



# GASTAR EXPLORATION USA, INC.

Location: Marshall County, WV  
 Field: Marshall  
 Facility: Armstrong

Slot: Slot #9  
 Well: Armstrong 9H  
 Wellbore: Armstrong 9H (PWB)



51-01620

## Location Information

Facility Name		Grid East (US ft)	Grid North (US ft)	Latitude	Longitude	
Armstrong		1694263.000	14437151.000	39°45'13.773"N	80°48'30.287"W	
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Slot #9	81.03	60.02	1694323.000	14437232.000	39°45'14.573"N	80°48'29.516"W
Nomac 323 (RT) to Mud line (At Slot: Slot #9)				29.4ft		
Mean Sea Level to Mud line (At Slot: Slot #9)				-1278ft		
Nomac 323 (RT) to Mean Sea Level				1307.4ft		

## Well Profile Data

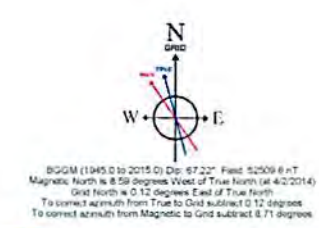
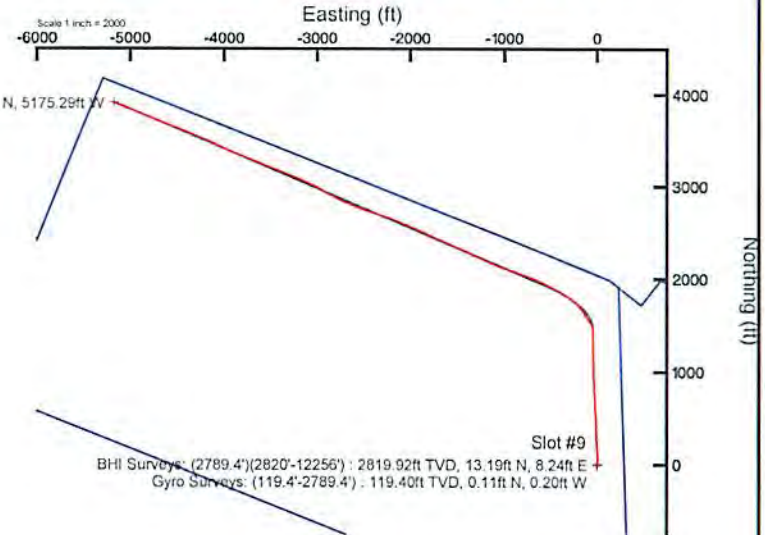
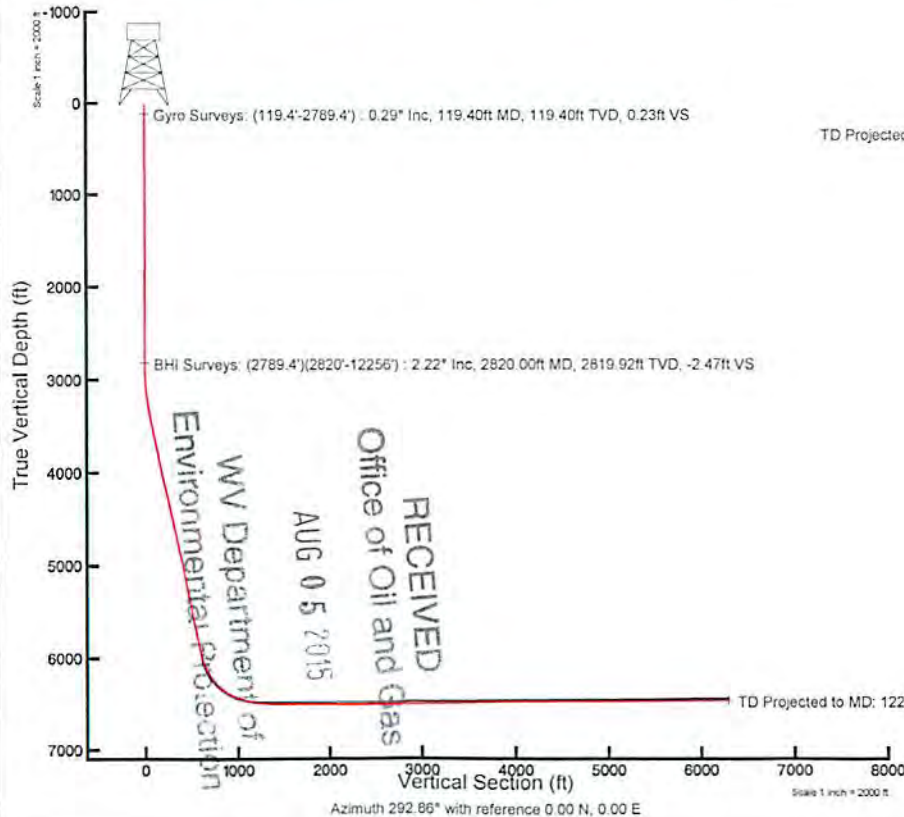
Design Comment	MD (ft)	Inc (")	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS ("/100ft)	VS (ft)
Tie On	6171.40	27.700	358.820	5856.75	1393.04	-40.60	0.56	578.58
Proj	6243.40	27.700	358.820	5920.50	1426.50	-41.28	0.00	592.21
End of Tangent	6363.40	27.700	358.820	6026.75	1482.27	-42.43	0.00	614.93
End of 3D Arc	7226.31	90.188	292.222	6483.07	1918.33	-526.27	9.22	1230.16
LP	7238.23	90.500	293.276	6483.00	1922.94	-537.26	9.22	1242.09
BHL	12286.04	90.500	293.276	6438.95	3917.56	-5174.06	0.00	6289.57

## Targets

Name	MD (ft)	TVD (ft)	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Armstrong 9H PBHL Rev-1	12286.04	6438.95	3917.56	-5174.06	1694315.00	14441148.00	39°45'13.302"N	80°48'29.080"W
Armstrong 9H PBHL Flat		6470.40	3917.56	-5174.06	1694315.00	14441148.00	39°45'13.363"N	80°48'29.666"W
Armstrong 9H LP Rev-1		6470.84	1922.94	-537.26	1693785.95	14439154.17	39°45'13.589"N	80°48'36.343"W
Armstrong 9H LP Rev-2	7238.23	6483.00	1922.94	-537.26	1693785.95	14439154.17	39°45'13.589"N	80°48'36.343"W
Armstrong Lim		6489.40	1820.73	-40.02	1694303.00	14439052.00	39°45'12.999"N	80°48'29.954"W

Plot reference wellpath is Armstrong 9H (PWP) Rev-E 0	
True vertical depths are referenced to Nomac 323 (RT)	Grid System: NAD83 / UTM Zone 17 North, US feet
Measured depths are referenced to Nomac 323 (RT)	North Reference: Grid north
Nomac 323 (RT) to Mean Sea Level: 1307.4 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: Slot #9): -1278 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: frjesl on 4/14/2014

**API#: 47-051-01620-0000**  
**Rig: Nomac 323**  
**BHI Job#: 5847930**  
**Duration: 04/08/14-04/12/14**



**REFERENCE WELLPATH IDENTIFICATION**

Operator	GASTAR EXPLORATION INC.	Slot	Slot #9
Area	Marshall County, WV	Well	Armstrong 9H
Field	Marshall	Wellbore	Armstrong 9H (AWB)
Facility	Armstrong	Wellpath	Armstrong 9H (AWP) Proj: 12,282'
		Sidetrack	(none)

**WELLPATH DATA † = interpolated/extrapolated station**

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vertical Section [ft]	North [ft]	East [ft]	Grid East [M]	Grid North [M]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS ["/100ft]
0.00	0.00	299.41	0.00	0.00	0.00	0.00	516430.7	4400477.0	39°45'14.573"N	80°48'29.516"W	0.00	0.00	0.00
29.40	0.00	299.41	29.40	0.00	0.00	0.00	516430.7	4400477.0	39°45'14.573"N	80°48'29.516"W	0.00	0.00	0.00
119.40	0.29	299.41	119.40	0.23	0.11	-0.20	516430.6	4400477.1	39°45'14.574"N	80°48'29.518"W	0.23	299.41	0.32
219.40	0.32	350.56	219.40	0.63	0.51	-0.46	516430.5	4400477.3	39°45'14.578"N	80°48'29.522"W	0.69	317.75	0.26
319.40	0.74	8.33	319.39	0.94	1.43	-0.42	516430.6	4400477.6	39°45'14.587"N	80°48'29.521"W	1.49	343.70	0.45
419.40	0.70	6.42	419.39	1.27	2.67	-0.26	516430.6	4400477.9	39°45'14.599"N	80°48'29.519"W	2.68	354.55	0.05
519.40	0.43	16.13	519.38	1.49	3.64	-0.08	516430.7	4400478.2	39°45'14.609"N	80°48'29.517"W	3.64	358.70	0.29
619.40	0.42	19.79	619.38	1.55	4.34	0.15	516430.7	4400478.4	39°45'14.616"N	80°48'29.514"W	4.35	1.92	0.03
719.40	0.50	357.11	719.38	1.76	5.13	0.25	516430.8	4400478.7	39°45'14.623"N	80°48'29.512"W	5.13	2.77	0.20
819.40	0.48	342.19	819.37	2.23	5.96	0.10	516430.7	4400478.9	39°45'14.632"N	80°48'29.514"W	5.96	0.94	0.13
919.40	0.27	337.25	919.37	2.67	6.58	-0.12	516430.6	4400479.1	39°45'14.638"N	80°48'29.517"W	6.58	358.94	0.21
1019.40	0.25	334.15	1019.37	3.00	6.99	-0.31	516430.6	4400479.2	39°45'14.642"N	80°48'29.520"W	7.00	357.48	0.02
1119.40	0.44	13.59	1119.37	3.22	7.56	-0.31	516430.6	4400479.4	39°45'14.647"N	80°48'29.520"W	7.57	357.63	0.29
1219.40	0.16	16.12	1219.37	3.30	8.07	-0.18	516430.6	4400479.6	39°45'14.652"N	80°48'29.518"W	8.07	358.70	0.28
1319.40	0.32	17.38	1319.36	3.35	8.47	-0.06	516430.7	4400479.7	39°45'14.656"N	80°48'29.516"W	8.47	359.59	0.16
1419.40	0.66	25.35	1419.36	3.35	9.25	0.27	516430.8	4400479.9	39°45'14.664"N	80°48'29.512"W	9.26	1.66	0.35
1519.40	0.52	36.67	1519.36	3.21	10.14	0.79	516430.9	4400480.2	39°45'14.673"N	80°48'29.505"W	10.17	4.43	0.18
1619.40	0.34	64.08	1619.35	2.91	10.63	1.32	516431.1	4400480.4	39°45'14.678"N	80°48'29.499"W	10.71	7.10	0.27
1719.40	0.36	81.59	1719.35	2.45	10.81	1.90	516431.3	4400480.4	39°45'14.679"N	80°48'29.491"W	10.97	9.98	0.11
1819.40	0.41	80.51	1819.35	1.88	10.91	2.57	516431.5	4400480.4	39°45'14.680"N	80°48'29.483"W	11.21	13.23	0.05
1919.40	0.76	93.91	1919.34	0.95	10.93	3.58	516431.8	4400480.4	39°45'14.681"N	80°48'29.470"W	11.50	18.14	0.37
2019.40	0.68	99.95	2019.34	-0.26	10.78	4.83	516432.2	4400480.4	39°45'14.679"N	80°48'29.454"W	11.81	24.12	0.11
2119.40	0.23	50.71	2119.33	-0.93	10.80	5.57	516432.4	4400480.4	39°45'14.679"N	80°48'29.444"W	12.15	27.26	0.56
2219.40	0.20	49.70	2219.33	-1.10	11.04	5.85	516432.5	4400480.5	39°45'14.682"N	80°48'29.441"W	12.50	27.93	0.03
2319.40	0.29	55.40	2319.33	-1.32	11.30	6.20	516432.6	4400480.6	39°45'14.684"N	80°48'29.436"W	12.89	28.74	0.09

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WELLPATH DATA † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [M]	Grid North [M]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]
2419.40	0.40	43.92	2419.33	-1.58	11.70	6.65	516432.7	4400480.7	39°45'14.688"N	80°48'29.430"W	13.45	29.61	0.13
2519.40	0.14	46.48	2519.33	-1.76	12.03	6.98	516432.8	4400480.8	39°45'14.691"N	80°48'29.426"W	13.91	30.11	0.26
2619.40	0.22	49.53	2619.33	-1.89	12.24	7.21	516432.9	4400480.8	39°45'14.693"N	80°48'29.423"W	14.21	30.51	0.08
2719.40	0.34	63.75	2719.33	-2.17	12.50	7.62	516433.0	4400480.9	39°45'14.696"N	80°48'29.418"W	14.64	31.39	0.14
2789.40	0.38	87.18	2789.32	-2.52	12.60	8.04	516433.1	4400481.0	39°45'14.697"N	80°48'29.413"W	14.95	32.55	0.22
2820.40	2.25	8.93	2820.32	-2.46	13.20	8.24	516433.2	4400481.1	39°45'14.703"N	80°48'29.410"W	15.56	31.96	7.11
2852.40	3.88	10.88	2852.27	-2.09	14.89	8.54	516433.3	4400481.7	39°45'14.720"N	80°48'29.406"W	17.16	29.84	5.10
2883.40	5.30	8.95	2883.17	-1.52	17.33	8.96	516433.4	4400482.4	39°45'14.744"N	80°48'29.401"W	19.51	27.34	4.61
2915.40	6.83	10.54	2914.99	-0.76	20.66	9.54	516433.6	4400483.4	39°45'14.777"N	80°48'29.393"W	22.76	24.78	4.81
2947.40	8.44	8.52	2946.70	0.22	24.86	10.24	516433.8	4400484.7	39°45'14.818"N	80°48'29.384"W	26.88	22.38	5.10
2978.40	10.12	7.33	2977.30	1.52	29.81	10.92	516434.0	4400486.2	39°45'14.867"N	80°48'29.375"W	31.75	20.12	5.45
3010.40	11.69	5.00	3008.72	3.26	35.83	11.56	516434.2	4400488.0	39°45'14.926"N	80°48'29.367"W	37.65	17.89	5.09
3042.40	12.55	3.82	3040.01	5.39	42.53	12.08	516434.4	4400490.1	39°45'14.993"N	80°48'29.360"W	44.21	15.85	2.80
3073.40	13.30	0.76	3070.22	7.83	49.45	12.35	516434.4	4400492.2	39°45'15.061"N	80°48'29.356"W	50.97	14.02	3.27
3104.40	14.29	359.53	3100.33	10.69	56.84	12.36	516434.5	4400494.4	39°45'15.134"N	80°48'29.356"W	58.17	12.27	3.33
3136.40	15.18	357.42	3131.27	14.05	64.98	12.14	516434.4	4400496.9	39°45'15.215"N	80°48'29.359"W	66.10	10.59	3.25
3168.40	16.04	356.47	3162.09	17.82	73.58	11.68	516434.2	4400499.5	39°45'15.300"N	80°48'29.364"W	74.50	9.02	2.80
3200.40	17.08	356.85	3192.76	21.84	82.68	11.15	516434.1	4400502.3	39°45'15.390"N	80°48'29.371"W	83.43	7.68	3.27
3231.40	18.13	357.48	3222.31	25.91	92.05	10.69	516433.9	4400505.2	39°45'15.482"N	80°48'29.376"W	92.66	6.62	3.44
3262.40	19.18	357.24	3251.68	30.18	101.95	10.23	516433.8	4400508.2	39°45'15.580"N	80°48'29.382"W	102.46	5.73	3.40
3294.40	20.13	356.79	3281.82	34.87	112.70	9.67	516433.6	4400511.5	39°45'15.686"N	80°48'29.389"W	113.11	4.90	3.01
3325.40	21.37	356.81	3310.81	39.70	123.67	9.06	516433.4	4400514.8	39°45'15.795"N	80°48'29.396"W	124.00	4.19	4.00
3357.40	22.61	357.35	3340.48	44.91	135.63	8.45	516433.3	4400518.4	39°45'15.913"N	80°48'29.404"W	135.89	3.56	3.93
3388.40	23.87	357.23	3368.96	50.19	147.85	7.87	516433.1	4400522.2	39°45'16.034"N	80°48'29.411"W	148.06	3.05	4.07
3419.40	24.61	357.41	3397.23	55.67	160.56	7.27	516432.9	4400526.0	39°45'16.159"N	80°48'29.418"W	160.73	2.59	2.40
3451.40	25.16	357.45	3426.26	61.45	174.02	6.67	516432.7	4400530.1	39°45'16.292"N	80°48'29.426"W	174.14	2.20	1.72
3482.40	24.91	357.35	3454.35	67.09	187.12	6.08	516432.5	4400534.1	39°45'16.422"N	80°48'29.433"W	187.22	1.86	0.82
3513.40	24.91	356.70	3482.46	72.78	200.16	5.40	516432.3	4400538.1	39°45'16.551"N	80°48'29.441"W	200.23	1.55	0.88
3544.40	24.05	356.31	3510.67	78.49	212.98	4.62	516432.1	4400542.0	39°45'16.677"N	80°48'29.451"W	213.03	1.24	2.82
3608.40	25.86	356.09	3568.70	90.60	239.92	2.82	516431.5	4400550.2	39°45'16.944"N	80°48'29.473"W	239.94	0.68	2.83
3671.40	26.65	357.19	3625.20	102.91	267.74	1.20	516431.0	4400558.7	39°45'17.219"N	80°48'29.493"W	267.74	0.26	1.47

51-01620

WV Department of  
 Environmental Protection  
 Office of Oil and Gas

WELL PATH DATA † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [M]	Grid North [M]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]
3734.40	27.36	359.57	3681.33	114.76	296.33	0.39	516430.8	4400567.4	39°45'17.501"N	80°48'29.503"W	296.33	0.08	2.05
3798.40	26.27	357.73	3738.45	126.59	325.19	-0.28	516430.6	4400576.2	39°45'17.786"N	80°48'29.510"W	325.19	359.95	2.14
3861.40	25.51	356.68	3795.12	138.49	352.67	-1.62	516430.2	4400584.6	39°45'18.058"N	80°48'29.527"W	352.67	359.74	1.41
3924.40	26.66	0.36	3851.71	149.89	380.35	-2.31	516430.0	4400593.0	39°45'18.332"N	80°48'29.535"W	380.35	359.65	3.15
3987.40	26.24	359.08	3908.12	160.91	408.41	-2.45	516429.9	4400601.5	39°45'18.609"N	80°48'29.536"W	408.41	359.66	1.12
4051.40	27.86	359.03	3965.11	172.66	437.51	-2.93	516429.8	4400610.4	39°45'18.896"N	80°48'29.541"W	437.52	359.62	2.53
4114.40	26.74	357.51	4021.10	184.68	466.38	-3.79	516429.5	4400619.2	39°45'19.182"N	80°48'29.552"W	466.40	359.53	2.09
4177.40	26.04	356.22	4077.53	196.95	494.34	-5.32	516429.1	4400627.7	39°45'19.458"N	80°48'29.570"W	494.37	359.38	1.44
4241.40	27.84	356.83	4134.58	209.80	523.28	-7.07	516428.5	4400636.6	39°45'19.744"N	80°48'29.592"W	523.33	359.23	2.85
4304.40	26.75	354.12	4190.57	223.08	552.08	-9.34	516427.8	4400645.3	39°45'20.029"N	80°48'29.620"W	552.16	359.03	2.62
4367.40	25.64	351.67	4247.10	236.95	579.67	-12.77	516426.8	4400653.7	39°45'20.302"N	80°48'29.663"W	579.81	358.74	2.46
4430.40	26.46	355.11	4303.70	250.55	607.14	-15.94	516425.8	4400662.1	39°45'20.573"N	80°48'29.703"W	607.35	358.50	2.73
4494.40	27.39	358.46	4360.77	263.27	636.07	-17.55	516425.3	4400670.9	39°45'20.859"N	80°48'29.723"W	636.31	358.42	2.78
4557.40	28.11	0.66	4416.52	274.87	665.40	-17.77	516425.3	4400679.8	39°45'21.149"N	80°48'29.725"W	665.63	358.47	1.99
4618.40	27.09	358.15	4470.58	286.10	693.65	-18.05	516425.2	4400688.5	39°45'21.428"N	80°48'29.728"W	693.88	358.51	2.54
4681.40	26.56	356.55	4526.80	298.34	722.05	-19.36	516424.8	4400697.1	39°45'21.709"N	80°48'29.744"W	722.31	358.46	1.42
4744.40	26.02	354.00	4583.29	311.25	749.85	-21.65	516424.1	4400705.6	39°45'21.984"N	80°48'29.773"W	750.16	358.35	1.99
4807.40	26.05	355.59	4639.90	324.26	777.39	-24.16	516423.3	4400714.0	39°45'22.256"N	80°48'29.804"W	777.76	358.22	1.11
4870.40	26.74	357.92	4696.33	336.58	805.34	-25.74	516422.8	4400722.5	39°45'22.532"N	80°48'29.823"W	805.75	358.17	1.98
4933.40	27.80	359.94	4752.33	348.28	834.20	-26.27	516422.7	4400731.3	39°45'22.817"N	80°48'29.829"W	834.61	358.20	2.23
4997.40	27.32	358.17	4809.07	360.22	863.80	-26.75	516422.5	4400740.3	39°45'23.110"N	80°48'29.835"W	864.22	358.23	1.48
5060.40	26.93	355.94	4865.14	372.72	892.49	-28.23	516422.1	4400749.0	39°45'23.393"N	80°48'29.853"W	892.93	358.19	1.73
5123.40	26.42	354.07	4921.44	385.93	920.66	-30.68	516421.3	4400757.6	39°45'23.672"N	80°48'29.883"W	921.17	358.09	1.56
5185.40	27.44	356.98	4976.71	398.81	948.64	-32.86	516420.7	4400766.1	39°45'23.949"N	80°48'29.911"W	949.21	358.02	2.69
5249.40	27.02	359.93	5033.62	410.91	977.91	-33.66	516420.4	4400775.1	39°45'24.238"N	80°48'29.920"W	978.49	358.03	2.21
5312.40	27.18	358.76	5089.71	422.36	1006.61	-33.99	516420.3	4400783.8	39°45'24.521"N	80°48'29.923"W	1007.18	358.07	0.88
5374.40	27.27	357.99	5144.84	434.12	1034.96	-34.79	516420.1	4400792.4	39°45'24.802"N	80°48'29.933"W	1035.54	358.08	0.59
5436.40	26.79	0.69	5200.07	445.36	1063.13	-35.12	516420.0	4400801.0	39°45'25.080"N	80°48'29.936"W	1063.71	358.11	2.12
5498.40	26.58	359.71	5255.47	456.09	1090.97	-35.02	516420.0	4400809.5	39°45'25.355"N	80°48'29.934"W	1091.53	358.16	0.79
5561.40	26.59	357.95	5311.81	467.57	1119.15	-35.60	516419.8	4400818.1	39°45'25.634"N	80°48'29.941"W	1119.72	358.18	1.25
5624.40	26.53	356.32	5368.16	479.80	1147.28	-37.00	516419.4	4400826.7	39°45'25.912"N	80°48'29.958"W	1147.88	358.15	1.16

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5687.40	26.10	359.95	5424.63	491.48	1175.19	-37.92	516419.1	4400835.2	39°45'26.187"N	80°48'29.969"W	1175.80	358.15	2.64
5750.40	25.64	359.36	5481.32	502.31	1202.67	-38.08	516419.1	4400843.5	39°45'26.459"N	80°48'29.970"W	1203.28	358.19	0.84
5813.40	25.21	358.21	5538.22	513.34	1229.71	-38.66	516418.9	4400851.8	39°45'26.726"N	80°48'29.977"W	1230.32	358.20	1.04
5877.40	26.60	359.18	5595.79	524.78	1257.67	-39.29	516418.7	4400860.3	39°45'27.003"N	80°48'29.984"W	1258.28	358.21	2.27
5939.40	26.64	359.38	5651.21	535.89	1285.44	-39.64	516418.6	4400868.8	39°45'27.277"N	80°48'29.988"W	1286.05	358.23	0.16
5970.40	27.58	359.46	5678.81	541.51	1299.57	-39.78	516418.6	4400873.1	39°45'27.417"N	80°48'29.990"W	1300.18	358.25	3.03
6033.40	27.54	359.86	5734.66	552.99	1328.72	-39.95	516418.5	4400881.9	39°45'27.705"N	80°48'29.991"W	1329.32	358.28	0.30
6097.40	27.94	359.55	5791.30	564.71	1358.51	-40.11	516418.5	4400891.0	39°45'27.999"N	80°48'29.992"W	1359.10	358.31	0.66
6171.40	27.70	358.82	5856.75	578.58	1393.04	-40.60	516418.3	4400901.5	39°45'28.340"N	80°48'29.997"W	1393.63	358.33	0.56
6239.00	27.55	358.54	5916.64	591.41	1424.37	-41.32	516418.1	4400911.1	39°45'28.650"N	80°48'30.006"W	1424.97	358.34	0.29
6287.00	28.53	358.48	5959.01	600.72	1446.93	-41.90	516417.9	4400918.0	39°45'28.873"N	80°48'30.013"W	1447.54	358.34	2.04
6334.00	29.31	352.52	6000.16	611.16	1469.56	-43.70	516417.4	4400924.9	39°45'29.097"N	80°48'30.035"W	1470.21	358.30	6.35
6382.00	29.35	342.99	6042.03	624.65	1492.47	-48.67	516415.9	4400931.8	39°45'29.323"N	80°48'30.098"W	1493.27	358.13	9.72
6429.00	28.84	332.05	6083.13	640.83	1513.52	-57.36	516413.2	4400938.3	39°45'29.531"N	80°48'30.209"W	1514.60	357.83	11.36
6477.00	30.24	325.00	6124.90	660.04	1533.65	-69.73	516409.4	4400944.4	39°45'29.731"N	80°48'30.367"W	1535.23	357.40	7.80
6525.00	34.92	325.18	6165.33	681.90	1554.84	-84.51	516404.9	4400950.8	39°45'29.940"N	80°48'30.555"W	1557.14	356.89	9.75
6572.00	37.50	325.46	6203.25	705.32	1577.67	-100.31	516400.1	4400957.8	39°45'30.166"N	80°48'30.757"W	1580.86	356.36	5.50
6620.00	40.91	324.29	6240.44	731.05	1602.48	-117.77	516394.8	4400965.4	39°45'30.412"N	80°48'30.980"W	1606.80	355.80	7.27
6667.00	45.94	326.85	6274.57	758.20	1629.13	-136.00	516389.2	4400973.5	39°45'30.676"N	80°48'31.213"W	1634.80	355.23	11.34
6716.00	50.25	327.19	6307.29	788.37	1659.72	-155.84	516383.2	4400982.8	39°45'30.978"N	80°48'31.466"W	1667.02	354.64	8.81
6762.00	54.74	322.99	6335.29	819.24	1689.60	-176.75	516376.8	4400991.9	39°45'31.274"N	80°48'31.733"W	1698.82	354.03	12.15
6808.00	56.71	316.00	6361.22	853.20	1718.45	-201.43	516369.3	4401000.7	39°45'31.560"N	80°48'32.048"W	1730.22	353.32	13.26
6856.00	60.49	310.43	6386.24	891.59	1746.46	-231.29	516360.2	4401009.2	39°45'31.837"N	80°48'32.430"W	1761.71	352.46	12.65
6904.00	66.35	308.36	6407.71	932.73	1773.67	-264.46	516350.1	4401017.5	39°45'32.107"N	80°48'32.854"W	1793.28	351.52	12.80
6951.00	70.29	306.41	6425.07	975.00	1800.18	-299.16	516339.5	4401025.6	39°45'32.370"N	80°48'33.297"W	1824.86	350.57	9.23
7000.00	74.49	302.74	6440.46	1018.47	1825.37	-335.72	516328.4	4401033.3	39°45'32.619"N	80°48'33.765"W	1855.98	349.58	7.81
7045.00	77.76	300.13	6455.60	1063.51	1849.12	-374.59	516316.6	4401040.5	39°45'32.855"N	80°48'34.262"W	1886.68	348.55	5.19
7094.00	75.19	297.91	6469.25	1109.26	1871.43	-414.82	516304.3	4401047.3	39°45'33.076"N	80°48'34.776"W	1916.86	347.50	8.41
7141.00	72.75	297.00	6480.24	1154.80	1892.50	-455.37	516291.9	4401053.7	39°45'33.285"N	80°48'35.295"W	1946.51	346.47	5.76
7190.00	83.65	298.06	6488.16	1202.97	1914.84	-498.23	516278.9	4401060.5	39°45'33.507"N	80°48'35.843"W	1978.60	345.42	12.23
7236.00	85.66	297.99	6492.44	1248.59	1936.36	-538.65	516266.6	4401067.1	39°45'33.720"N	80°48'36.360"W	2009.89	344.46	4.37

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7284.00	84.48	295.47	6496.57	1296.29	1957.87	-581.36	516253.6	4401073.6	39°45'33.934"N	80°48'36.906"W	2042.36	343.46	5.78
7331.00	85.63	293.69	6500.62	1343.10	1977.34	-623.94	516240.6	4401079.6	39°45'34.127"N	80°48'37.451"W	2073.45	342.49	4.50
7395.00	89.94	293.41	6503.09	1407.03	2002.89	-682.55	516222.7	4401087.4	39°45'34.381"N	80°48'38.201"W	2116.00	341.18	6.75
7427.00	89.85	292.74	6503.15	1439.03	2015.43	-711.99	516213.8	4401091.2	39°45'34.506"N	80°48'38.578"W	2137.50	340.54	2.11
7521.00	89.88	289.31	6503.37	1532.96	2049.15	-799.72	516187.0	4401101.4	39°45'34.841"N	80°48'39.700"W	2199.68	338.68	3.65
7615.00	89.94	288.41	6503.52	1626.73	2079.54	-888.67	516159.9	4401110.7	39°45'35.143"N	80°48'40.838"W	2261.46	336.86	0.96
7710.00	89.88	289.50	6503.67	1721.51	2110.40	-978.52	516132.5	4401120.1	39°45'35.450"N	80°48'41.988"W	2326.21	335.12	1.15
7805.00	89.91	291.90	6503.84	1816.44	2143.97	-1067.38	516105.5	4401130.3	39°45'35.783"N	80°48'43.125"W	2394.98	333.53	2.53
7899.00	89.91	294.20	6503.99	1910.43	2180.77	-1153.87	516079.1	4401141.6	39°45'36.149"N	80°48'44.231"W	2467.22	332.12	2.45
7994.00	89.88	294.10	6504.17	2005.41	2219.64	-1240.56	516052.7	4401153.4	39°45'36.535"N	80°48'45.340"W	2542.79	330.80	0.11
8089.00	89.91	294.60	6504.34	2100.37	2258.81	-1327.10	516026.3	4401165.3	39°45'36.924"N	80°48'46.447"W	2619.82	329.57	0.53
8184.00	90.43	295.81	6504.06	2195.29	2299.27	-1413.06	516000.2	4401177.7	39°45'37.325"N	80°48'47.547"W	2698.77	328.43	1.39
8279.00	90.40	294.61	6503.37	2290.21	2339.73	-1499.01	515974.0	4401190.0	39°45'37.727"N	80°48'48.646"W	2778.73	327.35	1.26
8375.00	90.40	293.33	6502.70	2386.19	2378.73	-1586.72	515947.2	4401201.9	39°45'38.114"N	80°48'49.769"W	2859.38	326.30	1.33
8471.00	90.46	293.92	6501.98	2482.17	2417.20	-1674.67	515920.4	4401213.6	39°45'38.496"N	80°48'50.894"W	2940.64	325.29	0.62
8565.00	90.40	295.61	6501.27	2576.12	2456.57	-1760.02	515894.4	4401225.6	39°45'38.887"N	80°48'51.986"W	3021.99	324.38	1.80
8660.00	90.46	295.03	6500.56	2671.03	2497.20	-1845.89	515868.3	4401238.0	39°45'39.290"N	80°48'53.084"W	3105.37	323.53	0.61
8756.00	90.74	294.07	6499.56	2766.98	2537.08	-1933.21	515841.7	4401250.1	39°45'39.686"N	80°48'54.201"W	3189.69	322.69	1.04
8850.00	90.74	293.05	6498.34	2860.96	2574.65	-2019.37	515815.4	4401261.6	39°45'40.059"N	80°48'55.303"W	3272.11	321.89	1.09
8946.00	90.89	292.32	6496.98	2956.95	2611.67	-2107.93	515788.4	4401272.8	39°45'40.427"N	80°48'56.436"W	3356.22	321.09	0.78
9041.00	90.99	290.79	6495.42	3051.91	2646.57	-2196.27	515761.5	4401283.5	39°45'40.773"N	80°48'57.567"W	3439.18	320.31	1.61
9136.00	90.89	288.45	6493.86	3146.74	2678.46	-2285.74	515734.3	4401293.2	39°45'41.090"N	80°48'58.712"W	3521.19	319.52	2.47
9231.00	90.86	287.50	6492.41	3241.38	2707.78	-2376.09	515706.7	4401302.1	39°45'41.382"N	80°48'59.868"W	3602.48	318.73	1.00
9326.00	91.20	289.40	6490.70	3336.08	2737.83	-2466.19	515679.3	4401311.3	39°45'41.681"N	80°49'01.021"W	3684.81	317.99	2.03
9420.00	91.17	291.72	6488.76	3429.98	2770.84	-2554.17	515652.5	4401321.3	39°45'42.009"N	80°49'02.147"W	3768.47	317.33	2.47
9513.00	91.17	293.07	6486.86	3522.95	2806.26	-2640.14	515626.3	4401332.1	39°45'42.361"N	80°49'03.246"W	3852.98	316.75	1.45
9608.00	90.89	294.99	6485.15	3617.91	2844.94	-2726.89	515599.9	4401343.9	39°45'42.745"N	80°49'04.356"W	3940.76	316.21	2.04
9702.00	90.92	297.82	6483.66	3711.71	2886.73	-2811.06	515574.2	4401356.6	39°45'43.159"N	80°49'05.433"W	4029.30	315.76	3.01
9797.00	90.86	299.91	6482.19	3806.18	2932.58	-2894.25	515548.9	4401370.6	39°45'43.614"N	80°49'06.497"W	4120.28	315.38	2.20
9892.00	90.68	298.30	6480.91	3900.60	2978.79	-2977.24	515523.6	4401384.7	39°45'44.072"N	80°49'07.559"W	4211.55	315.02	1.71
9988.00	90.58	295.73	6479.86	3996.33	3022.39	-3062.75	515497.5	4401398.0	39°45'44.505"N	80°49'08.653"W	4302.94	314.62	2.68

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10083.00	90.55	294.27	6478.92	4091.26	3062.53	-3148.85	515471.3	4401410.2	39°45'44.903"N	80°49'09.754"W	4392.53	314.20	1.54
10178.00	90.62	292.21	6477.95	4186.25	3100.01	-3236.13	515444.7	4401421.6	39°45'45.276"N	80°49'10.871"W	4481.36	313.77	2.17
10272.00	90.49	292.36	6477.04	4280.24	3135.66	-3323.10	515418.2	4401432.5	39°45'45.630"N	80°49'11.983"W	4568.96	313.34	0.21
10367.00	90.58	291.72	6476.15	4375.22	3171.31	-3411.16	515391.4	4401443.3	39°45'45.984"N	80°49'13.110"W	4657.59	312.91	0.68
10461.00	90.52	291.84	6475.25	4469.20	3206.18	-3498.44	515364.8	4401454.0	39°45'46.330"N	80°49'14.227"W	4745.39	312.50	0.14
10557.00	90.28	292.05	6474.58	4565.19	3242.06	-3587.48	515337.7	4401464.9	39°45'46.686"N	80°49'15.366"W	4835.39	312.11	0.33
10652.00	90.37	293.03	6474.04	4660.18	3278.47	-3675.22	515310.9	4401476.0	39°45'47.048"N	80°49'16.489"W	4925.00	311.73	1.04
10748.00	90.28	292.25	6473.50	4756.18	3315.43	-3763.82	515283.9	4401487.3	39°45'47.415"N	80°49'17.622"W	5015.82	311.38	0.82
10843.00	90.31	292.10	6473.01	4851.17	3351.28	-3851.80	515257.1	4401498.2	39°45'47.771"N	80°49'18.748"W	5105.63	311.03	0.16
10938.00	90.25	292.68	6472.54	4946.17	3387.47	-3939.63	515230.4	4401509.2	39°45'48.130"N	80°49'19.872"W	5195.73	310.69	0.61
11033.00	90.34	295.73	6472.05	5041.13	3426.41	-4026.27	515204.0	4401521.1	39°45'48.517"N	80°49'20.980"W	5286.89	310.40	3.21
11128.00	90.71	295.63	6471.18	5136.01	3467.58	-4111.88	515177.9	4401533.6	39°45'48.925"N	80°49'22.076"W	5378.82	310.14	0.40
11222.00	90.65	294.05	6470.07	5229.94	3507.06	-4197.18	515151.9	4401545.6	39°45'49.317"N	80°49'23.167"W	5469.53	309.88	1.68
11317.00	90.71	293.40	6468.94	5324.93	3545.28	-4284.14	515125.4	4401557.3	39°45'49.697"N	80°49'24.280"W	5560.84	309.61	0.69
11411.00	90.62	291.79	6467.85	5418.92	3581.40	-4370.92	515099.0	4401568.3	39°45'50.055"N	80°49'25.390"W	5650.78	309.33	1.72
11506.00	90.74	292.21	6466.72	5513.90	3616.98	-4458.99	515072.1	4401579.1	39°45'50.409"N	80°49'26.517"W	5741.53	309.05	0.46
11601.00	90.62	292.09	6465.59	5608.88	3652.80	-4546.98	515045.3	4401590.0	39°45'50.764"N	80°49'27.643"W	5832.49	308.78	0.18
11696.00	90.28	292.33	6464.85	5703.88	3688.71	-4634.93	515018.5	4401601.0	39°45'51.121"N	80°49'28.768"W	5923.60	308.52	0.44
11792.00	90.22	292.12	6464.43	5799.87	3725.02	-4723.79	514991.4	4401612.0	39°45'51.481"N	80°49'29.905"W	6015.81	308.26	0.23
11886.00	90.25	292.56	6464.04	5893.86	3760.75	-4810.74	514965.0	4401622.9	39°45'51.836"N	80°49'31.018"W	6106.26	308.02	0.47
11981.00	90.31	293.18	6463.58	5988.86	3797.67	-4898.27	514938.3	4401634.2	39°45'52.203"N	80°49'32.138"W	6198.01	307.79	0.66
12076.00	90.25	293.05	6463.11	6083.86	3834.96	-4985.64	514911.7	4401645.5	39°45'52.573"N	80°49'33.256"W	6289.95	307.57	0.15
12171.00	90.28	292.99	6462.67	6178.86	3872.11	-5073.07	514885.0	4401656.9	39°45'52.942"N	80°49'34.374"W	6381.95	307.35	0.07
12256.00	90.71	292.91	6461.94	6263.86	3905.25	-5151.34	514861.2	4401667.0	39°45'53.271"N	80°49'35.376"W	6464.31	307.17	0.51
12282.00	90.71	292.91	6461.62	6289.85	3915.37	-5175.29	514853.9	4401670.0	39°45'53.371"N	80°49'35.682"W	6489.51	307.11	0.00

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