

SURVEY DATA CERTIFICATION



PHOENIX
TECHNOLOGY SERVICES

Job # 60553 Wellbore Name OH
Well Name: Mickey 4
County/State: Weld, CO
Latitude: 40 30 59.043 N

Client: Extraction Oil and Gas
API#: 05 123 43851 00
Direction:
Longitude: 104 54 51.710 W

1/4-1/4 Section-Township-Range-Footages:

TIE IN DATA

MD	TVD	INC	AZM
1553.00	1549.46	11.20	328.00

N-S	E-W	DATA SOURCE
38.51	-26.40	MWD
Data Source Company:		NEWSCO

FIRST SURVEY

DATE	DEPTH	INC	AZM
11-Dec-16	1580.00	12.11	324.90

LAST SURVEY

DATE	DEPTH	INC	AZM
14-Dec-16	17723.00	83.10	88.57

STRAIGHT LINE PROJECTION TO TD

DATE	DEPTH	INC	AZM
14-Dec-16	17790.00	83.10	88.57

DEPTH DATUM

KELLY BUSHING	GROUND LEVEL
25.00	4880.00

MWD 1: Justin Schram
MWD 2: Kevin Hursh
MWD 3: Brian Murphy

DD 1: Chris Apodaca
DD 2: Scott Sanford
DD 3:

TOTAL CORRECTION: 8.45
DECLINATION OR GRID: DEC
MWD TYPE: Velocity UTX

PRINT YOUR NAME

Brian Murphy

SIGN YOUR NAME

DATE

3-Jan-17

PRINT WELL PLANNER

Travis Kniss

SIGN WELL PLANNER

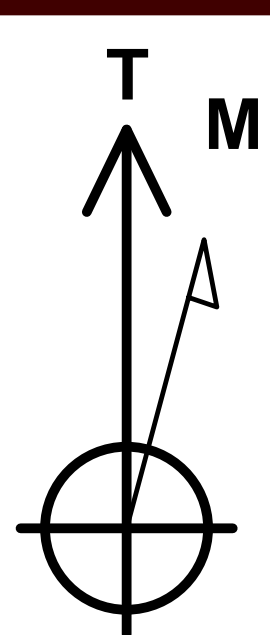
DATE

21-Feb-17

The data and calculations for this survey have been checked by me and conform to the calibration standards and operational procedures set forth by Phoenix Technology Services USA INC. I am authorized and qualified to review the data, calculations, and this report, and that the report represents a true and correct Directional Survey of this well based on the original data corrected to True North and obtained at the well site. Wellbore coordinates are calculated using Minimum curvature or other method.



Project: Weld County, CO (NAD83)
Site: Mickey
Well: 4
Wellbore: OH / Job #60553
Design: Plan 2 11-21-16
Rig: Patterson 346



Azimuths to True North
Magnetic North: 8.45°

Magnetic Field
Strength: 52519.5snT
Dip Angle: 66.95°
Date: 12/20/2016
Model: HDGM

LEGEND

- 4, OH / Job #60553, Surveys (Patterson 346) V0
- 10, OH / Job #60559, Plan 2 12-08-16 V0
- 10, OH / Job #60559, Surveys (Patterson 346) V0
- 2, OH / Job #60551, Surveys (Patterson 346) V0
- 6 (Abandoned), Surface, Surface V0
- 12, OH / Job #60561, Plan 2 12-07-16 V0
- 3, OH / Job #60552, Plan 2 11-21-16 V0
- 6-Z, OH / Job #60555, Plan 1 12-07-16 V0
- 11, OH / Job #60560, Plan 2 12-07-16 V0
- 11, OH / Job #60560, Surveys (Patterson 346) V0
- 13, OH / Job #60562, Plan 2 12-07-16 V0
- 13, OH / Job #60562, Surveys (Patterson 346) V0
- 1, OH / Job #60550, Surveys (Patterson 346) V0
- 7, OH / Job #60556, Plan 2 12-07-16 V0
- 7, OH / Job #60556, Surveys (Patterson 346) V0
- 3, OH / Job #60552, Surveys (Patterson 346) V0
- 12, OH / Job #60561, Surveys (Patterson 346) V0
- 5, OH / Job #60554, Surveys (Patterson 346) V0
- 9, OH / Job #60558, Plan 2 12-07-16 V0
- 9, OH / Job #60558, Surveys (Patterson 346) V0
- 8, OH / Job #60557, Plan 2 12-07-16 V0
- 8, OH / Job #60557, Surveys (Patterson 346) V0
- Plan 2 11-21-16

Map System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone Name: Colorado Northern Zone

Local Origin: Well 4, True North

Latitude: 40° 30' 59.043 N
Longitude: 104° 54' 51.710 W

Grid East: 3162824.45
Grid North: 1431503.14
Scale Factor: 1.000

Geomagnetic Model: HDGM
Sample Date: 20-Dec-16
Magnetic Declination: 8.45°
Dip Angle from Horizontal: 66.95°
Magnetic Field Strength: 52520

To convert a Magnetic Direction to a Grid Direction, Add 8.07°
To convert a Magnetic Direction to a True Direction, Add 8.45° East
To convert a True Direction to a Grid Direction, Subtract 0.38°

WELL DETAILS

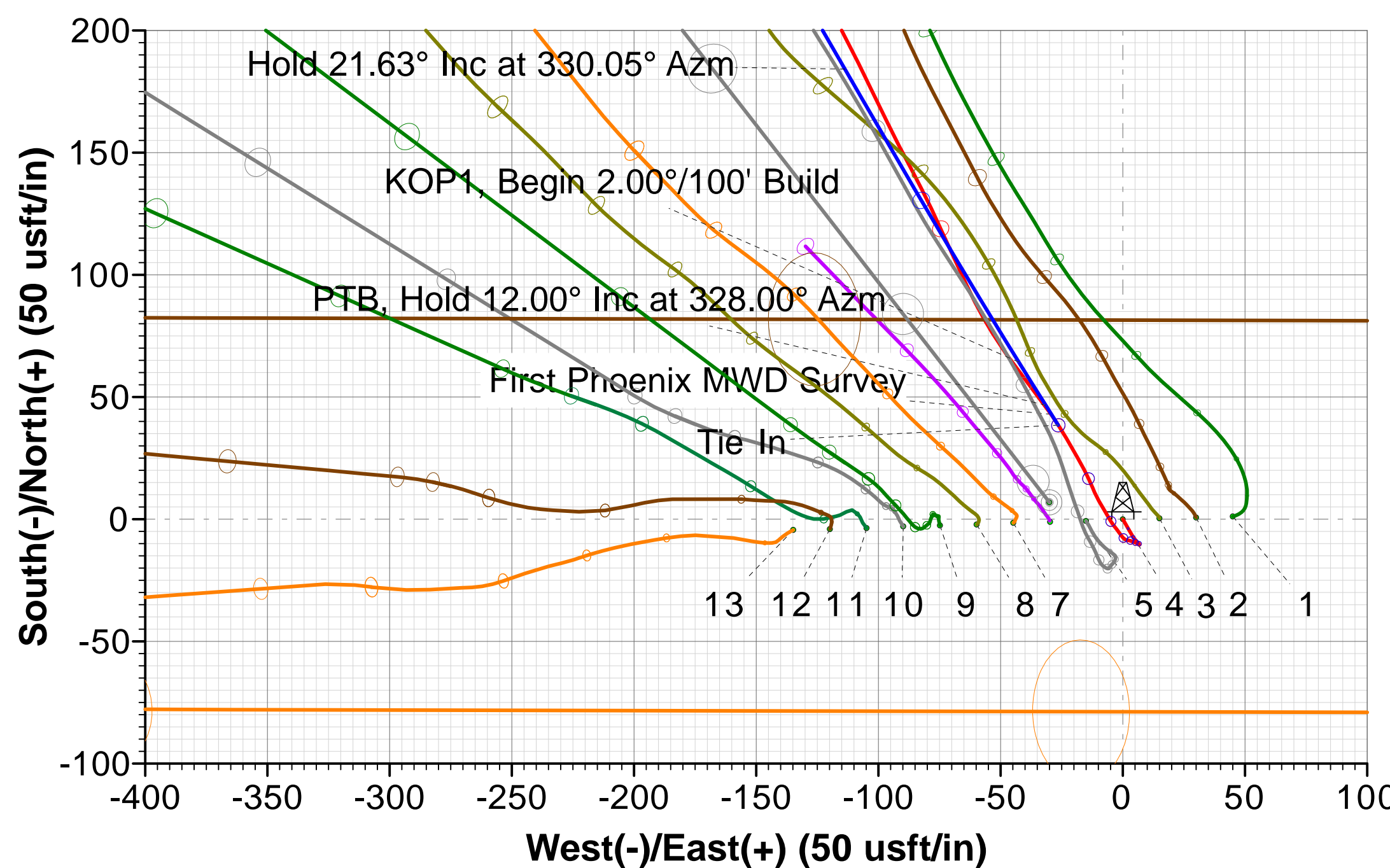
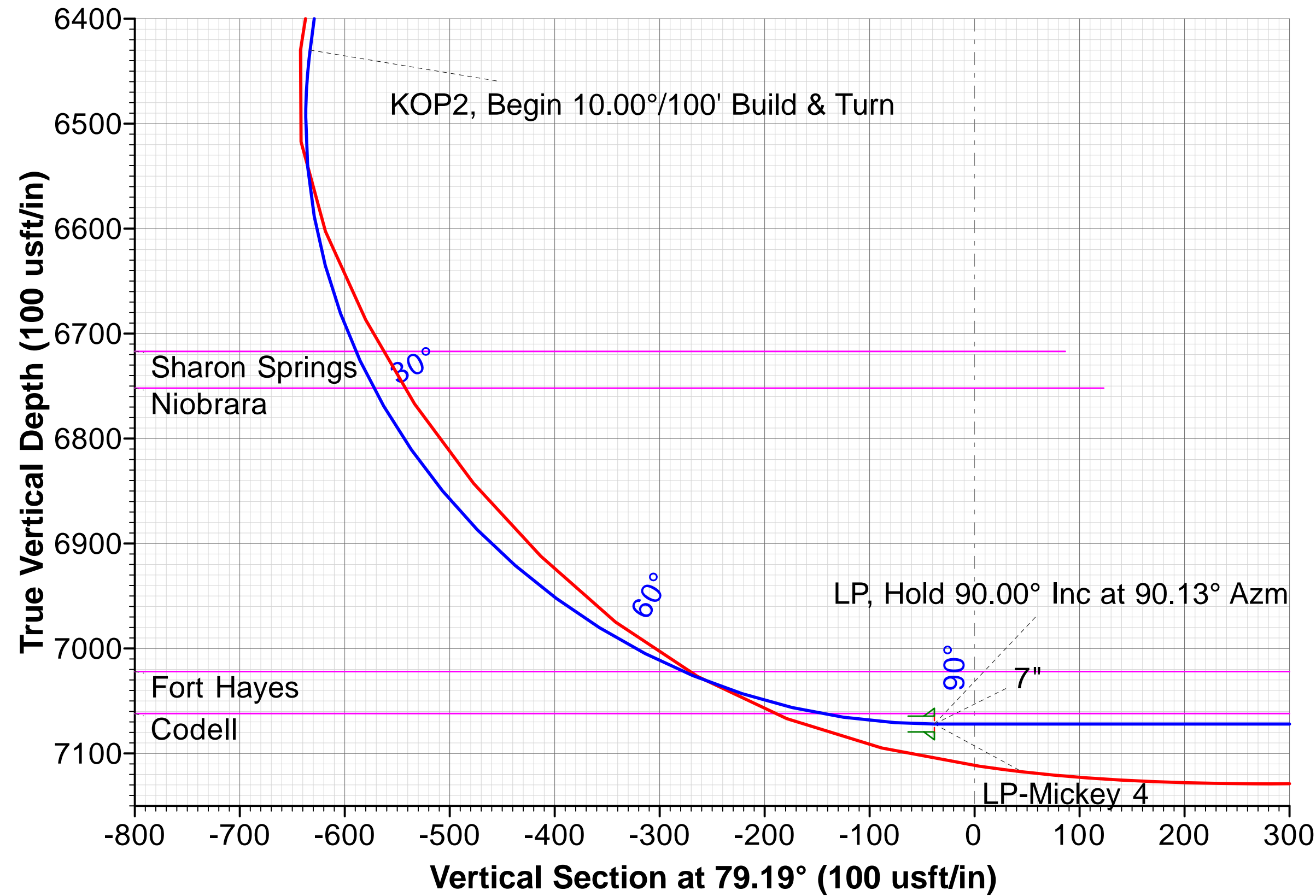
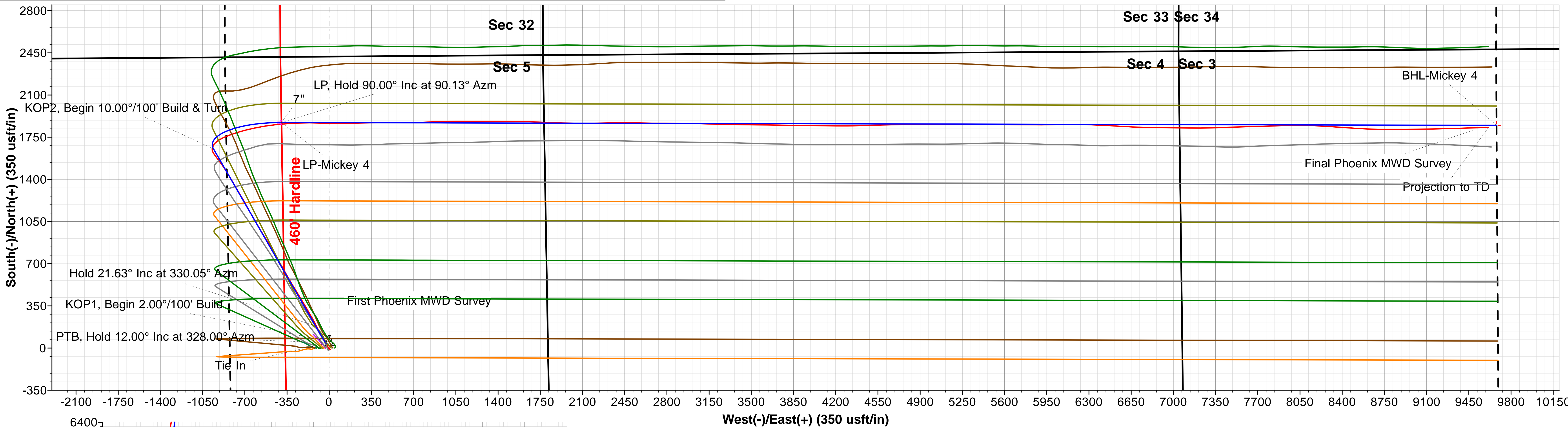
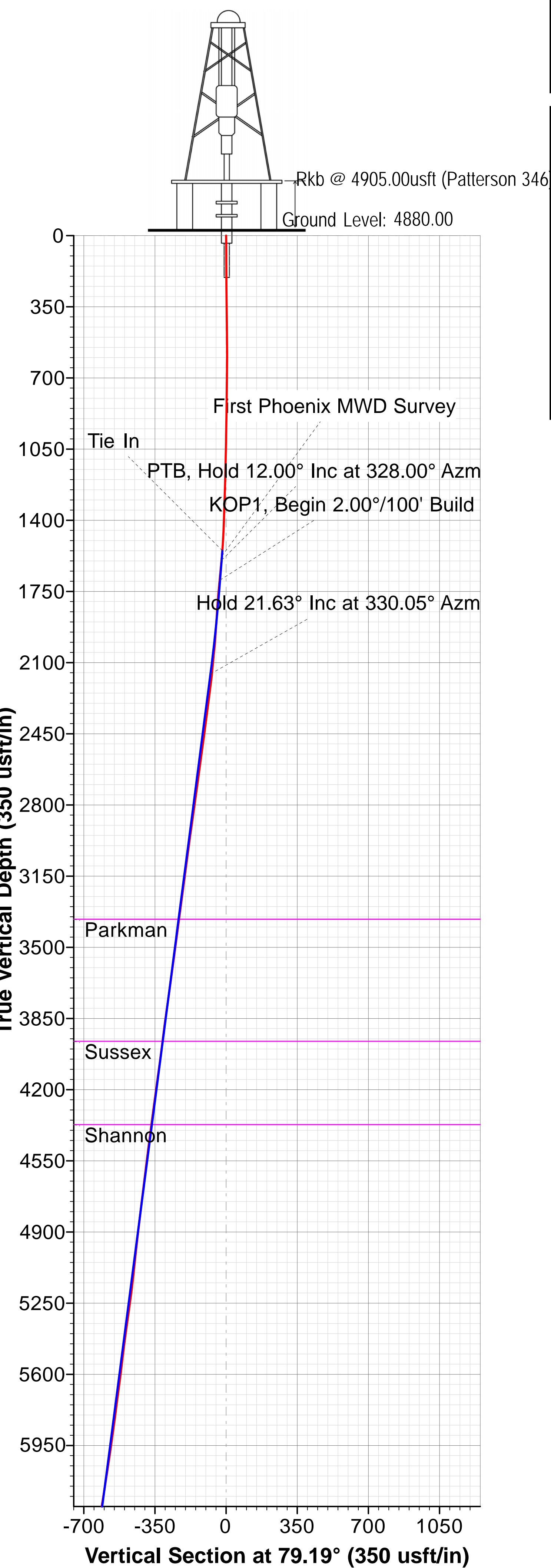
+N/-S	+E/-W	Northing	Ground Level: Easting	Latitude	Longitude
0.00	0.00	1431503.14	4880.00 3162824.45	40° 30' 59.043 N	104° 54' 51.710 W

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target	Annotation
1	1553.00	11.20	328.00	1549.46	38.51	-26.40	0.00	0.00	-18.71		Tie In
2	1601.00	12.00	328.00	1596.48	46.69	-31.51	1.67	0.00	-22.20		PTB, Hold 12.00° Inc at 328.00° Azm
3	1701.00	12.00	328.00	1694.30	64.32	-42.53	0.00	0.00	-29.71		KOP1, Begin 2.00°/100' Build
4	2183.58	21.63	330.05	2155.70	184.23	-113.70	2.00	4.51	-77.12		Hold 21.63° Inc at 330.05° Azm
5	6781.73	21.63	330.05	6429.92	1653.15	-960.05	0.00	0.00	-632.92		KOP2, Begin 10.00°/100' Build & Turn
6	7788.23	90.00	90.13	7072.00	1872.19	-396.44	10.00	118.30	-38.23	LP-Mickey 4	LP, Hold 90.00° Inc at 90.13° Azm
7	17865.05	90.00	90.13	7072.00	1848.59	9680.35	0.00	0.00	9855.28	BHL-Mickey 4	TD at 17865.05'

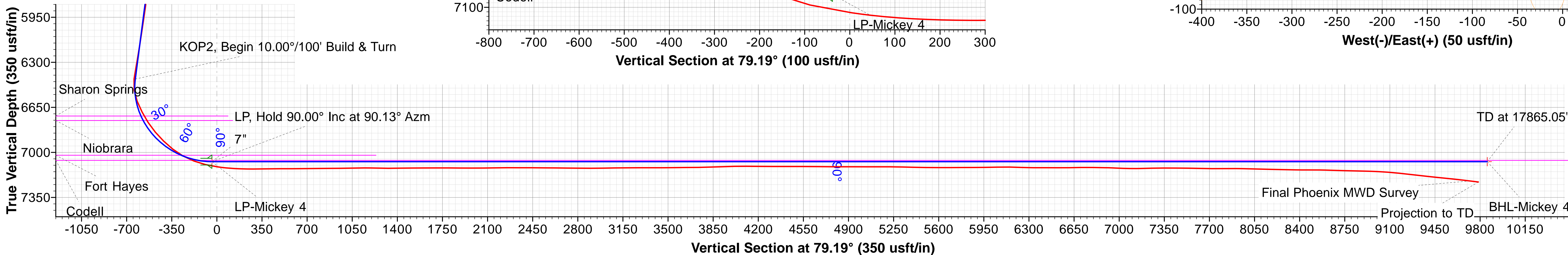
DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
BHL-Mickey 4	7072.00	1848.59	9680.35	1433415.62	3172492.39	40° 31' 17.292 N	104° 52' 46.358 W	Point
LP-Mickey 4	7072.00	1872.19	-396.44	1433372.67	3162415.65	40° 31' 17.544 N	104° 54' 56.844 W	Point



FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
3362.00	3481.30	Parkman	0.00	79.19
3962.00	4126.77	Sussex	0.00	79.19
4372.00	4567.85	Shannon	0.00	79.19
6717.00	7090.00	Sharon Springs	0.00	79.19
6752.00	7129.97	Niobrara	0.00	79.19
7022.00	7540.17	Fort Hayes	0.00	79.19
7062.00	7677.99	Codell	0.00	79.19





Extraction Oil & Gas

Weld County, CO (NAD83)

Mickey

4

OH / Job #60553

Survey: Phoenix MWD Surveys

Standard Survey Report

16 December, 2016





Phoenix Technology Services LP

Survey Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well 4
Project:	Weld County, CO (NAD83)	TVD Reference:	Rkb @ 4905.00usft (Patterson 346)
Site:	Mickey	MD Reference:	Rkb @ 4905.00usft (Patterson 346)
Well:	4	North Reference:	True
Wellbore:	OH / Job #60553	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Patterson 346)	Database:	Compass 5000 RMR

Project	Weld County, CO (NAD83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site	Mickey				
Site Position:		Northing:	1,431,504.55 usft	Latitude:	40° 30' 59.054 N
From:	Lat/Long	Easting:	3,162,869.49 usft	Longitude:	104° 54' 51.127 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.38 °

Well	4					
Well Position	+N/-S	0.00 usft	Northing:	1,431,503.14 usft	Latitude:	40° 30' 59.043 N
	+E/-W	0.00 usft	Easting:	3,162,824.45 usft	Longitude:	104° 54' 51.710 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	4,880.00 usft

Wellbore	OH / Job #60553				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	12/20/2016	8.45	66.95	52,520

Design	Surveys (Patterson 346)				
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	325.56	

Survey Program	Date	12/16/2016			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
94.00	1,601.00	Surveys (OH / Surface)	MWD		
1,553.00	17,790.00	Phoenix MWD Surveys (OH / Job #60553)	MWD+HDGM	OWSG Rev.2 MWD + HDGM	

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)	
1,553.00	11.20	328.00	1,549.46	38.51	-26.40	46.69	0.00	0.00	0.00	
Tie On										
1,580.00	12.11	324.90	1,575.91	43.05	-29.42	52.14	4.09	3.37	-11.48	
First Phoenix MWD Survey										
1,674.00	12.82	322.00	1,667.69	59.33	-41.51	72.41	1.01	0.76	-3.09	
1,769.00	12.58	328.04	1,760.37	76.42	-53.47	93.26	1.42	-0.25	6.36	
1,863.00	14.73	334.89	1,851.72	95.93	-63.97	115.29	2.86	2.29	7.29	
1,958.00	16.30	335.69	1,943.25	119.01	-74.58	140.33	1.67	1.65	0.84	
2,052.00	18.20	331.95	2,033.02	143.99	-86.92	167.91	2.34	2.02	-3.98	



Phoenix Technology Services LP

Survey Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well 4
Project:	Weld County, CO (NAD83)	TVD Reference:	Rkb @ 4905.00usft (Patterson 346)
Site:	Mickey	MD Reference:	Rkb @ 4905.00usft (Patterson 346)
Well:	4	North Reference:	True
Wellbore:	OH / Job #60553	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Patterson 346)	Database:	Compass 5000 RMR

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)	
2,147.00	20.28	334.45	2,122.71	171.94	-100.99	198.92	2.35	2.19	2.63	
2,241.00	22.11	332.37	2,210.35	202.32	-116.23	232.59	2.10	1.95	-2.21	
2,335.00	22.92	330.01	2,297.19	233.85	-133.58	268.40	1.29	0.86	-2.51	
2,430.00	23.17	330.49	2,384.61	266.13	-152.03	305.47	0.33	0.26	0.51	
2,524.00	22.59	330.70	2,471.21	297.97	-169.98	341.87	0.62	-0.62	0.22	
2,618.00	21.60	330.24	2,558.31	328.74	-187.40	377.10	1.07	-1.05	-0.49	
2,712.00	22.61	329.03	2,645.40	359.25	-205.29	412.38	1.18	1.07	-1.29	
2,807.00	21.78	328.98	2,733.36	390.01	-223.77	448.20	0.87	-0.87	-0.05	
2,901.00	21.10	328.49	2,820.85	419.38	-241.60	482.51	0.75	-0.72	-0.52	
2,996.00	22.23	328.31	2,909.14	449.25	-259.98	517.54	1.19	1.19	-0.19	
3,090.00	20.79	328.52	2,996.59	478.61	-278.03	551.96	1.53	-1.53	0.22	
3,185.00	21.83	329.31	3,085.09	508.18	-295.85	586.42	1.14	1.09	0.83	
3,279.00	21.58	329.36	3,172.43	538.08	-313.58	621.11	0.27	-0.27	0.05	
3,374.00	21.57	330.73	3,260.77	568.35	-331.02	655.94	0.53	-0.01	1.44	
3,468.00	22.25	330.20	3,347.98	598.87	-348.31	690.88	0.75	0.72	-0.56	
3,563.00	22.17	330.65	3,435.93	630.10	-366.04	726.66	0.20	-0.08	0.47	
3,657.00	22.87	330.25	3,522.77	661.41	-383.80	762.54	0.76	0.74	-0.43	
3,752.00	23.39	330.01	3,610.13	693.77	-402.38	799.73	0.56	0.55	-0.25	
3,846.00	24.00	330.47	3,696.20	726.57	-421.13	837.38	0.68	0.65	0.49	
3,940.00	23.08	330.42	3,782.38	759.23	-439.65	874.79	0.98	-0.98	-0.05	
4,035.00	21.13	329.38	3,870.39	790.16	-457.56	910.43	2.09	-2.05	-1.09	
4,129.00	21.63	331.34	3,957.93	819.94	-474.50	944.57	0.93	0.53	2.09	
4,223.00	21.91	329.22	4,045.22	850.21	-491.79	979.31	0.89	0.30	-2.26	
4,318.00	21.02	328.28	4,133.63	879.93	-509.82	1,014.02	1.00	-0.94	-0.99	
4,413.00	20.57	328.26	4,222.45	908.62	-527.55	1,047.71	0.47	-0.47	-0.02	
4,507.00	21.12	327.97	4,310.29	937.02	-545.22	1,081.13	0.60	0.59	-0.31	
4,601.00	20.07	329.65	4,398.28	965.30	-562.36	1,114.14	1.28	-1.12	1.79	
4,696.00	20.29	328.62	4,487.45	993.43	-579.17	1,146.84	0.44	0.23	-1.08	
4,791.00	21.19	330.38	4,576.30	1,022.42	-596.23	1,180.40	1.15	0.95	1.85	
4,886.00	20.20	329.75	4,665.17	1,051.51	-612.98	1,213.87	1.07	-1.04	-0.66	
4,980.00	21.33	330.95	4,753.06	1,080.48	-629.46	1,247.08	1.28	1.20	1.28	
5,074.00	18.88	328.78	4,841.33	1,108.43	-645.65	1,279.29	2.72	-2.61	-2.31	
5,168.00	19.71	330.83	4,930.05	1,135.28	-661.26	1,310.26	1.14	0.88	2.18	
5,262.00	19.43	331.34	5,018.62	1,162.84	-676.48	1,341.60	0.35	-0.30	0.54	
5,357.00	20.30	331.56	5,107.96	1,191.20	-691.91	1,373.71	0.92	0.92	0.23	
5,451.00	21.49	330.82	5,195.78	1,220.57	-708.07	1,407.07	1.30	1.27	-0.79	
5,546.00	22.19	328.25	5,283.96	1,251.02	-725.99	1,442.32	1.25	0.74	-2.71	
5,640.00	21.32	329.76	5,371.27	1,280.88	-743.94	1,477.09	1.10	-0.93	1.61	
5,735.00	21.07	328.09	5,459.84	1,310.29	-761.66	1,511.38	0.69	-0.26	-1.76	
5,830.00	20.26	332.19	5,548.73	1,339.34	-778.37	1,544.78	1.74	-0.85	4.32	
5,924.00	21.44	328.55	5,636.58	1,368.39	-794.92	1,578.10	1.86	1.26	-3.87	
6,019.00	21.51	330.34	5,724.98	1,398.34	-812.60	1,612.80	0.69	0.07	1.88	
6,113.00	21.10	329.16	5,812.56	1,427.84	-829.80	1,646.86	0.63	-0.44	-1.26	

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well 4
Project:	Weld County, CO (NAD83)	TVD Reference:	Rkb @ 4905.00usft (Patterson 346)
Site:	Mickey	MD Reference:	Rkb @ 4905.00usft (Patterson 346)
Well:	4	North Reference:	True
Wellbore:	OH / Job #60553	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Patterson 346)	Database:	Compass 5000 RMR

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)	
6,208.00	21.87	328.39	5,900.96	1,457.59	-847.84	1,681.60	0.86	0.81	-0.81	
6,302.00	21.16	327.74	5,988.41	1,486.85	-866.08	1,716.04	0.80	-0.76	-0.69	
6,397.00	20.00	323.98	6,077.35	1,514.49	-884.78	1,749.41	1.85	-1.22	-3.96	
6,492.00	19.94	324.31	6,166.64	1,540.79	-903.79	1,781.85	0.13	-0.06	0.35	
6,586.00	20.49	321.58	6,254.85	1,566.70	-923.36	1,814.29	1.16	0.59	-2.90	
6,681.00	22.45	324.46	6,343.25	1,594.49	-944.24	1,849.02	2.34	2.06	3.03	
6,775.00	23.30	329.54	6,429.87	1,625.12	-964.10	1,885.51	2.29	0.90	5.40	
6,870.00	24.58	9.30	6,517.25	1,661.05	-970.47	1,918.74	16.75	1.35	41.85	
6,964.00	26.07	42.01	6,602.63	1,695.86	-953.41	1,937.80	14.80	1.59	34.80	
7,059.00	29.23	57.44	6,686.88	1,723.89	-919.83	1,941.94	8.21	3.33	16.24	
7,153.00	33.66	65.47	6,767.09	1,747.08	-876.75	1,936.70	6.48	4.71	8.54	
7,248.00	40.65	69.67	6,842.77	1,768.79	-823.71	1,924.61	7.82	7.36	4.42	
7,343.00	45.37	72.02	6,912.23	1,789.99	-762.50	1,907.48	5.25	4.97	2.47	
7,438.00	52.06	76.43	6,974.89	1,809.24	-693.84	1,884.52	7.86	7.04	4.64	
7,532.00	60.96	77.87	7,026.71	1,826.61	-617.47	1,855.66	9.55	9.47	1.53	
7,626.00	68.48	80.75	7,066.83	1,842.30	-534.01	1,821.40	8.47	8.00	3.06	
7,721.00	77.16	83.93	7,094.87	1,854.33	-444.15	1,780.50	9.68	9.14	3.35	
7,816.00	81.81	86.31	7,112.20	1,862.25	-351.12	1,734.42	5.48	4.89	2.51	
7,910.00	85.52	86.91	7,122.57	1,867.78	-257.87	1,686.24	4.00	3.95	0.64	
8,005.00	88.41	90.97	7,127.60	1,869.53	-163.05	1,634.06	5.24	3.04	4.27	
8,099.00	89.86	91.32	7,129.02	1,867.65	-69.08	1,579.37	1.59	1.54	0.37	
8,194.00	91.31	90.92	7,128.05	1,865.79	25.89	1,524.13	1.58	1.53	-0.42	
8,314.00	89.89	88.86	7,126.80	1,866.02	145.88	1,456.47	2.08	-1.18	-1.72	
8,408.00	90.29	88.96	7,126.65	1,867.81	239.86	1,404.79	0.44	0.43	0.11	
8,503.00	90.70	88.63	7,125.83	1,869.81	334.83	1,352.73	0.55	0.43	-0.35	
8,597.00	90.47	88.02	7,124.87	1,872.55	428.79	1,301.86	0.69	-0.24	-0.65	
8,692.00	90.45	90.28	7,124.10	1,873.96	523.77	1,249.31	2.38	-0.02	2.38	
8,786.00	90.37	90.22	7,123.43	1,873.55	617.76	1,195.82	0.11	-0.09	-0.06	
8,880.00	91.40	90.26	7,121.98	1,873.16	711.75	1,142.34	1.10	1.10	0.04	
8,975.00	90.04	87.06	7,120.79	1,875.38	806.70	1,090.47	3.66	-1.43	-3.37	
9,069.00	88.82	88.28	7,121.72	1,879.20	900.62	1,040.51	1.84	-1.30	1.30	
9,163.00	89.23	89.02	7,123.32	1,881.42	994.58	989.20	0.90	0.44	0.79	
9,258.00	91.65	90.04	7,122.59	1,882.20	1,089.56	936.13	2.76	2.55	1.07	
9,352.00	89.98	90.12	7,121.25	1,882.07	1,183.55	882.87	1.78	-1.78	0.09	
9,446.00	90.29	90.01	7,121.03	1,881.96	1,277.55	829.62	0.35	0.33	-0.12	
9,541.00	90.22	89.91	7,120.61	1,882.03	1,372.55	775.95	0.13	-0.07	-0.11	
9,635.00	89.57	90.54	7,120.78	1,881.66	1,466.55	722.49	0.96	-0.69	0.67	
9,730.00	89.67	89.98	7,121.41	1,881.22	1,561.54	668.41	0.60	0.11	-0.59	
9,824.00	89.93	92.58	7,121.74	1,879.13	1,655.51	613.54	2.78	0.28	2.77	
9,918.00	90.45	92.64	7,121.43	1,874.84	1,749.41	556.90	0.56	0.55	0.06	
10,013.00	91.26	92.18	7,120.01	1,870.85	1,844.32	499.94	0.98	0.85	-0.48	
10,107.00	89.89	91.22	7,119.07	1,868.06	1,938.27	444.51	1.78	-1.46	-1.02	
10,202.00	90.00	90.87	7,119.16	1,866.33	2,033.25	389.36	0.39	0.12	-0.37	
10,296.00	89.77	89.67	7,119.35	1,865.89	2,127.25	335.84	1.30	-0.24	-1.28	

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well 4
Project:	Weld County, CO (NAD83)	TVD Reference:	Rkb @ 4905.00usft (Patterson 346)
Site:	Mickey	MD Reference:	Rkb @ 4905.00usft (Patterson 346)
Well:	4	North Reference:	True
Wellbore:	OH / Job #60553	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Patterson 346)	Database:	Compass 5000 RMR

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)	
10,391.00	89.59	89.23	7,119.88	1,866.80	2,222.24	282.87	0.50	-0.19	-0.46	
10,485.00	89.47	88.45	7,120.65	1,868.70	2,316.22	231.29	0.84	-0.13	-0.83	
10,579.00	89.19	89.73	7,121.75	1,870.19	2,410.20	179.38	1.39	-0.30	1.36	
10,674.00	89.46	91.09	7,122.87	1,869.51	2,505.19	125.10	1.46	0.28	1.43	
10,768.00	90.09	90.98	7,123.24	1,867.82	2,599.17	70.55	0.68	0.67	-0.12	
10,862.00	90.70	90.89	7,122.59	1,866.28	2,693.16	16.13	0.66	0.65	-0.10	
10,957.00	91.45	89.76	7,120.81	1,865.74	2,788.13	-38.03	1.43	0.79	-1.19	
11,051.00	89.89	90.92	7,119.71	1,865.19	2,882.12	-91.64	2.07	-1.66	1.23	
11,146.00	90.60	90.21	7,119.30	1,864.25	2,977.12	-146.13	1.06	0.75	-0.75	
11,240.00	89.62	91.90	7,119.12	1,862.52	3,071.09	-200.71	2.08	-1.04	1.80	
11,335.00	90.10	91.15	7,119.35	1,859.99	3,166.06	-256.50	0.94	0.51	-0.79	
11,429.00	91.13	91.62	7,118.34	1,857.72	3,260.03	-311.51	1.20	1.10	0.50	
11,524.00	90.18	91.43	7,117.26	1,855.19	3,354.98	-367.30	1.02	-1.00	-0.20	
11,618.00	90.98	90.44	7,116.31	1,853.66	3,448.97	-421.71	1.35	0.85	-1.05	
11,713.00	91.85	90.35	7,113.96	1,853.00	3,543.93	-475.96	0.92	0.92	-0.09	
11,807.00	91.58	90.51	7,111.15	1,852.30	3,637.89	-529.67	0.33	-0.29	0.17	
11,902.00	91.76	91.54	7,108.38	1,850.60	3,732.83	-584.77	1.10	0.19	1.08	
11,997.00	89.16	91.53	7,107.62	1,848.05	3,827.79	-640.57	2.74	-2.74	-0.01	
12,092.00	89.48	90.44	7,108.74	1,846.42	3,922.76	-695.62	1.20	0.34	-1.15	
12,186.00	90.03	90.04	7,109.15	1,846.03	4,016.76	-749.11	0.72	0.59	-0.43	
12,280.00	89.60	90.68	7,109.45	1,845.44	4,110.76	-802.75	0.82	-0.46	0.68	
12,375.00	90.17	90.59	7,109.64	1,844.38	4,205.75	-857.34	0.61	0.60	-0.09	
12,469.00	89.50	89.53	7,109.91	1,844.29	4,299.75	-910.58	1.33	-0.71	-1.13	
12,564.00	89.57	88.24	7,110.68	1,846.13	4,394.73	-962.77	1.36	0.07	-1.36	
12,659.00	89.61	88.48	7,111.36	1,848.85	4,489.69	-1,014.23	0.26	0.04	0.25	
12,753.00	90.13	88.11	7,111.57	1,851.65	4,583.64	-1,065.06	0.68	0.55	-0.39	
12,847.00	89.79	89.34	7,111.64	1,853.74	4,677.62	-1,116.48	1.36	-0.36	1.31	
12,942.00	89.86	88.49	7,111.93	1,855.54	4,772.60	-1,168.71	0.90	0.07	-0.89	
13,037.00	90.06	90.03	7,112.00	1,856.77	4,867.59	-1,221.41	1.63	0.21	1.62	
13,131.00	89.86	88.97	7,112.06	1,857.59	4,961.58	-1,273.90	1.15	-0.21	-1.13	
13,226.00	88.44	89.93	7,113.47	1,858.50	5,056.57	-1,326.86	1.80	-1.49	1.01	
13,320.00	88.81	89.68	7,115.73	1,858.82	5,150.54	-1,379.74	0.48	0.39	-0.27	
13,415.00	89.23	90.87	7,117.35	1,858.36	5,245.52	-1,433.83	1.33	0.44	1.25	
13,509.00	89.96	90.67	7,118.02	1,857.10	5,339.51	-1,488.02	0.81	0.78	-0.21	
13,603.00	90.37	89.97	7,117.75	1,856.57	5,433.51	-1,541.61	0.86	0.44	-0.74	
13,698.00	89.76	90.74	7,117.64	1,855.99	5,528.50	-1,595.82	1.03	-0.64	0.81	
13,792.00	90.59	90.68	7,117.35	1,854.82	5,622.49	-1,649.94	0.89	0.88	-0.06	
13,887.00	90.87	90.52	7,116.14	1,853.83	5,717.48	-1,704.48	0.34	0.29	-0.17	
13,981.00	91.38	90.02	7,114.29	1,853.38	5,811.46	-1,757.99	0.76	0.54	-0.53	
14,075.00	88.85	90.03	7,114.11	1,853.34	5,905.45	-1,811.18	2.69	-2.69	0.01	
14,170.00	88.03	88.36	7,116.69	1,854.68	6,000.41	-1,863.78	1.96	-0.86	-1.76	
14,264.00	89.31	89.20	7,118.87	1,856.68	6,094.36	-1,915.26	1.63	1.36	0.89	
14,358.00	90.43	90.64	7,119.09	1,856.81	6,188.35	-1,968.31	1.94	1.19	1.53	

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well 4
Project:	Weld County, CO (NAD83)	TVD Reference:	Rkb @ 4905.00usft (Patterson 346)
Site:	Mickey	MD Reference:	Rkb @ 4905.00usft (Patterson 346)
Well:	4	North Reference:	True
Wellbore:	OH / Job #60553	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Patterson 346)	Database:	Compass 5000 RMR

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)	
14,452.00	89.47	91.70	7,119.17	1,854.89	6,282.33	-2,023.04	1.52	-1.02	1.13	
14,547.00	90.68	92.72	7,119.05	1,851.23	6,377.26	-2,079.74	1.67	1.27	1.07	
14,641.00	91.57	93.60	7,117.20	1,846.04	6,471.09	-2,137.08	1.33	0.95	0.94	
14,736.00	88.48	93.02	7,117.16	1,840.56	6,565.92	-2,195.23	3.31	-3.25	-0.61	
14,830.00	89.38	93.16	7,118.91	1,835.49	6,659.77	-2,252.48	0.97	0.96	0.15	
14,924.00	87.23	91.37	7,121.69	1,831.78	6,753.64	-2,308.64	2.98	-2.29	-1.90	
15,019.00	89.03	90.49	7,124.79	1,830.24	6,848.58	-2,363.59	2.11	1.89	-0.93	
15,113.00	90.79	90.63	7,124.94	1,829.32	6,942.57	-2,417.50	1.88	1.87	0.15	
15,208.00	91.62	90.81	7,122.94	1,828.13	7,037.54	-2,472.20	0.89	0.87	0.19	
15,302.00	90.24	91.04	7,121.42	1,826.61	7,131.51	-2,526.59	1.49	-1.47	0.24	
15,396.00	89.37	89.19	7,121.74	1,826.42	7,225.51	-2,579.90	2.17	-0.93	-1.97	
15,491.00	89.20	88.81	7,122.92	1,828.08	7,320.48	-2,632.25	0.44	-0.18	-0.40	
15,585.00	88.79	87.82	7,124.57	1,830.84	7,414.43	-2,683.10	1.14	-0.44	-1.05	
15,680.00	89.26	87.97	7,126.19	1,834.33	7,509.35	-2,733.90	0.52	0.49	0.16	
15,774.00	91.05	88.75	7,125.93	1,837.02	7,603.31	-2,784.82	2.08	1.90	0.83	
15,868.00	89.51	88.18	7,125.48	1,839.54	7,697.27	-2,835.88	1.75	-1.64	-0.61	
15,963.00	88.17	88.14	7,127.40	1,842.59	7,792.20	-2,887.05	1.41	-1.41	-0.04	
16,057.00	88.88	88.04	7,129.82	1,845.72	7,886.11	-2,937.58	0.76	0.76	-0.11	
16,152.00	88.67	89.20	7,131.85	1,848.01	7,981.06	-2,989.39	1.24	-0.22	1.22	
16,247.00	88.73	89.93	7,134.00	1,848.73	8,076.03	-3,042.50	0.77	0.06	0.77	
16,341.00	89.03	92.98	7,135.84	1,846.34	8,169.98	-3,097.60	3.26	0.32	3.24	
16,435.00	90.22	93.86	7,136.46	1,840.74	8,263.80	-3,155.28	1.57	1.27	0.94	
16,530.00	89.35	93.98	7,136.81	1,834.24	8,358.58	-3,214.24	0.92	-0.92	0.13	
16,625.00	87.96	93.66	7,139.04	1,827.91	8,453.34	-3,273.04	1.50	-1.46	-0.34	
16,719.00	88.72	93.81	7,141.77	1,821.79	8,547.10	-3,331.12	0.82	0.81	0.16	
16,813.00	88.84	91.93	7,143.77	1,817.09	8,640.96	-3,388.08	2.00	0.13	-2.00	
16,908.00	88.50	91.36	7,145.97	1,814.36	8,735.89	-3,444.01	0.70	-0.36	-0.60	
17,002.00	87.34	88.82	7,149.39	1,814.21	8,829.82	-3,497.25	2.97	-1.23	-2.70	
17,096.00	84.80	89.57	7,155.83	1,815.53	8,923.58	-3,549.19	2.82	-2.70	0.80	
17,190.00	84.28	89.17	7,164.77	1,816.56	9,017.15	-3,601.26	0.70	-0.55	-0.43	
17,285.00	83.36	89.12	7,175.00	1,817.97	9,111.59	-3,653.50	0.97	-0.97	-0.05	
17,379.00	83.93	88.55	7,185.40	1,819.87	9,204.99	-3,704.76	0.85	0.61	-0.61	
17,474.00	84.21	88.42	7,195.22	1,822.37	9,299.45	-3,756.11	0.32	0.29	-0.14	
17,568.00	84.08	88.26	7,204.81	1,825.08	9,392.92	-3,806.74	0.22	-0.14	-0.17	
17,663.00	83.62	88.18	7,214.99	1,828.01	9,487.32	-3,857.71	0.49	-0.48	-0.08	
17,723.00	83.10	88.57	7,221.92	1,829.70	9,546.90	-3,890.01	1.08	-0.87	0.65	
Final Phoenix MWD Survey										
17,790.00	83.10	88.57	7,229.97	1,831.36	9,613.39	-3,926.24	0.00	0.00	0.00	
Projection to TD										



Phoenix Technology Services LP
Survey Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well 4
Project:	Weld County, CO (NAD83)	TVD Reference:	Rkb @ 4905.00usft (Patterson 346)
Site:	Mickey	MD Reference:	Rkb @ 4905.00usft (Patterson 346)
Well:	4	North Reference:	True
Wellbore:	OH / Job #60553	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Patterson 346)	Database:	Compass 5000 RMR

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,553.00	1,549.46	38.51	-26.40	Tie On
1,580.00	1,575.91	43.05	-29.42	First Phoenix MWD Survey
17,723.00	7,221.92	1,829.70	9,546.90	Final Phoenix MWD Survey
17,790.00	7,229.97	1,831.36	9,613.39	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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