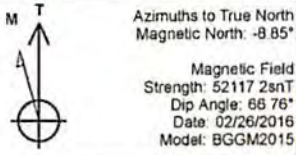




Company: XTO Energy
 Site: Hughes
 Well: 11H
 Project: Marion County, West Virginia (NAD 27)
 Rig: Nomac 78



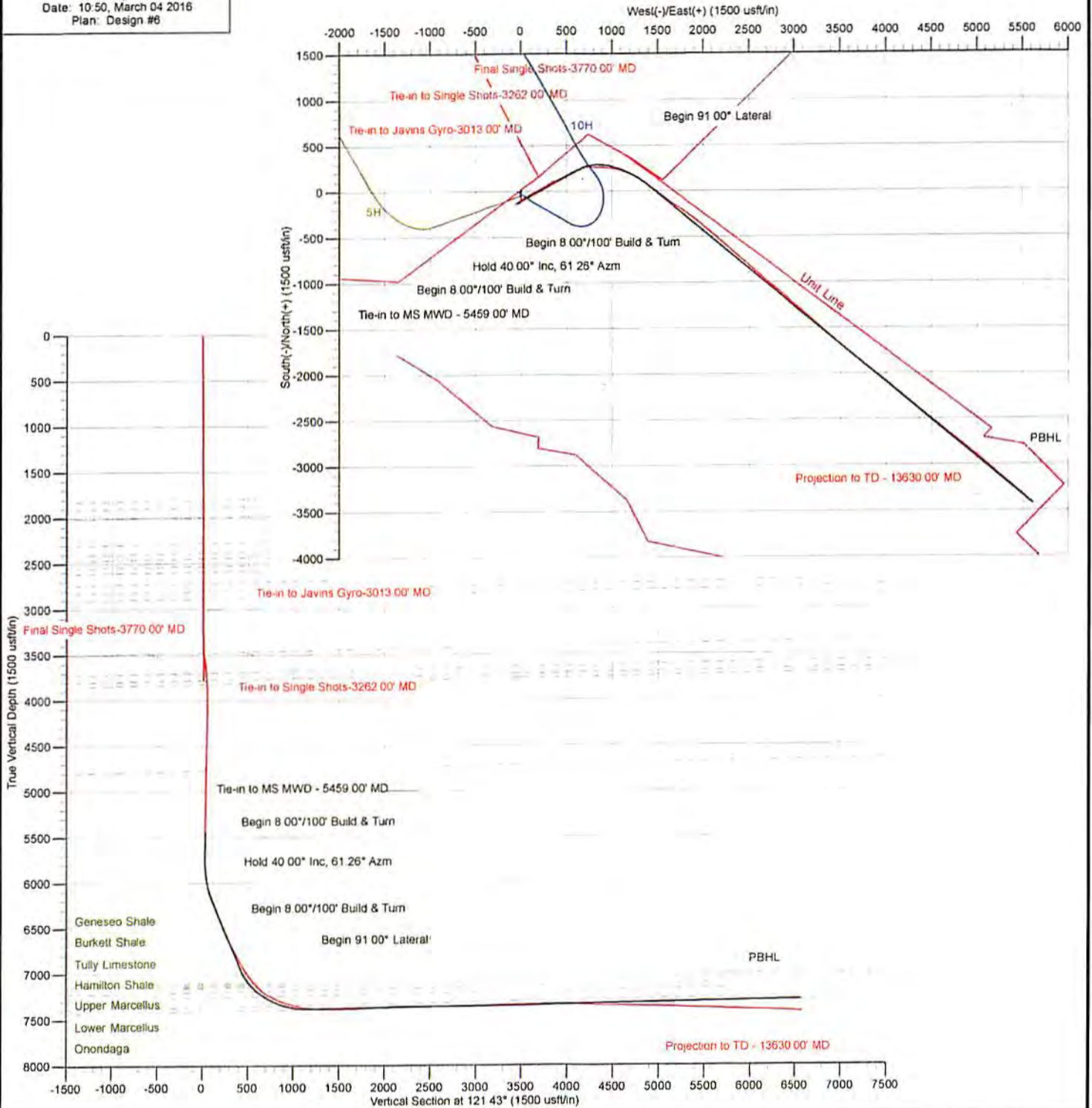
Azimuths to True North
 Magnetic North: -8.85°
 Magnetic Field
 Strength: 52117.2snT
 Dip Angle: 66.76°
 Date: 02/26/2016
 Model: BGGM2015

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	7290.89	-3422.73	5601.20	6564.18	7081.87	PBHL

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

Created By: CJH
 Date: 10.50, March 04 2016
 Plan: Design #6



This customer should only rely on this document after independently verifying all paths, targets, coordinates, lease and hard lines represented. Any decisions made or wells drilled utilizing this or any other information supplied by MS Energy are at the sole risk and responsibility of the customer. MS Energy is not responsible for the accuracy of this schematic or the information contained herein.

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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



01/05/2018



MS Energy Services
Survey Report



Company: XTO Energy
Project: Marion County, West Virginia (NAD 27)
Site: Hughes
Well: 11H
Wellbore: Wellbore #1
Design: Survey

Local Co-ordinate Reference: Well 11H
TVD Reference: WELL @ 1312.00usft (Nomac 78)
MD Reference: WELL @ 1312.00usft (Nomac 78)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Conroe DB

Table with project details: Project (Marion County, West Virginia (NAD 27)), Map System (US State Plane 1927), Geo Datum (NAD 1927), Map Zone (West Virginia North 4701), System Datum (Mean Sea Level)

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

Wellbore: Wellbore #1

Table with magnetic data: Model Name (BGGM2015), Sample Date (02/26/16), Declination (-8.85), Dip Angle (66.76), Field Strength (52,117 nT)

Design: Survey

Audit Notes:

Version: 1.0 Phase: ACTUAL Tie On Depth: 0.00

Table with vertical section data: Depth From (TVD) (0.00 usft), +N-S (0.00 usft), +E-W (0.00 usft), Direction (120.26°)

Survey Program Date: 02/18/16

Table with survey program details: From (usft), To (usft), Survey (Wellbore), Tool Name, Description

Survey

Main survey data table with columns: Measured Depth, Inclination, Azimuth, Vertical Depth, +N-S, +E-W, Vertical Section, Dogleg Rate, Build Rate, Turn Rate

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Company: XTO Energy
Project: Marion County, West Virginia (NAD 27)
Site: Hughes
Well: 11H
Wellbore: Wellbore #1
Design: Survey

Local Co-ordinate Reference: Well 11H
TVD Reference: WELL @ 1312.00usft (Nomac 78)
MD Reference: WELL @ 1312.00usft (Nomac 78)
North Reference: True
Survey Calculation Method: Minimum Curvature
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	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- Shape									
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		Comment
		+N/-S (usft)	+E/-W (usft)	
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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Company: XTO Energy
Project: Marion County, West Virginia (NAD 27)
Site: Hughes
Well: 11H
Wellbore: Wellbore #1
Design: Survey

Local Co-ordinate Reference: Well 11H
TVD Reference: WELL @ 1312.00usft (Nomac 78)
MD Reference: WELL @ 1312.00usft (Nomac 78)
North Reference: True
Survey Calculation Method: Minimum Curvature
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	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
- hit/miss target									
- Shape									
- 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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MS Energy Services
Survey Report



Company: XTO Energy
Project: Marion County, West Virginia (NAD 27)
Site: Hughes
Well: 11H
Wellbore: Wellbore #1
Design: Survey

Local Co-ordinate Reference: Well 11H
TVD Reference: WELL @ 1312.00usft (Nomac 78)
MD Reference: WELL @ 1312.00usft (Nomac 78)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Conroe DB

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
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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MS Energy Services
Survey Report



Company: XTO Energy
Project: Marion County, West Virginia (NAD 27)
Site: Hughes
Well: 11H
Wellbore: Wellbore #2
Design: Survey

Local Co-ordinate Reference: Well 11H
TVD Reference: WELL @ 1312.00usft (Nomac 78)
MD Reference: WELL @ 1312.00usft (Nomac 78)
North Reference: True
Survey Calculation Method: Minimum Curvature
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 #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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MS Energy Services
Survey Report



Company: XTO Energy
Project: Marion County, West Virginia (NAD 27)
Site: Hughes
Well: 11H
Wellbore: Wellbore #2
Design: Survey

Local Co-ordinate Reference: Well 11H
TVD Reference: WELL @ 1312.00usft (Nomac 78)
MD Reference: WELL @ 1312.00usft (Nomac 78)
North Reference: True
Survey Calculation Method: Minimum Curvature
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)	Bulld 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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MS Energy Services
Survey Report



Company: XTO Energy
Project: Marion County, West Virginia (NAD 27)
Site: Hughes
Well: 11H
Wellbore: Wellbore #2
Design: Survey

Local Co-ordinate Reference: Well 11H
TVD Reference: WELL @ 1312.00usft (Nomac 78)
MD Reference: WELL @ 1312.00usft (Nomac 78)
North Reference: True
Survey Calculation Method: Minimum Curvature
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

01/05/2018



MS Energy Services
Survey Report



Company: XTO Energy
Project: Marion County, West Virginia (NAD 27)
Site: Hughes
Well: 11H
Wellbore: Wellbore #2
Design: Survey

Local Co-ordinate Reference: Well 11H
TVD Reference: WELL @ 1312.00usft (Nomac 78)
MD Reference: WELL @ 1312.00usft (Nomac 78)
North Reference: True
Survey Calculation Method: Minimum Curvature
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		Comment
		+N/-S (usft)	+E/-W (usft)	
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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