



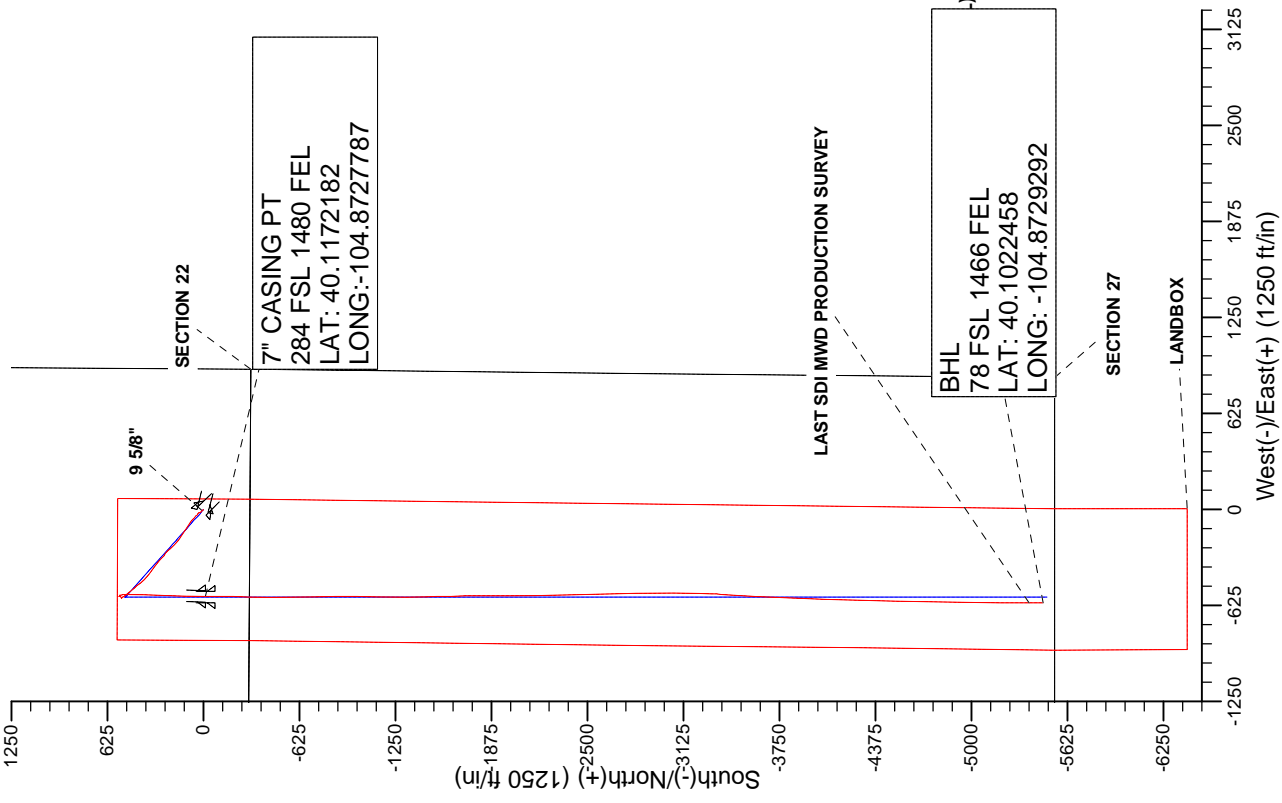
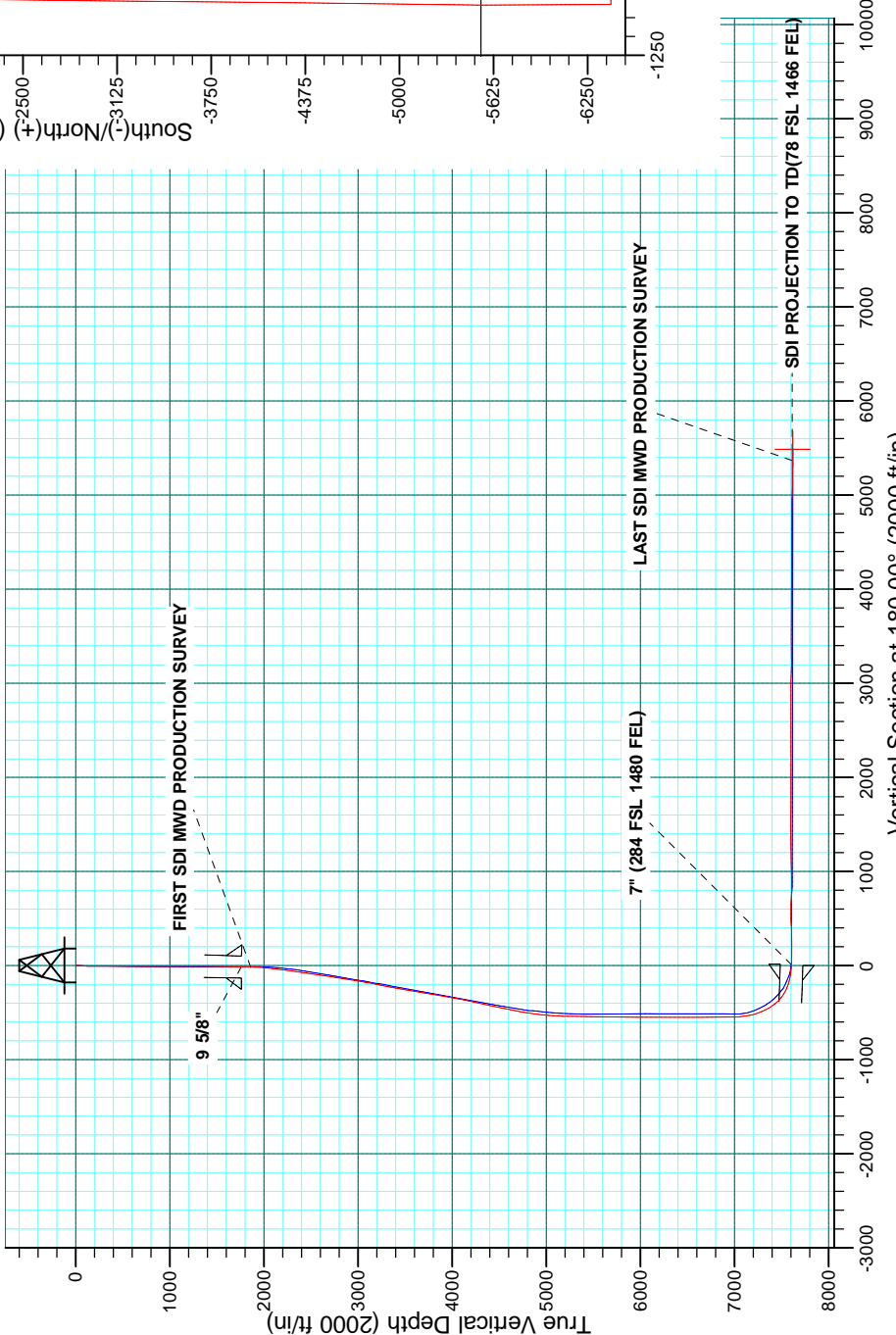
Project: COLORADO NORTHERN ZONE - 83
Site: BANDED 37-22 HZ PAD
Well: BANDED 37C-27HZ
Wellbore: OH
Design: OH



WELL DETAILS: BANDED 37C-27HZ			
GL-4977 & KB 25 @ 5002.00ft (HP 311)			
+N/S	+E/W	Northing	Longitude
0.00	0.00	1286182.22	-104.8707620
		Easting	Latitude
		3175978.73	40.1172490

PROJECT DETAILS: COLORADO NORTHERN ZONE - 83	
Geodetic System:	US State Plane 1983
Datum:	North American Datum 1983
Ellipsoid:	GRS 1980
Zone:	Colorado Northern Zone
Location:	SECTION 22 T24N-R67W
System Datum:	Mean Sea Level

CASING DETAILS		
TVD	MD	Name Size
1760.92	1761.00	9 5/8" 9.625
7606.34	8023.00	7" 7.000





Scientific Drilling

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

BANDED 37-22 HZ PAD

BANDED 37C-27HZ

OH

Design: OH

Standard Survey Report

19 August, 2014

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well BANDED 37C-27HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	GL 4977 & KB 25 @ 5002.00ft (HP 311)
Site:	BANDED 37-22 HZ PAD	MD Reference:	GL 4977 & KB 25 @ 5002.00ft (HP 311)
Well:	BANDED 37C-27HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales

Project	COLORADO NORTHERN ZONE - 83, KERR MCGEE OIL & GAS ONSHORE LP		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site	BANDED 37-22 HZ PAD, SECTION 22 T2N-R67W				
Site Position:		Northing:	1,286,182.29 usft	Latitude:	40.1172480
From:	Lat/Long	Easting:	3,176,038.58 usft	Longitude:	-104.8705480
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	0.41 °

Well	BANDED 37C-27HZ, 300' FSL 916' FEL					
Well Position	+N/-S	0.00 ft	Northing:	1,286,182.21 usft	Latitude:	40.1172490
	+E/-W	0.00 ft	Easting:	3,175,978.73 usft	Longitude:	-104.8707620
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	4,977.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2014	7/14/2014	8.57	66.69	52,546

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	180.00	

Survey Program	Date	8/19/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
25.00	1,571.00	Survey #1 GYRO (OH)	NS-GYRO-MS	North sensing gyrocompassing m/s	
1,858.00	13,479.00	Survey #2 SDI MWD SURVEY (OH)	SDI_MWD+CRUST_1.0	SDI MWD + Crustal anomaly, Version 1.0	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	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	0.00
25.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125.00	0.43	314.41	125.00	0.26	-0.27	-0.26	0.43	0.43	0.00	0.00
225.00	0.70	322.48	224.99	1.01	-0.91	-1.01	0.28	0.27	8.07	8.07
325.00	0.56	332.13	324.99	1.93	-1.51	-1.93	0.18	-0.14	9.65	9.65
425.00	0.22	358.21	424.99	2.55	-1.74	-2.55	0.38	-0.34	26.08	26.08
525.00	0.28	321.64	524.98	2.93	-1.90	-2.93	0.17	0.06	-36.57	-36.57
625.00	0.26	342.06	624.98	3.34	-2.12	-3.34	0.10	-0.02	20.42	20.42
725.00	0.22	309.87	724.98	3.68	-2.34	-3.68	0.14	-0.04	-32.19	-32.19
825.00	0.25	339.78	824.98	4.01	-2.56	-4.01	0.12	0.03	29.91	29.91

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well BANDED 37C-27HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	GL 4977 & KB 25 @ 5002.00ft (HP 311)
Site:	BANDED 37-22 HZ PAD	MD Reference:	GL 4977 & KB 25 @ 5002.00ft (HP 311)
Well:	BANDED 37C-27HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
925.00	0.23	342.97	924.98	4.40	-2.70	-4.40	0.02	-0.02	3.19
1,025.00	0.14	329.94	1,024.98	4.70	-2.82	-4.70	0.10	-0.09	-13.03
1,125.00	0.28	349.20	1,124.98	5.05	-2.92	-5.05	0.15	0.14	19.26
1,225.00	0.44	341.44	1,224.98	5.65	-3.09	-5.65	0.17	0.16	-7.76
1,325.00	0.54	352.06	1,324.97	6.48	-3.28	-6.48	0.13	0.10	10.62
1,425.00	0.50	324.05	1,424.97	7.30	-3.60	-7.30	0.25	-0.04	-28.01
1,525.00	0.53	289.79	1,524.97	7.81	-4.29	-7.81	0.30	0.03	-34.26
1,571.00	0.56	284.93	1,570.96	7.94	-4.71	-7.94	0.12	0.07	-10.57
1,761.00	1.80	316.25	1,760.92	10.34	-7.67	-10.34	0.71	0.65	16.49
9 5/8"									
1,858.00	2.48	319.69	1,857.85	13.04	-10.08	-13.04	0.71	0.70	3.54
FIRST SDI MWD PRODUCTION SURVEY									
1,949.00	4.31	323.19	1,948.69	17.28	-13.40	-17.28	2.02	2.01	3.85
2,041.00	6.59	328.59	2,040.27	24.55	-18.23	-24.55	2.54	2.48	5.87
2,132.00	8.26	321.51	2,130.50	34.13	-25.02	-34.13	2.09	1.84	-7.78
2,224.00	10.13	313.04	2,221.32	44.82	-35.05	-44.82	2.50	2.03	-9.21
2,315.00	11.90	311.64	2,310.64	56.52	-47.91	-56.52	1.97	1.95	-1.54
2,407.00	14.20	309.85	2,400.26	70.05	-63.66	-70.05	2.54	2.50	-1.95
2,590.00	13.17	302.38	2,578.08	95.60	-98.50	-95.60	1.12	-0.56	-4.08
2,681.00	14.91	304.18	2,666.36	107.73	-116.94	-107.73	1.97	1.91	1.98
2,772.00	16.58	304.49	2,753.94	121.66	-137.33	-121.66	1.84	1.84	0.34
2,863.00	15.92	304.97	2,841.30	136.17	-158.26	-136.17	0.74	-0.73	0.53
2,955.00	15.53	304.49	2,929.86	150.38	-178.75	-150.38	0.45	-0.42	-0.52
3,046.00	15.31	306.15	3,017.58	164.36	-198.49	-164.36	0.54	-0.24	1.82
3,229.00	16.33	315.38	3,193.68	196.93	-236.08	-196.93	1.48	0.56	5.04
3,320.00	15.22	320.83	3,281.25	215.30	-252.61	-215.30	2.03	-1.22	5.99
3,509.00	12.60	307.87	3,464.74	247.20	-284.57	-247.20	2.15	-1.39	-6.86
3,698.00	13.96	313.59	3,648.69	275.58	-317.36	-275.58	1.00	0.72	3.03
3,792.00	17.18	313.13	3,739.23	292.89	-335.71	-292.89	3.43	3.43	-0.49
3,886.00	15.09	307.87	3,829.53	309.90	-355.50	-309.90	2.71	-2.22	-5.60
4,075.00	16.18	303.49	4,011.54	339.53	-396.88	-339.53	0.85	0.58	-2.32
4,169.00	17.43	308.64	4,101.53	355.55	-418.81	-355.55	2.07	1.33	5.48
4,264.00	17.21	312.39	4,192.22	373.91	-440.30	-373.91	1.20	-0.23	3.95
4,358.00	17.56	316.81	4,281.93	393.62	-460.28	-393.62	1.45	0.37	4.70
4,547.00	14.98	321.70	4,463.35	433.59	-494.94	-433.59	1.54	-1.37	2.59
4,641.00	14.51	318.98	4,554.26	452.01	-510.19	-452.01	0.89	-0.50	-2.89
4,735.00	14.49	321.44	4,645.27	470.09	-525.25	-470.09	0.66	-0.02	2.62
4,924.00	11.33	318.84	4,829.47	502.56	-552.22	-502.56	1.70	-1.67	-1.38
5,018.00	8.25	328.58	4,922.09	515.27	-561.81	-515.27	3.71	-3.28	10.36
5,112.00	5.96	322.45	5,015.37	524.90	-568.31	-524.90	2.56	-2.44	-6.52
5,301.00	1.27	278.07	5,203.96	532.98	-576.36	-532.98	2.71	-2.48	-23.48
5,490.00	2.64	56.93	5,392.90	535.65	-574.79	-535.65	1.95	0.72	73.47
5,584.00	2.15	50.84	5,486.82	537.94	-571.61	-537.94	0.59	-0.52	-6.48

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Site:	BANDED 37-22 HZ PAD	MD Reference:	GL 4977 & KB 25 @ 5002.00ft (HP 311)
Well:	BANDED 37C-27HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
5,678.00	1.73	47.99	5,580.76	540.01	-569.19	-540.01	0.46	-0.45	-3.03	
5,772.00	1.62	42.09	5,674.72	541.94	-567.24	-541.94	0.22	-0.12	-6.28	
5,866.00	1.09	25.34	5,768.70	543.74	-565.97	-543.74	0.70	-0.56	-17.82	
5,960.00	0.75	12.10	5,862.69	545.15	-565.46	-545.15	0.42	-0.36	-14.09	
6,055.00	0.65	14.89	5,957.68	546.27	-565.19	-546.27	0.11	-0.11	2.94	
6,149.00	0.67	6.91	6,051.67	547.34	-564.99	-547.34	0.10	0.02	-8.49	
6,243.00	0.75	8.18	6,145.67	548.49	-564.83	-548.49	0.09	0.09	1.35	
6,338.00	0.68	0.30	6,240.66	549.67	-564.74	-549.67	0.13	-0.07	-8.29	
6,621.00	1.51	163.78	6,523.63	547.77	-563.69	-547.77	0.77	0.29	57.77	
6,715.00	1.03	142.23	6,617.61	545.91	-562.83	-545.91	0.71	-0.51	-22.93	
6,809.00	0.72	112.75	6,711.60	545.01	-561.76	-545.01	0.57	-0.33	-31.36	
6,904.00	0.75	76.80	6,806.59	544.93	-560.61	-544.93	0.48	0.03	-37.84	
6,998.00	1.09	52.42	6,900.58	545.61	-559.30	-545.61	0.54	0.36	-25.94	
7,045.00	0.99	73.01	6,947.57	546.00	-558.56	-546.00	0.82	-0.21	43.81	
7,092.00	2.46	145.51	6,994.55	545.29	-557.60	-545.29	5.02	3.13	154.26	
7,139.00	4.65	164.57	7,041.46	542.62	-556.52	-542.62	5.23	4.66	40.55	
7,186.00	7.74	169.63	7,088.18	537.67	-555.44	-537.67	6.67	6.57	10.77	
7,281.00	13.56	175.93	7,181.51	520.25	-553.50	-520.25	6.24	6.13	6.63	
7,375.00	20.62	179.45	7,271.30	492.68	-552.56	-492.68	7.59	7.51	3.74	
7,422.00	24.61	182.34	7,314.68	474.61	-552.88	-474.61	8.81	8.49	6.15	
7,469.00	28.81	181.61	7,356.66	453.51	-553.60	-453.51	8.96	8.94	-1.55	
7,564.00	40.24	181.45	7,434.80	399.77	-555.02	-399.77	12.03	12.03	-0.17	
7,611.00	47.32	181.62	7,468.71	367.28	-555.89	-367.28	15.07	15.06	0.36	
7,658.00	52.79	182.53	7,498.87	331.29	-557.21	-331.29	11.73	11.64	1.94	
7,705.00	58.32	181.88	7,525.45	292.57	-558.69	-292.57	11.82	11.77	-1.38	
7,752.00	64.47	181.79	7,547.94	251.35	-560.01	-251.35	13.09	13.09	-0.19	
7,799.00	69.58	181.35	7,566.28	208.11	-561.20	-208.11	10.91	10.87	-0.94	
7,847.00	73.82	180.79	7,581.35	162.56	-562.04	-162.56	8.90	8.83	-1.17	
7,894.00	78.83	180.63	7,592.46	116.91	-562.61	-116.91	10.66	10.66	-0.34	
7,941.00	82.83	180.81	7,599.94	70.52	-563.19	-70.52	8.52	8.51	0.38	
7,978.00	85.36	180.34	7,603.75	33.72	-563.56	-33.72	6.95	6.84	-1.27	
8,018.00	87.75	180.76	7,606.15	-6.20	-563.94	6.20	6.07	5.98	1.05	
8,023.00	87.89	180.77	7,606.34	-11.20	-564.01	11.20	2.87	2.86	0.21	
7" (284 FSL 1480 FEL)										
8,113.00	90.47	180.96	7,607.63	-101.17	-565.37	101.17	2.87	2.86	0.21	
8,207.00	90.74	181.07	7,606.64	-195.15	-567.03	195.15	0.31	0.29	0.12	
8,301.00	90.64	180.38	7,605.50	-289.13	-568.22	289.13	0.74	-0.11	-0.73	
8,395.00	90.74	180.61	7,604.37	-383.12	-569.04	383.12	0.27	0.11	0.24	
8,490.00	91.11	180.58	7,602.84	-478.11	-570.02	478.11	0.39	0.39	-0.03	
8,678.00	88.93	178.77	7,602.77	-666.08	-568.96	666.08	1.51	-1.16	-0.96	
8,773.00	89.23	179.03	7,604.30	-761.05	-567.13	761.05	0.42	0.32	0.27	
8,867.00	89.36	179.14	7,605.46	-855.04	-565.63	855.04	0.18	0.14	0.12	
8,961.00	90.54	180.11	7,605.54	-949.03	-565.02	949.03	1.63	1.26	1.03	
9,056.00	91.24	181.24	7,604.06	-1,044.01	-566.14	1,044.01	1.40	0.74	1.19	

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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales

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Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
9,150.00	91.41	180.63	7,601.89	-1,137.97	-567.67	1,137.97	0.67	0.18	-0.65	
9,245.00	91.31	180.60	7,599.63	-1,232.94	-568.69	1,232.94	0.11	-0.11	-0.03	
9,433.00	89.93	179.45	7,597.60	-1,420.92	-568.77	1,420.92	0.96	-0.73	-0.61	
9,528.00	89.43	178.98	7,598.13	-1,515.91	-567.47	1,515.91	0.72	-0.53	-0.49	
9,622.00	89.23	178.13	7,599.23	-1,609.87	-565.10	1,609.87	0.93	-0.21	-0.90	
9,717.00	89.26	178.42	7,600.48	-1,704.82	-562.24	1,704.82	0.31	0.03	0.31	
9,811.00	89.90	179.29	7,601.17	-1,798.80	-560.36	1,798.80	1.15	0.68	0.93	
9,905.00	90.03	179.57	7,601.23	-1,892.79	-559.43	1,892.79	0.33	0.14	0.30	
9,999.00	89.80	179.73	7,601.37	-1,986.79	-558.85	1,986.79	0.30	-0.24	0.17	
10,093.00	89.66	179.08	7,601.81	-2,080.79	-557.88	2,080.79	0.71	-0.15	-0.69	
10,188.00	89.70	179.18	7,602.34	-2,175.77	-556.43	2,175.77	0.11	0.04	0.11	
10,282.00	90.27	179.63	7,602.36	-2,269.77	-555.46	2,269.77	0.77	0.61	0.48	
10,471.00	90.00	179.03	7,601.92	-2,458.75	-553.25	2,458.75	0.35	-0.14	-0.32	
10,565.00	89.87	178.72	7,602.03	-2,552.73	-551.40	2,552.73	0.36	-0.14	-0.33	
10,660.00	89.50	178.33	7,602.55	-2,647.70	-548.96	2,647.70	0.57	-0.39	-0.41	
10,754.00	89.60	177.94	7,603.29	-2,741.65	-545.90	2,741.65	0.43	0.11	-0.41	
10,848.00	90.13	178.53	7,603.51	-2,835.60	-543.00	2,835.60	0.84	0.56	0.63	
10,943.00	90.07	180.21	7,603.34	-2,930.59	-541.96	2,930.59	1.77	-0.06	1.77	
11,037.00	89.83	181.63	7,603.42	-3,024.58	-543.47	3,024.58	1.53	-0.26	1.51	
11,225.00	89.46	180.60	7,604.59	-3,212.54	-547.12	3,212.54	0.58	-0.20	-0.55	
11,320.00	89.70	181.51	7,605.29	-3,307.52	-548.87	3,307.52	0.99	0.25	0.96	
11,414.00	90.74	183.42	7,604.92	-3,401.42	-552.92	3,401.42	2.31	1.11	2.03	
11,603.00	90.20	183.19	7,603.37	-3,590.10	-563.81	3,590.10	0.31	-0.29	-0.12	
11,697.00	89.60	182.73	7,603.54	-3,683.98	-568.67	3,683.98	0.80	-0.64	-0.49	
11,792.00	89.26	182.41	7,604.48	-3,778.88	-572.93	3,778.88	0.49	-0.36	-0.34	
11,886.00	88.86	182.43	7,606.03	-3,872.78	-576.89	3,872.78	0.43	-0.43	0.02	
12,075.00	90.44	181.74	7,607.18	-4,061.64	-583.77	4,061.64	0.91	0.84	-0.37	
12,169.00	89.80	181.38	7,606.98	-4,155.61	-586.33	4,155.61	0.78	-0.68	-0.38	
12,263.00	90.17	181.65	7,607.01	-4,249.57	-588.81	4,249.57	0.49	0.39	0.29	
12,452.00	91.01	181.67	7,605.06	-4,438.48	-594.29	4,438.48	0.44	0.44	0.01	
12,546.00	88.52	180.73	7,605.45	-4,532.45	-596.26	4,532.45	2.83	-2.65	-1.00	
12,640.00	90.10	181.31	7,606.58	-4,626.43	-597.93	4,626.43	1.79	1.68	0.62	
12,726.00	89.23	180.33	7,607.08	-4,712.42	-599.16	4,712.42	1.52	-1.01	-1.14	
12,915.00	89.50	180.43	7,609.18	-4,901.40	-600.41	4,901.40	0.15	0.14	0.05	
13,103.00	89.60	181.22	7,610.65	-5,089.37	-603.12	5,089.37	0.42	0.05	0.42	
13,198.00	89.63	180.66	7,611.29	-5,184.36	-604.68	5,184.36	0.59	0.03	-0.59	
13,292.00	90.40	180.60	7,611.27	-5,278.35	-605.71	5,278.35	0.82	0.82	-0.06	
13,386.00	88.80	180.02	7,611.92	-5,372.34	-606.22	5,372.34	1.81	-1.70	-0.62	
LAST SDI MWD PRODUCTION SURVEY										
13,479.00	88.80	180.02	7,613.87	-5,465.32	-606.25	5,465.32	0.00	0.00	0.00	
SDI PROJECTION TO TD(78 FSL 1466 FEL)										

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well BANDED 37C-27HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	GL 4977 & KB 25 @ 5002.00ft (HP 311)
Site:	BANDED 37-22 HZ PAD	MD Reference:	GL 4977 & KB 25 @ 5002.00ft (HP 311)
Well:	BANDED 37C-27HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
1,761.00	1,760.92	9 5/8"	9.625	13.500	
8,023.00	7,606.34	7" (284 FSL 1480 FEL)	7.000	8.750	

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
1,858.00	1,857.85	13.04	-10.08	FIRST SDI MWD PRODUCTION SURVEY	
13,386.00	7,611.92	-5,372.34	-606.22	LAST SDI MWD PRODUCTION SURVEY	
13,479.00	7,613.87	-5,465.32	-606.25	SDI PROJECTION TO TD(78 FSL 1466 FEL)	

Checked By: _____	Approved By: _____	Date: _____
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