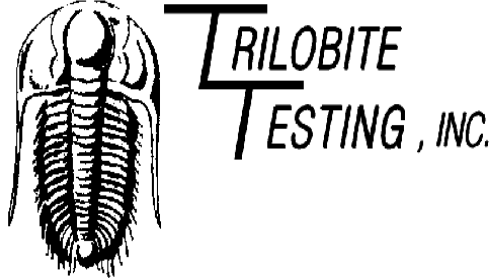
Before Abandonment:

Fort Scott 4352' – 4358' Not Tested

Respectfully Submitted,



Jason T Alm
Hard Rock Consulting, Inc.
AAPG #10134582



DRILL STEM TEST REPORT

Prepared For: **DK Operating Inc**

621 Benton St
Jetmore, KS 67854

ATTN: Jason Alm

Hays-Waterhouse 1-12

12-21s-23w Hodgeman,KS

Start Date: 2019.11.12 @ 22:59:53

End Date: 2019.11.13 @ 06:29:53

Job Ticket #: 66066 DST #: 1

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

Printed: 2019.11.14 @ 15:55:00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

DK Operating Inc
621 Benton St
Jetmore, KS 67854
ATTN: Jason Alm

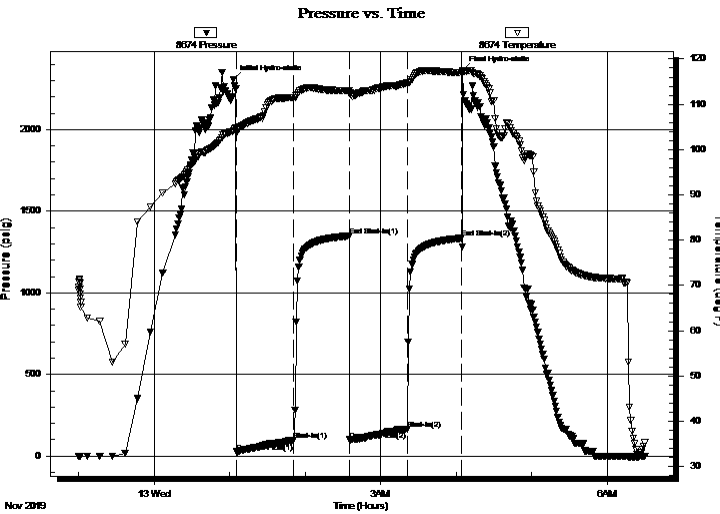
12-21s-23w Hodgeman, KS
Hays-Waterhouse 1-12
Job Ticket: 66066 **DST#: 1**
Test Start: 2019.11.12 @ 22:59:53

GENERAL INFORMATION:

Formation: **Miss**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 01:05:23
Time Test Ended: 06:29:53
Interval: **4379.00 ft (KB) To 4452.00 ft (KB) (TVD)**
Total Depth: 4452.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good
Test Type: Conventional Bottom Hole (Initial)
Tester: Brandon Turley
Unit No: 79
Reference Elevations: 2287.00 ft (KB)
2280.00 ft (CF)
KB to GR/CF: 7.00 ft

Serial #: 8674 Outside
Press@RunDepth: 164.13 psig @ 4380.00 ft (KB) Capacity: 8000.00 psig
Start Date: 2019.11.12 End Date: 2019.11.13 Last Calib.: 2019.11.13
Start Time: 22:59:58 End Time: 06:29:52 Time On Btm: 2019.11.13 @ 01:02:53
Time Off Btm: 2019.11.13 @ 04:05:23

TEST COMMENT: IF: BOB in 27 mins. 16"
IS: Surface blow that never built.
FF: BOB in 20 mins. 19"
FS: Surface blow built to 1/4"



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2306.82	104.13	Initial Hydro-static
3	25.91	103.63	Open To Flow (1)
48	96.39	111.40	Shut-In(1)
92	1348.73	113.08	End Shut-In(1)
93	99.52	112.41	Open To Flow (2)
138	164.13	114.68	Shut-In(2)
182	1334.60	116.93	End Shut-In(2)
183	2362.14	117.47	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
126.00	gocm 30%g 10%o 60%m	1.77
126.00	gocm 10%g 30%o 60%m	1.77
83.00	go 20%g 80%o	1.16
0.00	169 GIP	0.00

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

DK Operating Inc
621 Benton St
Jetmore, KS 67854
ATTN: Jason Alm

12-21s-23w Hodgeman, KS
Hays-Waterhouse 1-12
Job Ticket: 66066 **DST#: 1**
Test Start: 2019.11.12 @ 22:59:53

Tool Information

Drill Pipe:	Length: 4384.00 ft	Diameter: 3.80 inches	Volume: 61.50 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer: 30000.00 lb
Drill Collar:	Length: 0.00 ft	Diameter: 2.25 inches	Volume: 0.00 bbl	Weight to Pull Loose: 80000.00 lb
			Total Volume: 61.50 bbl	Tool Chased 0.00 ft
Drill Pipe Above KB:	32.00 ft			String Weight: Initial 60000.00 lb
Depth to Top Packer:	4379.00 ft			Final 62000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	73.00 ft			
Tool Length:	100.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
------------------	-------------	------------	----------	------------	----------------

Stubb	1.00			4353.00	
Shut In Tool	5.00			4358.00	
Hydraulic tool	5.00			4363.00	
Jars	5.00			4368.00	
Safety Joint	2.00			4370.00	
Packer	5.00			4375.00	27.00 Bottom Of Top Packer
Packer	4.00			4379.00	
Stubb	1.00			4380.00	
Recorder	0.00	8790	Inside	4380.00	
Recorder	0.00	8674	Outside	4380.00	
Perforations	3.00			4383.00	
Change Over Sub	1.00			4384.00	
Drill Pipe	64.00			4448.00	
Change Over Sub	1.00			4449.00	
Bullnose	3.00			4452.00	73.00 Bottom Packers & Anchor

Total Tool Length: 100.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

DK Operating Inc
621 Benton St
Jetmore, KS 67854
ATTN: Jason Alm

12-21s-23w Hodgeman,KS
Hays-Waterhouse 1-12
Job Ticket: 66066 **DST#: 1**
Test Start: 2019.11.12 @ 22:59:53

Mud and Cushion Information

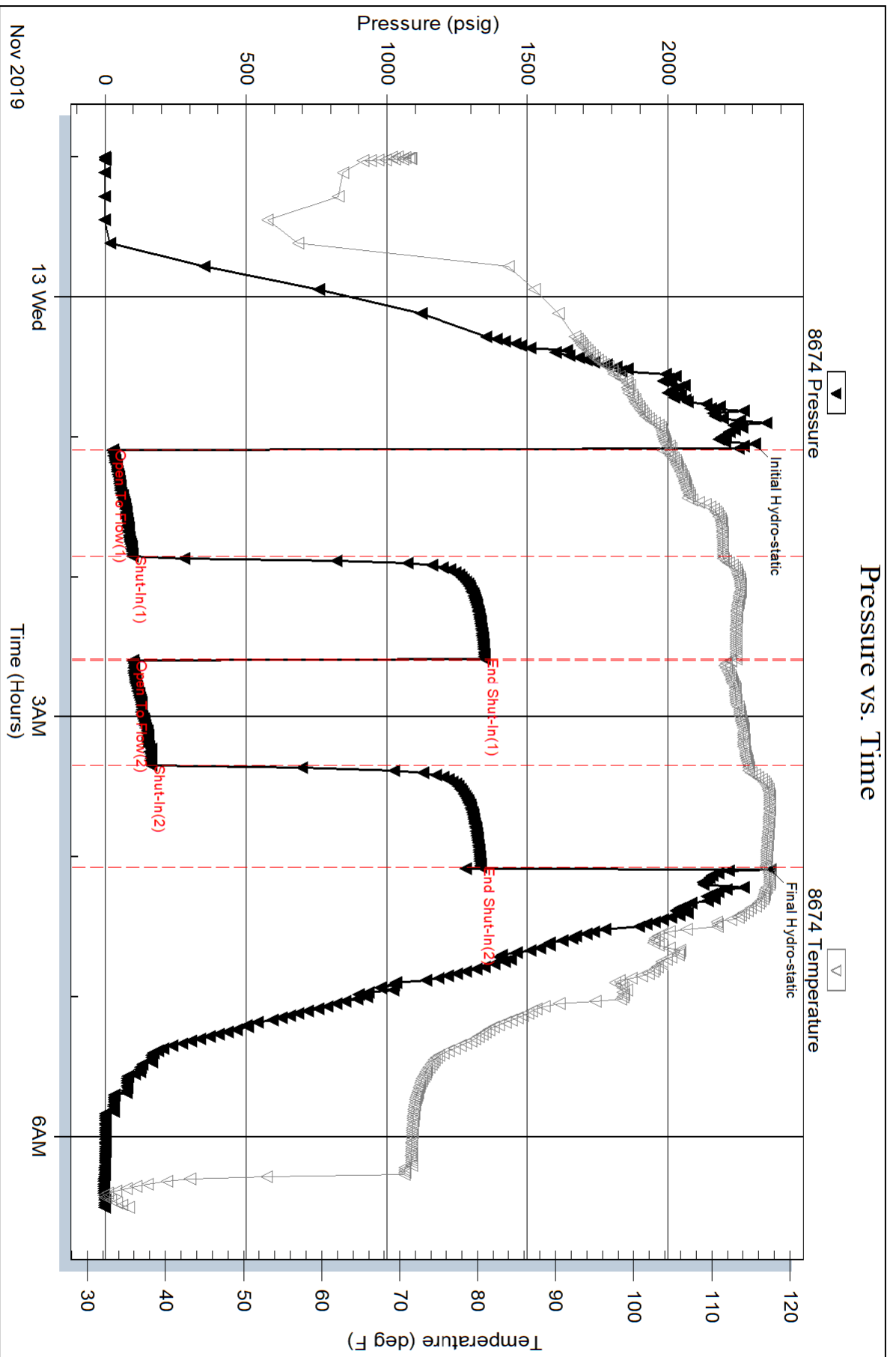
Mud Type: Gel Chem	Cushion Type:	Oil API: 37 deg API
Mud Weight: 9.00 lb/gal	Cushion Length: ft	Water Salinity: 0 ppm
Viscosity: 53.00 sec/qt	Cushion Volume: bbl	
Water Loss: 9.18 in ³	Gas Cushion Type:	
Resistivity: 0.00 ohm.m	Gas Cushion Pressure: psig	
Salinity: 6000.00 ppm		
Filter Cake: 1.00 inches		

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
126.00	gocm 30%g 10%o 60%m	1.767
126.00	gocm 10%g 30%o 60%m	1.767
83.00	go 20%g 80%o	1.164
0.00	169 GIP	0.000

Total Length: 335.00 ft Total Volume: 4.698 bbl
 Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:
 Laboratory Name: Laboratory Location:
 Recovery Comments: 34@30=37



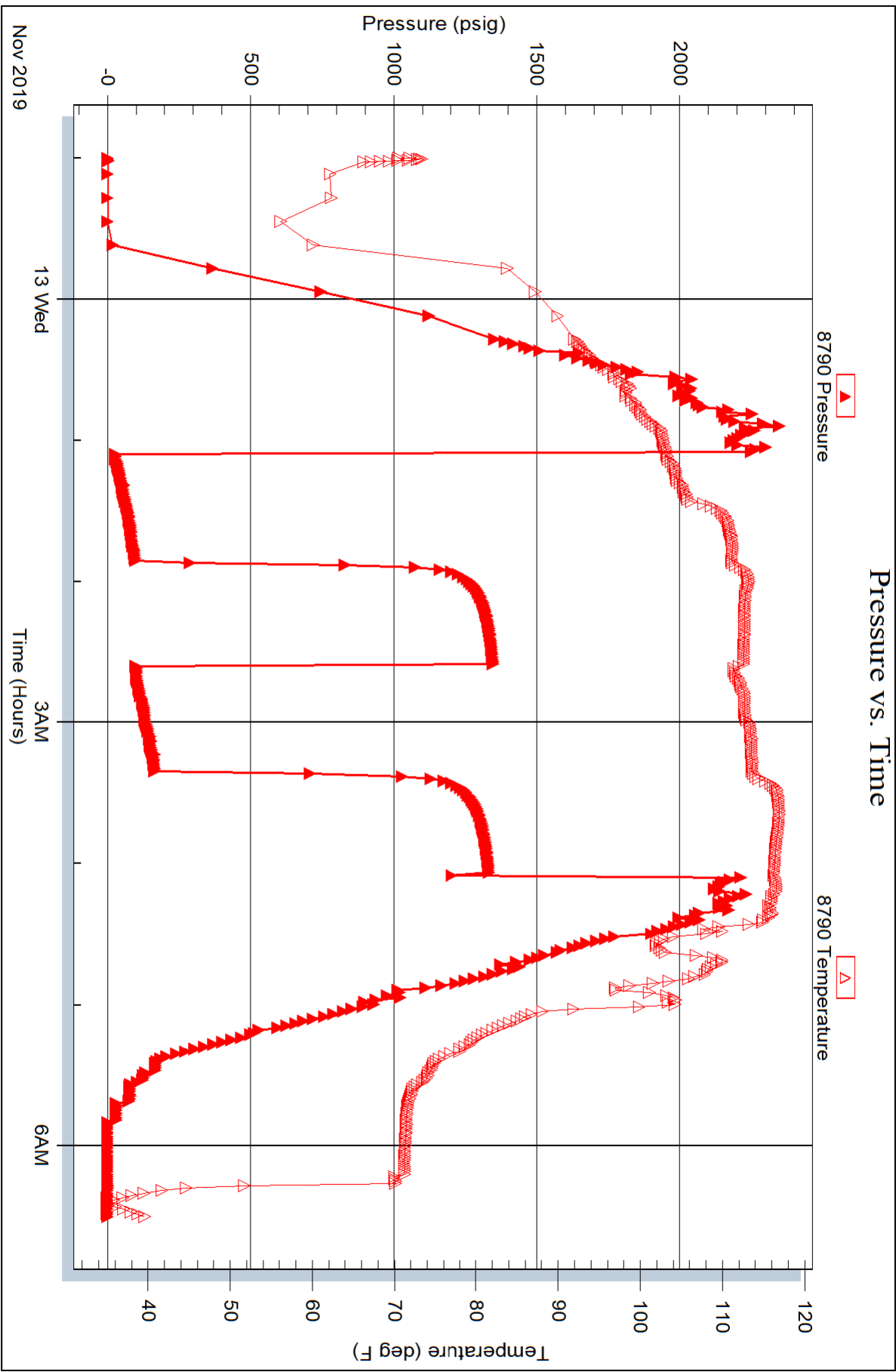
Serial #: 8790

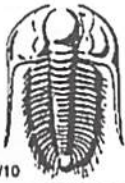
Inside

DK Operating Inc

Hays-Waterhouse 1-12

DST Test Number: 1





TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket 66066

NO.

Well Name & No. Hays-WaterHouse 142 Test No. 1 Date 11-12-19
 Company DK Operating Inc Elevation 2287 KB 2280 GL
 Address 621 Benton St Jetmore, KS 67854
 Co. Rep / Geo. Jason T Alm Rig Pickrell #10
 Location: Sec. 12 Twp 21S Rge. 23W Co. Hodgeman State KS

Interval Tested 4379 4352 Zone Tested Miss
 Anchor Length 73 Drill Pipe Run 4384 Mud Wt. 9.3
 Top Packer Depth 4374 Drill Collars Run — Vis 53
 Bottom Packer Depth 4379 Wt. Pipe Run — WL 9.2
 Total Depth 4452 Chlorides 6000 ppm System LCM 1

Blow Description IF: BoB in 27 mins. 16"
IS: surface blow back that never built.
FF: BoB in 20 min. 19"
FS: surface blow built to 1/4.

Rec	Feet of	%gas	%oil	%water	%mud
<u>83</u>	<u>90</u>	<u>20</u>	<u>80</u>		
<u>126</u>	<u>90cm</u>	<u>10</u>	<u>30</u>		<u>60</u>
<u>126</u>	<u>90cm</u>	<u>30</u>	<u>10</u>		<u>60</u>
<u>Rec</u>	<u>Feet of</u>	<u>%gas</u>	<u>%oil</u>	<u>%water</u>	<u>%mud</u>
	<u>169 GIP</u>				

Rec Total 335 BHT 116 Gravity 37 API RW — @ — °F Chlorides — ppm

(A) Initial Hydrostatic <u>2306</u>	<input checked="" type="checkbox"/> Test <u>1300</u>	T-On Location <u>22:05</u>
(B) First Initial Flow <u>25</u>	<input checked="" type="checkbox"/> Jars <u>250</u>	T-Started <u>22:59</u>
(C) First Final Flow <u>96</u>	<input checked="" type="checkbox"/> Safety Joint <u>75</u>	T-Open <u>1:04</u>
(D) Initial Shut-In <u>1348</u>	<input checked="" type="checkbox"/> Circ Sub <u>NIL</u>	T-Pulled <u>4:04</u>
(E) Second Initial Flow <u>99</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>6:31</u>
(F) Second Final Flow <u>164</u>	<input checked="" type="checkbox"/> Mileage <u>160-</u> 140 rt	Comments <u>Geo Trailer</u>
(G) Final Shut-In <u>1334</u>	<input type="checkbox"/> Sampler	<u>right in front of</u>
(H) Final Hydrostatic <u>2362</u>	<input type="checkbox"/> Straddle	<u>cat walk</u>
Initial Open <u>45</u>	<input type="checkbox"/> Shale Packer	<input type="checkbox"/> EM Tool
Initial Shut-In <u>45</u>	<input type="checkbox"/> Extra Packer	<input type="checkbox"/> Ruined Shale Packer
Final Flow <u>45</u>	<input type="checkbox"/> Extra Recorder	<input type="checkbox"/> Ruined Packer
Final Shut-In <u>45</u>	<input type="checkbox"/> Day Standby	<input type="checkbox"/> Extra Copies
	<input checked="" type="checkbox"/> Accessibility <u>150.00</u>	Sub Total <u>0</u>
	Sub Total <u>1915</u>	Total <u>1915</u>

Approved By _____ Our Representative _____

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



P. O. Box 466
Ness City, KS 67560
Off: 785-798-2300



Invoice

DATE	INVOICE #
11/21/2019	32817

BILL TO
D K Operating, Inc. 621 Benton Street Jetmore, KS 67854

- Acidizing
- Cement
- Tool Rental

TERMS	Well No.	Lease	County	Contractor	Well Type	Well Category	Job Purpose	Operator
Net 30	#1	Hayes-Water...	Hodgeman	Company Tools	Oil	Development	Cement Port Collar	Blaine
PRICE REF.	DESCRIPTION				QTY	UM	UNIT PRICE	AMOUNT
575D	Mileage - 1 Way				20	Miles	5.00	100.00
576D-D	Pump Charge - Deep Surface (> 500 Ft.) & Port Collars				1	Job	1,400.00	1,400.00
330	Swift Multi-Density Standard (MIDCON II)				125	Sacks	17.00	2,125.00T
276	Flocele				25	Lb(s)	3.00	75.00T
290	D-Air				1	Gallon(s)	42.00	42.00T
104	Port Collar Tool Rental				1	Each	200.00	200.00T
581D	Service Charge Cement				175	Sacks	1.85	323.75
582D	Minimum Drayage Charge				1	Each	250.00	250.00
	Subtotal							4,515.75
	Sales Tax Hodgeman County						7.65%	186.81
We Appreciate Your Business!						Total		\$4,702.56



Services, Inc.

TICKET 032817

CHARGE TO: DK Operating
 ADDRESS _____
 CITY, STATE, ZIP CODE _____

PAGE 1 OF 1

WELL/PROJECT NO: #1
 LEASE: Hays - Viterbas
 COUNTY/PARISH: Holcom
 STATE: KS
 CITY: Jetmore
 DATE: 21 Nov 19
 OWNER: _____
 ORDER NO. _____

TICKET TYPE: SERVICE SALES
 CONTRACTOR: _____
 RIG NAME/NO: _____
 SHIPPED TO: location
 DELIVERED TO: _____
 WELL PERMIT NO. _____

WELL TYPE: 0-1
 WELL CATEGORY: Development
 JOB PURPOSE: Cement port collar
 WELL LOCATION: 12-21-23

PRICE REFERENCE	SECONDARY REFERENCE/ PART NUMBER	ACCOUNTING LOC	ACCT	DF	DESCRIPTION	QTY.	UM	QTY.	UM	UNIT PRICE	AMOUNT
575					MILEAGE	20	mi			5.00	100.00
576D					Rump Charge	1	ea			1400.00	1400.00
330					SMB cement	125	sk			3.00	375.00
276					Fluore	25	lb			42.00	1050.00
290					D-AIR	1	gal			200.00	200.00
104					port collar opening tool rental	1	ea			185.00	185.00
581					service charge	175	sk			0.95	166.25
583					Drayage					250.00	250.00
582					Drayage (mix)	1	ea				
					PAGE TOTAL						4515.75

LEGAL TERMS: Customer hereby acknowledges and agrees to the terms and conditions on the reverse side hereof which include, but are not limited to, PAYMENT, RELEASE, INDEMNITY, and LIMITED WARRANTY provisions.

MUST BE SIGNED BY CUSTOMER OR CUSTOMER'S AGENT PRIOR TO START OF WORK OR DELIVERY OF GOODS

DATE SIGNED: _____ TIME SIGNED: _____

SWIFT SERVICES, INC.
 P.O. BOX 466
 NESS CITY, KS 67560
 785-798-2300

SURVEY: OUR EQUIPMENT PERFORMED WITHOUT BREAKDOWN? WE UNDERSTOOD AND MET YOUR NEEDS? OUR SERVICE WAS PERFORMED WITHOUT DELAY? WE OPERATED THE EQUIPMENT AND PERFORMED JOB CALCULATIONS SATISFACTORILY? ARE YOU SATISFIED WITH OUR SERVICE? CUSTOMER DID NOT WISH TO RESPOND

TOTAL: 4902.50

CUSTOMER ACCEPTANCE OF MATERIALS AND SERVICES: The customer hereby acknowledges receipt of the materials and services listed on this ticket.

SWIFT OPERATOR: _____ APPROVAL: _____

Thank You!

CUSTOMER: DK Operating WELL NO.: 1-12 LEASE: Hayes - Waterhaus JOB TYPE: cement pit collar TICKET NO.: 32817

CHART NO.	TIME	RATE (BPM)	VOLUME (BBL) (GAL)	PUMPS		PRESSURE (PSI)		DESCRIPTION OF OPERATION AND MATERIALS
				T	C	TUBING	CASING	
	1325							175 sk SMD cement w/ 1/4" # flange 2 7/8 x 5 1/2" port collar - 1498 on loc TRK 114
						1000	1000	test to 1000 psi - hold open port collar
	1336	3 1/2	3			400		Inj rate 3 1/2 bpm @ 400 psi
		3 1/2				400		Mix SMD cement @ 11.2 ppg
		3 1/2	4			400		- fluid to pit -
		3 1/2	67			200		→ cement to pit ← { 125 sk mixed 15 to pit }
			8					Displace w/ H ₂ O close port collar
	1435		20					test to 1000 psi - hold RUN 5 joints Reverse hole clean - 2 cement flags -
								pull tool from hole wash truck Rack up
	1515							job complete Thanks Blaine, Flint & Isaac

SWIFT



Services, Inc.

P. O. Box 466
Ness City, KS 67560
Off: 785-798-2300



Invoice

DATE	INVOICE #
11/21/2019	32817

BILL TO
D K Operating, Inc. 621 Benton Street Jetmore, KS 67854

- Acidizing
- Cement
- Tool Rental

TERMS	Well No.	Lease	County	Contractor	Well Type	Well Category	Job Purpose	Operator
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	Subtotal							4,515.75
	Sales Tax Hodgeman County						7.65%	186.81
We Appreciate Your Business!						Total		\$4,702.56



Services, Inc.

TICKET 032817

CHARGE TO: DK Operating
 ADDRESS _____
 CITY, STATE, ZIP CODE _____

PAGE 1 OF 1

WELL/PROJECT NO: #1
 LEASE: Hays - Winters
 COUNTY/PARISH: Haskell
 STATE: KS
 CITY: Jetmore
 DATE: 21 Nov 19
 OWNER: _____

TICKET TYPE: SERVICE SALES
 CONTRACTOR: _____
 RIG NAME/NO: _____
 SHIPPED TO: location
 DELIVERED TO: _____
 ORDER NO. _____

WELL TYPE: 0-1
 WELL CATEGORY: Development
 JOB PURPOSE: Cement port collar
 WELL PERMIT NO. _____

WELL LOCATION: 12-21-23

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MUST BE SIGNED BY CUSTOMER OR CUSTOMER'S AGENT PRIOR TO START OF WORK OR DELIVERY OF GOODS

DATE SIGNED: _____ TIME SIGNED: _____

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 NESS CITY, KS 67560
 785-798-2300

SURVEY: OUR EQUIPMENT PERFORMED WITHOUT BREAKDOWN? WE UNDERSTOOD AND MET YOUR NEEDS? OUR SERVICE WAS PERFORMED WITHOUT DELAY? WE OPERATED THE EQUIPMENT AND PERFORMED JOB CALCULATIONS SATISFACTORILY? ARE YOU SATISFIED WITH OUR SERVICE? CUSTOMER DID NOT WISH TO RESPOND

TOTAL: 4902.50

CUSTOMER ACCEPTANCE OF MATERIALS AND SERVICES: The customer hereby acknowledges receipt of the materials and services listed on this ticket.

SWIFT OPERATOR: _____ APPROVAL: _____

Thank You!

CUSTOMER DK Operating WELL NO. 1-12 LEASE #Hayes - Waterhaus JOB TYPE cement pit collar TICKET NO. 32817

CHART NO.	TIME	RATE (BPM)	VOLUME (BBL) (GAL)	PUMPS		PRESSURE (PSI)		DESCRIPTION OF OPERATION AND MATERIALS
				T	C	TUBING	CASING	
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		3 1/2	67			200		→ cement to pit ← { 125 sk mixed 15 to pit }
			8					Displace w/ H ₂ O close port collar
	1435		20					test to 1000 psi - hold RUN 5 joints Reverse hole clean - 2 cement flags -
								pull tool from hole wash truck Rack up
	1515							job complete Thanks Blaine, Flint & Isaac