



Directional Survey Certification

2948 I-70 Business Loop
Grand Junction, CO 81504
(970)-245-9447 Fax (970)-245-9454

Operator	TEP Rocky Mountain, LLC.
Well Name & No.	TR 13-21-597
County & State	Garfield County, CO
SDI Job No.	420117DEFK411603 & 420317DEF123456
Rig	H&P 271

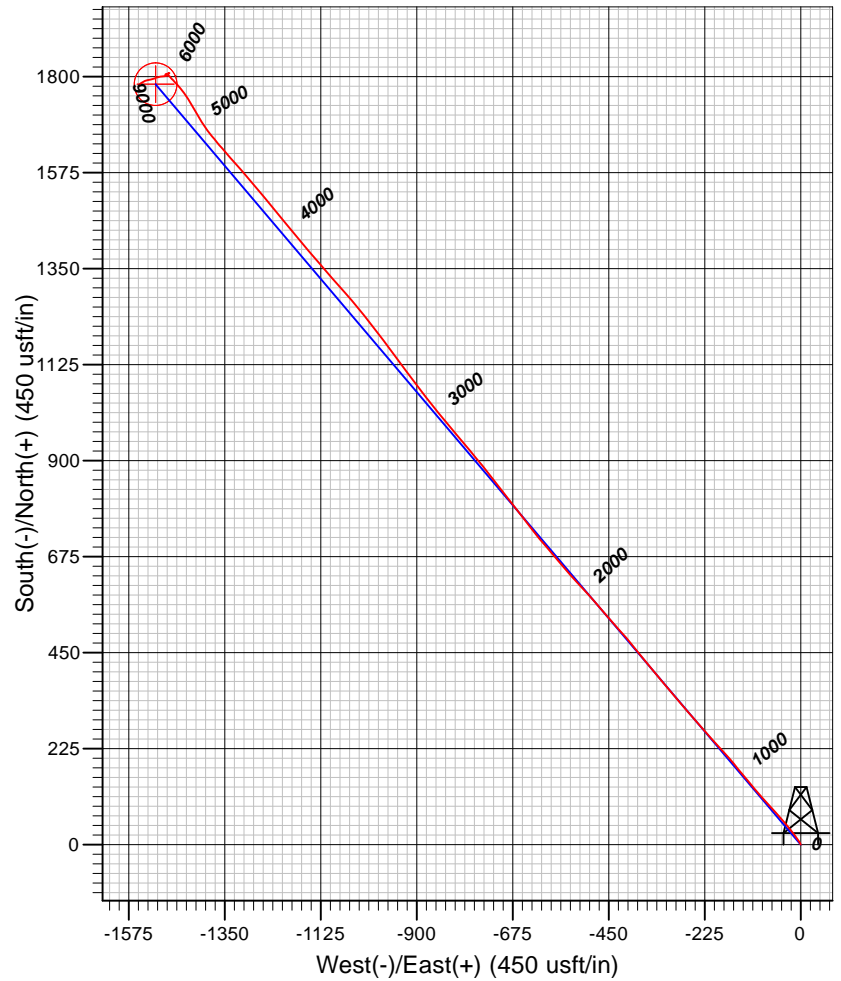
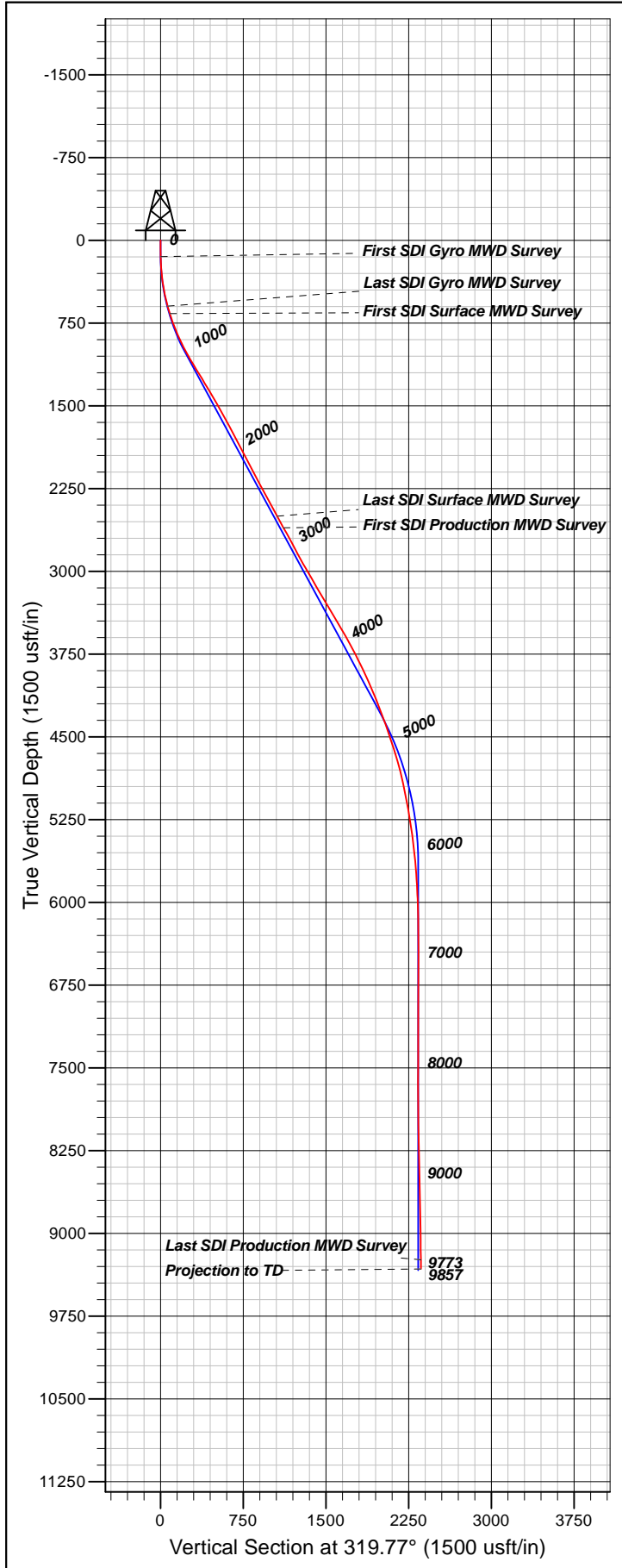
I, Mel Mireles Jr., having personal knowledge of all the facts, hereby certify that the attached directional survey run from a measured depth of 148 feet to a measured depth of 9,871 feet is true and correct as determined from all available records.


Signature

21-Mar-17

Date

Mel Mireles Jr.
Grand Junction Assistant Well Planner
Scientific Drilling - Colorado District



Well Details: Chevron TR 13-21-597

TVD Reference: GL 8292' & RKB 24' @ 8316.00usft (H&P 271)		Horizontal Reference: GL 8292' & RKB 24' @ 8316.00usft (H&P 271)		Slot	
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	1653228.50	2215064.10	39.5938619	-108.2857927 (TR 13-21-597)

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well Chevron TR 13-21-597 - Slot A4 (TR 13-21-597), True North
 Vertical (TVD) Reference: GL 8292' & RKB 24' @ 8316.00usft (H&P 271)
 Section (VS) Reference: Slot - A4 (TR 13-21-597)(0.00N, 0.00E)
 Measured Depth Reference: GL 8292' & RKB 24' @ 8316.00usft (H&P 271)
 Calculation Method: Minimum Curvature

PROJECT DETAILS: Garfield County, CO NAD83

Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Colorado Central Zone

System Datum: Mean Sea Level

Plan: OH

11:20, March 21 2017
 Created By: Janie Collins

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well Chevron TR 13-21-597 - Slot A4 (TR 13-21-597)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 8292' & RKB 24' @ 8316.00usft (H&P 271)
Site:	TR 24-21-597 Pad	MD Reference:	GL 8292' & RKB 24' @ 8316.00usft (H&P 271)
Well:	Chevron TR 13-21-597	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Project	Garfield County, CO NAD83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site		TR 24-21-597 Pad					
Site Position:		Northing:	1,653,248.80	usft	Latitude:	39.5939185	
From:	Map	Easting:	2,215,073.70	usft	Longitude:	-108.2857609	
Position Uncertainty:	0.00	usft	Slot Radius:	13.20	in	Grid Convergence:	-1.76 °

Well		Chevron TR 13-21-597 - Slot A4 (TR 13-21-597)				
Well Position	+N/-S	0.00 usft	Northing:	1,653,228.49 usft	Latitude:	39.5938619
	+E/-W	0.00 usft	Easting:	2,215,064.10 usft	Longitude:	-108.2857927
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	8,292.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	1/15/2017	9.83	65.92	51,664
	HDGM	3/12/2017	9.82	65.92	51,646

Design	OH				
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	319.77	

Survey Program	Date	3/21/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
148.00	602.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
673.00	2,753.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
2,873.00	9,857.00	Survey #3 - Production MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	

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	
148.00	1.32	333.98	147.99	1.53	-0.75	1.65	0.89	0.89	0.00	
First SDI Gyro MWD Survey										
240.00	3.43	333.46	239.90	4.95	-2.44	5.35	2.29	2.29	-0.57	
331.00	6.51	323.00	330.55	11.50	-6.76	13.15	3.51	3.38	-11.49	
422.00	9.59	325.37	420.64	21.86	-14.18	25.85	3.40	3.38	2.60	
511.00	12.40	320.80	508.00	35.37	-24.43	42.79	3.30	3.16	-5.13	

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well Chevron TR 13-21-597 - Slot A4 (TR 13-21-597)
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Site:	TR 24-21-597 Pad	MD Reference:	GL 8292' & RKB 24' @ 8316.00usft (H&P 271)
Well:	Chevron TR 13-21-597	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

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)
602.00	15.13	319.31	596.38	51.95	-38.35	64.43	3.02	3.00	-1.64
Last SDI Gyro MWD Survey									
673.00	17.63	318.33	664.49	67.01	-51.55	84.45	3.54	3.52	-1.38
First SDI Surface MWD Survey									
765.00	20.34	317.27	751.48	89.17	-71.66	114.36	2.97	2.95	-1.15
858.00	22.59	318.92	838.03	114.51	-94.37	148.37	2.50	2.42	1.77
953.00	25.67	320.63	924.72	144.18	-119.42	187.20	3.32	3.24	1.80
1,047.00	28.61	320.71	1,008.36	177.34	-146.59	230.07	3.13	3.13	0.09
1,142.00	30.41	318.82	1,091.03	213.04	-176.83	276.86	2.13	1.89	-1.99
1,237.00	31.85	317.33	1,172.35	249.57	-209.65	325.94	1.72	1.52	-1.57
1,331.00	31.24	317.83	1,252.46	285.88	-242.82	375.08	0.71	-0.65	0.53
1,426.00	30.16	320.20	1,334.15	322.47	-274.64	423.57	1.71	-1.14	2.49
1,520.00	31.35	320.07	1,414.93	359.37	-305.45	471.64	1.27	1.27	-0.14
1,615.00	30.25	320.00	1,496.53	396.65	-336.70	520.28	1.16	-1.16	-0.07
1,709.00	28.61	321.51	1,578.39	432.40	-365.92	566.46	1.91	-1.74	1.61
1,804.00	28.40	320.60	1,661.88	467.67	-394.42	611.78	0.51	-0.22	-0.96
1,898.00	28.24	317.75	1,744.63	501.40	-423.56	656.36	1.45	-0.17	-3.03
1,993.00	27.88	319.63	1,828.47	534.96	-453.06	701.04	1.01	-0.38	1.98
2,091.00	27.39	318.44	1,915.29	569.29	-482.86	746.49	0.75	-0.50	-1.21
2,186.00	26.57	316.86	1,999.95	601.14	-511.88	789.55	1.15	-0.86	-1.66
2,280.00	27.34	318.65	2,083.74	632.69	-540.52	832.13	1.19	0.82	1.90
2,375.00	27.79	319.82	2,167.95	665.99	-569.22	876.09	0.74	0.47	1.23
2,469.00	28.64	319.77	2,250.78	699.93	-597.91	920.53	0.90	0.90	-0.05
2,564.00	29.08	321.70	2,333.99	735.43	-626.92	966.37	1.08	0.46	2.03
2,658.00	28.68	322.41	2,416.30	771.23	-654.84	1,011.73	0.56	-0.43	0.76
2,753.00	28.76	321.82	2,499.61	807.26	-682.87	1,057.35	0.31	0.08	-0.62
Last SDI Surface MWD Survey									
2,873.00	28.95	322.20	2,604.71	852.90	-718.52	1,115.21	0.22	0.16	0.32
First SDI Production MWD Survey									
2,967.00	28.98	321.44	2,686.95	888.68	-746.66	1,160.70	0.39	0.03	-0.81
3,062.00	28.14	319.99	2,770.39	923.84	-775.41	1,206.11	1.15	-0.88	-1.53
3,156.00	27.86	320.07	2,853.39	957.66	-803.76	1,250.24	0.30	-0.30	0.09
3,251.00	29.63	320.69	2,936.68	992.85	-832.88	1,295.92	1.89	1.86	0.65
3,346.00	30.76	321.60	3,018.79	1,030.06	-862.85	1,343.69	1.28	1.19	0.96
3,440.00	29.72	321.32	3,100.00	1,067.09	-892.35	1,391.01	1.12	-1.11	-0.30
3,534.00	30.24	323.94	3,181.42	1,104.42	-920.84	1,437.91	1.50	0.55	2.79
3,629.00	31.08	323.11	3,263.14	1,143.37	-949.64	1,486.25	0.99	0.88	-0.87
3,724.00	30.18	323.81	3,344.89	1,182.25	-978.46	1,534.55	1.02	-0.95	0.74
3,818.00	31.21	321.93	3,425.72	1,220.50	-1,007.43	1,582.46	1.50	1.10	-2.00
3,912.00	30.73	319.90	3,506.32	1,258.04	-1,037.92	1,630.81	1.22	-0.51	-2.16
4,007.00	28.98	318.91	3,588.71	1,293.96	-1,068.69	1,678.10	1.91	-1.84	-1.04
4,101.00	28.51	318.88	3,671.13	1,328.02	-1,098.41	1,723.30	0.50	-0.50	-0.03
4,196.00	27.87	319.46	3,754.86	1,361.97	-1,127.75	1,768.17	0.73	-0.67	0.61

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well Chevron TR 13-21-597 - Slot A4 (TR 13-21-597)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 8292' & RKB 24' @ 8316.00usft (H&P 271)
Site:	TR 24-21-597 Pad	MD Reference:	GL 8292' & RKB 24' @ 8316.00usft (H&P 271)
Well:	Chevron TR 13-21-597	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

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)
4,290.00	26.25	319.00	3,838.56	1,394.36	-1,155.67	1,810.93	1.74	-1.72	-0.49
4,385.00	25.38	320.67	3,924.08	1,425.97	-1,182.36	1,852.30	1.19	-0.92	1.76
4,480.00	23.75	320.73	4,010.48	1,456.53	-1,207.37	1,891.79	1.72	-1.72	0.06
4,574.00	21.75	320.60	4,097.16	1,484.64	-1,230.41	1,928.13	2.13	-2.13	-0.14
4,669.00	21.96	319.97	4,185.34	1,511.84	-1,253.01	1,963.49	0.33	0.22	-0.66
4,763.00	21.06	320.55	4,272.79	1,538.34	-1,275.04	1,997.96	0.98	-0.96	0.62
4,857.00	19.64	318.51	4,360.92	1,563.22	-1,296.24	2,030.64	1.69	-1.51	-2.17
4,952.00	19.46	319.03	4,450.44	1,587.13	-1,317.19	2,062.43	0.26	-0.19	0.55
5,046.00	18.73	319.19	4,539.27	1,610.37	-1,337.32	2,093.17	0.78	-0.78	0.17
5,141.00	17.94	318.32	4,629.45	1,632.85	-1,357.02	2,123.05	0.88	-0.83	-0.92
5,235.00	15.52	322.47	4,719.47	1,653.64	-1,374.31	2,150.09	2.87	-2.57	4.41
5,330.00	13.96	320.67	4,811.34	1,672.58	-1,389.32	2,174.25	1.71	-1.64	-1.89
5,425.00	12.61	329.05	4,903.80	1,690.34	-1,401.92	2,195.94	2.47	-1.42	8.82
5,519.00	11.32	328.59	4,995.76	1,707.01	-1,412.00	2,215.19	1.38	-1.37	-0.49
5,614.00	10.61	330.66	5,089.02	1,722.60	-1,421.15	2,232.99	0.85	-0.75	2.18
5,708.00	9.91	330.49	5,181.52	1,737.18	-1,429.37	2,249.43	0.75	-0.74	-0.18
5,803.00	8.79	325.17	5,275.26	1,750.25	-1,437.54	2,264.69	1.49	-1.18	-5.60
5,897.00	8.62	324.91	5,368.17	1,761.91	-1,445.70	2,278.86	0.19	-0.18	-0.28
5,992.00	6.77	319.63	5,462.32	1,772.00	-1,453.42	2,291.55	2.08	-1.95	-5.56
6,086.00	6.16	317.35	5,555.72	1,779.94	-1,460.42	2,302.13	0.70	-0.65	-2.43
6,180.33	4.67	318.04	5,649.63	1,786.51	-1,466.42	2,311.03	1.58	-1.58	0.74
TR 13-21-597 MVRD									
6,181.00	4.66	318.05	5,650.29	1,786.55	-1,466.45	2,311.08	1.58	-1.58	0.97
6,275.00	4.75	316.12	5,743.98	1,792.20	-1,471.71	2,318.78	0.19	0.10	-2.05
6,370.00	3.08	320.51	5,838.75	1,797.00	-1,476.05	2,325.26	1.78	-1.76	4.62
6,464.00	3.03	318.29	5,932.62	1,800.81	-1,479.31	2,330.27	0.14	-0.05	-2.36
6,559.00	1.58	279.47	6,027.54	1,802.90	-1,482.28	2,333.78	2.16	-1.53	-40.86
6,653.00	1.85	274.02	6,121.50	1,803.22	-1,485.07	2,335.82	0.34	0.29	-5.80
6,748.00	0.36	351.84	6,216.48	1,803.62	-1,486.64	2,337.15	1.90	-1.57	81.92
6,842.00	0.44	309.09	6,310.48	1,804.14	-1,486.96	2,337.75	0.32	0.09	-45.48
6,937.00	0.83	289.72	6,405.48	1,804.60	-1,487.89	2,338.71	0.46	0.41	-20.39
7,032.00	1.07	268.31	6,500.46	1,804.81	-1,489.43	2,339.85	0.45	0.25	-22.54
7,127.00	0.65	67.50	6,595.46	1,804.99	-1,489.82	2,340.24	1.78	-0.44	167.57
7,221.00	1.85	65.01	6,689.43	1,805.83	-1,487.95	2,339.68	1.28	1.28	-2.65
7,316.00	1.67	71.61	6,784.39	1,806.92	-1,485.25	2,338.76	0.29	-0.19	6.95
7,410.00	1.41	71.08	6,878.35	1,807.73	-1,482.85	2,337.83	0.28	-0.28	-0.56
7,504.00	1.01	78.67	6,972.33	1,808.26	-1,480.95	2,337.01	0.46	-0.43	8.07
7,599.00	0.35	74.86	7,067.33	1,808.50	-1,479.84	2,336.49	0.70	-0.69	-4.01
7,694.00	0.18	237.55	7,162.33	1,808.50	-1,479.69	2,336.38	0.55	-0.18	171.25
7,788.00	0.88	237.98	7,256.32	1,808.04	-1,480.43	2,336.51	0.74	0.74	0.46
7,883.00	1.49	235.61	7,351.30	1,806.95	-1,482.06	2,336.74	0.64	0.64	-2.49
7,977.00	0.53	182.61	7,445.29	1,805.83	-1,483.09	2,336.54	1.32	-1.02	-56.38
8,072.00	0.70	196.50	7,540.28	1,804.83	-1,483.28	2,335.90	0.24	0.18	14.62

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Design:	OH	Database:	Grand Junction District

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8,166.00	0.81	226.48	7,634.27	1,803.83	-1,483.92	2,335.55	0.43	0.12	31.89
8,261.00	1.19	246.50	7,729.26	1,802.97	-1,485.31	2,335.79	0.54	0.40	21.07
8,355.00	1.41	245.54	7,823.23	1,802.10	-1,487.26	2,336.39	0.24	0.23	-1.02
8,450.00	1.49	261.27	7,918.20	1,801.43	-1,489.55	2,337.35	0.43	0.08	16.56
8,544.00	1.49	259.96	8,012.17	1,801.03	-1,491.96	2,338.60	0.04	0.00	-1.39
8,639.00	1.58	266.37	8,107.14	1,800.73	-1,494.48	2,340.01	0.20	0.09	6.75
8,733.00	2.20	263.82	8,201.09	1,800.46	-1,497.57	2,341.79	0.67	0.66	-2.71
8,828.00	2.34	262.86	8,296.01	1,800.02	-1,501.31	2,343.87	0.15	0.15	-1.01
8,923.00	2.90	249.76	8,390.91	1,798.95	-1,505.48	2,345.75	0.86	0.59	-13.79
9,017.00	3.13	256.02	8,484.78	1,797.50	-1,510.21	2,347.70	0.43	0.24	6.66
9,112.00	3.25	250.20	8,579.64	1,795.97	-1,515.26	2,349.78	0.36	0.13	-6.13
9,206.00	3.52	253.72	8,673.47	1,794.25	-1,520.53	2,351.89	0.36	0.29	3.74
9,301.00	2.46	257.67	8,768.34	1,793.00	-1,525.32	2,354.02	1.14	-1.12	4.16
9,395.00	2.29	260.66	8,862.26	1,792.27	-1,529.15	2,355.93	0.22	-0.18	3.18
9,490.00	2.33	258.68	8,957.18	1,791.58	-1,532.92	2,357.84	0.09	0.04	-2.08
9,584.00	2.55	248.00	9,051.10	1,790.42	-1,536.73	2,359.42	0.54	0.23	-11.36
9,679.00	2.69	239.18	9,146.00	1,788.49	-1,540.60	2,360.44	0.45	0.15	-9.28
9,773.00	3.17	237.10	9,239.88	1,785.94	-1,544.68	2,361.13	0.52	0.51	-2.21
Last SDI Production MWD Survey									
9,857.00	3.17	237.10	9,323.75	1,783.42	-1,548.58	2,361.73	0.00	0.00	0.00
Projection to TD - TR 13-21-597 PBHL									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
148.00	147.99	1.53	-0.75	First SDI Gyro MWD Survey
602.00	596.38	51.95	-38.35	Last SDI Gyro MWD Survey
673.00	664.49	67.01	-51.55	First SDI Surface MWD Survey
2,753.00	2,499.61	807.26	-682.87	Last SDI Surface MWD Survey
2,873.00	2,604.71	852.90	-718.52	First SDI Production MWD Survey
9,773.00	9,239.88	1,785.94	-1,544.68	Last SDI Production MWD Survey
9,857.00	9,323.75	1,783.42	-1,548.58	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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