



Where energy meets innovation.

## **EQT Production**

**Randolph County, WV  
Randolph County 513058  
Well #513058**

**Main Wellbore**

**Design: 513058 Surveys**

## **Standard Survey Report**

**31 January, 2019**

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# EQT

## Survey Report

<b>Database:</b> EDM_Definitive	<b>Local Co-ordinate Reference:</b> Site Randolph County 513058
<b>Company:</b> EQT Production	<b>TVD Reference:</b> WELL @ 2976.994usft (Original Well Elev)
<b>Project:</b> Randolph County, WV	<b>MD Reference:</b> WELL @ 2976.994usft (Original Well Elev)
<b>Site:</b> Randolph County 513058	<b>North Reference:</b> Grid
<b>Well:</b> Well #513058	<b>Survey Calculation Method:</b> Minimum Curvature
<b>Wellbore:</b> Main Wellbore	
<b>Design:</b> 513058 Surveys	

**Project** Randolph County, WV

<b>Map System:</b> US State Plane 1927 (Exact solution)	<b>System Datum:</b> Mean Sea Level
<b>Geo Datum:</b> NAD 1927 (NADCON CONUS)	
<b>Map Zone:</b> West Virginia South 4702	

**Site** Randolph County 513058

<b>Site Position:</b>	<b>Northing:</b> 633,391.000 usft	<b>Latitude:</b> 38.74
<b>From:</b> Map	<b>Easting:</b> 2,243,574.000 usft	<b>Longitude:</b> -80.15
<b>Position Uncertainty:</b> 0.000 usft	<b>Slot Radius:</b> 13-3/16 "	<b>Grid Convergence:</b> 0.5279 °

**Well** Well #513058

<b>Well Position</b>	<b>+N/-S</b> 0.000 usft	<b>Northing:</b> 633,391.000 usft	<b>Latitude:</b> 38.7363484
	<b>+E/-W</b> 0.000 usft	<b>Easting:</b> 2,243,574.000 usft	<b>Longitude:</b> 80.1461146°W
<b>Position Uncertainty</b>	0.000 usft	<b>Wellhead Elevation:</b> usft	<b>Ground Level:</b> 2,966.994 usft

**Wellbore** Main Wellbore

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2000	9/24/2010	-8.6410	66.6526	52,375.76436053

**Design** 513058 Surveys

**Audit Notes:**

<b>Version:</b> 1.0	<b>Phase:</b> ACTUAL	<b>Tie On Depth:</b> 0.000
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Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.000	0.000	0.000	340.997

**Survey Program** Date 1/31/2019

From (')	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	8,100.000	Gyro (Main Wellbore)	WLST	

**Survey**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.000	0.000	0.000	0.000	-2,976.994	0.000	0.000	0.000	0.00000	0.00000	0.00000
100.000	0.660	65.900	99.998	-2,876.996	0.235	0.526	0.051	0.66000	0.66000	0.00000
200.000	0.710	91.650	199.990	-2,777.003	0.453	1.671	-0.116	0.30913	0.05000	25.75005
299.999	0.680	118.080	299.983	-2,677.011	0.155	2.814	-0.769	0.31909	-0.03000	26.43005
399.999	0.670	135.240	399.976	-2,577.018	-0.539	3.749	-1.730	0.20165	-0.01000	17.16005
499.999	0.690	136.810	499.969	-2,477.025	-1.393	4.573	-2.806	0.02733	0.02000	1.57000
599.999	0.680	137.630	599.962	-2,377.032	-2.271	5.385	-3.900	0.01400	-0.01000	0.82000
699.999	0.560	132.950	699.955	-2,277.038	-3.042	6.142	-4.876	0.13015	-0.12000	-4.68000
799.998	0.420	127.840	799.952	-2,177.042	-3.600	6.789	-5.614	0.14653	-0.14000	-5.11000

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# EQT Survey Report

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Survey											
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
899.998	0.350	94.470	899.949	-2,077.045	-3.849	7.383	-6.043	0.23102	-0.07000	-33.37007	
999.998	0.380	65.040	999.947	-1,977.047	-3.732	7.989	-6.130	0.18768	0.03000	-29.43006	
1,099.998	0.390	64.690	1,099.945	-1,877.049	-3.447	8.597	-6.058	0.01027	0.01000	-0.35000	
1,199.998	0.400	72.100	1,199.942	-1,777.052	-3.194	9.237	-6.028	0.05202	0.01000	7.41002	
1,299.997	0.400	80.090	1,299.939	-1,677.055	-3.027	9.913	-6.090	0.05574	0.00000	7.99002	
1,399.997	0.450	91.190	1,399.936	-1,577.057	-2.975	10.649	-6.280	0.09610	0.05000	11.10002	
1,499.997	0.700	109.200	1,499.931	-1,477.063	-3.184	11.619	-6.794	0.30556	0.25000	18.01004	
1,599.997	0.930	114.040	1,599.921	-1,377.073	-3.715	12.937	-7.725	0.23988	0.23000	4.84001	
1,699.997	1.160	117.570	1,699.904	-1,277.090	-4.514	14.575	-9.014	0.23873	0.23000	3.53001	
1,799.996	1.200	119.650	1,799.883	-1,177.111	-5.501	16.382	-10.536	0.05860	0.04000	2.08000	
1,899.996	1.220	121.210	1,899.860	-1,077.134	-6.571	18.203	-12.140	0.03854	0.02000	1.56000	
1,999.996	1.070	125.610	1,999.840	-977.154	-7.666	19.872	-13.719	0.17376	-0.15000	4.40001	
2,099.996	1.010	125.730	2,099.823	-877.171	-8.724	21.347	-15.200	0.06004	-0.06000	0.12000	
2,199.995	0.900	135.090	2,199.809	-777.185	-9.795	22.617	-16.626	0.19053	-0.11000	9.36002	
2,299.995	0.710	153.420	2,299.799	-677.195	-10.905	23.449	-17.946	0.31771	-0.19000	18.33004	
2,399.995	0.760	164.080	2,399.791	-577.203	-12.097	23.908	-19.223	0.14534	0.05000	10.66002	
2,499.995	1.330	170.640	2,499.774	-477.220	-13.880	24.278	-21.029	0.58149	0.57000	6.56001	
2,599.995	1.340	169.390	2,599.746	-377.248	-16.175	24.682	-23.330	0.03079	0.01000	-1.25000	
2,699.994	1.260	165.730	2,699.720	-277.274	-18.389	25.169	-25.582	0.11527	-0.08000	-3.66001	
2,799.994	1.360	151.360	2,799.694	-177.300	-20.496	26.009	-27.848	0.34236	0.10000	-14.37003	
2,899.994	1.280	149.350	2,899.667	-77.326	-22.499	27.147	-30.112	0.09242	-0.08000	-2.01000	
2,999.994	1.100	157.660	2,999.646	22.652	-24.348	28.081	-32.164	0.24892	-0.18000	8.31002	
3,099.994	1.050	160.950	3,099.628	122.634	-26.101	28.745	-34.039	0.07942	-0.05000	3.29001	
3,199.993	0.890	164.240	3,199.613	222.619	-27.715	29.255	-35.730	0.16935	-0.16000	3.29001	
3,299.993	0.890	161.590	3,299.601	322.607	-29.199	29.711	-37.282	0.04116	0.00000	-2.65001	
3,399.993	0.890	158.700	3,399.589	422.595	-30.660	30.239	-38.835	0.04489	0.00000	-2.89001	
3,499.993	0.920	156.090	3,499.576	522.582	-32.117	30.846	-40.411	0.05098	0.03000	-2.61001	
3,599.993	0.980	158.190	3,599.562	622.568	-33.645	31.489	-42.065	0.06936	0.06000	2.10000	
3,699.992	0.810	174.530	3,699.550	722.556	-35.143	31.874	-43.606	0.30499	-0.17000	16.34003	
3,799.992	0.770	173.310	3,799.540	822.546	-36.514	32.020	-44.950	0.04339	-0.04000	-1.22000	
3,899.992	0.780	174.460	3,899.531	922.537	-37.858	32.164	-46.268	0.01849	0.01000	1.15000	
3,999.992	0.860	174.030	3,999.520	1,022.527	-39.282	32.308	-47.661	0.08024	0.08000	-0.43000	
4,099.992	0.900	174.280	4,099.508	1,122.515	-40.810	32.464	-49.157	0.04018	0.04000	0.25000	
4,199.991	0.910	172.530	4,199.496	1,222.502	-42.379	32.645	-50.699	0.02939	0.01000	-1.75000	
4,299.991	0.810	174.680	4,299.484	1,322.490	-43.870	32.814	-52.164	0.10506	-0.10000	2.15000	
4,399.991	0.700	185.080	4,399.475	1,422.481	-45.182	32.826	-53.409	0.17530	-0.11000	10.40002	
4,499.991	0.680	191.000	4,499.468	1,522.474	-46.373	32.658	-54.480	0.07401	-0.02000	5.92001	
4,599.991	0.660	201.270	4,599.461	1,622.467	-47.493	32.336	-55.433	0.12157	-0.02000	10.27002	
4,699.990	0.810	240.200	4,699.453	1,722.459	-48.381	31.514	-56.005	0.50985	0.15000	38.93008	
4,799.990	0.920	200.470	4,799.442	1,822.448	-49.484	30.620	-56.757	0.59688	0.11000	-39.73008	
4,899.990	1.370	182.320	4,899.422	1,922.428	-51.431	30.291	-58.491	0.57263	0.45000	18.50004	
4,999.990	2.110	189.920	4,999.375	2,022.381	-54.438	29.925	-61.216	0.77355	0.74000	7.60002	

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<b>Company:</b> EQT Production	<b>TVD Reference:</b>	WELL @ 2976.994usft (Original Well Elev)
<b>Project:</b> Randolph County, WV	<b>MD Reference:</b>	WELL @ 2976.994usft (Original Well Elev)
<b>Site:</b> Randolph County 513058	<b>North Reference:</b>	Grid
<b>Well:</b> Well #513058	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b> Main Wellbore		
<b>Design:</b> 513058 Surveys		

Survey											
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
5,099.990	2.910	199.980	5,099.279	2,122.285	-58.637	28.741	-64.800	0.91032	0.80000	10.06002	
5,199.989	3.230	199.970	5,199.135	2,222.141	-63.671	26.911	-68.964	0.32000	0.32000	-0.01000	
5,299.989	3.460	200.000	5,298.964	2,321.970	-69.154	24.917	-73.499	0.23001	0.23000	0.03000	
5,399.989	3.540	199.620	5,398.778	2,421.784	-74.898	22.848	-78.256	0.08330	0.08000	-0.38000	
5,499.989	3.600	197.990	5,498.583	2,521.590	-80.792	20.842	-83.175	0.11790	0.06000	-1.63000	
5,599.989	3.440	196.050	5,598.395	2,621.401	-86.661	19.043	-88.139	0.19945	-0.16000	-1.94000	
5,699.988	3.320	196.190	5,698.220	2,721.226	-92.325	17.406	-92.961	0.12028	-0.12000	0.14000	
5,799.988	3.160	197.050	5,798.060	2,821.066	-97.741	15.790	-97.556	0.16722	-0.16000	0.86000	
5,899.988	2.980	200.400	5,897.917	2,920.923	-102.812	14.076	-101.793	0.25407	-0.18000	3.35001	
5,999.988	2.270	209.080	5,997.811	3,020.817	-106.980	12.208	-105.125	0.81176	-0.71000	8.68002	
6,099.988	2.000	218.280	6,097.742	3,120.748	-110.080	10.164	-107.391	0.43549	-0.27000	9.20002	
6,199.987	1.940	242.010	6,197.684	3,220.690	-112.244	7.588	-108.598	0.81206	-0.06000	23.73005	
6,299.987	1.880	250.520	6,297.629	3,320.635	-113.586	4.547	-108.876	0.28962	-0.06000	8.51002	
6,399.987	1.450	231.180	6,397.587	3,420.593	-114.926	2.015	-109.319	0.70177	-0.43000	-19.34004	
6,499.987	1.200	210.990	6,497.560	3,520.566	-116.617	0.490	-110.421	0.52564	-0.25000	-20.19004	
6,599.986	1.080	189.080	6,597.541	3,620.547	-118.445	-0.198	-111.926	0.44899	-0.12000	-21.91004	
6,699.986	0.930	168.490	6,697.525	3,720.532	-120.171	-0.185	-113.562	0.38834	-0.15000	-20.59004	
6,799.986	1.270	154.940	6,797.507	3,820.513	-121.970	0.447	-115.469	0.42584	0.34000	-13.55003	
6,899.986	0.830	147.820	6,897.490	3,920.496	-123.587	1.302	-117.276	0.45810	-0.44000	-7.12001	
6,999.986	0.940	146.950	6,997.477	4,020.484	-124.888	2.135	-118.777	0.11081	0.11000	-0.87000	
7,099.985	0.470	186.180	7,097.470	4,120.476	-125.983	2.538	-119.944	0.64811	-0.47000	39.23008	
7,199.985	0.370	151.000	7,197.467	4,220.473	-126.673	2.651	-120.633	0.27116	-0.10000	-35.18007	
7,299.985	0.420	158.770	7,297.465	4,320.471	-127.297	2.940	-121.317	0.07317	0.05000	7.77002	
7,399.985	0.390	149.960	7,397.462	4,420.468	-127.933	3.243	-122.017	0.06903	-0.03000	-8.81002	
7,499.985	0.600	136.200	7,497.458	4,520.464	-128.606	3.776	-122.827	0.23986	0.21000	-13.76003	
<b>513058 TD</b>											
7,543.989	0.677	131.692	7,541.460	4,564.466	-128.945	4.129	-123.263	0.20909	0.17533	-10.24387	
<b>513058 LP</b>											
7,548.297	0.685	131.306	7,545.767	4,568.773	-128.979	4.168	-123.307	0.20909	0.17991	-8.96488	
7,599.984	0.780	127.280	7,597.450	4,620.457	-129.396	4.680	-123.868	0.20909	0.18399	-7.78921	
7,699.984	0.700	113.660	7,697.442	4,720.448	-130.053	5.781	-124.848	0.19263	-0.08000	-13.62003	
7,799.984	0.650	130.120	7,797.435	4,820.441	-130.664	6.774	-125.749	0.19948	-0.05000	16.46003	
7,899.984	0.450	103.520	7,897.430	4,920.436	-131.121	7.590	-126.447	0.31925	-0.20000	-26.60005	
<b>Final Gyro Survey=7999' MD/7996' TVD</b>											
7,998.984	0.440	120.970	7,996.427	5,019.433	-131.408	8.293	-126.947	0.13673	-0.01010	17.62630	
<b>PROJ to Bit=8100' MD/8097' TVD</b>											
8,100.000	0.440	120.970	8,097.440	5,120.446	-131.807	8.959	-127.541	0.00000	0.00000	0.00000	

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## Survey Report

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Design Targets										
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	
- hit/miss target	(°)	(°)	(usft)	(536.581)	(-184.760)	(usft)	(usft)			
- Shape										
513058 LP	0.000	0.000	7,552.98 5	536.581	-184.760	633,927.581	2,243,389.241	38.7378264	80.1467450°W	
- actual wellpath misses target center by 691.893usft at 7548.297usft MD (7545.768 TVD, -128.979 N, 4.168 E)										
- Point										
513058 TD	0.000	0.000	7,612.98 4	6,397.000	-2,203.000	639,788.000	2,241,371.000	38.7539681	80.1536323°W	
- actual wellpath misses target center by 6889.448usft at 7544.466usft MD (7541.936 TVD, -128.949 N, 4.134 E)										
- Point										

Design Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(usft)	(usft)	+N/-S	+E/-W		
		(usft)	(usft)		
7,998.984	7,996.427	-131.408	8.293	Final Gyro Survey=7999' MD/7996' TVD	
8,100.000	8,097.440	-131.807	8.959	PROJ to Bit=8100' MD/8097' TVD	

Checked By: _____	Approved By: _____	Date: _____
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