



Well Details: NR 413-3

TVD Reference: GL 6720' & RKB 24' @ 6744.00usft
 +N/-S +E/-W Northing Easting Latitude Longitude Slot
 0.00 0.00 1634898.54 2329762.14 39.5525062 -107.8772212 NR 413-3 (A11)

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well NR 413-3 - Slot NR 413-3 (A11), True North
 Vertical (TVD) Reference: GL 6720' & RKB 24' @ 6744.00usft
 Section (VS) Reference: Slot - NR 413-3 (A11)(0.00N, 0.00E)
 Measured Depth Reference: GL 6720' & RKB 24' @ 6744.00usft
 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

18:06, November 13 2018
 Created By: Mel Mireles Jr.



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.	NR 413-3
County & State	Garfield County, CO
SDI Job No.	OP.014307
Rig	H&P 318

I, Mel Mireles Jr., having personal knowledge of all the facts, hereby certify that the attached directional survey run from a measured depth of 121 feet to a measured depth of 10,087 feet is true and correct as determined from all available records.

A handwritten signature in black ink, appearing to read 'Mel Mireles Jr.', written over a horizontal line.

Signature

14-Nov-18

Date

Mel Mireles Jr.

Grand Junction Assistant Well Planner
Scientific Drilling - Colorado District

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well NR 413-3 - Slot NR 413-3 (A11)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 6720' & RKB 24' @ 6744.00usft
Site:	NR 23-3 Pad	MD Reference:	GL 6720' & RKB 24' @ 6744.00usft
Well:	NR 413-3	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		NR 23-3 Pad			
Site Position:		Northing:	1,634,904.55 usft	Latitude:	39.5525224
From:	Map	Easting:	2,329,757.66 usft	Longitude:	-107.8772377
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.50 °

Well		NR 413-3 - Slot NR 413-3 (A11)				
Well Position	+N/-S	0.00 usft	Northing:	1,634,898.54 usft	Latitude:	39.5525062
	+E/-W	0.00 usft	Easting:	2,329,762.14 usft	Longitude:	-107.8772212
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	6,720.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	11/3/2018	9.42	65.78	51,521

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	252.63	

Survey Program	Date	11/13/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
121.00	581.00	Survey #1 - Gyro MWD Survey (OH)	Gyro MWD 105	Gyro MWD Error Model Ver 1.0.5	
651.00	1,070.00	Survey #2 - Surface MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	
1,181.00	10,087.00	Survey #3 - Production MWD Survey (OH)	MWD+HDGM	OWSG 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)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
121.00	0.70	236.00	121.00	-0.41	-0.61	0.71	0.58	0.58	0.00	
First SDI Gyro MWD Survey										
213.00	2.46	250.31	212.96	-1.39	-2.94	3.22	1.95	1.91	15.55	
305.00	5.63	258.93	304.72	-2.93	-9.23	9.68	3.50	3.45	9.37	
397.00	8.71	255.76	395.99	-5.51	-20.41	21.12	3.37	3.35	-3.45	
489.00	11.88	250.66	486.50	-10.36	-36.10	37.55	3.58	3.45	-5.54	
581.00	11.96	247.06	576.52	-17.21	-53.82	56.50	0.81	0.09	-3.91	

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well NR 413-3 - Slot NR 413-3 (A11)
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Site:	NR 23-3 Pad	MD Reference:	GL 6720' & RKB 24' @ 6744.00usft
Well:	NR 413-3	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)
Last SDI Gyro MWD Survey									
651.00	13.82	252.08	644.75	-22.61	-68.45	72.08	3.10	2.66	7.17
First SDI Surface MWD Survey									
745.00	14.73	249.32	735.85	-30.28	-90.32	95.24	1.21	0.97	-2.94
840.00	15.60	248.76	827.54	-39.18	-113.52	120.04	0.93	0.92	-0.59
934.00	16.09	245.74	917.97	-49.11	-137.18	145.58	1.02	0.52	-3.21
1,029.00	14.25	252.09	1,009.66	-58.11	-160.31	170.35	2.61	-1.94	6.68
1,070.00	14.60	253.67	1,049.37	-61.12	-170.07	180.56	1.28	0.85	3.85
Last SDI Surface MWD Survey									
1,181.00	14.51	254.94	1,156.81	-68.66	-196.92	208.44	0.30	-0.08	1.14
First SDI Production MWD Survey									
1,275.00	14.98	256.39	1,247.71	-74.58	-220.10	232.33	0.64	0.50	1.54
1,369.00	15.30	258.24	1,338.45	-79.97	-244.05	256.80	0.62	0.34	1.97
1,464.00	14.05	249.54	1,430.36	-86.56	-267.13	280.79	2.66	-1.32	-9.16
1,558.00	13.65	250.28	1,521.63	-94.29	-288.26	303.27	0.47	-0.43	0.79
1,653.00	13.36	247.05	1,614.00	-102.35	-308.92	325.39	0.85	-0.31	-3.40
1,748.00	13.25	244.30	1,706.45	-111.35	-328.84	347.09	0.68	-0.12	-2.89
1,842.00	13.45	249.01	1,797.91	-119.94	-348.75	368.66	1.18	0.21	5.01
1,937.00	13.68	247.48	1,890.26	-128.20	-369.45	390.87	0.45	0.24	-1.61
2,031.00	14.95	252.70	1,981.35	-136.06	-391.29	414.07	1.93	1.35	5.55
2,126.00	15.74	252.70	2,072.96	-143.54	-415.29	439.21	0.83	0.83	0.00
2,220.00	16.72	250.85	2,163.21	-151.77	-440.24	465.47	1.18	1.04	-1.97
2,315.00	17.32	249.71	2,254.05	-161.15	-466.41	493.26	0.72	0.63	-1.20
2,410.00	16.62	256.13	2,344.92	-169.31	-492.87	520.94	2.10	-0.74	6.76
2,505.00	17.17	256.91	2,435.82	-175.75	-519.72	548.49	0.63	0.58	0.82
2,599.00	16.27	261.84	2,525.85	-180.76	-546.27	575.32	1.79	-0.96	5.24
2,694.00	16.88	261.84	2,616.90	-184.60	-573.10	602.07	0.64	0.64	0.00
2,789.00	15.57	256.04	2,708.12	-189.64	-599.12	628.42	2.19	-1.38	-6.11
2,883.00	15.65	256.74	2,798.66	-195.59	-623.71	653.66	0.22	0.09	0.74
2,978.00	16.00	258.50	2,890.06	-201.14	-649.01	679.46	0.63	0.37	1.85
3,073.00	14.68	254.90	2,981.67	-206.89	-673.46	704.52	1.71	-1.39	-3.79
3,167.00	13.63	256.48	3,072.82	-212.58	-695.73	727.47	1.19	-1.12	1.68
3,262.00	12.84	250.42	3,165.30	-218.73	-716.56	749.19	1.68	-0.83	-6.38
3,357.00	12.66	249.36	3,257.96	-225.94	-736.25	770.13	0.31	-0.19	-1.12
3,451.00	12.92	250.50	3,349.62	-233.08	-755.80	790.91	0.39	0.28	1.21
3,546.00	12.44	248.40	3,442.31	-240.39	-775.32	811.73	0.70	-0.51	-2.21
3,640.00	11.84	247.32	3,534.20	-247.84	-793.63	831.43	0.68	-0.64	-1.15
3,735.00	11.47	245.85	3,627.25	-255.46	-811.24	850.51	0.50	-0.39	-1.55
3,829.00	12.26	247.31	3,719.24	-263.13	-828.98	869.73	0.90	0.84	1.55
3,924.00	12.05	247.78	3,812.11	-270.77	-847.47	889.66	0.24	-0.22	0.49
4,018.00	13.26	249.27	3,903.82	-278.30	-866.63	910.20	1.33	1.29	1.59
4,112.00	13.33	246.10	3,995.30	-286.51	-886.62	931.72	0.78	0.07	-3.37
4,206.00	13.63	253.76	4,086.72	-294.00	-907.17	953.57	1.92	0.32	8.15
4,301.00	13.01	252.00	4,179.17	-300.43	-928.08	975.45	0.78	-0.65	-1.85

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well NR 413-3 - Slot NR 413-3 (A11)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 6720' & RKB 24' @ 6744.00usft
Site:	NR 23-3 Pad	MD Reference:	GL 6720' & RKB 24' @ 6744.00usft
Well:	NR 413-3	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)	
4,396.00	13.98	254.38	4,271.54	-306.82	-949.30	997.61	1.18	1.02	2.51	
4,490.00	13.54	254.72	4,362.85	-312.78	-970.85	1,019.96	0.48	-0.47	0.36	
4,585.00	12.87	254.27	4,455.33	-318.58	-991.77	1,041.65	0.71	-0.71	-0.47	
4,679.00	15.04	254.02	4,546.55	-324.78	-1,013.57	1,064.31	2.31	2.31	-0.27	
4,773.00	14.95	252.60	4,637.35	-331.76	-1,036.87	1,088.63	0.40	-0.10	-1.51	
4,868.00	14.33	249.45	4,729.27	-339.55	-1,059.57	1,112.62	1.06	-0.65	-3.32	
4,962.00	15.91	255.15	4,820.02	-346.94	-1,082.92	1,137.11	2.31	1.68	6.06	
5,056.00	15.52	257.19	4,910.50	-353.03	-1,107.63	1,162.52	0.72	-0.41	2.17	
5,151.00	14.67	252.29	5,002.23	-359.51	-1,131.49	1,187.22	1.61	-0.89	-5.16	
5,245.00	13.75	251.27	5,093.35	-366.71	-1,153.41	1,210.29	1.01	-0.98	-1.09	
5,340.00	12.97	251.19	5,185.78	-373.78	-1,174.19	1,232.23	0.82	-0.82	-0.08	
5,434.00	15.04	255.34	5,276.98	-380.27	-1,195.98	1,254.96	2.45	2.20	4.41	
5,528.00	14.42	252.26	5,367.90	-386.92	-1,218.93	1,278.85	1.06	-0.66	-3.28	
5,622.00	14.52	256.02	5,458.92	-393.33	-1,241.51	1,302.32	1.00	0.11	4.00	
5,716.00	13.47	255.67	5,550.12	-398.89	-1,263.55	1,325.01	1.12	-1.12	-0.37	
5,811.00	14.87	258.88	5,642.23	-403.98	-1,286.23	1,348.18	1.69	1.47	3.38	
5,905.00	13.92	257.65	5,733.28	-408.72	-1,309.11	1,371.44	1.06	-1.01	-1.31	
6,000.00	12.85	255.71	5,825.70	-413.78	-1,330.52	1,393.37	1.22	-1.13	-2.04	
6,094.00	10.38	251.82	5,917.77	-419.00	-1,348.69	1,412.28	2.76	-2.63	-4.14	
6,189.00	11.08	251.03	6,011.11	-424.64	-1,365.46	1,429.96	0.75	0.74	-0.83	
6,283.00	10.99	248.92	6,103.37	-430.80	-1,382.36	1,447.93	0.44	-0.10	-2.24	
6,378.00	11.38	245.51	6,196.57	-437.94	-1,399.34	1,466.27	0.81	0.41	-3.59	
6,472.00	11.05	252.60	6,288.78	-444.48	-1,416.37	1,484.48	1.51	-0.35	7.54	
6,567.00	9.85	263.60	6,382.21	-448.10	-1,433.14	1,501.56	2.45	-1.26	11.58	
6,662.00	9.37	265.98	6,475.87	-449.55	-1,448.93	1,517.06	0.66	-0.51	2.51	
6,756.00	7.74	272.74	6,568.83	-449.79	-1,462.89	1,530.45	2.03	-1.73	7.19	
6,851.00	5.89	278.98	6,663.15	-448.72	-1,474.09	1,540.83	2.09	-1.95	6.57	
6,945.00	4.27	281.79	6,756.78	-447.25	-1,482.28	1,548.21	1.74	-1.72	2.99	
7,040.00	3.44	273.22	6,851.57	-446.37	-1,488.59	1,553.97	1.06	-0.87	-9.02	
7,135.00	2.37	264.92	6,946.44	-446.38	-1,493.39	1,558.55	1.21	-1.13	-8.74	
7,229.00	1.16	275.48	7,040.40	-446.46	-1,496.28	1,561.33	1.33	-1.29	11.23	
7,323.00	1.44	249.54	7,134.37	-446.79	-1,498.33	1,563.38	0.69	0.30	-27.60	
7,417.00	1.67	251.42	7,228.34	-447.64	-1,500.73	1,565.93	0.25	0.24	2.00	
7,512.00	1.49	239.78	7,323.30	-448.70	-1,503.11	1,568.52	0.39	-0.19	-12.25	
7,523.22	1.43	241.87	7,334.52	-448.84	-1,503.36	1,568.80	0.72	-0.55	18.59	
NR 413-3 BTV										
7,606.00	1.06	264.04	7,417.28	-449.40	-1,505.03	1,570.57	0.72	-0.45	26.79	
7,700.00	0.97	304.21	7,511.27	-449.05	-1,506.56	1,571.91	0.75	-0.10	42.73	
7,795.00	1.06	304.51	7,606.25	-448.10	-1,507.95	1,572.95	0.09	0.09	0.32	
7,890.00	1.29	334.31	7,701.23	-446.63	-1,509.13	1,573.65	0.68	0.24	31.37	
7,984.00	1.93	340.50	7,795.19	-444.19	-1,510.12	1,573.86	0.70	0.68	6.59	
8,078.00	1.93	357.91	7,889.14	-441.12	-1,510.71	1,573.51	0.62	0.00	18.52	
8,173.00	1.53	2.55	7,984.10	-438.25	-1,510.71	1,572.65	0.45	-0.42	4.88	
8,267.00	1.31	1.89	8,078.07	-435.92	-1,510.62	1,571.87	0.23	-0.23	-0.70	

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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Survey									
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8,362.00	0.79	39.13	8,173.05	-434.33	-1,510.17	1,570.97	0.88	-0.55	39.20
8,455.00	1.18	72.84	8,266.04	-433.55	-1,508.85	1,569.47	0.73	0.42	36.25
8,549.00	1.32	104.25	8,360.02	-433.53	-1,506.88	1,567.58	0.73	0.15	33.41
8,644.00	0.97	110.76	8,455.00	-434.08	-1,505.06	1,566.02	0.39	-0.37	6.85
8,738.00	1.16	139.38	8,548.99	-435.09	-1,503.70	1,565.02	0.59	0.20	30.45
8,832.00	1.23	176.24	8,642.97	-436.82	-1,503.01	1,564.88	0.81	0.07	39.21
8,927.00	0.87	202.33	8,737.95	-438.50	-1,503.22	1,565.58	0.62	-0.38	27.46
9,022.00	0.70	228.18	8,832.94	-439.56	-1,503.93	1,566.57	0.41	-0.18	27.21
9,116.00	1.41	225.02	8,926.93	-440.76	-1,505.17	1,568.12	0.76	0.76	-3.36
9,211.00	2.02	224.49	9,021.88	-442.78	-1,507.17	1,570.63	0.64	0.64	-0.56
9,305.00	2.39	231.31	9,115.81	-445.18	-1,509.86	1,573.92	0.48	0.39	7.26
9,399.00	3.52	246.40	9,209.69	-447.56	-1,514.04	1,578.61	1.45	1.20	16.05
9,493.00	4.49	247.90	9,303.46	-450.10	-1,520.09	1,585.15	1.04	1.03	1.60
9,587.00	5.84	242.87	9,397.07	-453.67	-1,527.76	1,593.53	1.51	1.44	-5.35
9,681.00	5.84	239.53	9,490.59	-458.28	-1,536.14	1,602.90	0.36	0.00	-3.55
9,775.00	6.42	240.43	9,584.05	-463.29	-1,544.83	1,612.69	0.63	0.62	0.96
9,869.00	7.03	236.00	9,677.40	-469.10	-1,554.17	1,623.34	0.85	0.65	-4.71
9,964.00	8.00	231.52	9,771.59	-476.47	-1,564.16	1,635.08	1.19	1.02	-4.72
10,028.00	8.44	230.99	9,834.93	-482.20	-1,571.30	1,643.60	0.70	0.69	-0.83
Last SDI Production MWD Survey									
10,087.00	8.44	230.99	9,893.29	-487.65	-1,578.03	1,651.65	0.00	0.00	0.00
Projection to TD - NR 413-3 PBHL									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
121.00	121.00	-0.41	-0.61	First SDI Gyro MWD Survey
581.00	576.52	-17.21	-53.82	Last SDI Gyro MWD Survey
651.00	644.75	-22.61	-68.45	First SDI Surface MWD Survey
1,070.00	1,049.37	-61.12	-170.07	Last SDI Surface MWD Survey
1,181.00	1,156.81	-68.66	-196.92	First SDI Production MWD Survey
10,028.00	9,834.93	-482.20	-1,571.30	Last SDI Production MWD Survey
10,087.00	9,893.29	-487.65	-1,578.03	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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