APPROVED
NAME: [illegible]
DATE: 1/8/17

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Page ___ of ___

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

API 47 - 049 - 02361 County Marion District Mannington
Quad Shinnston Pad Name Hughes Pad Field/Pool Name Marcellus
Farm name Rockwell, Faye C. Well Number Hughes 11H
Operator (as registered with the OOG) XTO Energy Inc.
Address PO Box 1008 City Jane Lew State WV Zip 26378

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4367330 Easting 554145
Landing Point of Curve Northing 4367313.2 Easting 554623.8
Bottom Hole Northing 4366297 Easting 555865

Elevation (ft) 1287 GL Type of Well ■New □ Existing Type of Report □Interim ■Final

Permit Type □ Deviated □ Horizontal ■ Horizontal 6A □ Vertical Depth Type □ Deep ■ Shallow

Type of Operation □ Convert □ Deepen ■ Drill □ Plug Back □ Redrilling □ Rework ■ Stimulate

Well Type □ Brine Disposal □ CBM ■ Gas □ Oil □ Secondary Recovery □ Solution Mining □ Storage □ Other _____

Type of Completion ■ Single □ Multiple Fluids Produced ■ Brine ■Gas □ NGL □ Oil □ Other _____
Drilled with □ Cable ■ Rotary

Drilling Media Surface hole ■ Air □ Mud □Fresh Water Intermediate hole ■ Air □ Mud □ Fresh Water □ Brine
Production hole □ Air ■ Mud □ Fresh Water □ Brine
Mud Type(s) and Additive(s)
Synthetic Oil Based Mud

Date permit issued 3/11/2015 Date drilling commenced 11/19/2015 Date drilling ceased 3/5/2016
Date completion activities began 7/28/2016 Date completion activities ceased 8/14/2016
Verbal plugging (Y/N) _____ Date permission granted _____ Granted by _____

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 115 Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1410 Void(s) encountered (Y/N) depths N
Coal depth(s) ft 98-102, 470-477, 874-879 Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) Y

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API 47- 049 - 02361 Farm name Rockwell, Faye C. Well number Hughes 11H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	28"	24"	40	NEW	PE&B 94.62#		Grouted to surface
Surface	17 1/2"	13 3/8"	613	NEW	H-40 48#		Y
Coal							
Intermediate 1	12 3/8" / 12 1/4"	9 5/8"	3152	NEW	J-55 36#		Y
Intermediate 2							
Intermediate 3							
Production	8 3/4"	5 1/2"	13603	NEW	P-110 20#		TOC - 2644
Tubing							
Packer type and depth set							

Comment Details

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft^3/sks)	Volume (ft^3)	Cement Top (MD)	WOC (hrs)
Conductor	Redi-mix	5 Yards				0	8
Surface	1	460	15.60	1.19	547.40	0	8
Coal							
Intermediate 1	A	1130	15.60	1.18	1333.4	0	8
Intermediate 2							
Intermediate 3							
Production	50:50 POZ H / H	355/1875	15.20 / 15.60	1.07 / 1.18	379.85 / 2212.5	2644	8
Tubing							

Drillers TD (ft) 13,630 Loggers TD (ft) 13,630

Deepest formation penetrated Marcellus Plug back to (ft)

Plug back procedure

Kick off depth (ft) 5786

Check all wireline logs run ■ caliper □ density ■ deviated/directional □ induction
□ neutron □ resistivity ■ gamma ray □ temperature □sonic

Well cored □ Yes ■ No Conventional Sidewall Were cuttings collected ■ Yes □ No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING

Surface - Every 3rd Joint
Intermediate - Every 3rd Joint
Production - Every other Joint (TD-TOC)

WAS WELL COMPLETED AS SHOT HOLE □ Yes ■ No DETAILS

WAS WELL COMPLETED OPEN HOLE? □ Yes ■ No DETAILS

WERE TRACERS USED □ Yes ■ No TYPE OF TRACER(S) USED

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API 47- 049 - 02361 Farm name Rockwell, Faye C. Well number Hughes 11H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
	See attached				

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
	See att							

Please insert additional pages as applicable.

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API 47- 049 - 02361 Farm name Rockwell, Faye C. Well number Hughes 11H

PRODUCING FORMATION(S)	DEPTHS			
Marcellus	7419	TVD	13,409	MD

Please insert additional pages as applicable.

GAS TEST ☐ Build up ☐ Drawdown ■ Open Flow OIL TEST ☐ Flow ☐ Pump

SHUT-IN PRESSURE Surface 1500 psi Bottom Hole 3210 psi DURATION OF TEST 24 hrs

OPEN FLOW	Gas	Oil	NGL	Water	GAS MEASURED BY
	3289 mcfpd	0 bpd	0 bpd	760 bpd	☐ Estimated ■ Orifice ☐ Pilot

LITHOLOGY/ FORMATION NAME	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
	0		0		
See attached					

Please insert additional pages as applicable.

Drilling Contractor Nomac Drilling
Address 3400 South Radio Road City El Reno State OK Zip 73036

Logging Company MS Energy Services
Address 7821 Will Rogers Blvd City Ft. Worth State TX Zip 76140

Cementing Company C&J Energy Services
Address 3990 Rogerdale Rd. City Houston State TX Zip 77042

Stimulating Company Schlumberger Oilfield Services
Address 1325 S. Dairy Ashford Dr. City Houston State TX Zip 77077

Please insert additional pages as applicable.

Completed by Tim Sands Telephone 304-884-6000
Signature [signature] Title Regulatory Compliance Technician Date 1-19-17

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

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Perforation Record Hughes 11H 47-049-02361

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	7/28/2016	13,321	13,455	48	Marcellus
2	7/29/2016	13,117	13,251	48	Marcellus
3	7/29/2016	12,913	13,047	48	Marcellus
4	7/30/2016	12,709	12,843	48	Marcellus
5	7/31/2016	12,505	12,639	48	Marcellus
6	7/31/2016	12,301	12,435	48	Marcellus
7	8/1/2016	12,035	12,231	84	Marcellus
8	8/3/2016	11,831	11,963	60	Marcellus
9	8/3/2016	11,631	11,757	60	Marcellus
10	8/4/2016	11,429	11,559	60	Marcellus
11	8/4/2016	11,229	11,352	60	Marcellus
12	8/6/2016	11,025	11,155	60	Marcellus
13	8/6/2016	10,823	10,956	60	Marcellus
14	8/6/2016	10,621	10,751	60	Marcellus
15	8/7/2016	10,419	10,549	60	Marcellus
16	8/7/2016	10,201	10,351	60	Marcellus
17	8/9/2016	10,014	10,145	60	Marcellus
18	8/9/2016	9,813	9,943	60	Marcellus
19	8/9/2016	9,611	9,741	60	Marcellus
20	8/10/2016	9,411	9,539	60	Marcellus
21	8/11/2016	9,207	9,337	60	Marcellus
22	8/11/2016	9,005	9,139	60	Marcellus
23	8/11/2016	8,803	8,933	60	Marcellus
24	8/12/2016	8,601	8,734	60	Marcellus
25	8/13/2016	8,399	8,529	60	Marcellus
26	8/14/2016	8,197	8,322	60	Marcellus
27	8/14/2016	7,995	8,125	60	Marcellus

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Stimulation Information Per Stage Hughes 11H 47-049-02361

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amout of Water (bbls)	Amount of Nitrogen/other (units)
1	7/28/2016	75.8	8,736	6,919	5,597	108,800	7,724	0
2	7/29/2016	78.4	8,213	6,950	4,726	346,680	11,835	0
3	7/30/2016	78.3	8,137	7,162	4,799	345,980	14,466	0
4	7/31/2016	66.5	8,409	6,496	6,056	114,820	11,278	0
5	7/31/2016	73.5	7,984	6,618	4,644	319,580	12,314	0
6	8/2/2016	78.3	7,990	7,395	4,606	311,340	10,794	0
7	8/2/2016	47	8,494	7,133	8,638	44,730	4,999	0
8	8/3/2016	74.4	7,870	7,465	5,081	286,300	10,892	0
9	8/4/2016	80	8,084	7,318	5,653	306,420	11,236	0
10	8/4/2016	79.4	7,978	6,892	4,782	304,200	10,590	0
11	8/5/2016	80.5	7,797	7,487	3,139	310,800	10,729	0
12	8/6/2016	80.3	7,799	6,845	5,527	307,515	10,667	0
13	8/6/2016	85.1	7,798	6,453	5,171	302,860	10,544	0
14	8/7/2016	82.7	7,749	6,826	5,627	309,120	10,746	0
15	8/8/2016	85.1	8,052	6,577	5,951	308,540	11,264	0
16	8/9/2016	81.5	8,022	6,837	5,380	307,120	10,753	0
17	8/9/2016	80.1	8,230	6,476	5,560	254,520	12,698	0
18	8/9/2016	80.7	8,152	7,142	5,253	307,900	11,006	0
19	8/10/2016	85.2	7,528	6,414	5,300	306,520	10,760	0
20	8/10/2016	83	7,770	6,485	5,503	307,620	11,196	0
21	8/11/2016	84.8	7,663	6,722	5,205	307,930	10,948	0
22	8/11/2016	83	7,588	6,433	5,428	308,020	10,601	0
23	8/12/2016	84.9	7,505	6,794	5,268	307,300	10,456	0
24	8/12/2016	82.5	7,570	6,778	5,521	307,660	10,861	0
25	8/13/2016	83.2	7,621	6,769	5,090	307,540	10,626	0
26	8/13/2016	84.6	7,485	6,418	5,478	307,300	10,480	0
27	8/13/2016	83.1	7,139	6,134	5,062	308,900	10,383	0

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Lithology Hughes 11H 47-049-02361

Lithology / Formation Name	Top Depth in FT TVD	Bottom Depth in FT TVD	Top Depth in FT MD	Bottom Depth in FT MD	Describe Rock Type and Record Quantity and Type of Fluid (Freshwater, Brine, Oil, Gas, H2S, ETC)
SOIL / GRAY SANDSTONE	0	98	0	98	
COAL	98	102	98	102	
SAND	102	300	102	300	10 GP @ 115' - FW
SAND & SHALE	300	400	300	400	
GRAY SAND	400	470	400	470	
COAL	470	477	470	477	
SAND AND SHALE	477	717	477	717	
GRAY SHALE	717	874	717	874	
COAL	874	879	874	879	
GRAY SHALE AND SAND	879	1383	879	1383	
GRAY SHALE	1383	1859	1383	1859	10 GP @1410' - SW
WHITE SAND	1859	2398	1859	2398	
RED ROCK	2398	2494	2398	2494	
GRAY SAND	2494	2716	2494	2716	
GRAY SHALE	2716	3193	2716	3193	
GRAY SAND AND SANDSTONE	3193	3415	3193	3415	
GRAY SHALE	3415	3670	3415	3670	
GRAY SAND AND SHALE	3670	4020	3670	4020	
SST, SH, SLTST	4020	5500	4020	5500	
SHALE			5500	7510	
LIMESTONE, SHALE			7510	7660	
SHALE			7660	7780	
SHALE, LIMESTONE			7780	7810	
SHALE			7810	7990	
LIMESTONE, SHALE			7990	8090	
SHALE			8090	8170	
SHALE, LIMESTONE			8170	8210	
SHALE			8210	8330	
SHALE, LIMESTONE			8330	8990	
SHALE			8990	12410	
SHALE, LIMESTONE			12410	12500	
SHALE			12500	12630	

Geneseo Shale @ 7,473' MD / 7,133' TVD
Burkett Shale @ 7,495' MD / 7,129' TVD
Tully Limestone @ 7,540' MD / 7,158' TVD
Hamilton Shale @ 7,620'MD / 7,204' TVD
Upper Marcellus Shale @ 7,749'MD / 7,266' TVD
Purcell Limestone @8,024' MD / 7,354' TVD
Lower Marcellus Shale @ 8,047' MD / 7,359' TVD

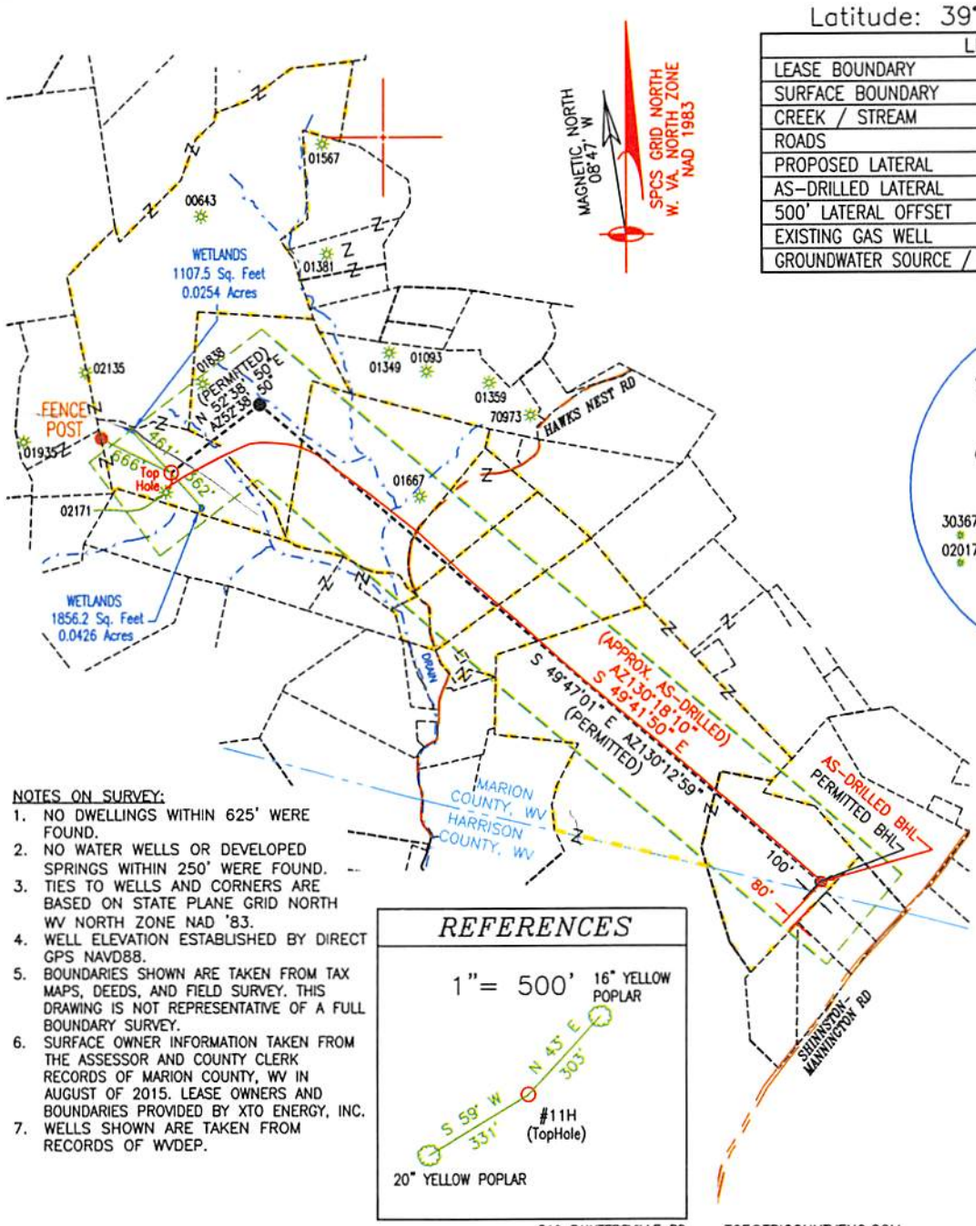
10585' (Scale: 1" = 2000')

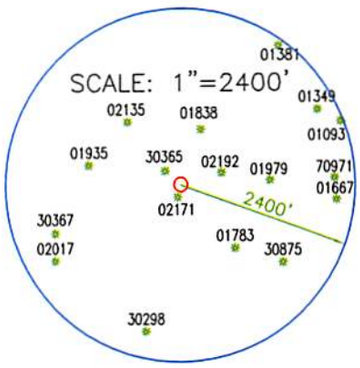
1667 (Scale: 1" = 2000')

Latitude: 39°27'30"

Longitude: 80°20'00"

LEGEND
LEASE BOUNDARY
SURFACE BOUNDARY
CREEK / STREAM
ROADS
PROPOSED LATERAL
AS-DRILLED LATERAL
500' LATERAL OFFSET
EXISTING GAS WELL
GROUNDWATER SOURCE / WATER SUPPLY





NOTES ON SURVEY:

1. NO DWELLINGS WITHIN 625' WERE FOUND.
2. NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250' WERE FOUND.
3. TIES TO WELLS AND CORNERS ARE BASED ON STATE PLANE GRID NORTH WV NORTH ZONE NAD '83.
4. WELL ELEVATION ESTABLISHED BY DIRECT GPS NAVD88.
5. BOUNDARIES SHOWN ARE TAKEN FROM TAX MAPS, DEEDS, AND FIELD SURVEY. THIS DRAWING IS NOT REPRESENTATIVE OF A FULL BOUNDARY SURVEY.
6. SURFACE OWNER INFORMATION TAKEN FROM THE ASSESSOR AND COUNTY CLERK RECORDS OF MARION COUNTY, WV IN AUGUST OF 2015. LEASE OWNERS AND BOUNDARIES PROVIDED BY XTO ENERGY, INC.
7. WELLS SHOWN ARE TAKEN FROM RECORDS OF WVDEP.

REFERENCES

1"= 500'

HUGHES 11H

State Plane Coord.
West Virginia North
NAD27
Top Hole Loc
(N) 348567.868
(E) 1754096.245

TRI-COUNTY ENGINEERING, LLC 319 PAINTERSVILLE RD. HUNKER, PA 15639 TCE@TRICOUNTYENG.COM (724) 635-0210

PAGE 1 of 2

FILE # XT00G57-11

DRAWING # XT00G57-11-11H

SCALE: 1"= 1500'

MINIMUM DEGREE OF ACCURACY: 1:2500

PROVEN SOURCE OF ELEVATION: DIRECT GPS

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed: Donald Hixson

R.P.E.: 17818 L.L.S.:

DONALD R. HIXSON JR. REGISTERED 17818 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

(+) DENOTES LOCATION OF AS-DRILLED WELL ON UNITED STATES TOPOGRAPHIC MAPS

WVDEP
OFFICE OF OIL & GAS
601 57TH STREET
CHARLESTOWN, WV 25304

STATE OF WEST VIRGINIA MONTANI SEMPER LIBERI

PLACE SEAL HERE

DATE: 6/28/2016

OPERATOR'S WELL #: HUGHES 11H

API WELL #: 47 (STATE) 49 (COUNTY) 02361 (PERMIT)

Well Type: ☐ Oil ☐ Waste Disposal ☒ Production ☐ Deep
☒ Gas ☐ Liquid Injection ☐ Storage ☒ Shallow

WATERSHED: BINGAMON CREEK WATERSHED ELEVATION: 1287'

COUNTY/DISTRICT: MARION / MANNINGTON QUADRANGLE SHINNSTON 7.5'

SURFACE OWNER FAYE C. ROCKWELL ACREAGE 107.50

OIL & GAS ROYALTY OWNER: FAYE C. ROCKWELL ACREAGE 423.33

DRILL ☒ CONVERT ☐ DRILL DEEPER ☐ REDRILL ☐ FRACTURE OR STIMULATE ☒

PLUG OFF OLD FORMATION ☐ PERFORATE NEW FORMATION ☐ PHYSICAL CHANGE ☐ ABANDON ☐

CLEAN OUT & REPLUG ☐ OTHER CHANGE ☐ (SPECIFY):

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TARGET FORMATION MARCELLUS ACTUAL DEPTH: TVD: 7,419' TMD: 13,630'

WELL OPERATOR XTO ENERGY INC.
Address 810 HOUSTON STREET
City FORT WORTH State TX Zip Code 76102

DESIGNATED AGENT GARY DOWL
Address P.O. BOX 1008
City JANE LEW State WV Zip Code 26378

RECEIVED Office of Oil and Gas JAN 23 2017 WV Department of Environmental Protection

4914'
(Scale: 1" = 2000')

5084'
(Scale: 1" = 2000')

Latitude: 39°27'30"

Longitude: 80°20'00"

NOTES ON SURVEY:
1. NO DWELLINGS WITHIN 625' WERE FOUND.
2. NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250' WERE FOUND.
3. TIES TO WELLS AND CORNERS ARE BASED ON STATE PLANE GRID NORTH WV NORTH ZONE NAD '83.
4. WELL ELEVATION ESTABLISHED BY DIRECT GPS NAVD88.
5. BOUNDARIES SHOWN ARE TAKEN FROM TAX MAPS, DEEDS, AND FIELD SURVEY. THIS DRAWING IS NOT REPRESENTATIVE OF A FULL BOUNDARY SURVEY.
6. SURFACE OWNER INFORMATION TAKEN FROM THE ASSESSOR AND COUNTY CLERK RECORDS OF MARION COUNTY, WV IN AUGUST OF 2015. LEASE OWNERS AND BOUNDARIES PROVIDED BY XTO ENERGY, INC.
7. WELLS SHOWN ARE TAKEN FROM RECORDS OF WVDEP.

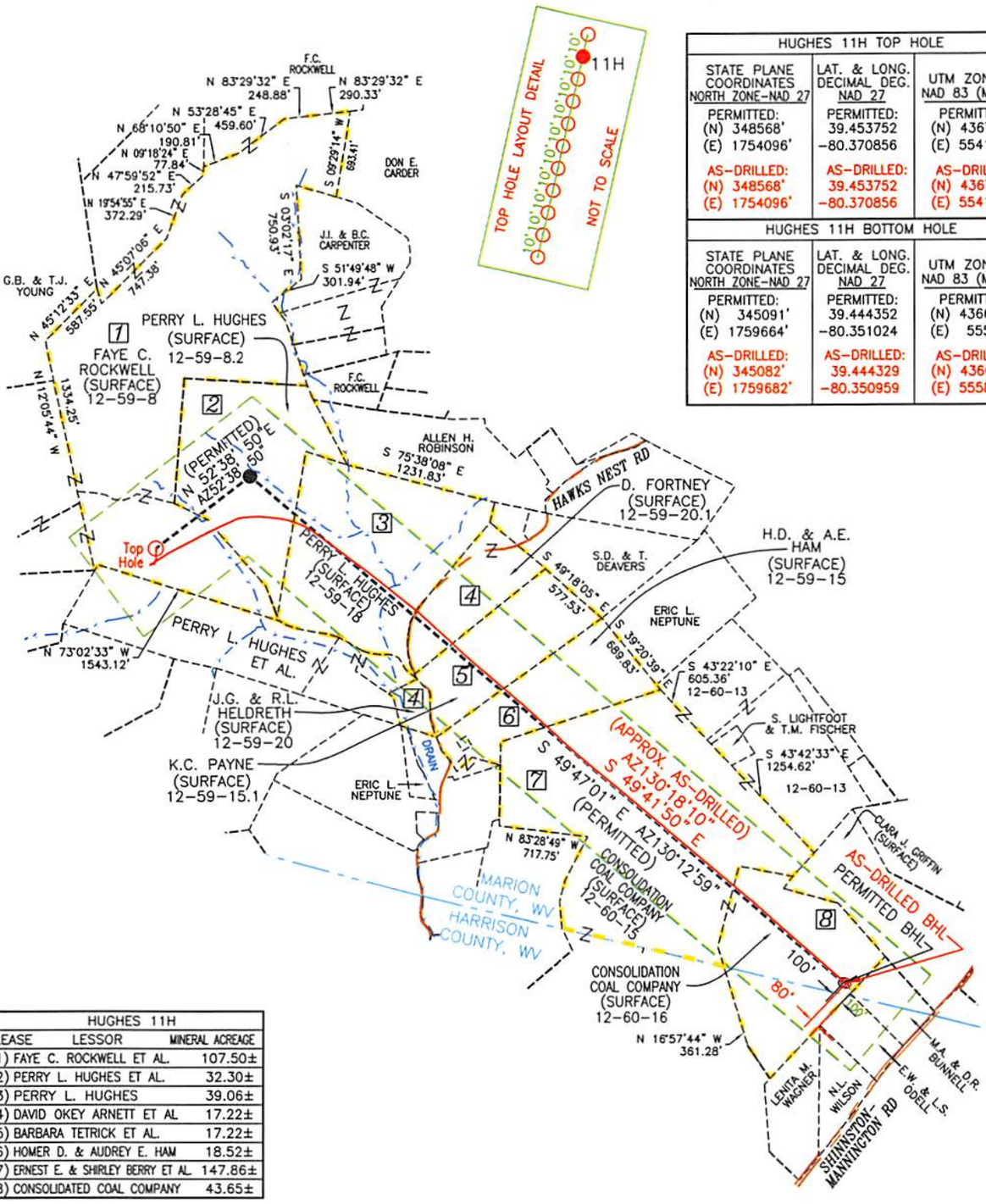
HUGHES 11H

State Plane Coord.
West Virginia North
NAD27

Top Hole Loc
(N) 348567.868
(E) 1754096.245

LEGEND
LEASE BOUNDARY
SURFACE BOUNDARY
CREEK / STREAM
ROADS
PROPOSED LATERAL
AS-DRILLED LATERAL
500' LATERAL OFFSET
EXISTING GAS WELL
GROUNDWATER SOURCE / WATER SUPPLY

QUADRANGLE (BHL) SHINNSTON 7.5'
(+) DENOTES LOCATION OF AS-DRILLED WELL BOTTOM HOLE ON UNITED STATES TOPOGRAPHIC MAPS



HUGHES 11H TOP HOLE		
STATE PLANE COORDINATES NORTH ZONE-NAD 27	LAT. & LONG. DECIMAL DEG. NAD 27	UTM ZONE 17 NAD 83 (METERS)
PERMITTED: (N) 348568' (E) 1754096'	PERMITTED: 39.453752 -80.370856	PERMITTED: (N) 4367330 (E) 554145
AS-DRILLED: (N) 348568' (E) 1754096'	AS-DRILLED: 39.453752 -80.370856	AS-DRILLED: (N) 4367330 (E) 554145
HUGHES 11H BOTTOM HOLE		
STATE PLANE COORDINATES NORTH ZONE-NAD 27	LAT. & LONG. DECIMAL DEG. NAD 27	UTM ZONE 17 NAD 83 (METERS)
PERMITTED: (N) 345091' (E) 1759664'	PERMITTED: 39.444352 -80.351024	PERMITTED: (N) 4366299 (E) 555859
AS-DRILLED: (N) 345082' (E) 1759682'	AS-DRILLED: 39.444329 -80.350959	AS-DRILLED: (N) 4366297 (E) 555865

HUGHES 11H		
LEASE	LESSOR	MINERAL ACREAGE
1)	FAYE C. ROCKWELL ET AL.	107.50±
2)	PERRY L. HUGHES ET AL.	32.30±
3)	PERRY L. HUGHES	39.06±
4)	DAVID OKEY ARNETT ET AL	17.22±
5)	BARBARA TETRICK ET AL.	17.22±
6)	HOMER D. & AUDREY E. HAM	18.52±
7)	ERNEST E. & SHIRLEY BERRY ET AL.	147.86±
8)	CONSOLIDATED COAL COMPANY	43.65±

MAGNETIC NORTH 08°47' W
SPCS GRID NORTH W. VA. NORTH ZONE NAD 1983

XTO ENERGY
810 HOUSTON STREET
FORT WORTH, TX 76102

0' 1200'
SCALE: 1" = 1200'

TRI-COUNTY ENGINEERING, LLC
An ENERCON Company
319 Paintersville Road
Hunker, PA 15639
www.tricountyeng.com
Voice: (724) 635-0210
Fax: (724) 635-0676

Excellence-Every project. Every day.

SUPPLEMENTAL
SURFACE & LESSOR EXHIBIT
HUGHES 11H

DRAWN BY: NJP
DATE: 6/28/2016
SCALE: 1" = 1200'
MANNINGTON DISTRICT, MARION COUNTY, WEST VIRGINIA
SHEET: 2 OF 2
FILE NO. OG57-09-11H

Office of Oil and Gas
JAN 2 6 2017
WV Department of Environmental Protection

Company: XTO Energy
Site: Hughes
Well: 11H
Project: Marion County, West Virginia (NAD 27)
Rig: Nomac 78

MS Energy Services.
WWW.MSENERGYSERVICES.COM

Azimuths to True North
Magnetic North: -8.85°

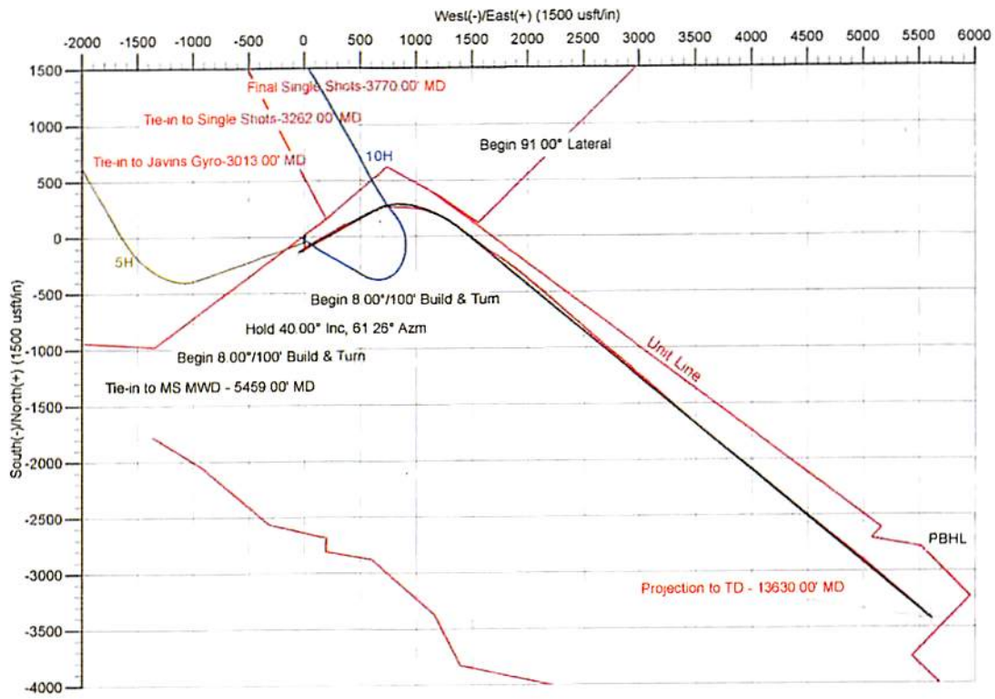
Magnetic Field
Strength: 52117.2snT
Dip Angle: 66.76°
Date: 02/26/2016
Model: BGGM2015

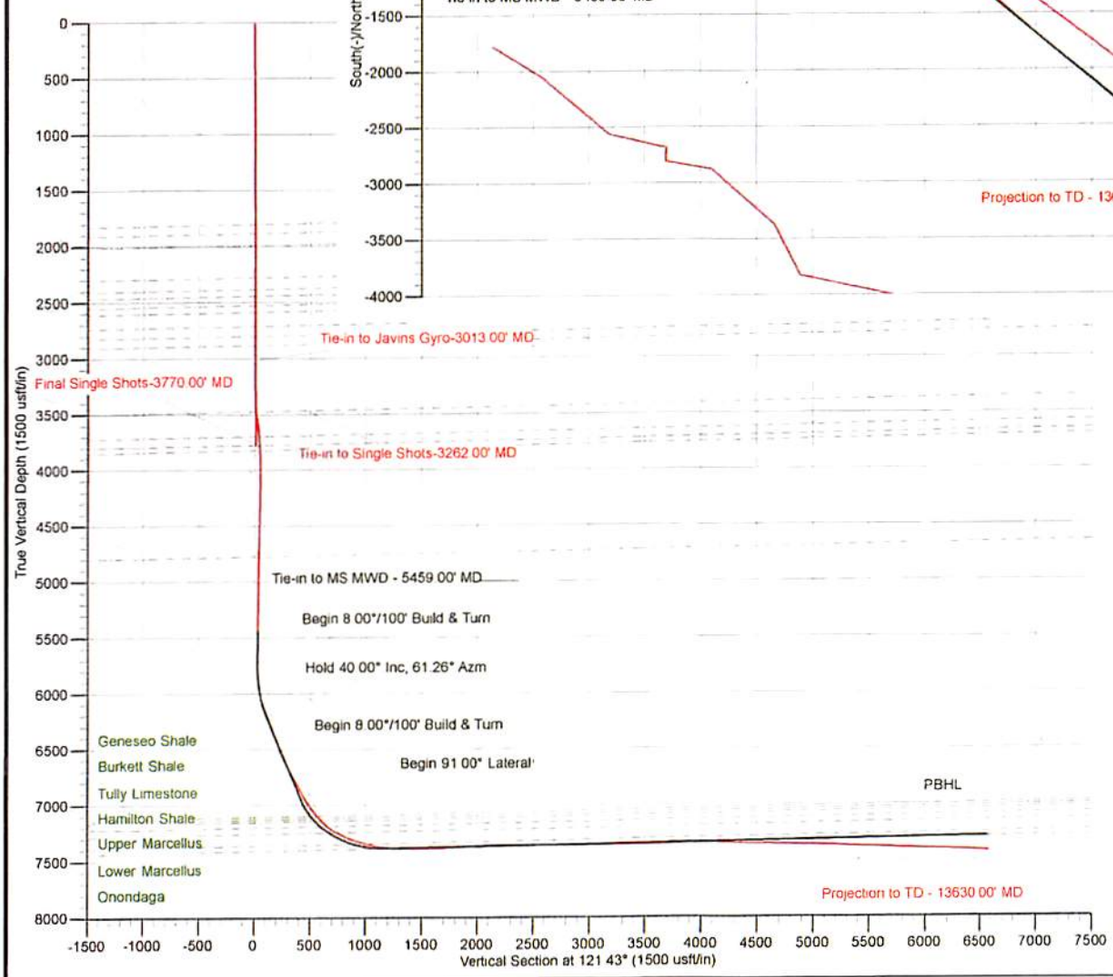
US State Plane 1927 (Exact solution)
West Virginia North 4701

Created By: CJH
Date: 10:50, March 04 2016
Plan: Design #6

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSect	Departure	Annotation
5459.00	2.39	233.96	5449.46	-130.64	-41.95	32.33	0.00	Tie-in to MS MWD - 5459.00' MD
5732.00	2.39	233.96	5722.22	-137.34	-51.15	27.96	11.38	Begin 8.00°/100' Build & Turn
6261.66	40.00	61.26	6212.23	-58.34	95.94	112.29	180.24	Hold 40.00° Inc, 61.26° Azm
7236.20	40.00	61.26	6958.76	242.88	645.20	423.90	806.68	Begin 8.00°/100' Build & Turn
8199.98	91.00	129.66	7386.00	55.09	1406.18	1171.16	1632.70	Begin 91.00° Lateral
13649.98	91.00	129.66	7290.88	-3422.73	5601.20	6564.18	7081.87	PBHL





The customer should only rely on this document after independently verifying all paths, targets, coordinates, lease and hard lines represented.
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XTO Energy

Marion County, West Virginia (NAD 27)
Hughes
11H

Wellbore #1

Survey: Javins Gyro

Standard Survey Report

04 March, 2016

MS Energy Services.
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MS Energy Services
Survey Report

Company:	XTO Energy	**Local Co-ordinate Reference:**	Well 11H
Project:	Marion County, West Virginia (NAD 27)	**TVD Reference:**	WELL @ 1312.00usft (Nomac 78)
Site:	Hughes	**MD Reference:**	WELL @ 1312.00usft (Nomac 78)
Well:	11H	**North Reference:**	True
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Survey	**Database:**	EDM 5000.1 Conroe DB

Project	Marion County, West Virginia (NAD 27)		
Map System:	US State Plane 1927 (Exact solution)	**System Datum:**	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	West Virginia North 4701		

Well	11H					
Well Position	**+N/-S**	0.00 usft	**Northing:**	348,567.87 usfl	**Latitude:**	39° 27' 13.507 N
	+E/-W	0.00 usft	**Easting:**	1,754,096.24 usfl	**Longitude:**	80° 22' 15.083 W
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	0.00 usfl	**Ground Level:**	1,286.00 usfl

Wellbore Wellbore #1

Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	BGGM2015	02/26/16	-8.85	66.76	52,117

Design Survey

Audit Notes:

Version: 1.0 **Phase:** ACTUAL **Tie On Depth:** 0.00

Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**
	0.00	0.00	0.00	120.26

Survey Program **Date** 02/18/16

From (usft)	**To (usft)**	**Survey (Wellbore)**	**Tool Name**	**Description**
13.00	3,013.00	Javins Gyro (Wellbore #1)	GYRO-NS	OWSG Gyrocompass Gyro
3,262.00	3,770.00	Single Shots (Wellbore #1)	GYRO-NS	OWSG Gyrocompass Gyro

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)**
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13.00	0.00	0.00	13.00	0.00	0.00	0.00	0.00	0.00	0.00
Added to adjust for KB-13.00' MD									
113.00	0.48	76.58	113.00	0.10	0.41	0.30	0.48	0.48	0.00
213.00	0.67	94.28	212.99	0.15	1.40	1.13	0.26	0.19	17.70
313.00	1.21	108.18	312.98	-0.22	2.98	2.69	0.58	0.54	13.90
413.00	0.90	121.48	412.96	-0.96	4.66	4.51	0.39	-0.31	13.30
513.00	0.06	18.38	512.96	-1.32	5.34	5.28	0.92	-0.84	-103.10
613.00	0.65	147.58	612.96	-1.75	5.66	5.77	0.69	0.59	129.20
713.00	0.10	168.38	712.95	-2.32	5.99	6.34	0.56	-0.55	20.80
813.00	0.74	169.28	812.95	-3.04	6.12	6.82	0.64	0.64	0.90
913.00	0.61	174.88	912.94	-4.20	6.29	7.55	0.15	-0.13	5.60
1,013.00	1.07	177.48	1,012.93	-5.66	6.38	8.36	0.46	0.46	2.60
1,113.00	0.40	216.28	1,112.93	-6.88	6.21	8.83	0.80	-0.67	38.80
1,213.00	0.48	145.48	1,212.92	-7.50	6.24	9.18	0.51	0.08	-70.80

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Company:	XTO Energy	**Local Co-ordinate Reference:**	Well 11H
Project:	Marion County, West Virginia (NAD 27)	**TVD Reference:**	WELL @ 1312.00usft (Nomac 78)
Site:	Hughes	**MD Reference:**	WELL @ 1312.00usft (Nomac 78)
Well:	11H	**North Reference:**	True
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Survey	**Database:**	EDM 5000.1 Conroe DB

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)
1,313.00	0.42	223.18	1,312.92	-8.12	6.23	9.47	0.57	-0.06	77.70
1,413.00	0.42	144.98	1,412.92	-8.68	6.19	9.72	0.53	0.00	-78.20
1,513.00	0.46	222.98	1,512.92	-9.28	6.13	9.97	0.55	0.04	78.00
1,613.00	0.30	215.48	1,612.91	-9.79	5.70	9.86	0.17	-0.16	-7.50
1,713.00	0.62	215.68	1,712.91	-10.44	5.23	9.78	0.32	0.32	0.20
1,813.00	0.36	158.08	1,812.91	-11.17	5.04	9.98	0.52	-0.26	-57.60
1,913.00	0.63	205.18	1,912.90	-11.96	4.92	10.27	0.47	0.27	47.10
2,013.00	0.30	180.58	2,012.90	-12.72	4.68	10.45	0.38	-0.33	-24.60
2,113.00	0.48	222.08	2,112.90	-13.29	4.40	10.50	0.32	0.18	41.50
2,213.00	0.61	209.28	2,212.89	-14.06	3.86	10.42	0.18	0.13	-12.80
2,313.00	0.74	175.48	2,312.89	-15.17	3.65	10.80	0.41	0.13	-33.80
2,413.00	0.66	212.08	2,412.88	-16.30	3.39	11.15	0.45	-0.08	36.60
2,513.00	0.35	142.68	2,512.88	-17.04	3.27	11.41	0.63	-0.31	-69.40
2,613.00	0.56	200.08	2,612.87	-17.74	3.29	11.78	0.47	0.21	57.40
2,713.00	0.70	158.18	2,712.87	-18.76	3.35	12.35	0.47	0.14	-41.90
2,813.00	0.42	140.48	2,812.86	-19.61	3.81	13.17	0.33	-0.28	-17.70
2,913.00	0.57	190.98	2,912.86	-20.38	3.95	13.68	0.44	0.15	50.50
3,013.00	0.63	203.58	3,012.86	-21.38	3.63	13.91	0.14	0.06	12.60

Final Javins Gyro-3013.00' MD

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Interp @ 3499.76813	0.00	359.44	3,499.77	-29.86	0.44	348,538.00	1,754,096.39	39° 27' 13.212 N	80° 22' 15.077 W

- survey misses target center by 487.00usft at 3013.00usft MD (3012.86 TVD, -21.38 N, 3.63 E)
- Point

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
13.00	13.00	0.00	0.00	Added to adjust for KB-13.00' MD
3,013.00	3,012.86	-21.38	3.63	Final Javins Gyro-3013.00' MD

XTO Energy

Marion County, West Virginia (NAD 27)
Hughes
11H

Wellbore #1

Survey: Single Shots

Standard Survey Report

04 March, 2016

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Survey Report

Company:	XTO Energy	**Local Co-ordinate Reference:**	Well 11H
Project:	Marion County, West Virginia (NAD 27)	**TVD Reference:**	WELL @ 1312.00usft (Nomac 78)
Site:	Hughes	**MD Reference:**	WELL @ 1312.00usft (Nomac 78)
Well:	11H	**North Reference:**	True
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Survey	**Database:**	EDM 5000.1 Conroe DB

Project Marion County, West Virginia (NAD 27)

Map System:	US State Plane 1927 (Exact solution)	**System Datum:**	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	West Virginia North 4701		

Well 11H

Well Position	**+N/-S**	0.00 usft	**Northing:**	348,567.87 usft	**Latitude:**	39° 27' 13.507 N
	+E/-W	0.00 usft	**Easting:**	1,754,096.24 usft	**Longitude:**	80° 22' 15.083 W
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	0.00 usft	**Ground Level:**	1,286.00 usft

Wellbore Wellbore #1

Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	BGGM2015	02/26/16	-8.85	66.76	52,117

Design Survey

Audit Notes:

Version: 1.0 **Phase:** ACTUAL **Tie On Depth:** 0.00

Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**
	0.00	0.00	0.00	120.26

Survey Program **Date** 02/18/16

From (usft)	**To (usft)**	**Survey (Wellbore)**	**Tool Name**	**Description**
13.00	3,013.00	Javins Gyro (Wellbore #1)	GYRO-NS	OWSG Gyrocompass Gyro
3,262.00	3,770.00	Single Shots (Wellbore #1)	GYRO-NS	OWSG Gyrocompass Gyro

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)**
3,013.00	0.63	203.58	3,012.86	-21.38	3.63	13.91	0.00	0.00	0.00
Tie-in to Javins Gyro-3013.00' MD									
3,262.00	1.20	203.64	3,261.82	-25.02	2.04	14.37	0.23	0.23	0.02
3,770.00	1.30	184.04	3,769.70	-35.64	-0.50	17.53	0.09	0.02	-3.86
Final Single Shots-3770.00' MD									

Design Targets

Target Name - hit/miss target - Shape	**Dip Angle (°)**	**Dip Dir. (°)**	**TVD (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Northing (usft)**	**Easting (usft)**	**Latitude**	**Longitude**
Interp @ 3499.76813(	0.00	359.44	3,499.77	-29.86	0.44	348,538.00	1,754,096.39	39° 27' 13.212 N	80° 22' 15.077 W
- survey misses target center by 238.00usft at 3262.00usft MD (3261.82 TVD, -25.02 N, 2.04 E)									
- Point									

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Company:	XTO Energy	**Local Co-ordinate Reference:**	Well 11H
Project:	Marion County, West Virginia (NAD 27)	**TVD Reference:**	WELL @ 1312.00usft (Nomac 78)
Site:	Hughes	**MD Reference:**	WELL @ 1312.00usft (Nomac 78)
Well:	11H	**North Reference:**	True
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Survey	**Database:**	EDM 5000.1 Conroe DB

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
3,013.00	3,012.86	-21.38	3.63	Tie-in to Javins Gyro-3013.00' MD
3,770.00	3,769.70	-35.64	-0.50	Final Single Shots-3770.00' MD

XTO Energy

Marion County, West Virginia (NAD 27)
Hughes
11H

Wellbore #2

Survey: MS MWD

Standard Survey Report

04 March, 2016

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Survey Report

Company:	XTO Energy	**Local Co-ordinate Reference:**	Well 11H
Project:	Marion County, West Virginia (NAD 27)	**TVD Reference:**	WELL @ 1312.00usft (Nomac 78)
Site:	Hughes	**MD Reference:**	WELL @ 1312.00usft (Nomac 78)
Well:	11H	**North Reference:**	True
Wellbore:	Wellbore #2	**Survey Calculation Method:**	Minimum Curvature
Design:	Survey	**Database:**	EDM 5000.1 Conroe DB

Project Marion County, West Virginia (NAD 27)

Map System:	US State Plane 1927 (Exact solution)	**System Datum:**	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	West Virginia North 4701		

Well 11H

Well Position	**+N/-S**	0.00 usft	**Northing:**	348,567.87 usfl	**Latitude:**	39° 27' 13.507 N
	+E/-W	0.00 usft	**Easting:**	1,754,096.24 usfl	**Longitude:**	80° 22' 15.083 W
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	0.00 usfl	**Ground Level:**	1,286.00 usfl

Wellbore Wellbore #2

Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	BGGM2015	02/26/16	-8.85	66.76	52,117

Design Survey

Audit Notes:

Version: 1.0 **Phase:** ACTUAL **Tie On Depth:** 3,262.00

Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**
	0.00	0.00	0.00	121.43

Survey Program **Date** 03/04/16

From (usft)	**To (usft)**	**Survey (Wellbore)**	**Tool Name**	**Description**
13.00	3,013.00	Javins Gyro (Wellbore #1)	GYRO-NS	OWSG Gyrocompass Gyro
3,262.00	3,262.00	Single Shots (Wellbore #1)	GYRO-NS	OWSG Gyrocompass Gyro
3,432.00	13,630.00	MS MWD (Wellbore #2)	MWD	OWSG MWD - Standard

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)**
3,262.00	1.20	203.64	3,261.82	-25.02	2.04	14.79	0.00	0.00	0.00
Tie-in to Single Shots-3262.00' MD									
3,432.00	1.99	182.63	3,431.76	-29.60	1.19	16.45	0.57	0.46	-12.36
3,464.00	4.29	172.72	3,463.71	-31.34	1.32	17.47	7.36	7.19	-30.97
3,495.00	7.29	166.33	3,494.55	-34.40	1.93	19.58	9.88	9.68	-20.61
3,527.00	11.00	165.31	3,526.13	-39.33	3.18	23.22	11.60	11.59	-3.19
3,559.00	13.30	168.44	3,557.41	-45.89	4.69	27.93	7.47	7.19	9.78
3,591.00	13.70	174.75	3,588.53	-53.27	5.78	32.71	4.77	1.25	19.72
3,622.00	13.92	177.61	3,618.64	-60.65	6.27	36.98	2.31	0.71	9.23
3,654.00	13.30	183.91	3,649.74	-68.17	6.18	40.82	5.02	-1.94	19.69
3,686.00	11.89	195.41	3,680.97	-75.02	5.05	43.43	8.97	-4.41	35.94
3,718.00	11.49	196.43	3,712.31	-81.26	3.27	45.16	1.41	-1.25	3.19
3,749.00	11.31	195.63	3,742.70	-87.15	1.58	46.79	0.77	-0.58	-2.58
3,781.00	11.40	195.32	3,774.07	-93.22	-0.10	48.52	0.34	0.28	-0.97

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Company:	XTO Energy	**Local Co-ordinate Reference:**	Well 11H
Project:	Marion County, West Virginia (NAD 27)	**TVD Reference:**	WELL @ 1312.00usft (Nomac 78)
Site:	Hughes	**MD Reference:**	WELL @ 1312.00usft (Nomac 78)
Well:	11H	**North Reference:**	True
Wellbore:	Wellbore #2	**Survey Calculation Method:**	Minimum Curvature
Design:	Survey	**Database:**	EDM 5000.1 Conroe DB

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)
3,813.00	9.99	194.93	3,805.52	-98.95	-1.65	50.19	4.41	-4.41	-1.22
3,844.00	8.00	191.93	3,836.13	-103.66	-2.79	51.67	6.59	-6.42	-9.68
3,876.00	7.69	191.84	3,867.83	-107.93	-3.69	53.13	0.97	-0.97	-0.28
3,971.00	4.99	198.41	3,962.24	-118.08	-6.30	56.19	2.94	-2.84	6.92
4,067.00	2.78	225.64	4,058.03	-123.67	-9.29	56.56	2.94	-2.30	28.36
4,162.00	2.70	225.64	4,152.92	-126.84	-12.54	55.45	0.08	-0.08	0.00
4,257.00	1.02	285.44	4,247.87	-128.18	-14.95	54.08	2.48	-1.77	62.95
4,352.00	1.28	285.31	4,342.85	-127.68	-16.79	52.25	0.27	0.27	-0.14
4,450.00	1.68	284.91	4,440.82	-127.02	-19.23	49.82	0.41	0.41	-0.41
4,544.00	1.02	295.93	4,534.79	-126.30	-21.32	47.67	0.75	-0.70	11.72
4,639.00	1.02	299.94	4,629.78	-125.50	-22.81	45.98	0.08	0.00	4.22
4,733.00	1.68	291.22	4,723.75	-124.59	-24.82	43.79	0.73	0.70	-9.28
4,828.00	1.68	277.42	4,818.71	-123.90	-27.50	41.15	0.42	0.00	-14.53
4,923.00	1.90	282.71	4,913.66	-123.38	-30.42	38.38	0.29	0.23	5.57
5,017.00	1.59	254.23	5,007.62	-123.39	-33.19	36.02	0.97	-0.33	-30.30
5,112.00	1.28	227.44	5,102.59	-124.46	-35.24	34.83	0.77	-0.33	-28.20
5,207.00	1.59	239.16	5,197.56	-125.86	-37.15	33.93	0.45	0.33	12.34
5,301.00	1.99	233.83	5,291.52	-127.49	-39.59	32.70	0.46	0.43	-5.67
5,396.00	1.02	178.44	5,386.49	-129.31	-40.90	32.53	1.73	-1.02	-58.31
5,459.00	2.39	233.96	5,449.46	-130.64	-41.95	32.33	3.17	2.17	88.13
5,500.00	2.30	234.90	5,490.43	-131.62	-43.31	31.68	0.24	-0.22	2.28
5,596.00	2.00	234.00	5,586.36	-133.71	-46.24	30.27	0.31	-0.31	-0.94
5,691.00	1.80	229.80	5,681.31	-135.65	-48.72	29.16	0.26	-0.21	-4.42
5,786.00	5.50	62.90	5,776.19	-134.53	-45.81	31.07	7.65	3.89	-175.68
5,881.00	12.30	51.40	5,870.00	-126.14	-33.83	36.91	7.36	7.16	-12.11
5,976.00	20.30	52.80	5,961.11	-109.83	-12.76	46.38	8.43	8.42	1.47
6,072.00	30.80	54.30	6,047.60	-85.35	20.56	62.05	10.96	10.94	1.56
6,167.00	40.50	60.80	6,124.73	-56.03	67.36	86.70	10.95	10.21	6.84
6,263.00	38.20	61.40	6,198.96	-26.61	120.65	116.82	2.43	-2.40	0.63
6,358.00	35.10	60.20	6,275.17	1.03	170.15	144.65	3.35	-3.26	-1.26
6,454.00	35.30	64.50	6,353.63	26.69	219.14	173.07	2.59	0.21	4.48
6,549.00	35.30	62.40	6,431.17	51.23	268.24	202.17	1.28	0.00	-2.21
6,645.00	36.50	60.10	6,508.93	78.31	317.58	230.15	1.88	1.25	-2.40
6,740.00	41.90	62.50	6,582.53	107.07	370.25	260.10	5.90	5.68	2.53
6,834.00	46.30	64.20	6,650.02	136.37	428.72	294.71	4.85	4.68	1.81
6,930.00	45.50	63.70	6,716.83	166.64	490.65	331.77	0.91	-0.83	-0.52
7,025.00	44.50	63.70	6,784.00	196.40	550.88	367.63	1.05	-1.05	0.00
7,120.00	42.50	63.80	6,852.91	225.33	609.52	402.59	2.11	-2.11	0.11
7,216.00	41.70	71.00	6,924.18	250.05	668.85	440.32	5.09	-0.83	7.50
7,311.00	41.40	86.80	6,995.47	262.13	730.26	486.42	11.02	-0.32	16.63
7,407.00	43.80	91.60	7,066.15	262.97	795.19	541.39	4.21	2.50	5.00
7,501.00	45.50	94.00	7,133.03	259.73	861.16	599.37	2.55	1.81	2.55
7,597.00	53.50	91.60	7,195.33	256.25	934.00	663.34	8.55	8.33	-2.50

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Company:	XTO Energy	**Local Co-ordinate Reference:**	Well 11H
Project:	Marion County, West Virginia (NAD 27)	**TVD Reference:**	WELL @ 1312.00usft (Nomac 78)
Site:	Hughes	**MD Reference:**	WELL @ 1312.00usft (Nomac 78)
Well:	11H	**North Reference:**	True
Wellbore:	Wellbore #2	**Survey Calculation Method:**	Minimum Curvature
Design:	Survey	**Database:**	EDM 5000.1 Conroe DB

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)
7,692.00	65.10	98.60	7,243.79	248.71	1,015.12	736.49	13.75	12.21	7.37
7,787.00	68.60	107.50	7,281.20	228.93	1,100.07	819.29	9.37	3.68	9.37
7,883.00	69.50	112.70	7,315.54	198.12	1,184.22	907.16	5.14	0.94	5.42
7,978.00	75.30	124.10	7,344.34	155.03	1,263.62	997.38	12.96	6.11	12.00
8,073.00	80.00	125.20	7,364.66	102.27	1,339.94	1,090.01	5.07	4.95	1.16
8,169.00	81.70	125.80	7,379.92	47.24	1,417.09	1,184.54	1.88	1.77	0.63
8,264.00	86.50	127.30	7,389.68	-9.02	1,492.98	1,278.63	5.29	5.05	1.58
8,360.00	89.20	127.10	7,393.29	-67.02	1,569.38	1,374.07	2.82	2.81	-0.21
8,455.00	91.40	126.20	7,392.79	-123.72	1,645.60	1,468.67	2.50	2.32	-0.95
8,550.00	90.20	120.80	7,391.46	-176.13	1,724.78	1,563.56	5.82	-1.26	-5.68
8,646.00	92.30	124.60	7,389.37	-227.97	1,805.52	1,659.49	4.52	2.19	3.96
8,740.00	94.90	127.40	7,383.46	-283.10	1,881.41	1,752.99	4.06	2.77	2.98
8,774.00	94.90	127.70	7,380.56	-303.74	1,908.27	1,786.67	0.88	0.00	0.88
8,869.00	93.80	130.20	7,373.35	-363.29	1,981.93	1,880.57	2.87	-1.16	2.63
8,965.00	92.80	130.70	7,367.83	-425.47	2,054.86	1,975.23	1.16	-1.04	0.52
9,060.00	92.30	130.20	7,363.60	-487.04	2,127.08	2,068.96	0.74	-0.53	-0.53
9,155.00	91.40	130.50	7,360.53	-548.51	2,199.44	2,162.76	1.00	-0.95	0.32
9,250.00	89.20	132.30	7,360.03	-611.33	2,270.69	2,256.31	2.99	-2.32	1.89
9,345.00	89.40	131.60	7,361.20	-674.83	2,341.34	2,349.71	0.77	0.21	-0.74
9,441.00	89.90	131.70	7,361.78	-738.63	2,413.07	2,444.18	0.53	0.52	0.10
9,536.00	90.50	132.50	7,361.45	-802.32	2,483.56	2,537.54	1.05	0.63	0.84
9,631.00	89.40	130.30	7,361.53	-865.14	2,554.81	2,631.10	2.59	-1.16	-2.32
9,727.00	89.10	130.30	7,362.79	-927.23	2,628.02	2,725.94	0.31	-0.31	0.00
9,822.00	89.40	129.00	7,364.03	-987.84	2,701.16	2,819.96	1.40	0.32	-1.37
9,917.00	90.20	129.80	7,364.36	-1,048.14	2,774.57	2,914.04	1.19	0.84	0.84
10,013.00	91.30	130.70	7,363.11	-1,110.16	2,847.83	3,008.89	1.48	1.15	0.94
10,108.00	91.00	130.20	7,361.20	-1,171.78	2,920.11	3,102.70	0.61	-0.32	-0.53
10,205.00	90.90	129.90	7,359.59	-1,234.19	2,994.35	3,198.59	0.33	-0.10	-0.31
10,300.00	90.40	129.70	7,358.52	-1,294.99	3,067.33	3,292.57	0.57	-0.53	-0.21
10,395.00	90.90	130.80	7,357.44	-1,356.37	3,139.83	3,386.44	1.27	0.53	1.16
10,491.00	90.10	131.90	7,356.60	-1,419.79	3,211.89	3,481.00	1.42	-0.83	1.15
10,586.00	90.50	132.40	7,356.10	-1,483.54	3,282.32	3,574.34	0.67	0.42	0.53
10,681.00	90.30	133.10	7,355.44	-1,548.02	3,352.08	3,667.49	0.77	-0.21	0.74
10,777.00	92.30	131.20	7,353.26	-1,612.42	3,423.23	3,761.78	2.87	2.08	-1.98
10,873.00	92.50	131.10	7,349.24	-1,675.54	3,495.45	3,856.32	0.23	0.21	-0.10
10,968.00	90.90	130.10	7,346.42	-1,737.33	3,567.55	3,950.06	1.99	-1.68	-1.05
11,064.00	90.90	130.50	7,344.91	-1,799.42	3,640.76	4,044.90	0.42	0.00	0.42
11,158.00	89.30	129.00	7,344.75	-1,859.52	3,713.02	4,137.90	2.33	-1.70	-1.60
11,253.00	88.20	125.80	7,346.82	-1,917.20	3,788.46	4,232.35	3.56	-1.16	-3.37
11,348.00	88.40	128.50	7,349.64	-1,974.54	3,864.14	4,326.83	2.85	0.21	2.84
11,443.00	88.30	128.80	7,352.38	-2,033.85	3,938.31	4,421.03	0.33	-0.11	0.32
11,538.00	88.40	128.30	7,355.11	-2,093.03	4,012.57	4,515.26	0.54	0.11	-0.53
11,634.00	89.30	129.90	7,357.04	-2,153.56	4,087.05	4,610.38	1.91	0.94	1.67
11,729.00	89.00	129.20	7,358.45	-2,214.04	4,160.30	4,704.42	0.80	-0.32	-0.74

Company:	XTO Energy	**Local Co-ordinate Reference:**	Well 11H
Project:	Marion County, West Virginia (NAD 27)	**TVD Reference:**	WELL @ 1312.00usft (Nomac 78)
Site:	Hughes	**MD Reference:**	WELL @ 1312.00usft (Nomac 78)
Well:	11H	**North Reference:**	True
Wellbore:	Wellbore #2	**Survey Calculation Method:**	Minimum Curvature
Design:	Survey	**Database:**	EDM 5000.1 Conroe DB

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)
11,825.00	89.00	129.80	7,360.13	-2,275.10	4,234.36	4,799.45	0.62	0.00	0.63
11,921.00	88.90	130.10	7,361.88	-2,336.73	4,307.94	4,894.37	0.33	-0.10	0.31
12,015.00	88.70	129.70	7,363.85	-2,397.01	4,380.04	4,987.33	0.48	-0.21	-0.43
12,111.00	88.50	129.90	7,366.20	-2,458.44	4,453.77	5,082.28	0.29	-0.21	0.21
12,206.00	88.00	129.00	7,369.10	-2,518.78	4,527.09	5,176.30	1.08	-0.53	-0.95
12,302.00	87.60	129.00	7,372.78	-2,579.15	4,601.65	5,271.40	0.42	-0.42	0.00
12,398.00	89.10	129.70	7,375.55	-2,639.99	4,675.85	5,366.44	1.72	1.56	0.73
12,493.00	88.10	128.10	7,377.87	-2,699.63	4,749.76	5,460.60	1.99	-1.05	-1.68
12,587.00	86.50	127.50	7,382.30	-2,757.17	4,823.94	5,553.91	1.82	-1.70	-0.64
12,683.00	87.50	128.60	7,387.32	-2,816.26	4,899.44	5,649.14	1.55	1.04	1.15
12,778.00	88.30	129.80	7,390.80	-2,876.26	4,973.00	5,743.20	1.52	0.84	1.26
12,873.00	88.10	130.20	7,393.79	-2,937.30	5,045.74	5,837.09	0.47	-0.21	0.42
12,969.00	87.90	130.60	7,397.14	-2,999.48	5,118.81	5,931.86	0.47	-0.21	0.42
13,064.00	87.60	130.00	7,400.87	-3,060.88	5,191.20	6,025.65	0.71	-0.32	-0.63
13,160.00	88.40	132.00	7,404.22	-3,123.82	5,263.61	6,120.25	2.24	0.83	2.08
13,254.00	88.30	130.70	7,406.93	-3,185.89	5,334.14	6,212.81	1.39	-0.11	-1.38
13,349.00	88.30	130.60	7,409.74	-3,247.75	5,406.18	6,306.54	0.11	0.00	-0.11
13,444.00	88.10	130.90	7,412.73	-3,309.73	5,478.12	6,400.24	0.38	-0.21	0.32
13,538.00	87.80	130.60	7,416.09	-3,371.05	5,549.28	6,492.94	0.45	-0.32	-0.32
13,563.00	88.00	130.90	7,417.01	-3,387.36	5,568.21	6,517.59	1.44	0.80	1.20
13,630.00	88.00	130.90	7,419.34	-3,431.20	5,618.82	6,583.64	0.00	0.00	0.00

Projection to TD - 13630.00' MD

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
3,262.00	3,261.82	-25.02	2.04	Tie-in to Single Shots-3262.00' MD
13,630.00	7,419.34	-3,431.20	5,618.82	Projection to TD - 13630.00' MD

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	7/29/2016
Job End Date:	8/13/2016
State:	West Virginia
County:	Marion
API Number:	47-049-02361-00-00
Operator Name:	XTO Energy/ExxonMobil
Well Name and Number:	Hughes 11H
Latitude:	39.44460500
Longitude:	-80.35064100
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	7,420
Total Base Water Volume (gal):	12,304,030
Total Base Non Water Volume:	0

Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Schlumberger	N/A					
			Water (Including Mix Water Supplied by Client)*	7732-18-5		92.92235	
S100	Schlumberger	Fluid Loss Additive					
				Listed Below			

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A264A	Schlumberger	Corrosion Inhibitor					
				Listed Below			
L058	Schlumberger	Iron Control Agent					
				Listed Below			
M300	Schlumberger	Myacide|TS GA 25					
				Listed Below			
S012-3050	Schlumberger	Propping Agent					
				Listed Below			
H315	Schlumberger	Acid					
				Listed Below			
B317	Schlumberger	Scale Inhibitor					
				Listed Below			
J609W	Schlumberger	Friction Reducer					
				Listed Below			
Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.							
			Quartz, Crystalline silica	14808-60-7	98.10546	6.94356	
			Hydrochloric acid	7647-01-0	1.02103	0.07226	
			Glutaraldehyde	111-30-8	0.32482	0.02299	
			Ammonium sulfate	7783-20-2	0.24468	0.01732	

			Acrylamide, 2-acrylamido-2-methylpropanesulfonic acid, sodium salt polymer	38193-60-1	0.18059	0.01278	
			Ethanol, 2,2',2"-nitrilotris-, 1,1',1"-tris (dihydrogen phosphate), sodium salt	68171-29-9	0.04178	0.00296	
			Polymer of 2-acrylamido-2-methylpropanesulfonic acid sodium salt and methyl acrylate	136793-29-8	0.01935	0.00137	
			Trisodium ortho phosphate	7601-54-9	0.01836	0.00130	
			Urea	57-13-6	0.01188	0.00084	
			Sodium erythorbate	6381-77-7	0.00844	0.00060	
			Methanol	67-56-1	0.00558	0.00040	
			Ethylene Glycol	107-21-1	0.00523	0.00037	
			Sodium sulfate	7757-82-6	0.00277	0.00020	
			Silicon Dioxide	7631-86-9	0.00247	0.00017	
			Reaction product of: acetophenone, formaldehyde, cyclohexylamine, methanol and acetic acid	224635-63-6	0.00231	0.00016	
			Cinnamaldehyde	104-55-2	0.00128	0.00009	
			Alcohol, C9-C11, Ethoxylated	68439-46-3	0.00096	0.00007	
			Alcohols, C10-16, ethoxylated	68002-97-1	0.00064	0.00005	
			2-Propenamid (impurity)	79-06-1	0.00059	0.00004	
			Tetrasodium ethylenediaminetetraacetate	64-02-8	0.00031	0.00002	
			Acetic acid(impurity)	64-19-7	0.00025	0.00002	
			Acetophenone	98-86-2	0.00024	0.00002	
			Amines, tallow alkyl, ethoxylated	61791-26-2	0.00019	0.00001	

			Dimethyl siloxanes and silicones	63148-62-9	0.00017	0.00001	
			Formaldehyde (impurity)	50-00-0	0.00016	0.00001	
			Dodecamethylcyclohexa siloxane	540-97-6	0.00001		
			Decamethyl cyclopentasiloxane	541-02-6	0.00001		
			Copper(II) sulfate	7758-98-7	0.00001		
			Siloxanes and silicones, dimethyl, reaction products with silica	67762-90-7	0.00002		
			Octamethylcyclotetrasilo xane	556-67-2	0.00002		

* Total Water Volume sources may include various types of water including fresh water, produced water, and recycled water
** Information is based on the maximum potential for concentration and thus the total may be over 100%
*** If you are calculating a percentage of total ingredients do not add the water volume below the green line to the water volume above the green line

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.
Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)