Confidentiality Requested:
☑ Yes ☐ No

KANSAS CORPORATION COMMISSION
OIL & GAS CONSERVATION DIVISION

1209447

Form ACO-1
August 2013
Form must be Typed
Form must be Signed
All blanks must be Filled

WELL COMPLETION FORM
WELL HISTORY - DESCRIPTION OF WELL & LEASE

OPERATOR: License # 3882
Name: Samuel Gary Jr. & Associates, Inc.
Address 1: 1515 WYNKOOP, STE 700
Address 2:
City: DENVER State: CO Zip: 80202 + __ __ __ __
Contact Person: CHRISTOPHER MITCHELL
Phone: (303) 831-4673
CONTRACTOR: License # 34740
Name: Horizontal Well Drillers, LLC
Wellsite Geologist: SCHUYLER HEDRICK
Purchaser: SAMUEL GARY JR. & ASSOCIATES, INC.

Designate Type of Completion:

☑ New Well ☐ Re-Entry ☐ Workover

☑ Oil ☐ WSW ☐ SWD ☐ SIOW
☐ Gas ☐ D&A ☐ ENHR ☐ SIGW
☐ OG ☐ GSW ☐ Temp. Abd.
☐ 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 ENHR ☐ Conv. to SWD
☐ Plug Back ☐ Conv. to GSW ☐ Conv. to Producer

☐ Commingled Permit #:
☐ Dual Completion Permit #:
☐ SWD Permit #:
☐ ENHR Permit #:
☐ GSW Permit #:

2/24/2014	3/26/2014	3/27/2014
Spud Date or Recompletion Date	Date Reached TD	Completion Date or Recompletion Date

API No. 15 - 15-195-22881-01-00
Spot Description:
SE - SW - SE - NE Sec. 4 Twp. 12 S. R. 22 ☐ East ☑ West
2440 Feet from ☑ North / ☐ South Line of Section
800 Feet from ☑ East / ☐ West Line of Section
Footages Calculated from Nearest Outside Section Corner:
☐ NE ☐ NW ☐ SE ☐ SW
GPS Location: Lat: *(e.g. xx.xxxxx)* , Long: *(e.g. -xxx.xxxxx)*
Datum: ☐ NAD27 ☐ NAD83 ☐ WGS84
County: Trego
Lease Name: 12-22-4 Well #: H4
Field Name:
Producing Formation: MARMATON
Elevation: Ground: 2390 Kelly Bushing: 2402
Total Vertical Depth: 8744 Plug Back Total Depth:
Amount of Surface Pipe Set and Cemented at: 1966 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: 27000 ppm Fluid volume: 560 bbls
Dewatering method used: Hauled to Disposal
Location of fluid disposal if hauled offsite:
Operator Name: AMERICAN TANK SERVICE, LLC
Lease Name: STAAB 1 License #: 34590
Quarter SW Sec. 20 Twp. 12 S. R. 22 ☐ East ☑ West
County: TREGO Permit #: D31526

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: 06/18/2014
☑ **Confidential Release Date:** 06/17/2016
☑ **Wireline Log Received**
☐ **Geologist Report Received**
☐ **UIC Distribution**
ALT ☐ I ☑ II ☐ III **Approved by:** NAOMI JAMES **Date:** 06/18/2014

[redacted] 1209447

Operator Name: Samuel Gary Jr. & Associates, Inc. Lease Name: 12-22-4 Well #: H4

Sec. 4 Twp. 12 S. R. 22 ☐ East ☑ West County: Trego

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 ☐ Yes ☑ No
(Attach Additional Sheets)

Samples Sent to Geological Survey ☑ Yes ☐ No

Cores Taken ☐ Yes ☑ No

Electric Log Run ☑ Yes ☐ No

List All E. Logs Run:

GR

☑ Log Formation (Top), Depth and Datum ☐ Sample

Name	Top	Datum
HEEBNER	3643	-1240
LANSING	3677	-1274
MARMATON	3994	-1591

CASING RECORD ☑ New ☐ 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
Attached	Attached	Attached	Attached	Attached	Attached	Attached	Attached

ADDITIONAL CEMENTING / SQUEEZE RECORD

Purpose:	Depth Top Bottom	Type of Cement	# Sacks Used	Type and Percent Additives
___ Perforate ___ Protect Casing ___ Plug Back TD ___ Plug Off Zone	-			
	-			

Did you perform a hydraulic fracturing treatment on this well? ☑ Yes ☐ No *(If No, skip questions 2 and 3)*

Does the volume of the total base fluid of the hydraulic fracturing treatment exceed 350,000 gallons? ☑ Yes ☐ No *(If No, skip question 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)*

Shots Per Foot	PERFORATION RECORD - Bridge Plugs Set/Type Specify Footage of Each Interval Perforated	Acid, Fracture, Shot, Cement Squeeze Record *(Amount and Kind of Material Used)*	Depth
Attached	Attached	Attached	Attached

TUBING RECORD: Size: Set At: Packer At: Liner Run: ☑ Yes ☐ No

Date of First, Resumed Production, SWD or ENHR. 4/23/2014

Producing Method: ☐ Flowing ☑ Pumping ☐ Gas Lift ☐ Other *(Explain)* _____

Estimated Production Per 24 Hours	Oil Bbls.	Gas Mcf	Water Bbls.	Gas-Oil Ratio	Gravity

DISPOSITION OF GAS:
☐ Vented ☐ Sold ☐ Used on Lease
(If vented, Submit ACO-18.)

METHOD OF COMPLETION:
☐ Open Hole ☑ Perf. ☐ Dually Comp. *(Submit ACO-5)* ☐ Commingled *(Submit ACO-4)*
☐ Other *(Specify)* _____

PRODUCTION INTERVAL:
_____
_____

Mail to: KCC - Conservation Division, 130 S. Market - Room 2078, Wichita, Kansas 67202

Form	ACO1 - Well Completion
Operator	Samuel Gary Jr. & Associates, Inc.
Well Name	12-22-4 H4
Doc ID	1209447

Perforations

Shots Per Foot	Perforation Record	Material Record	Depth
6	4794-4796		4794-4796
6	4844-4846		4844-4846
6	4894-4896		4894-4896
6	5000-5002		5000-5002
6	5044-5046		5044-5046
6	5094-5096		5094-5096
6	5194-5196		5194-5196
6	5252-5254		5252-5254
6	5294-5296		5294-5296
6	5394-5396		5394-5396
6	5444-5446		5444-5446
6	5500-5502		5500-5502
6	5594-5596		5594-5596
6	5644-5646		5644-5646
6	5694-5696		5694-5696
6	5794-5796		5794-5796
6	5844-5846		5844-5846
6	5894-5896		5894-5896
6	5990-5992		5990-5992
6	6050-6052		6050-6052
6	6094-6096		6094-6096
6	6194-6196		6194-6196
6	6244-6246		6244-6246
6	6300-6302		6394-6396

Form	ACO1 - Well Completion
Operator	Samuel Gary Jr. & Associates, Inc.
Well Name	12-22-4 H4
Doc ID	1209447

Perforations

Shots Per Foot	Perforation Record	Material Record	Depth
6	6394-6396		6394-6396
6	6444-6446		6444-6446
6	6494-6496		6494-6496
6	6594-6596		6594-6596
6	6644-6646		6644-6646
6	6694-6696		6694-6696
6	6790-6792		6790-6792
6	6846-6848		6846-6848
6	6894-6896		6894-6896
6	6994-6996		6994-6996
6	7044-7046		7044-7046
6	7100-7102		7100-7102
6	7194-7196		7194-7196
6	7244-7246		7244-7246
6	7294-7296		7294-7296
6	7394-7396		7394-7396
6	7444-7446		7444-7446
6	7494-7496		7494-7496
6	7590-7592		7590-7592
6	7644-7646		7644-7646
6	7694-7696		7694-7696
6	7794-7796		7794-7796
6	7840-7842		7840-7842
6	7894-7896		7894-7896

Form	ACO1 - Well Completion
Operator	Samuel Gary Jr. & Associates, Inc.
Well Name	12-22-4 H4
Doc ID	1209447

Perforations

Shots Per Foot	Perforation Record	Material Record	Depth
6	7994-7996		7994-7996
6	8044-8046		8044-8046
6	8092-8094		8092-8094
6	8194-8196		8194-8196
6	8244-8246		8244-8246
6	8294-8296		8294-8296
6	8396-8398		8396-8398
6	8444-8446		8444-8446
6	8494-8496		8494-8496
6	8594-8596		8594-8596
6	8644-8646		8644-8646
6	8694-8696		8694-8696

Form	ACO1 - Well Completion
Operator	Samuel Gary Jr. & Associates, Inc.
Well Name	12-22-4 H4
Doc ID	1209447

Casing

Purpose Of String	Size Hole Drilled	Size Casing Set	Weight	Setting Depth	Type Of Cement	Number of Sacks Used	Type and Percent Additives
SURFACE	12.25	9.625	36	1966	65/35	525	6% GEL, 3% CC
SURFACE	12.25	9.625	36	1966	COMMON CLASS A	200	3% CC
PRODUCTION	7.875	5.5	17	8744	COMMON CLASS A	1000	2% GEL, 1/4#/SK FLO SEAL
PRODUCTION	7.785	5.5	17	8744	COMMON CLASS A	180	2% GEL, 1.4#/SK FLO SEAL

ALLIED OIL & GAS SERVICES, LLC 062701

Federal Tax I.D. # 20-8651475

REMIT TO P.O. BOX 93999
SOUTHLAKE, TEXAS 76092

SERVICE POINT: great Bend

2-28-14

DATE	SEC.	TWP.	RANGE	CALLED OUT	ON LOCATION	JOB START	JOB FINISH
3-1-14	4	12	22	4:00 am	8:30 am	8:00 am	9:30 pm

LEASE	WELL #	LOCATION	COUNTY	STATE
12-22-4-44 Hixson	1	I 70 to ogallah exit 3N to HRd 1W to 320 Rd ½ N	trego	Ks

OLD OR (NEW) (Circle one)

CONTRACTOR HWD #7
TYPE OF JOB surface
HOLE SIZE 12¼ T.D. 1966'
CASING SIZE 9⅝ 36# DEPTH 1966'
TUBING SIZE DEPTH
DRILL PIPE DEPTH
TOOL DEPTH
PRES. MAX 1000 MINIMUM 500
MEAS. LINE SHOE JOINT 45.27
CEMENT LEFT IN CSG. 45.27
PERFS.
DISPLACEMENT Mud 148 BBl

OWNER sam garey

CEMENT
AMOUNT ORDERED 525 sx 65/35 6% gel 3% cc ¼ #/sx flosea l
200 sx class A 3% cc

EQUIPMENT
PUMP TRUCK #597 CEMENTER Dustin chambers / Charles Pringer
HELPER Mike northcutt
BULK TRUCK #599 DRIVER Kevin Weighouse
BULK TRUCK #870-844 DRIVER Dan Casper

COMMON	200 SX	@ 17.90	$3580
POZMIX		@	
GEL		@	
CHLORIDE	265X	@ 69	$1664
ASC		@	
Flo seal	132 lb	@ 2.97	$392.04
allied light weight		@	
type I - class A	525 SX	@ 16.50	$8662.50
		@	
		@	
		@	
		@	
HANDLING	913.62	@ 2.48	$2265.28
MILEAGE	38.94 x 35 x	2.60	$3543.54
		TOTAL	$20107.85

REMARKS:
Had safety meeting Rig up Rig Ran 1966' Csg Broke circulation w/ Rig mud Hook to head 10 BBl H20 ahead Mix 525 sx 65/35 6% gel 3% cc ¼ #/sx flosea l lead mix 200 sx class A 3% cc tail shut down release plug displace 148 BBl of Mud plug did land float held Bump plug to 1000# 128 BBl to the pit

SERVICE

DEPTH OF JOB	1966		
PUMP TRUCK CHARGE			$2213.75
EXTRA FOOTAGE		@	
MILEAGE	35	@ 7.70	$269.50
MANIFOLD	Head	@ 275	$275
IVM	35	@ 4.40	$154
High connector		@	$600
Wait time	19 Hrs	440	$8360
		TOTAL	$11872.25

CHARGE TO: sam garey
STREET
CITY STATE ZIP

PLUG & FLOAT EQUIPMENT

9⅝ guide shoe			$460
float collar		@	$1344
top Rubber plug		@	$185
Basket		@	$595
4- thread lock		@ $85	$340
5- centralizer		@ $90	$450
		TOTAL	$3374

To: Allied Oil & Gas Services, LLC.
You are hereby requested to rent cementing equipment and furnish cementer and helper(s) to assist owner or contractor to do work as is listed. The above work was done to satisfaction and supervision of owner agent or contractor. I have read and understand the "GENERAL TERMS AND CONDITIONS" listed on the reverse side.

thank you!

PRINTED NAME Sammy Seamon

SIGNATURE

SALES TAX (If Any)	
TOTAL CHARGES	$35354.10
DISCOUNT	$6613.62 IF PAID IN 30 DAYS
	$28740.48
less wait Time	2,000.00
	26,740.48

ALLIED OIL & GAS SERVICES, LLC 062864

Federal Tax I.D. # 20-8651475

REMIT TO P.O. BOX 93999
SOUTHLAKE, TEXAS 76092

SERVICE POINT: Great Bend

DATE	SEC	TWP	RANGE	CALLED OUT	ON LOCATION	JOB START	JOB FINISH
3-27-14	4	12	22	3-26-14 9:30 PM	3-27-14 12:30 AM	4:00 AM	6:30 AM

LEASE	WELL #	LOCATION	COUNTY	STATE
Hixson	K-22-4 #4	I-70 & Oakley Exit N to Rd. 140, 1 1/2 W, W/ into	Trego	Ks

OLD OR NEW (Circle one)

CONTRACTOR HWD
TYPE OF JOB Production
HOLE SIZE 7 7/8" T.D. 8744'
CASING SIZE 5 1/2" 17# DEPTH 8749.72
TUBING SIZE DEPTH
DRILL PIPE DEPTH
TOOL DEPTH
PRES. MAX 2600# MINIMUM 1150
MEAS. LINE SHOE JOINT 2.37
CEMENT LEFT IN CSG. 2.37
PERFS.
DISPLACEMENT 203

OWNER Same

EQUIPMENT

PUMP TRUCK # 392 CEMENTER Tim Dickson
HELPER Chester Kruger
BULK TRUCK # 599 DRIVER Ben Newell
BULK TRUCK # 870-844 DRIVER Mike Scothorn
607-239 Don Cooper

REMARKS:

Ran 8749.73' of 5 1/2 csg. Break Circ. Pumped 5 bbls H20. 40 bbls Allied Spacer. Mixed 150 sks lead, & 1030 sks Tail. Washed Line clean. Released Plug. Displaced with 10 bbls Sugar H20 & 193 bbls H20. Landed Plug at 1800#. Released & Float Held. Resumed to 2600# & Pumped Plug. Released & Held. Cement did circulate Approx 46 BBLs to Pit. Hard Rest

CHARGE TO: Samuel Moyer JR & Associates

STREET

CITY STATE ZIP

CEMENT

AMOUNT ORDERED 150 sks 3% CC, 3% Gypsol, 1/4# Flocel/sk, 1030 sks Class A, 3% Salt, .8% FL-160, .15% CD-31, 2% CD-31, 2# Kolseal/sk, 1/4# Flocel/sk

COMMON	1780	@ 12.90	21,122.00
POZMIX		@	
GEL	39	@ 23.40	912.60
CHLORIDE		@	
ASC Super	100#	@ 2.00	200.00
Flocel	31#	@ 2.97	92.07
Metro Beads	564	@ 3.47	1974.43
Mayflake	9	@ 37.60	338.40
FL-160	775	@ 18.90	14,647.50
CD-31	194	@ 10.30	1998.20
Defoamer	264	@ 9.80	2528.40
Kolseal	2060	@ .98	2018.80
Allied Spacer	40	@ 115.00	4600.00
HANDLING	1288.19	@ 2.48	3194.72
MILEAGE	2050.49	.60	5331.27

TOTAL 58,958.39

SERVICE

DEPTH OF JOB 8749.73
PUMP TRUCK CHARGE 4932.50
EXTRA FOOTAGE @
MILEAGE 35 @ 7.70 269.50
MANIFOLD @
LVM 35 @ 4.40 154.60
Hard Rest @ 275.00 275.00

TOTAL 5632.00

PLUG & FLOAT EQUIPMENT

5 1/2" 3- Baskets @ 85.00 255.00
~~Super Seal Shoe @ 600.00 600.00~~
~~Super Seal Collar @ 725.00 725.00~~
~~3- Baskets @ 85.00 255.00~~
~~2- Centralizers @ 395.00 790.00~~
Down Lock - 4 @ 57.00 228.00

TOTAL ~~3083.00~~ 1483.00

SALES TAX (If Any)
TOTAL CHARGES $ 64,823.39
DISCOUNT $ 12,964.68 IF PAID IN 30 DAYS
$ 51,858.71

To: Allied Oil & Gas Services, LLC.
You are hereby requested to rent cementing equipment and furnish cementer and helper(s) to assist owner or contractor to do work as is listed. The above work was done to satisfaction and supervision of owner agent or contractor. I have read and understand the "GENERAL TERMS AND CONDITIONS" listed on the reverse side.

PRINTED NAME X SAMMY STEPHON

SIGNATURE X

Survey Report

Company:	Samuel Gary Jr & Associates, Inc.	**Local Co-ordinate Reference:**	Well 12-22-4-H4
Project:	Trego County, KS	**TVD Reference:**	Well @ 2403.0usft
Site:	Section 4-T12S-R22W	**MD Reference:**	Well @ 2403.0usft
Well:	12-22-4-H4	**North Reference:**	Grid
Wellbore:	HWD #7	**Survey Calculation Method:**	Minimum Curvature
Design:	HWD #7	**Database:**	Rocky Mountain R5000 Database

Project Trego County, KS

Map System:	US State Plane 1927 (Exact solution)	**System Datum:**	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Kansas North 1501		

Site Section 4-T12S-R22W

Site Position:		**Northing:**	261,586.00 usft	**Latitude:**	39° 2' 17.521 N
From:	Lat/Long	**Easting:**	1,499,326.00 usft	**Longitude:**	99° 45' 45.836 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	-1.12 °

Well 12-22-4-H4

Well Position	**+N/-S**	0.0 usft	**Northing:**	261,585.97 usft	**Latitude:**	39° 2' 17.521 N
	+E/-W	0.0 usft	**Easting:**	1,499,326.00 usft	**Longitude:**	99° 45' 45.836 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**	2,403.0 usft	**Ground Level:**	2,389.5 usft

Wellbore HWD #7

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/24/2014	5.49	66.57	52,592

Design HWD #7

Audit Notes:

Version:	1.0	**Phase:**	ACTUAL	**Tie On Depth:**	0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	1.74

Survey Program **Date** 3/25/2014

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
3,106.0	8,745.0	End of Well Report (HWD #7)	MWD	

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
3,098.0	0.40	225.00	3,097.9	-1.0	-15.3	-1.5	0.00	0.00	0.00
Tie-On Survey									
3,106.0	0.40	217.10	3,105.9	-1.0	-15.3	-1.5	0.69	0.00	-98.75
3,151.0	1.10	335.40	3,150.9	-0.8	-15.6	-1.2	2.97	1.56	262.89
3,196.0	4.80	350.40	3,195.8	1.5	-16.1	1.0	8.33	8.22	33.33
3,241.0	8.00	354.60	3,240.5	6.5	-16.7	5.9	7.18	7.11	9.33
3,286.0	10.90	356.80	3,284.9	13.8	-17.2	13.3	6.49	6.44	4.89
3,331.0	15.20	359.50	3,328.8	24.0	-17.5	23.4	9.65	9.56	6.00
3,376.0	19.60	359.10	3,371.7	37.4	-17.7	36.9	9.78	9.78	-0.89
3,421.0	22.80	1.10	3,413.6	53.7	-17.7	53.1	7.29	7.11	4.44
3,466.0	26.10	1.40	3,454.6	72.3	-17.2	71.8	7.34	7.33	0.67

Company:	Samuel Gary Jr & Associates, Inc.	**Local Co-ordinate Reference:**	Well 12-22-4-H4
Project:	Trego County, KS	**TVD Reference:**	Well @ 2403.0usft
Site:	Section 4-T12S-R22W	**MD Reference:**	Well @ 2403.0usft
Well:	12-22-4-H4	**North Reference:**	Grid
Wellbore:	HWD #7	**Survey Calculation Method:**	Minimum Curvature
Design:	HWD #7	**Database:**	Rocky Mountain R5000 Database

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
3,511.0	29.40	1.60	3,494.4	93.3	-16.7	92.7	7.34	7.33	0.44
3,556.0	32.50	1.70	3,533.0	116.4	-16.0	115.8	6.89	6.89	0.22
3,600.0	35.30	1.50	3,569.5	140.9	-15.3	140.4	6.37	6.36	-0.45
3,646.0	37.50	1.50	3,606.5	168.2	-14.6	167.7	4.78	4.78	0.00
3,691.0	39.90	2.40	3,641.7	196.3	-13.7	195.8	5.48	5.33	2.00
3,735.0	42.50	2.20	3,674.8	225.3	-12.5	224.8	5.92	5.91	-0.45
3,781.0	45.30	2.40	3,707.9	257.1	-11.2	256.7	6.09	6.09	0.43
3,826.0	47.50	2.70	3,738.9	289.7	-9.8	289.3	4.91	4.89	0.67
3,871.0	49.90	2.00	3,768.6	323.5	-8.4	323.1	5.46	5.33	-1.56
3,916.0	52.70	2.60	3,796.8	358.6	-7.0	358.2	6.31	6.22	1.33
3,960.0	55.60	3.10	3,822.5	394.2	-5.2	393.8	6.65	6.59	1.14
4,005.0	57.90	2.70	3,847.2	431.8	-3.3	431.5	5.16	5.11	-0.89
4,050.0	60.40	2.60	3,870.3	470.3	-1.5	470.1	5.56	5.56	-0.22
4,095.0	62.10	1.80	3,891.9	509.8	0.0	509.5	4.09	3.78	-1.78
4,140.0	63.30	1.90	3,912.6	549.7	1.3	549.5	2.67	2.67	0.22
4,185.0	64.50	2.00	3,932.4	590.1	2.7	589.9	2.67	2.67	0.22
4,231.0	66.30	2.70	3,951.5	631.9	4.4	631.7	4.15	3.91	1.52
4,276.0	68.10	1.50	3,968.9	673.4	5.9	673.2	4.69	4.00	-2.67
4,321.0	71.20	1.30	3,984.6	715.5	6.9	715.4	6.90	6.89	-0.44
4,366.0	75.30	1.50	3,997.6	758.6	8.0	758.5	9.12	9.11	0.44
4,411.0	78.50	2.70	4,007.8	802.4	9.6	802.3	7.57	7.11	2.67
4,456.0	80.90	2.50	4,015.8	846.6	11.6	846.6	5.35	5.33	-0.44
4,501.0	82.90	3.00	4,022.1	891.1	13.7	891.1	4.58	4.44	1.11
4,545.0	84.70	3.20	4,026.9	934.8	16.1	934.9	4.12	4.09	0.45
4,590.0	86.20	2.80	4,030.5	979.6	18.4	979.7	3.45	3.33	-0.89
4,635.0	87.70	1.70	4,032.9	1,024.5	20.2	1,024.6	4.13	3.33	-2.44
4,680.0	89.40	1.70	4,034.0	1,069.5	21.5	1,069.6	3.78	3.78	0.00
4,700.4	89.81	1.70	4,034.1	1,089.8	22.2	1,090.0	2.00	2.00	0.00
12-22-4-H4 LP									
4,725.0	90.30	1.70	4,034.1	1,114.4	22.9	1,114.6	2.00	2.00	0.00
4,770.0	90.70	1.60	4,033.7	1,159.4	24.2	1,159.6	0.92	0.89	-0.22
4,815.0	90.50	1.00	4,033.3	1,204.4	25.2	1,204.6	1.41	-0.44	-1.33
4,860.0	90.70	0.40	4,032.8	1,249.4	25.7	1,249.6	1.41	0.44	-1.33
4,924.0	90.00	359.20	4,032.4	1,313.4	25.5	1,313.6	2.17	-1.09	-1.88
4,969.0	89.70	0.40	4,032.5	1,358.4	25.4	1,358.5	2.75	-0.67	2.67
5,014.0	90.00	0.70	4,032.6	1,403.4	25.8	1,403.5	0.94	0.67	0.67
5,059.0	90.00	1.20	4,032.6	1,448.4	26.5	1,448.5	1.11	0.00	1.11
5,104.0	90.10	1.50	4,032.6	1,493.4	27.6	1,493.5	0.70	0.22	0.67
5,149.0	90.20	2.20	4,032.5	1,538.3	29.1	1,538.5	1.57	0.22	1.56
5,194.0	89.80	1.50	4,032.5	1,583.3	30.5	1,583.5	1.79	-0.89	-1.56
5,239.0	89.00	1.60	4,032.9	1,628.3	31.7	1,628.5	1.79	-1.78	0.22
5,284.0	89.10	1.80	4,033.7	1,673.3	33.1	1,673.5	0.50	0.22	0.44
5,329.0	88.40	1.60	4,034.7	1,718.2	34.4	1,718.5	1.62	-1.56	-0.44

Company:	Samuel Gary Jr & Associates, Inc.	**Local Co-ordinate Reference:**	Well 12-22-4-H4
Project:	Trego County, KS	**TVD Reference:**	Well @ 2403.0usft
Site:	Section 4-T12S-R22W	**MD Reference:**	Well @ 2403.0usft
Well:	12-22-4-H4	**North Reference:**	Grid
Wellbore:	HWD #7	**Survey Calculation Method:**	Minimum Curvature
Design:	HWD #7	**Database:**	Rocky Mountain R5000 Database

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,373.0	90.50	1.10	4,035.1	1,762.2	35.4	1,762.5	4.91	4.77	-1.14
5,418.0	90.90	1.10	4,034.5	1,807.2	36.3	1,807.5	0.89	0.89	0.00
5,463.0	90.10	0.70	4,034.1	1,852.2	37.0	1,852.5	1.99	-1.78	-0.89
5,509.0	90.00	0.60	4,034.1	1,898.2	37.5	1,898.5	0.31	-0.22	-0.22
5,554.0	90.90	0.80	4,033.8	1,943.2	38.1	1,943.5	2.05	2.00	0.44
5,598.0	91.30	0.70	4,032.9	1,987.2	38.7	1,987.4	0.94	0.91	-0.23
5,643.0	90.70	0.70	4,032.1	2,032.2	39.2	2,032.4	1.33	-1.33	0.00
5,688.0	90.70	0.60	4,031.6	2,077.2	39.7	2,077.4	0.22	0.00	-0.22
5,733.0	90.50	1.60	4,031.1	2,122.2	40.6	2,122.4	2.27	-0.44	2.22
5,778.0	90.00	1.60	4,030.9	2,167.1	41.8	2,167.4	1.11	-1.11	0.00
5,823.0	90.50	2.00	4,030.7	2,212.1	43.2	2,212.4	1.42	1.11	0.89
5,868.0	90.80	2.90	4,030.2	2,257.1	45.2	2,257.4	2.11	0.67	2.00
5,912.0	91.40	2.90	4,029.4	2,301.0	47.4	2,301.4	1.36	1.36	0.00
5,957.0	91.60	3.10	4,028.2	2,345.9	49.7	2,346.4	0.63	0.44	0.44
6,002.0	91.60	3.30	4,026.9	2,390.8	52.3	2,391.3	0.44	0.00	0.44
6,047.0	91.40	3.00	4,025.7	2,435.8	54.7	2,436.3	0.80	-0.44	-0.67
6,092.0	91.10	3.00	4,024.8	2,480.7	57.1	2,481.3	0.67	-0.67	0.00
6,137.0	91.50	3.20	4,023.7	2,525.6	59.5	2,526.3	0.99	0.89	0.44
6,182.0	91.40	2.70	4,022.6	2,570.5	61.8	2,571.2	1.13	-0.22	-1.11
6,227.0	91.40	2.70	4,021.5	2,615.5	64.0	2,616.2	0.00	0.00	0.00
6,272.0	91.10	2.80	4,020.5	2,660.4	66.1	2,661.2	0.70	-0.67	0.22
6,317.0	90.60	2.30	4,019.9	2,705.4	68.1	2,706.2	1.57	-1.11	-1.11
6,362.0	90.60	2.20	4,019.4	2,750.3	69.9	2,751.2	0.22	0.00	-0.22
6,407.0	90.70	2.20	4,018.9	2,795.3	71.6	2,796.2	0.22	0.22	0.00
6,452.0	90.80	2.00	4,018.3	2,840.3	73.3	2,841.2	0.50	0.22	-0.44
6,496.0	90.90	1.60	4,017.6	2,884.2	74.6	2,885.2	0.94	0.23	-0.91
6,541.0	91.00	1.30	4,016.9	2,929.2	75.8	2,930.2	0.70	0.22	-0.67
6,587.0	90.90	0.70	4,016.1	2,975.2	76.6	2,976.1	1.32	-0.22	-1.30
6,631.0	89.70	359.90	4,015.9	3,019.2	76.8	3,020.1	3.28	-2.73	-1.82
6,676.0	89.50	0.10	4,016.2	3,064.2	76.8	3,065.1	0.63	-0.44	0.44
6,721.0	89.00	359.50	4,016.8	3,109.2	76.7	3,110.1	1.74	-1.11	-1.33
6,766.0	88.90	359.20	4,017.6	3,154.2	76.1	3,155.0	0.70	-0.22	-0.67
6,811.0	89.70	359.20	4,018.2	3,199.2	75.5	3,200.0	1.78	1.78	0.00
6,856.0	89.40	359.80	4,018.5	3,244.2	75.1	3,244.9	1.49	-0.67	1.33
6,901.0	89.60	359.70	4,018.9	3,289.2	74.9	3,289.9	0.50	0.44	-0.22
6,946.0	89.80	0.30	4,019.1	3,334.2	74.9	3,334.9	1.41	0.44	1.33
6,991.0	90.00	359.80	4,019.2	3,379.2	75.0	3,379.9	1.20	0.44	-1.11
7,036.0	90.00	1.20	4,019.2	3,424.2	75.4	3,424.9	3.11	0.00	3.11
7,081.0	89.70	1.30	4,019.3	3,469.1	76.3	3,469.9	0.70	-0.67	0.22
7,126.0	89.70	1.70	4,019.6	3,514.1	77.5	3,514.9	0.89	0.00	0.89
7,171.0	89.90	1.90	4,019.7	3,559.1	78.9	3,559.9	0.63	0.44	0.44
7,216.0	90.30	2.20	4,019.7	3,604.1	80.5	3,604.9	1.11	0.89	0.67
7,261.0	90.20	2.60	4,019.5	3,649.0	82.4	3,649.9	0.92	-0.22	0.89

Company:	Samuel Gary Jr & Associates, Inc.	**Local Co-ordinate Reference:**	Well 12-22-4-H4
Project:	Trego County, KS	**TVD Reference:**	Well @ 2403.0usft
Site:	Section 4-T12S-R22W	**MD Reference:**	Well @ 2403.0usft
Well:	12-22-4-H4	**North Reference:**	Grid
Wellbore:	HWD #7	**Survey Calculation Method:**	Minimum Curvature
Design:	HWD #7	**Database:**	Rocky Mountain R5000 Database

Survey

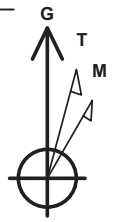
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,305.0	90.20	2.40	4,019.3	3,693.0	84.3	3,693.9	0.45	0.00	-0.45
7,350.0	90.10	1.90	4,019.2	3,738.0	86.0	3,738.8	1.13	-0.22	-1.11
7,396.0	90.20	2.30	4,019.1	3,783.9	87.7	3,784.8	0.90	0.22	0.87
7,440.0	90.20	2.50	4,018.9	3,827.9	89.6	3,828.8	0.45	0.00	0.45
7,485.0	90.20	2.10	4,018.8	3,872.9	91.4	3,873.8	0.89	0.00	-0.89
7,530.0	90.30	2.20	4,018.6	3,917.8	93.1	3,918.8	0.31	0.22	0.22
7,575.0	90.20	2.00	4,018.4	3,962.8	94.7	3,963.8	0.50	-0.22	-0.44
7,620.0	90.10	1.70	4,018.2	4,007.8	96.2	4,008.8	0.70	-0.22	-0.67
7,665.0	90.20	2.00	4,018.1	4,052.7	97.6	4,053.8	0.70	0.22	0.67
7,710.0	90.00	2.60	4,018.1	4,097.7	99.4	4,098.8	1.41	-0.44	1.33
7,755.0	90.40	2.40	4,017.9	4,142.7	101.4	4,143.8	0.99	0.89	-0.44
7,800.0	90.50	2.00	4,017.5	4,187.6	103.1	4,188.8	0.92	0.22	-0.89
7,845.0	90.30	2.70	4,017.2	4,232.6	105.0	4,233.8	1.62	-0.44	1.56
7,890.0	89.80	2.70	4,017.2	4,277.5	107.1	4,278.8	1.11	-1.11	0.00
7,935.0	89.70	2.80	4,017.4	4,322.5	109.2	4,323.8	0.31	-0.22	0.22
7,980.0	89.70	2.40	4,017.6	4,367.4	111.3	4,368.8	0.89	0.00	-0.89
8,025.0	89.70	2.50	4,017.9	4,412.4	113.2	4,413.8	0.22	0.00	0.22
8,070.0	89.80	2.30	4,018.1	4,457.4	115.1	4,458.8	0.50	0.22	-0.44
8,115.0	89.80	2.00	4,018.2	4,502.3	116.8	4,503.8	0.67	0.00	-0.67
8,160.0	90.20	1.80	4,018.2	4,547.3	118.3	4,548.8	0.99	0.89	-0.44
8,205.0	90.50	2.00	4,017.9	4,592.3	119.8	4,593.8	0.80	0.67	0.44
8,249.0	90.90	2.40	4,017.4	4,636.2	121.4	4,637.8	1.29	0.91	0.91
8,294.0	90.90	2.00	4,016.7	4,681.2	123.2	4,682.8	0.89	0.00	-0.89
8,339.0	91.00	1.90	4,015.9	4,726.2	124.7	4,727.8	0.31	0.22	-0.22
8,384.0	90.70	3.10	4,015.3	4,771.1	126.7	4,772.8	2.75	-0.67	2.67
8,429.0	89.60	3.20	4,015.2	4,816.1	129.1	4,817.8	2.45	-2.44	0.22
8,474.0	89.50	3.40	4,015.5	4,861.0	131.7	4,862.7	0.50	-0.22	0.44
8,519.0	89.60	3.30	4,015.9	4,905.9	134.4	4,907.7	0.31	0.22	-0.22
8,564.0	89.80	3.70	4,016.1	4,950.8	137.1	4,952.7	0.99	0.44	0.89
8,609.0	89.80	3.70	4,016.3	4,995.7	140.0	4,997.7	0.00	0.00	0.00
8,654.0	90.50	3.40	4,016.1	5,040.6	142.8	5,042.6	1.69	1.56	-0.67
8,699.0	91.00	3.40	4,015.6	5,085.5	145.5	5,087.6	1.11	1.11	0.00
12-22-4-H4 PBHL									
8,745.0	91.00	3.40	4,014.7	5,131.5	148.2	5,133.6	0.00	0.00	0.00
Projected Survey to 8,745' MD									

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
3,098.0	3,097.9	-1.0	-15.3	Tie-On Survey
8,745.0	4,014.7	5,131.5	148.2	Projected Survey to 8,745' MD

Samuel Gary Jr & Associates, Inc.
12-22-4-H4
Trego County, KS

Geodetic System: US State Plane 1927 (Exact solution)
Zone: Kansas North 1501
Well @ 2403.0usft
Ground Level: 2389.5
Latitude: 39° 2' 17.521 N
Longitude: 99° 45' 45.836 W
Magnetic North is 5.49° East of True North (Magnetic Declination)



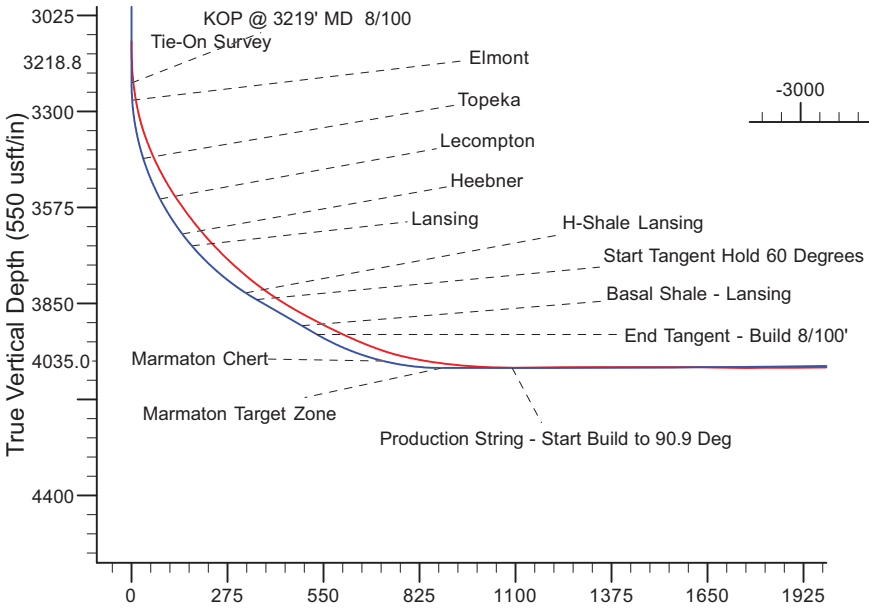
Azimuths to Grid North
True North: 1.11°
Magnetic North: 6.61°

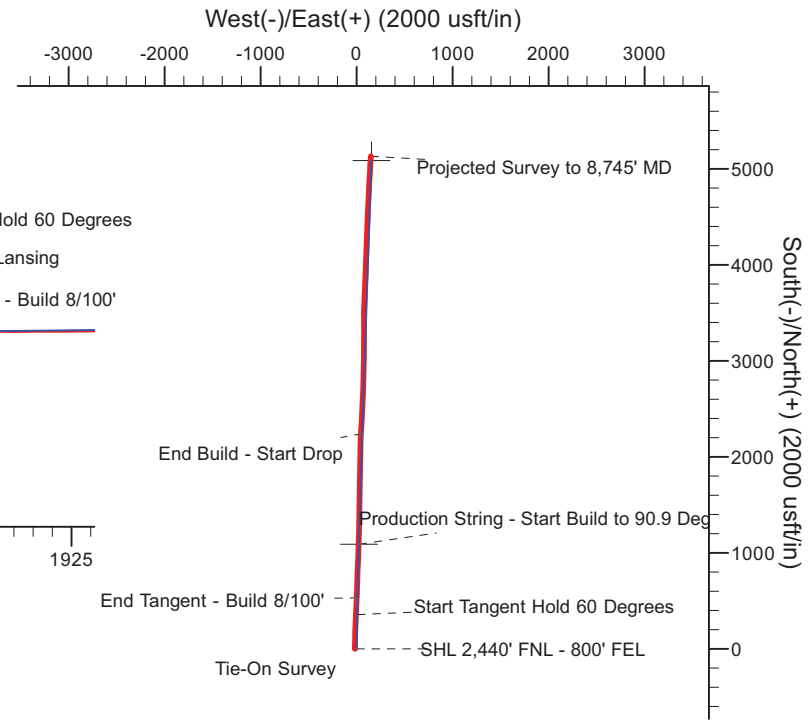
Magnetic Field
Strength: 52592.0snT
Dip Angle: 66.57°
Date: 2/24/2014
Model: IGRF2010

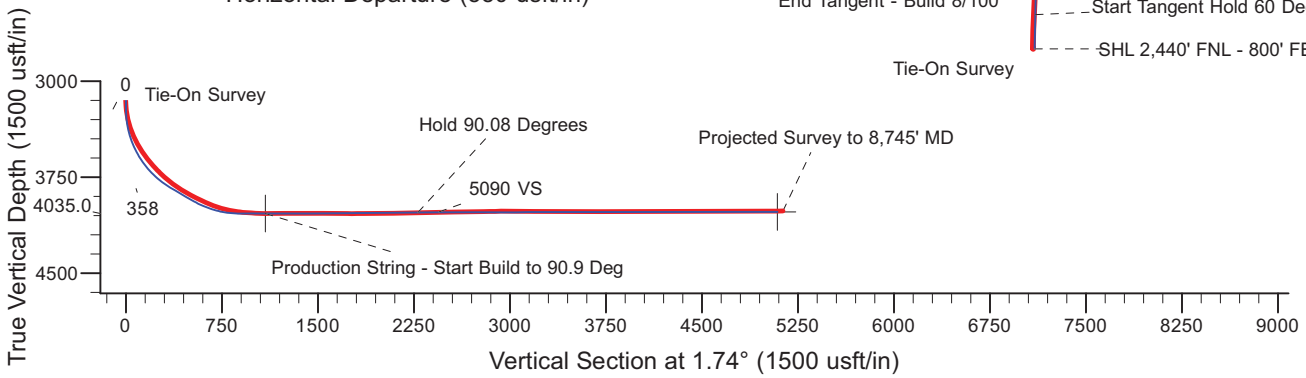
MD	Inc	Azi	TVD	+N/-S	+E/-W	DIeg	TFace	VSect
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0
3218.8	0.00	0.00	3218.8	0.0	0.0	0.00	0.00	0.0
3968.8	60.00	1.32	3839.0	358.0	8.2	8.00	1.32	358.1
4168.8	60.00	1.32	3939.0	531.2	12.2	0.00	0.00	531.3
4543.8	90.00	1.32	4035.0	889.2	20.5	8.00	0.00	889.4
4744.4	90.00	1.32	4035.0	1089.7	25.1	0.00	0.00	1090.0
5895.4	90.90	1.95	4026.0	2240.2	57.9	0.10	35.00	2241.0
5936.1	90.08	1.95	4025.6	2280.8	59.3	2.00	180.00	2281.6
7124.4	90.08	1.95	4023.9	3468.5	99.7	0.00	0.00	3470.0
8745.0	90.08	1.95	4021.6	5088.1	154.7	0.00	0.00	5090.5

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1850.0	1850.0	Stone Corral
2211.0	2211.0	Hutchinson Salt
2322.0	2322.0	Base Hutchinson
2942.0	2942.0	Neva
3268.0	3268.0	Elmont
3435.0	3438.4	Topeka
3551.0	3564.2	Lecompton
3651.0	3682.8	Heebner
3685.0	3726.4	Lansing
3820.0	3932.3	H-Shale Lansing
3914.0	4118.7	Basal Shale - Lansing
4015.0	4543.8	Marmaton Chert
4035.0	4374.1	Marmaton Target Zone







Plan: Revised 02-25-14 (12-22-4-H4/HWD #7)

Created By:	Mike Kirby	Date:	8:44, March 25 2014
Checked:		Date:	
Reviewed:		Date:	
Approved:	x	Date:	x

****CELLS WITH BLUE BACKGROUND ARE THE ONLY CELLS TO BE EDITED****

Fracture Start Date/Time:	4/18/14 0:00
Fracture End Date/Time:	4/18/14 0:00
State:	Kansas
County:	Trego
API Number:	*(e.g. XX-XXX-XXXXX-0000)*
Operator Number:	
Well Name:	Hixson 12-22-4-H4
Federal Well:	
Longitude:	
Latitude:	
Long/Lat Projection:	NAD27
True Vertical Depth (TVD):	
Total Clean Fluid Volume* (gal):	186,816

Additive	*Specific Gravity*	*Additive Quantity*	*Mass (lbs)*	
Water	1.00	736,890	*6,149,347*	gal
Plexsurf 210E	0.95	885	*7,016*	gal
Plexbreak 134	0.97	445	*3,602*	gal
Plexcide P5	0.96	170	*1,362*	gal
Plexbore 101	1.30	556	*6,032*	gal
Ammonium Persulfate	1.98	605	*9,996*	gal
DF 100	0.95	1,370	*10,861*	gal
				gal
				gal
				gal
				gal
				gal
				gal
				gal
				gal
				gal
				gal
				gal
				gal
				gal
			Total Slurry Mass (lbs)	
			6,188,216	

Ingredients Section:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Mass per Component (LBS)	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Questa Energy	Carrier/Base Fluid	Water	7732-18-5	100.00%	*6,149,347*	*99.37188%*	
Plexsurf 210E	Chemplex	Flowback Aid	Methyl Alcohol	67-56-1	30.00%	*2,105*	*0.03401%*	
			Alcohol Alkoxylate	NA	20.00%	*1,403*	*0.02268%*	
			Ethyleneglycol Monobutyl Ether	111-76-2	5.00%	*351*	*0.00567%*	
Plexbreak 134	Chemplex	Nonemulsifier for acid	Isopropyl Alcohol	67-63-0	20.00%	*119*	*0.00933%*	
Plexcide P5	Chemplex	Industrial water treatment	Tributyl tetradecyl phosphonium	81741-28-8	5.00%	*9*	*0.00072%*	
			Methanol	67-56-1	20.00%	*37*	*0.00290%*	
Plexbore 101	Chemplex	Crosslinker	Potassium Metaborate	13709-94-9	30.00%	*368*	*0.02891%*	
			Potassium Hydroxide	1310-58-3	5.00%	*61*	*0.00482%*	
			Ethylene Glycol	107-21-1	10.00%	*123*	*0.00964%*	
Ammonium Persulfate	Chemplex	Breaker	Ammonium Persulfate	7727-54-0	98.00%	*131*	*0.01032%*	
DF 100	Drilling Fluid Technology	Foamer	Methanol	67-56-1	10.00%	*289*	*0.02274%*	
			Isopropyl Alcohol	67-63-0	15.00%	*434*	*0.03412%*	
			Ethylene Glycol Buty Ether	111-76-2	25.00%	*723*	*0.05686%*	
								Non-MSDS Component
								Non-MSDS Component
								Non-MSDS Component
								Non-MSDS Component
								Non-MSDS Component
								Non-MSDS Component

*Total Water Volume sources may include fresh water, produced water, and/or recycled water
** Information is based on the maximum potential for concentration and thus the total may be over 100%

All component information listed was obtained from the supplier's Material Safety Data Sheets (MSDS). As such, the Operator is not responsible for inaccurate and/or incomplete information. Any questions regarding the content of the MSDS should be directed to the supplier who provided it. The Occupational Safety and Health Administration's (OSHA) regulations govern the criteria for the disclosure of this information. Please note that Federal Law protects "proprietary", "trade secret", and "confidential business information" and the criteria for how this information is reported on an MSDS is subject to 29 CFR 1910.1200(i) and Appendix D.