



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 522-23-597
County & State	Garfield County, CO
SDI Job No.	OP.001217 & OP.003206
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 153 feet to a measured depth of 10,140 feet is true and correct as determined from all available records.


Signature

17-Aug-17
Date

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

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well TR 522-23-597 - Slot A6 (TR 522-23-597)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 8545.20' & RKB 24' @ 8569.20usft (H&P 318)
Site:	TR 32-23-597 Pad	MD Reference:	GL 8545.20' & RKB 24' @ 8569.20usft (H&P 318)
Well:	TR 522-23-597	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 32-23-597 Pad			
Site Position:		Northing:	1,654,899.00 usft	Latitude:	39.5994964
From:	Map	Easting:	2,227,644.00 usft	Longitude:	-108.2413519
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.73 °

Well	TR 522-23-597 - Slot A6 (TR 522-23-597)					
Well Position	+N/-S	0.00 usft	Northing:	1,654,863.60 usft	Latitude:	39.5993970
	+E/-W	0.00 usft	Easting:	2,227,616.30 usft	Longitude:	-108.2414464
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	8,545.20 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	7/31/2017	9.75	65.93	51,586

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	273.30	

Survey Program	Date	8/16/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
153.00	662.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
731.00	2,895.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
3,067.00	10,140.00	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	
153.00	0.44	213.13	153.00	-0.49	-0.32	0.29	0.29	0.29	0.00	
First SDI Gyro MWD Survey										
214.00	1.06	257.52	213.99	-0.81	-1.00	0.95	1.32	1.02	72.77	
303.00	2.29	278.79	302.95	-0.72	-3.56	3.51	1.53	1.38	23.90	
393.00	5.01	277.21	392.76	0.05	-9.24	9.23	3.02	3.02	-1.76	
483.00	7.30	277.65	482.24	1.31	-18.80	18.85	2.54	2.54	0.49	

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well TR 522-23-597 - Slot A6 (TR 522-23-597)
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Site:	TR 32-23-597 Pad	MD Reference:	GL 8545.20' & RKB 24' @ 8569.20usft (H&P 318)
Well:	TR 522-23-597	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)
572.00	10.91	276.86	570.10	3.07	-32.78	32.90	4.06	4.06	-0.89
662.00	13.81	277.91	658.01	5.56	-51.88	52.11	3.23	3.22	1.17
Last SDI Gyro MWD Survey									
731.00	15.08	278.68	724.82	8.05	-68.91	69.26	1.86	1.84	1.12
First SDI Surface MWD Survey									
820.00	15.63	276.30	810.65	11.11	-92.27	92.76	0.94	0.62	-2.67
909.00	16.61	273.18	896.15	13.13	-116.89	117.45	1.47	1.10	-3.51
999.00	18.29	271.77	982.01	14.28	-143.85	144.43	1.92	1.87	-1.57
1,094.00	18.69	275.91	1,072.10	16.31	-173.89	174.54	1.44	0.42	4.36
1,188.00	18.01	274.90	1,161.32	19.10	-203.35	204.11	0.80	-0.72	-1.07
1,283.00	16.97	271.68	1,251.93	20.76	-231.84	232.65	1.49	-1.09	-3.39
1,378.00	15.74	268.43	1,343.09	20.82	-258.58	259.35	1.61	-1.29	-3.42
1,472.00	14.87	268.24	1,433.76	20.10	-283.38	284.07	0.93	-0.93	-0.20
1,567.00	15.26	269.71	1,525.49	19.66	-308.07	308.69	0.57	0.41	1.55
1,662.00	15.15	268.25	1,617.17	19.22	-332.98	333.53	0.42	-0.12	-1.54
1,757.00	15.35	270.72	1,708.82	19.00	-357.96	358.46	0.72	0.21	2.60
1,851.00	15.58	275.65	1,799.42	20.40	-382.96	383.50	1.42	0.24	5.24
1,946.00	16.44	273.18	1,890.74	22.40	-409.08	409.69	1.15	0.91	-2.60
2,041.00	16.27	274.01	1,981.89	24.07	-435.78	436.44	0.30	-0.18	0.87
2,136.00	14.48	281.07	2,073.50	27.29	-460.72	461.52	2.72	-1.88	7.43
2,230.00	13.28	278.10	2,164.75	31.06	-482.94	483.93	1.48	-1.28	-3.16
2,325.00	14.13	276.96	2,257.05	34.01	-505.25	506.37	0.94	0.89	-1.20
2,420.00	14.33	281.00	2,349.13	37.66	-528.30	529.60	1.07	0.21	4.25
2,515.00	15.02	279.78	2,441.03	41.99	-551.98	553.48	0.80	0.73	-1.28
2,610.00	13.83	278.49	2,533.04	45.76	-575.34	577.02	1.30	-1.25	-1.36
2,705.00	14.43	276.18	2,625.16	48.71	-598.34	600.15	0.87	0.63	-2.43
2,800.00	14.68	276.19	2,717.12	51.28	-622.07	623.99	0.26	0.26	0.01
2,895.00	14.70	276.28	2,809.01	53.90	-646.02	648.05	0.03	0.02	0.09
Last SDI Surface MWD Survey									
3,067.00	14.27	276.31	2,975.54	58.61	-688.78	691.02	0.25	-0.25	0.02
First SDI Production MWD Survey									
3,162.00	15.74	277.99	3,067.30	61.69	-713.18	715.55	1.61	1.55	1.77
3,256.00	15.74	274.74	3,157.78	64.52	-738.51	741.01	0.94	0.00	-3.46
3,351.00	13.28	273.69	3,249.74	66.28	-762.25	764.80	2.60	-2.59	-1.11
3,445.00	12.49	277.46	3,341.38	68.30	-783.10	785.74	1.23	-0.84	4.01
3,540.00	13.15	277.98	3,434.01	71.13	-803.99	806.75	0.71	0.69	0.55
3,635.00	14.60	275.21	3,526.23	73.72	-826.62	829.49	1.68	1.53	-2.92
3,729.00	15.72	275.48	3,616.96	76.01	-851.09	854.06	1.19	1.19	0.29
3,824.00	15.39	275.00	3,708.48	78.34	-876.46	879.52	0.37	-0.35	-0.51
3,918.00	16.09	276.41	3,798.96	80.88	-901.83	904.99	0.85	0.74	1.50
4,012.00	14.77	274.30	3,889.57	83.23	-926.72	929.98	1.53	-1.40	-2.24
4,107.00	15.16	273.86	3,981.34	84.98	-951.19	954.51	0.43	0.41	-0.46
4,201.00	13.81	273.33	4,072.35	86.46	-974.66	978.02	1.44	-1.44	-0.56

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Well:	TR 522-23-597	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

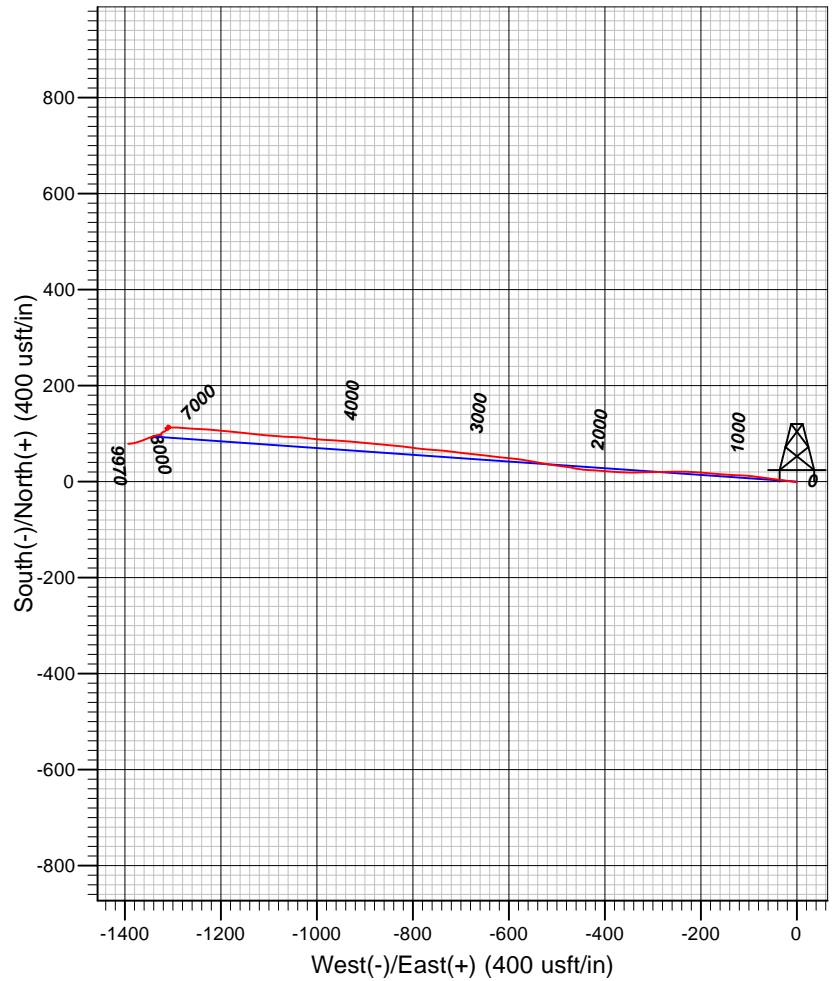
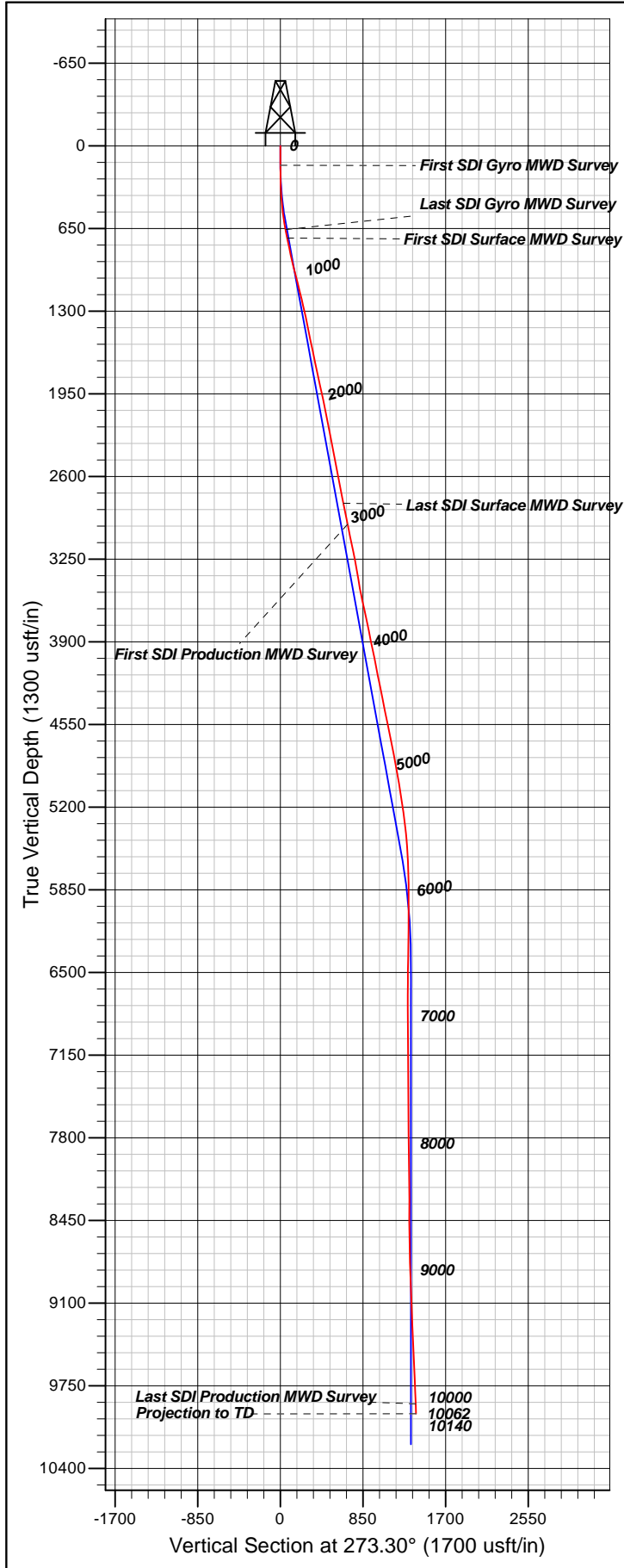
Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,296.00	14.77	274.65	4,164.41	88.10	-998.05	1,001.47	1.07	1.01	1.39
4,390.00	15.21	276.94	4,255.22	90.56	-1,022.23	1,025.75	0.78	0.47	2.44
4,485.00	14.95	272.98	4,346.95	92.70	-1,046.84	1,050.44	1.12	-0.27	-4.17
4,580.00	14.33	272.10	4,438.86	93.77	-1,070.83	1,074.45	0.69	-0.65	-0.93
4,674.00	14.68	275.36	4,529.87	95.31	-1,094.31	1,097.98	0.94	0.37	3.47
4,769.00	15.33	276.64	4,621.63	97.89	-1,118.77	1,122.55	0.77	0.68	1.35
4,863.00	14.75	275.47	4,712.41	100.46	-1,143.02	1,146.91	0.70	-0.62	-1.24
4,958.00	14.07	275.61	4,804.42	102.75	-1,166.56	1,170.54	0.72	-0.72	0.15
5,052.00	13.54	275.88	4,895.70	104.99	-1,188.87	1,192.95	0.57	-0.56	0.29
5,147.00	12.66	275.53	4,988.23	107.13	-1,210.30	1,214.46	0.93	-0.93	-0.37
5,241.00	11.61	273.51	5,080.13	108.70	-1,229.99	1,234.21	1.20	-1.12	-2.15
5,336.00	11.02	271.42	5,173.28	109.51	-1,248.61	1,252.85	0.76	-0.62	-2.20
5,430.00	9.94	275.97	5,265.71	110.58	-1,265.66	1,269.93	1.45	-1.15	4.84
5,525.00	7.74	273.42	5,359.58	111.82	-1,280.20	1,284.52	2.35	-2.32	-2.68
5,619.00	6.70	275.34	5,452.83	112.70	-1,291.98	1,296.33	1.14	-1.11	2.04
5,714.00	4.13	264.81	5,547.40	112.91	-1,300.91	1,305.25	2.89	-2.71	-11.08
5,808.00	3.87	265.25	5,641.17	112.34	-1,307.44	1,311.74	0.28	-0.28	0.47
5,903.00	2.53	269.91	5,736.02	112.07	-1,312.73	1,317.01	1.44	-1.41	4.91
5,998.00	1.14	250.57	5,830.97	111.75	-1,315.72	1,319.97	1.58	-1.46	-20.36
6,092.00	0.62	138.69	5,924.97	111.06	-1,316.27	1,320.48	1.58	-0.55	-119.02
6,186.00	0.74	126.84	6,018.96	110.32	-1,315.45	1,319.62	0.20	0.13	-12.61
6,281.00	0.88	129.90	6,113.95	109.48	-1,314.40	1,318.52	0.15	0.15	3.22
6,375.00	0.88	137.46	6,207.94	108.48	-1,313.35	1,317.42	0.12	0.00	8.04
6,470.00	1.32	115.04	6,302.92	107.48	-1,311.87	1,315.88	0.64	0.46	-23.60
6,564.00	1.49	44.03	6,396.90	107.90	-1,310.04	1,314.08	1.74	0.18	-75.54
6,593.36	1.41	43.89	6,426.25	108.44	-1,309.52	1,313.60	0.27	-0.27	-0.49
TR 522-23-597 MVRD									
6,659.00	1.23	43.50	6,491.87	109.53	-1,308.48	1,312.62	0.27	-0.27	-0.59
6,753.00	1.14	34.36	6,585.85	111.04	-1,307.26	1,311.48	0.22	-0.10	-9.72
6,847.00	1.14	36.03	6,679.84	112.56	-1,306.18	1,310.49	0.04	0.00	1.78
6,942.00	0.53	3.51	6,774.83	113.77	-1,305.60	1,309.98	0.79	-0.64	-34.23
7,036.00	0.62	315.87	6,868.82	114.57	-1,305.92	1,310.35	0.50	0.10	-50.68
7,130.00	0.45	325.43	6,962.82	115.23	-1,306.49	1,310.96	0.20	-0.18	10.17
7,225.00	0.62	303.04	7,057.81	115.82	-1,307.13	1,311.63	0.28	0.18	-23.57
7,319.00	0.79	286.87	7,151.81	116.29	-1,308.18	1,312.70	0.28	0.18	-17.20
7,413.00	0.88	279.13	7,245.80	116.59	-1,309.51	1,314.05	0.15	0.10	-8.23
7,508.00	1.06	267.97	7,340.78	116.67	-1,311.11	1,315.65	0.27	0.19	-11.75
7,602.00	1.22	173.64	7,434.77	115.65	-1,311.87	1,316.35	1.78	0.17	-100.35
7,697.00	1.14	180.26	7,529.75	113.70	-1,311.76	1,316.13	0.17	-0.08	6.97
7,791.00	1.49	192.47	7,623.73	111.57	-1,312.03	1,316.27	0.47	0.37	12.99
7,886.00	1.85	209.22	7,718.69	109.03	-1,313.04	1,317.14	0.63	0.38	17.63
7,980.00	1.32	234.49	7,812.65	107.07	-1,314.66	1,318.65	0.92	-0.56	26.88

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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)	
8,075.00	1.85	218.49	7,907.61	105.24	-1,316.51	1,320.38	0.72	0.56	-16.84	
8,169.00	0.97	256.99	8,001.59	103.87	-1,318.23	1,322.02	1.33	-0.94	40.96	
8,264.00	1.23	250.92	8,096.57	103.36	-1,319.97	1,323.74	0.30	0.27	-6.39	
8,358.00	1.85	243.80	8,190.54	102.36	-1,322.29	1,325.99	0.69	0.66	-7.57	
8,453.00	0.88	202.67	8,285.51	101.01	-1,323.95	1,327.57	1.39	-1.02	-43.29	
8,547.00	1.59	176.01	8,379.49	99.04	-1,324.13	1,327.64	0.95	0.76	-28.36	
8,643.00	0.70	134.05	8,475.47	97.30	-1,323.62	1,327.03	1.22	-0.93	-43.71	
8,738.00	0.88	298.56	8,570.47	97.25	-1,323.84	1,327.25	1.65	0.19	173.17	
8,833.00	1.32	275.79	8,665.45	97.71	-1,325.57	1,329.00	0.64	0.46	-23.97	
8,928.00	1.76	264.63	8,760.41	97.68	-1,328.11	1,331.54	0.56	0.46	-11.75	
9,022.00	2.55	257.78	8,854.35	97.10	-1,331.60	1,334.98	0.88	0.84	-7.29	
9,117.00	3.10	251.98	8,949.23	95.86	-1,336.10	1,339.41	0.65	0.58	-6.11	
9,211.00	3.45	250.77	9,043.08	94.14	-1,341.19	1,344.39	0.38	0.37	-1.29	
9,306.00	3.66	248.74	9,137.89	92.10	-1,346.72	1,349.79	0.26	0.22	-2.14	
9,400.00	3.43	249.93	9,231.71	90.05	-1,352.15	1,355.10	0.26	-0.24	1.27	
9,495.00	3.42	249.98	9,326.54	88.10	-1,357.48	1,360.31	0.01	-0.01	0.05	
9,589.00	3.78	249.31	9,420.36	86.05	-1,363.02	1,365.71	0.39	0.38	-0.71	
9,684.00	3.56	246.92	9,515.16	83.79	-1,368.66	1,371.21	0.28	-0.23	-2.52	
9,778.00	3.46	253.53	9,608.99	81.84	-1,374.07	1,376.50	0.44	-0.11	7.03	
9,873.00	2.98	258.57	9,703.84	80.54	-1,379.24	1,381.58	0.59	-0.51	5.31	
9,967.00	2.96	260.35	9,797.71	79.65	-1,384.02	1,386.31	0.10	-0.02	1.89	
10,062.00	3.17	264.98	9,892.58	79.00	-1,389.06	1,391.30	0.34	0.22	4.87	
Last SDI Production MWD Survey										
10,140.00	3.17	264.98	9,970.46	78.63	-1,393.35	1,395.57	0.00	0.00	0.00	
Projection to TD - TR 522-23-597 PBHL										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
153.00	153.00	-0.49	-0.32	First SDI Gyro MWD Survey	
662.00	658.01	5.56	-51.88	Last SDI Gyro MWD Survey	
731.00	724.82	8.05	-68.91	First SDI Surface MWD Survey	
2,895.00	2,809.01	53.90	-646.02	Last SDI Surface MWD Survey	
3,067.00	2,975.54	58.61	-688.78	First SDI Production MWD Survey	
10,062.00	9,892.58	79.00	-1,389.06	Last SDI Production MWD Survey	
10,140.00	9,970.46	78.63	-1,393.35	Projection to TD	

Checked By: _____	Approved By: _____	Date: _____
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Well Details: TR 522-23-597

+N/-S	+E/-W	North	East	Latitude	Longitude	Slot
0.00	0.00	1654863.60	2227616.30	39.5993969	-108.241464	TR 522-23-597

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well TR 522-23-597 - Slot A6 (TR 522-23-597), True North
 Vertical (TVD) Reference: GL 8545.20' & RKB 24' @ 8569.20usft (H&P 318)
 Section (VS) Reference: Slot - A6 (TR 522-23-597)(0.00N, 0.00E)
 Measured Depth Reference: GL 8545.20' & RKB 24' @ 8569.20usft (H&P 318)
 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

15:46, August 17 2017
 Created By: Mel Mireles Jr.