



## Directional Survey Certification

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

<b>Operator</b>	<u>TEP Rocky Mountain, LLC.</u>
<b>Well Name &amp; No.</b>	<u>GM 342-10</u>
<b>County &amp; State</b>	<u>Garfield County, CO</u>
<b>SDI Job No.</b>	<u>OP.004035</u>
<b>Rig</b>	<u>H&amp;P 273</u>

I, Mel Mireles Jr., having personal knowledge of all the facts, hereby certify that the attached directional survey run from a measured depth of 88 feet to a measured depth of 7,332 feet is true and correct as determined from all available records.

  
Signature

18-Sep-17  
Date

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

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well Federal GM 342-10 - Slot A18
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 6148' & RKB 24' @ 6172.00usft (H&P 318)
<b>Site:</b>	MV 5-10 Pad	<b>MD Reference:</b>	GL 6148' & RKB 24' @ 6172.00usft (H&P 318)
<b>Well:</b>	Federal GM 342-10	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Grand Junction District

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

<b>Site</b>	MV 5-10 Pad				
<b>Site Position:</b>		<b>Northing:</b>	1,600,344.70 usft	<b>Latitude:</b>	39.4529509
<b>From:</b>	Map	<b>Easting:</b>	2,266,881.70 usft	<b>Longitude:</b>	-108.0966291
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13.20 in	<b>Grid Convergence:</b>	-1.64 °

<b>Well</b>	Federal GM 342-10 - Slot A18					
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	1,600,365.70 usft	<b>Latitude:</b>	39.4530136
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	2,266,945.80 usft	<b>Longitude:</b>	-108.0964043
<b>Position Uncertainty</b>		0.00 usft	<b>Wellhead Elevation:</b>	0.00 usft	<b>Ground Level:</b>	6,148.00 usft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM	9/1/2017	9.52	65.75	51,769

<b>Design</b>	OH				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	82.85	

<b>Survey Program</b>	<b>Date</b>	9/18/2017			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
88.00	305.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
377.00	748.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
841.00	7,332.00	Survey #3 - Production MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
88.00	0.26	53.26	88.00	0.12	0.16	0.17	0.30	0.30	0.00	
<b>First SDI Gyro MWD Survey</b>										
133.00	1.14	95.80	133.00	0.14	0.69	0.70	2.14	1.96	94.53	
168.00	1.64	82.35	167.99	0.17	1.53	1.54	1.70	1.43	-38.43	
213.00	3.78	82.71	212.93	0.44	3.64	3.67	4.76	4.76	0.80	
258.00	5.89	82.88	257.77	0.92	7.40	7.46	4.69	4.69	0.38	
305.00	7.48	79.89	304.45	1.75	12.81	12.93	3.46	3.38	-6.36	

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well Federal GM 342-10 - Slot A18
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 6148' & RKB 24' @ 6172.00usft (H&P 318)
<b>Site:</b>	MV 5-10 Pad	<b>MD Reference:</b>	GL 6148' & RKB 24' @ 6172.00usft (H&P 318)
<b>Well:</b>	Federal GM 342-10	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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)	
<b>Last SDI Gyro MWD Survey</b>										
377.00	9.75	80.58	375.63	3.57	23.44	23.70	3.16	3.15	0.96	
<b>First SDI Surface MWD Survey</b>										
469.00	12.86	78.51	465.84	6.89	41.16	41.70	3.41	3.38	-2.25	
562.00	15.37	84.21	556.03	10.19	63.57	64.34	3.08	2.70	6.13	
655.00	17.89	86.03	645.13	12.43	90.08	90.93	2.77	2.71	1.96	
748.00	19.90	84.06	733.11	15.05	120.08	121.02	2.27	2.16	-2.12	
<b>Last SDI Surface MWD Survey</b>										
841.00	22.49	83.86	819.82	18.59	153.51	154.64	2.79	2.78	-0.22	
<b>First SDI Production MWD Survey</b>										
935.00	24.48	83.70	906.03	22.65	190.75	192.09	2.12	2.12	-0.17	
1,030.00	25.90	81.96	991.99	27.72	230.86	232.52	1.69	1.49	-1.83	
1,109.00	27.68	82.35	1,062.51	32.57	266.14	268.12	2.26	2.25	0.49	
1,180.00	28.84	80.66	1,125.04	37.55	299.38	301.72	1.98	1.63	-2.38	
1,274.00	28.82	81.27	1,207.39	44.67	344.14	347.03	0.31	-0.02	0.65	
1,369.00	30.45	82.91	1,289.97	51.11	390.67	393.99	1.92	1.72	1.73	
1,463.00	30.10	82.49	1,371.15	57.13	437.67	441.38	0.44	-0.37	-0.45	
1,557.00	29.74	82.11	1,452.62	63.41	484.14	488.27	0.43	-0.38	-0.40	
1,652.00	30.73	84.11	1,534.70	69.14	531.62	536.09	1.49	1.04	2.11	
1,747.00	30.40	83.18	1,616.50	74.49	579.63	584.40	0.61	-0.35	-0.98	
1,841.00	30.03	82.60	1,697.73	80.34	626.58	631.70	0.50	-0.39	-0.62	
1,936.00	29.72	82.30	1,780.10	86.56	673.49	679.02	0.36	-0.33	-0.32	
2,031.00	29.83	84.12	1,862.56	92.13	720.33	726.19	0.96	0.12	1.92	
2,126.00	29.56	83.48	1,945.09	97.21	767.11	773.25	0.44	-0.28	-0.67	
2,222.00	29.18	83.41	2,028.75	102.59	813.89	820.33	0.40	-0.40	-0.07	
2,317.00	29.75	84.27	2,111.46	107.60	860.35	867.05	0.75	0.60	0.91	
2,411.00	28.93	83.70	2,193.40	112.42	906.15	913.10	0.92	-0.87	-0.61	
2,506.00	27.86	83.10	2,276.97	117.61	951.03	958.27	1.17	-1.13	-0.63	
2,600.00	29.10	83.95	2,359.59	122.66	995.56	1,003.09	1.39	1.32	0.90	
2,695.00	28.50	83.98	2,442.84	127.47	1,041.08	1,048.85	0.63	-0.63	0.03	
2,790.00	28.87	84.31	2,526.18	132.12	1,086.44	1,094.44	0.42	0.39	0.35	
2,884.00	29.86	84.41	2,608.10	136.65	1,132.31	1,140.51	1.05	1.05	0.11	
2,978.00	30.86	84.05	2,689.21	141.43	1,179.58	1,188.01	1.08	1.06	-0.38	
3,073.00	30.12	83.51	2,771.08	146.65	1,227.50	1,236.20	0.83	-0.78	-0.57	
3,168.00	30.73	83.63	2,852.99	152.04	1,275.30	1,284.31	0.65	0.64	0.13	
3,263.00	29.88	83.56	2,935.01	157.38	1,322.94	1,332.24	0.90	-0.89	-0.07	
3,357.00	29.09	83.64	3,016.84	162.54	1,368.92	1,378.50	0.84	-0.84	0.09	
3,452.00	28.31	84.26	3,100.16	167.35	1,414.28	1,424.12	0.88	-0.82	0.65	
3,546.00	27.36	84.02	3,183.29	171.83	1,457.95	1,468.00	1.02	-1.01	-0.26	
3,641.00	27.50	81.84	3,267.61	177.22	1,501.37	1,511.75	1.07	0.15	-2.29	
3,735.00	26.83	82.57	3,351.24	183.04	1,543.89	1,554.67	0.80	-0.71	0.78	
3,830.00	26.29	82.87	3,436.21	188.43	1,586.02	1,597.14	0.59	-0.57	0.32	
3,925.00	24.48	81.02	3,522.04	194.11	1,626.34	1,637.86	2.08	-1.91	-1.95	
4,019.00	23.79	81.56	3,607.82	199.93	1,664.33	1,676.28	0.77	-0.73	0.57	

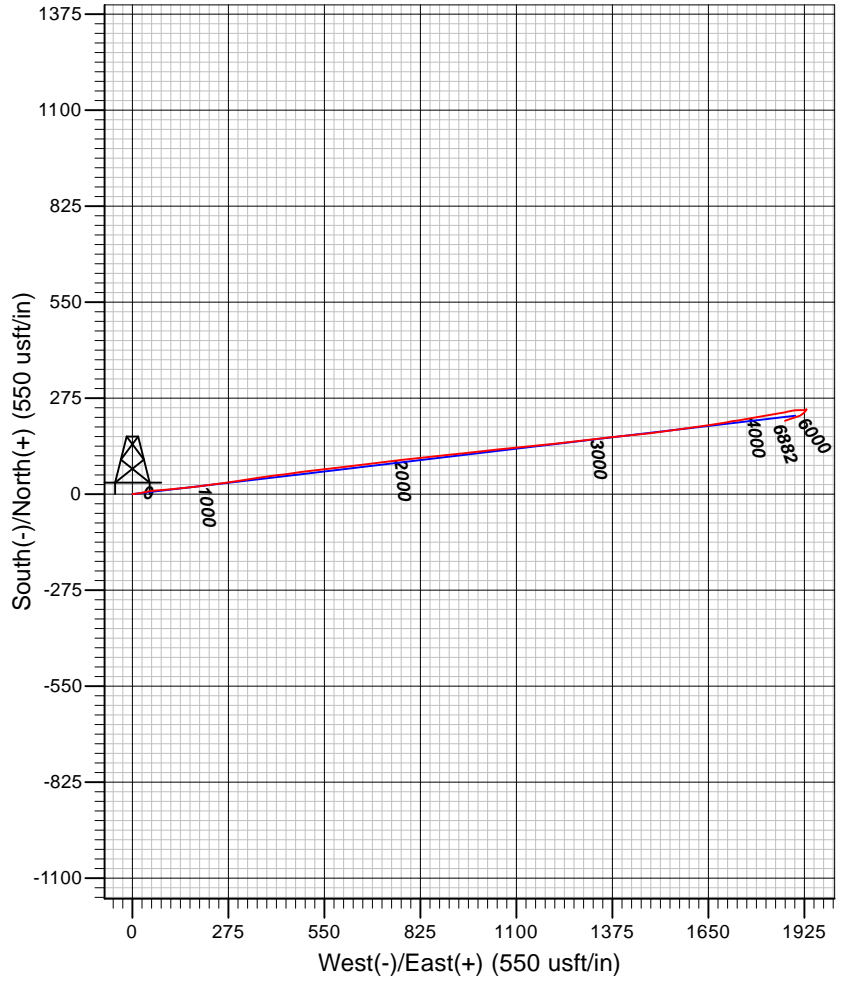
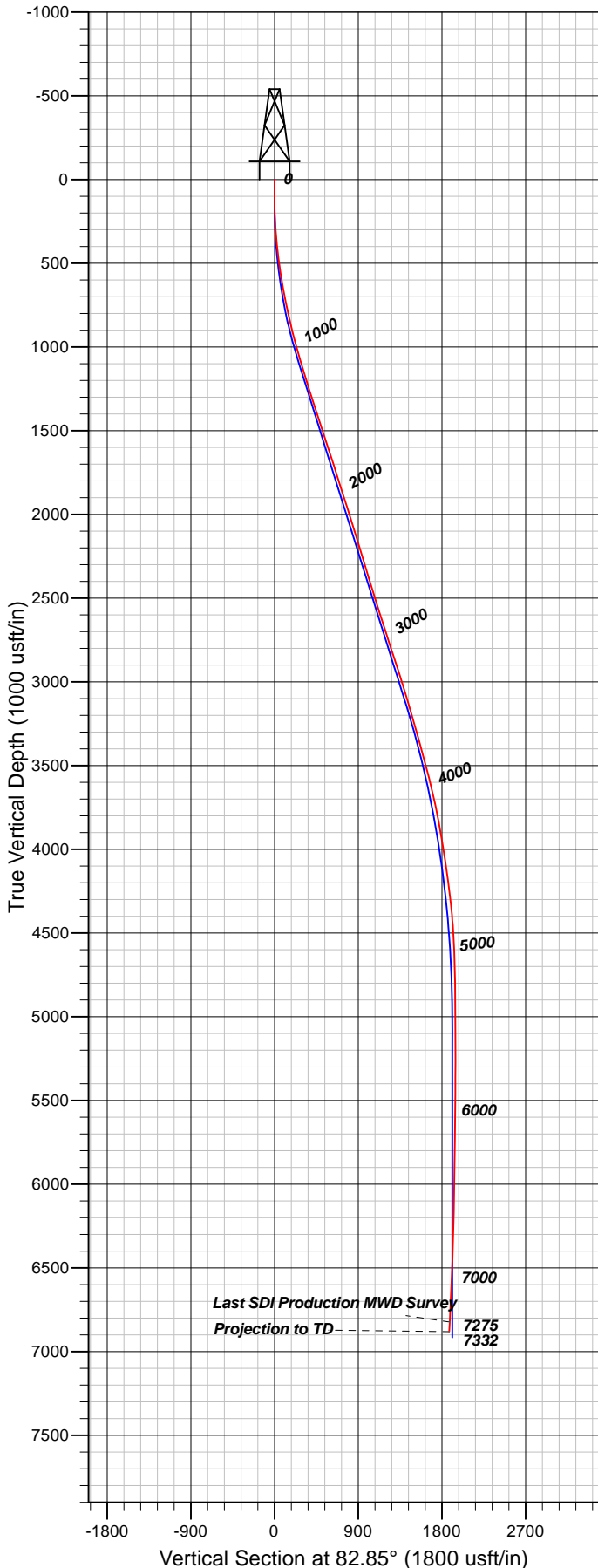
<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well Federal GM 342-10 - Slot A18
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 6148' & RKB 24' @ 6172.00usft (H&P 318)
<b>Site:</b>	MV 5-10 Pad	<b>MD Reference:</b>	GL 6148' & RKB 24' @ 6172.00usft (H&P 318)
<b>Well:</b>	Federal GM 342-10	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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)	
4,114.00	21.49	79.93	3,695.50	205.79	1,700.43	1,712.82	2.51	-2.42	-1.72	
4,208.00	20.35	81.61	3,783.30	211.19	1,733.55	1,746.36	1.37	-1.21	1.79	
4,303.00	17.80	79.83	3,873.08	216.16	1,764.19	1,777.38	2.75	-2.68	-1.87	
4,398.00	17.13	79.82	3,963.70	221.20	1,792.25	1,805.85	0.71	-0.71	-0.01	
4,492.00	14.77	79.92	4,054.07	225.74	1,817.68	1,831.64	2.51	-2.51	0.11	
4,587.00	14.42	81.10	4,146.01	229.69	1,841.29	1,855.56	0.48	-0.37	1.24	
4,681.00	13.25	78.86	4,237.28	233.58	1,863.42	1,878.00	1.37	-1.24	-2.38	
4,776.00	10.29	76.80	4,330.27	237.63	1,882.37	1,897.31	3.15	-3.12	-2.17	
4,871.00	8.44	83.53	4,424.00	240.35	1,897.56	1,912.72	2.26	-1.95	7.08	
4,961.00	6.11	92.96	4,513.28	240.85	1,908.91	1,924.04	2.90	-2.59	10.48	
5,056.00	4.66	87.66	4,607.85	240.74	1,917.81	1,932.86	1.61	-1.53	-5.58	
5,151.00	3.25	98.03	4,702.63	240.52	1,924.33	1,939.31	1.66	-1.48	10.92	
5,245.00	0.86	61.00	4,796.56	240.49	1,927.59	1,942.53	2.78	-2.54	-39.39	
5,339.00	0.53	42.75	4,890.55	241.15	1,928.50	1,943.52	0.42	-0.35	-19.41	
5,434.00	0.62	50.39	4,985.55	241.81	1,929.20	1,944.29	0.12	0.09	8.04	
5,469.08	0.62	47.12	5,020.63	242.06	1,929.48	1,944.61	0.10	0.01	-9.31	
<b>GM 342-10 KMV</b>										
5,528.00	0.63	41.72	5,079.54	242.52	1,929.93	1,945.11	0.10	0.01	-9.17	
5,623.00	0.27	118.90	5,174.54	242.80	1,930.48	1,945.68	0.66	-0.38	81.24	
5,717.00	0.12	210.28	5,268.54	242.60	1,930.62	1,945.80	0.32	-0.16	97.21	
5,812.00	0.55	217.25	5,363.54	242.16	1,930.29	1,945.42	0.45	0.45	7.34	
5,910.00	1.00	211.92	5,461.53	241.06	1,929.56	1,944.56	0.46	0.46	-5.44	
6,005.00	1.34	215.05	5,556.51	239.44	1,928.48	1,943.29	0.36	0.36	3.29	
6,099.00	1.51	227.02	5,650.48	237.70	1,926.94	1,941.55	0.36	0.18	12.73	
6,193.00	1.44	214.01	5,744.45	235.88	1,925.38	1,939.76	0.36	-0.07	-13.84	
6,288.00	1.85	212.64	5,839.41	233.59	1,923.88	1,938.00	0.43	0.43	-1.44	
6,383.00	1.93	227.14	5,934.36	231.21	1,921.88	1,935.72	0.51	0.08	15.26	
6,477.00	1.93	232.77	6,028.31	229.18	1,919.46	1,933.06	0.20	0.00	5.99	
6,572.00	2.37	238.83	6,123.24	227.20	1,916.51	1,929.88	0.52	0.46	6.38	
6,667.00	2.64	242.78	6,218.15	225.18	1,912.88	1,926.03	0.34	0.28	4.16	
6,761.00	3.41	254.01	6,312.02	223.42	1,908.27	1,921.24	1.03	0.82	11.95	
6,855.00	3.86	248.72	6,405.83	221.50	1,902.63	1,915.41	0.60	0.48	-5.63	
6,950.00	3.96	246.83	6,500.61	219.05	1,896.64	1,909.15	0.17	0.11	-1.99	
7,044.00	4.04	257.63	6,594.38	217.06	1,890.42	1,902.74	0.80	0.09	11.49	
7,139.00	4.66	253.53	6,689.11	215.25	1,883.45	1,895.60	0.73	0.65	-4.32	
7,233.00	4.48	249.14	6,782.81	212.86	1,876.36	1,888.26	0.42	-0.19	-4.67	
7,275.00	4.48	249.73	6,824.68	211.71	1,873.29	1,885.07	0.11	0.00	1.40	
<b>Last SDI Production MWD Survey</b>										
7,332.00	4.48	249.73	6,881.51	210.17	1,869.11	1,880.73	0.00	0.00	0.00	
<b>Projection to TD - GM 342-10 PBHL</b>										

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well Federal GM 342-10 - Slot A18
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 6148' & RKB 24' @ 6172.00usft (H&P 318)
<b>Site:</b>	MV 5-10 Pad	<b>MD Reference:</b>	GL 6148' & RKB 24' @ 6172.00usft (H&P 318)
<b>Well:</b>	Federal GM 342-10	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Grand Junction District

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
88.00	88.00	0.12	0.16	First SDI Gyro MWD Survey	
305.00	304.45	1.75	12.81	Last SDI Gyro MWD Survey	
377.00	375.63	3.57	23.44	First SDI Surface MWD Survey	
748.00	733.11	15.05	120.08	Last SDI Surface MWD Survey	
841.00	819.82	18.59	153.51	First SDI Production MWD Survey	
7,275.00	6,824.68	211.71	1,873.29	Last SDI Production MWD Survey	
7,332.00	6,881.51	210.17	1,869.11	Projection to TD	

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_



Well Details: Federal GM 342-10

TVD Reference: GL 6148' & RKB 24' @ 6172.00usft (H&P 318) @ 6148.00						
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	1600365.70	2266945.80	39.4530136	-108.0964043	A18

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well Federal GM 342-10 - Slot A18, True North  
 Vertical (TVD) Reference: GL 6148' & RKB 24' @ 6172.00usft (H&P 318)  
 Section (VS) Reference: Slot - A18(0.00N, 0.00E)  
 Measured Depth Reference: GL 6148' & RKB 24' @ 6172.00usft (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

11:57, September 18 2017  
 Created By: Mel Mireles Jr.