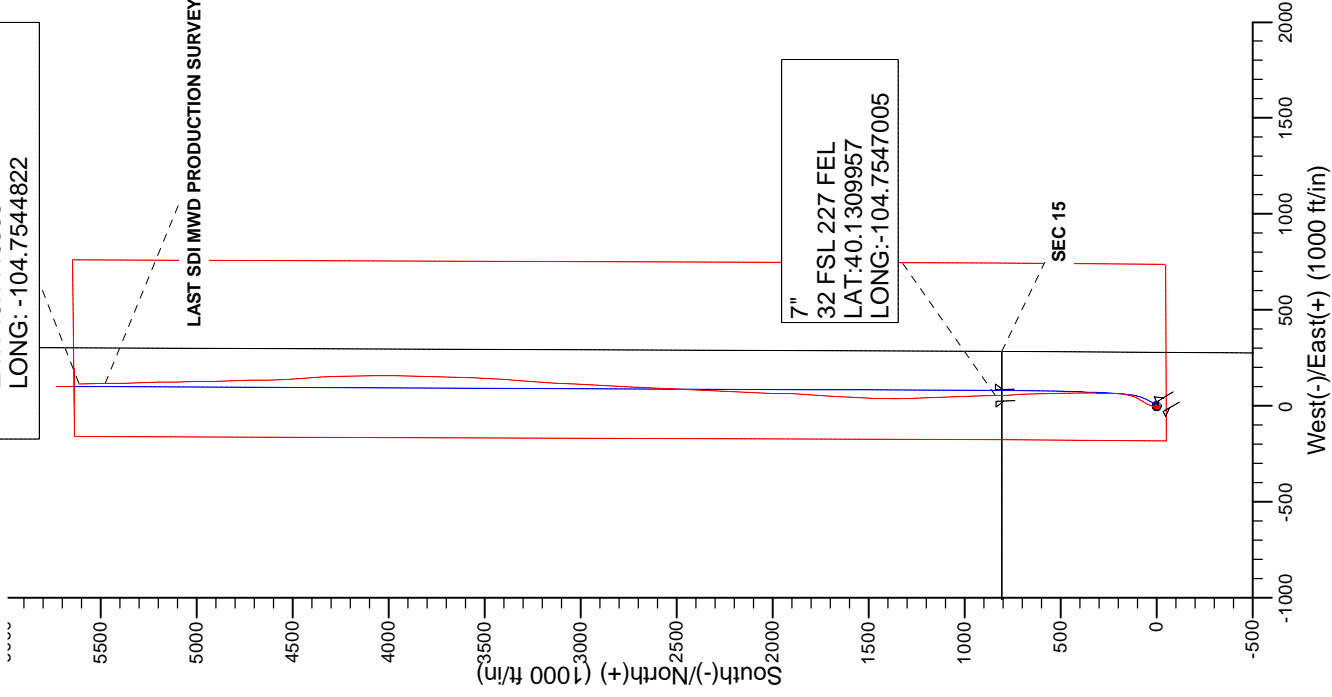
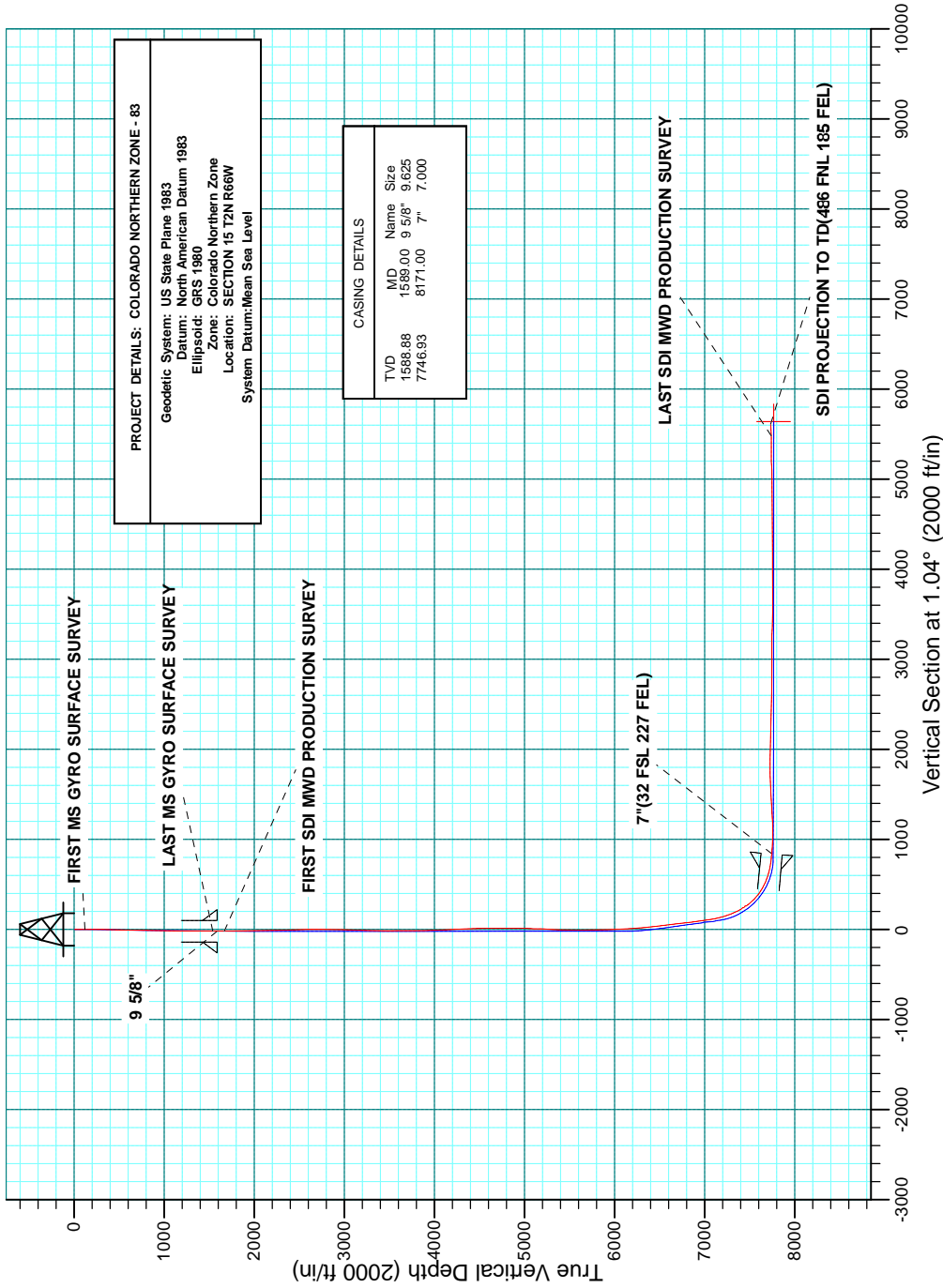




Project: COLORADO NORTHERN ZONE - 83
Site: TURKEY SPRINGS 1G-15HZ
Well: TURKEY SPRINGS 1G-15HZ
Wellbore: OH
Design: OH



WELL DETAILS: TURKEY SPRINGS 1G-15HZ						
GL 5091 & KB 25 @ 5116.00ft (HP 311)						
	+N-S	+E-W	Northing	Easting	Latitude	Longitude
	0.00	0.00	1290601.37	3208345.80	40.1286929	-104.7549010



Design: OH (TURKEY SPRINGS 1G-15HZ/OH)
Created By: R.Scott Date: 11:53, October 21 2014

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

TURKEY SPRINGS 1G-15HZ

TURKEY SPRINGS 1G-15HZ

OH

Design: OH

Standard Survey Report

21 October, 2014

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well TURKEY SPRINGS 1G-15HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	GL 5091 & KB 25 @ 5116.00ft (HP 311)
Site:	TURKEY SPRINGS 1G-15HZ	MD Reference:	GL 5091 & KB 25 @ 5116.00ft (HP 311)
Well:	TURKEY SPRINGS 1G-15HZ	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	TURKEY SPRINGS 1G-15HZ, SECTION 15 T2N R66W				
Site Position:		Northing:	1,290,601.99 usft	Latitude:	40.1286930
From:	Lat/Long	Easting:	3,208,345.80 usft	Longitude:	-104.7549010
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	0.48 °

Well	TURKEY SPRINGS 1G-15HZ, 806 FNL 278 FEL					
Well Position	+N/-S	0.00 ft	Northing:	1,290,601.97 usft	Latitude:	40.1286930
	+E/-W	0.00 ft	Easting:	3,208,345.80 usft	Longitude:	-104.7549010
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	5,091.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2014	9/25/2014	8.49	66.71	52,536

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	1.04	

Survey Program	Date	10/21/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
25.00	1,542.00	Survey #1 MS ENERGY GYRO (OH)	NS-GYRO-MS	North sensing gyrocompassing m/s	
1,674.00	12,950.00	Survey #2 SDI MWD PRODUCTION (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	
25.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	
125.00	0.70	213.30	125.00	-0.51	-0.34	-0.52	0.70	0.70	0.00	
FIRST MS GYRO SURFACE SURVEY										
225.00	0.70	199.27	224.99	-1.60	-0.87	-1.61	0.17	0.00	-14.03	
325.00	0.82	216.78	324.98	-2.75	-1.50	-2.77	0.26	0.12	17.51	
425.00	0.82	186.09	424.97	-4.03	-2.01	-4.07	0.43	0.00	-30.69	
525.00	0.81	198.04	524.96	-5.42	-2.30	-5.46	0.17	-0.01	11.95	
625.00	0.76	193.90	624.95	-6.73	-2.68	-6.78	0.08	-0.05	-4.14	
752.00	0.69	200.94	751.94	-8.26	-3.16	-8.32	0.09	-0.06	5.54	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well TURKEY SPRINGS 1G-15HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	GL 5091 & KB 25 @ 5116.00ft (HP 311)
Site:	TURKEY SPRINGS 1G-15HZ	MD Reference:	GL 5091 & KB 25 @ 5116.00ft (HP 311)
Well:	TURKEY SPRINGS 1G-15HZ	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)
825.00	0.78	195.92	824.94	-9.15	-3.45	-9.21	0.15	0.12	-6.88
925.00	0.69	184.49	924.93	-10.41	-3.68	-10.47	0.17	-0.09	-11.43
1,025.00	0.61	179.38	1,024.92	-11.54	-3.72	-11.60	0.10	-0.08	-5.11
1,125.00	0.70	175.87	1,124.91	-12.68	-3.67	-12.75	0.10	0.09	-3.51
1,225.00	0.83	170.21	1,224.91	-14.00	-3.51	-14.07	0.15	0.13	-5.66
1,325.00	0.72	175.76	1,324.90	-15.34	-3.34	-15.40	0.13	-0.11	5.55
1,425.00	0.73	161.51	1,424.89	-16.57	-3.09	-16.63	0.18	0.01	-14.25
1,525.00	0.62	168.11	1,524.88	-17.71	-2.78	-17.76	0.13	-0.11	6.60
1,542.00	0.42	151.32	1,541.88	-17.85	-2.73	-17.90	1.47	-1.18	-98.76
LAST MS GYRO SURFACE SURVEY									
1,589.00	0.07	329.06	1,588.88	-17.98	-2.66	-18.02	1.05	-0.73	378.18
9 5/8"									
1,674.00	0.97	330.83	1,673.88	-17.30	-3.04	-17.35	1.05	1.05	2.08
FIRST SDI MWD PRODUCTION SURVEY									
1,766.00	0.94	328.07	1,765.86	-15.98	-3.82	-16.05	0.06	-0.03	-3.00
1,856.00	1.09	335.41	1,855.85	-14.58	-4.56	-14.66	0.22	0.17	8.16
1,948.00	1.33	325.62	1,947.83	-12.90	-5.53	-13.00	0.34	0.26	-10.64
2,039.00	1.53	336.40	2,038.80	-10.91	-6.61	-11.03	0.37	0.22	11.85
2,131.00	1.33	332.59	2,130.77	-8.84	-7.60	-8.98	0.24	-0.22	-4.14
2,222.00	1.02	322.67	2,221.75	-7.26	-8.57	-7.41	0.41	-0.34	-10.90
2,404.00	1.34	323.65	2,403.71	-4.26	-10.82	-4.45	0.18	0.18	0.54
2,496.00	1.56	311.91	2,495.69	-2.55	-12.39	-2.78	0.40	0.24	-12.76
2,587.00	1.17	338.65	2,586.66	-0.86	-13.65	-1.11	0.81	-0.43	29.38
2,678.00	0.73	99.08	2,677.65	-0.09	-13.41	-0.33	1.83	-0.48	132.34
2,770.00	1.78	124.74	2,769.63	-0.99	-11.66	-1.21	1.27	1.14	27.89
2,861.00	0.91	121.22	2,860.60	-2.17	-9.88	-2.35	0.96	-0.96	-3.87
2,952.00	0.20	104.63	2,951.60	-2.59	-9.11	-2.75	0.79	-0.78	-18.23
3,044.00	1.53	192.03	3,043.59	-3.83	-9.21	-4.00	1.67	1.45	95.00
3,135.00	1.64	190.47	3,134.55	-6.30	-9.70	-6.48	0.13	0.12	-1.71
3,226.00	1.44	198.92	3,225.52	-8.66	-10.31	-8.85	0.33	-0.22	9.29
3,318.00	1.31	185.92	3,317.49	-10.80	-10.79	-11.00	0.37	-0.14	-14.13
3,412.00	0.96	159.49	3,411.48	-12.61	-10.63	-12.80	0.66	-0.37	-28.12
3,506.00	0.99	105.11	3,505.46	-13.56	-9.57	-13.73	0.95	0.03	-57.85
3,600.00	0.93	64.18	3,599.45	-13.44	-8.10	-13.58	0.72	-0.06	-43.54
3,694.00	1.14	20.70	3,693.44	-12.23	-7.08	-12.36	0.84	0.22	-46.26
3,788.00	0.90	345.16	3,787.42	-10.64	-6.94	-10.77	0.71	-0.26	-37.81
3,882.00	0.74	20.75	3,881.42	-9.36	-6.91	-9.48	0.56	-0.17	37.86
3,976.00	1.16	354.02	3,975.40	-7.85	-6.79	-7.97	0.64	0.45	-28.44
4,070.00	2.10	60.53	4,069.37	-6.05	-5.39	-6.15	2.08	1.00	70.76
4,165.00	2.77	59.10	4,164.28	-4.02	-1.91	-4.05	0.71	0.71	-1.51
4,259.00	4.32	33.74	4,258.11	0.09	2.01	0.13	2.31	1.65	-26.98
4,353.00	3.84	28.02	4,351.87	5.82	5.45	5.91	0.67	-0.51	-6.09
4,447.00	2.57	9.89	4,445.72	10.67	7.29	10.80	1.71	-1.35	-19.29
4,541.00	2.02	321.07	4,539.66	14.04	6.61	14.15	2.09	-0.59	-51.94

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well TURKEY SPRINGS 1G-15HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	GL 5091 & KB 25 @ 5116.00ft (HP 311)
Site:	TURKEY SPRINGS 1G-15HZ	MD Reference:	GL 5091 & KB 25 @ 5116.00ft (HP 311)
Well:	TURKEY SPRINGS 1G-15HZ	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)
4,636.00	2.14	233.90	4,634.61	14.29	4.13	14.37	3.02	0.13	-91.76
4,730.00	2.12	245.87	4,728.55	12.55	1.12	12.57	0.47	-0.02	12.73
4,922.00	2.69	272.73	4,920.38	11.31	-6.62	11.19	0.65	0.30	13.99
5,017.00	1.78	243.81	5,015.31	10.77	-10.17	10.58	1.50	-0.96	-30.44
5,111.00	2.08	176.09	5,109.27	8.42	-11.36	8.21	2.30	0.32	-72.04
5,205.00	1.25	171.36	5,203.23	5.70	-11.09	5.50	0.89	-0.88	-5.03
5,299.00	1.65	212.16	5,297.20	3.55	-11.66	3.33	1.15	0.43	43.40
5,394.00	2.18	206.14	5,392.15	0.77	-13.18	0.53	0.60	0.56	-6.34
5,488.00	1.29	177.88	5,486.11	-1.90	-13.93	-2.15	1.29	-0.95	-30.06
5,582.00	1.20	210.27	5,580.09	-3.80	-14.39	-4.06	0.74	-0.10	34.46
5,676.00	0.63	38.15	5,674.08	-4.25	-14.57	-4.51	1.94	-0.61	-183.11
5,771.00	0.45	22.99	5,769.08	-3.49	-14.10	-3.75	0.24	-0.19	-15.96
5,865.00	1.73	40.72	5,863.06	-2.08	-13.03	-2.31	1.39	1.36	18.86
5,959.00	1.36	39.46	5,957.02	-0.14	-11.39	-0.35	0.40	-0.39	-1.34
6,053.00	1.88	48.92	6,050.99	1.73	-9.52	1.56	0.62	0.55	10.06
6,148.00	3.00	26.70	6,145.90	4.98	-7.23	4.85	1.52	1.18	-23.39
6,242.00	4.77	25.42	6,239.68	10.71	-4.45	10.62	1.89	1.88	-1.36
6,336.00	5.81	15.55	6,333.28	18.82	-1.49	18.79	1.47	1.11	-10.50
6,430.00	6.82	17.87	6,426.71	28.72	1.49	28.74	1.11	1.07	2.47
6,525.00	8.53	20.54	6,520.86	40.68	5.70	40.78	1.84	1.80	2.81
6,619.00	8.13	30.74	6,613.87	52.92	11.54	53.12	1.63	-0.43	10.85
6,713.00	7.35	35.34	6,707.01	63.54	18.42	63.87	1.06	-0.83	4.89
6,808.00	7.57	33.66	6,801.21	73.71	25.40	74.16	0.33	0.23	-1.77
6,902.00	9.12	32.07	6,894.21	85.17	32.79	85.76	1.67	1.65	-1.69
6,996.00	9.31	26.02	6,987.00	98.32	40.08	99.03	1.05	0.20	-6.44
7,091.00	9.52	21.53	7,080.72	112.53	46.33	113.36	0.80	0.22	-4.73
7,185.00	16.19	19.13	7,172.31	132.17	53.49	133.12	7.12	7.10	-2.55
7,279.00	19.81	10.37	7,261.71	160.23	60.65	161.31	4.80	3.85	-9.32
7,374.00	25.58	1.85	7,349.35	196.61	64.22	197.74	6.98	6.07	-8.97
7,468.00	32.36	2.01	7,431.54	242.08	65.76	243.24	7.21	7.21	0.17
7,563.00	39.56	1.74	7,508.38	297.80	67.57	298.98	7.58	7.58	-0.28
7,657.00	50.98	0.04	7,574.43	364.46	68.51	365.64	12.22	12.15	-1.81
7,751.00	55.91	0.17	7,630.40	439.95	68.65	441.12	5.25	5.24	0.14
7,845.00	67.34	358.14	7,675.00	522.50	67.35	523.64	12.31	12.16	-2.16
7,940.00	73.28	357.89	7,706.99	611.85	64.25	612.92	6.26	6.25	-0.26
8,034.00	79.97	358.04	7,728.72	703.19	61.01	704.18	7.12	7.12	0.16
8,126.00	83.08	357.86	7,742.28	794.12	57.75	795.03	3.39	3.38	-0.20
8,171.00	85.06	357.77	7,746.93	838.84	56.05	839.72	4.40	4.39	-0.20
7"(32 FSL 227 FEL)									
8,197.00	86.20	357.72	7,748.91	864.75	55.03	865.60	4.40	4.39	-0.20
8,291.00	88.02	358.14	7,753.65	958.56	51.64	959.34	1.99	1.94	0.45
8,385.00	88.49	357.96	7,756.51	1,052.46	48.44	1,053.17	0.54	0.50	-0.19
8,479.00	90.94	357.71	7,756.98	1,146.39	44.89	1,147.01	2.62	2.61	-0.27

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well TURKEY SPRINGS 1G-15HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	GL 5091 & KB 25 @ 5116.00ft (HP 311)
Site:	TURKEY SPRINGS 1G-15HZ	MD Reference:	GL 5091 & KB 25 @ 5116.00ft (HP 311)
Well:	TURKEY SPRINGS 1G-15HZ	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)	
8,573.00	92.55	358.41	7,754.12	1,240.29	41.71	1,240.84	1.87	1.71	0.74	
8,667.00	93.26	359.22	7,749.36	1,334.14	39.77	1,334.65	1.15	0.76	0.86	
8,761.00	93.93	0.79	7,743.46	1,427.95	39.77	1,428.44	1.81	0.71	1.67	
8,856.00	93.02	2.30	7,737.70	1,522.74	42.33	1,523.26	1.85	-0.96	1.59	
8,950.00	91.54	3.89	7,733.96	1,616.52	47.40	1,617.12	2.31	-1.57	1.69	
9,044.00	89.70	4.16	7,732.95	1,710.28	54.00	1,710.98	1.98	-1.96	0.29	
9,138.00	90.00	3.04	7,733.19	1,804.10	59.90	1,804.89	1.23	0.32	-1.19	
9,233.00	90.00	1.69	7,733.19	1,899.01	63.82	1,899.86	1.42	0.00	-1.42	
9,327.00	89.13	2.56	7,733.91	1,992.94	67.31	1,993.84	1.31	-0.93	0.93	
9,421.00	89.53	2.44	7,735.01	2,086.85	71.41	2,087.80	0.44	0.43	-0.13	
9,515.00	89.26	2.39	7,736.00	2,180.76	75.37	2,181.77	0.29	-0.29	-0.05	
9,609.00	88.62	2.52	7,737.74	2,274.66	79.39	2,275.72	0.69	-0.68	0.14	
9,798.00	88.79	2.49	7,742.01	2,463.43	87.65	2,464.61	0.09	0.09	-0.02	
9,892.00	89.06	2.23	7,743.77	2,557.33	91.52	2,558.57	0.40	0.29	-0.28	
9,986.00	89.60	3.17	7,744.87	2,651.22	95.95	2,652.52	1.15	0.57	1.00	
10,080.00	88.86	2.54	7,746.13	2,745.09	100.63	2,746.47	1.03	-0.79	-0.67	
10,175.00	89.26	2.89	7,747.69	2,839.97	105.13	2,841.41	0.56	0.42	0.37	
10,269.00	89.97	3.34	7,748.32	2,933.83	110.24	2,935.35	0.89	0.76	0.48	
10,363.00	90.17	2.07	7,748.21	3,027.72	114.67	3,029.31	1.37	0.21	-1.35	
10,457.00	90.74	2.94	7,747.46	3,121.63	118.78	3,123.27	1.11	0.61	0.93	
10,552.00	89.26	4.15	7,747.46	3,216.44	124.66	3,218.18	2.01	-1.56	1.27	
10,646.00	88.05	4.53	7,749.67	3,310.15	131.77	3,311.99	1.35	-1.29	0.40	
10,740.00	87.21	4.13	7,753.56	3,403.80	138.86	3,405.76	0.99	-0.89	-0.43	
10,835.00	87.75	2.69	7,757.73	3,498.53	144.50	3,500.58	1.62	0.57	-1.52	
10,929.00	90.44	1.73	7,759.22	3,592.44	148.13	3,594.54	3.04	2.86	-1.02	
11,023.00	90.64	1.52	7,758.33	3,686.40	150.79	3,688.53	0.31	0.21	-0.22	
11,117.00	91.58	2.59	7,756.51	3,780.32	154.16	3,782.50	1.51	1.00	1.14	
11,212.00	89.73	0.81	7,755.43	3,875.26	156.98	3,877.48	2.70	-1.95	-1.87	
11,306.00	89.50	0.50	7,756.06	3,969.26	158.05	3,971.47	0.41	-0.24	-0.33	
11,400.00	90.27	0.02	7,756.25	4,063.25	158.48	4,065.46	0.97	0.82	-0.51	
11,495.00	90.74	359.04	7,755.41	4,158.25	157.70	4,160.42	1.14	0.49	-1.03	
11,589.00	89.80	357.96	7,754.97	4,252.21	155.24	4,254.33	1.52	-1.00	-1.15	
11,683.00	90.10	356.93	7,755.05	4,346.11	151.05	4,348.14	1.14	0.32	-1.10	
11,777.00	90.50	356.07	7,754.56	4,439.94	145.31	4,441.84	1.01	0.43	-0.91	
11,872.00	90.77	358.21	7,753.50	4,534.81	140.57	4,536.61	2.27	0.28	2.25	
11,966.00	91.38	358.44	7,751.74	4,628.75	137.83	4,630.49	0.69	0.65	0.24	
12,061.00	90.40	358.60	7,750.26	4,723.71	135.37	4,725.38	1.05	-1.03	0.17	
12,155.00	90.23	358.49	7,749.75	4,817.67	132.99	4,819.29	0.22	-0.18	-0.12	
12,249.00	90.74	358.80	7,748.95	4,911.64	130.76	4,913.21	0.63	0.54	0.33	
12,344.00	91.01	359.20	7,747.50	5,006.62	129.11	5,008.14	0.51	0.28	0.42	
12,438.00	90.40	359.02	7,746.34	5,100.60	127.65	5,102.08	0.68	-0.65	-0.19	
12,532.00	90.40	358.25	7,745.69	5,194.57	125.41	5,195.99	0.82	0.00	-0.82	
12,626.00	90.77	358.75	7,744.73	5,288.53	122.95	5,289.89	0.66	0.39	0.53	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well TURKEY SPRINGS 1G-15HZ
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	GL 5091 & KB 25 @ 5116.00ft (HP 311)
Site:	TURKEY SPRINGS 1G-15HZ	MD Reference:	GL 5091 & KB 25 @ 5116.00ft (HP 311)
Well:	TURKEY SPRINGS 1G-15HZ	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)
12,721.00	91.11	358.69	7,743.17	5,383.50	120.82	5,384.80	0.36	0.36	-0.06
12,815.00	91.54	359.16	7,741.00	5,477.45	119.06	5,478.71	0.68	0.46	0.50
LAST SDI MWD PRODUCTION SURVEY									
12,950.00	91.54	359.16	7,737.37	5,612.39	117.08	5,613.59	0.00	0.00	0.00
SDI PROJECTION TO TD(486 FNL 185 FEL)									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
1,589.00	1,588.88	9 5/8"	9.625	13.500	
8,171.00	7,746.93	7"(32 FSL 227 FEL)	7.000	8.750	

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
125.00	125.00	-0.51	-0.34	FIRST MS GYRO SURFACE SURVEY	
1,542.00	1,541.88	-17.85	-2.73	LAST MS GYRO SURFACE SURVEY	
1,674.00	1,673.88	-17.30	-3.04	FIRST SDI MWD PRODUCTION SURVEY	
12,815.00	7,741.00	5,477.45	119.06	LAST SDI MWD PRODUCTION SURVEY	
12,950.00	7,737.37	5,612.39	117.08	SDI PROJECTION TO TD(486 FNL 185 FEL)	

Checked By: _____ Approved By: _____ Date: _____