



# GASTAR EXPLORATION USA, INC.

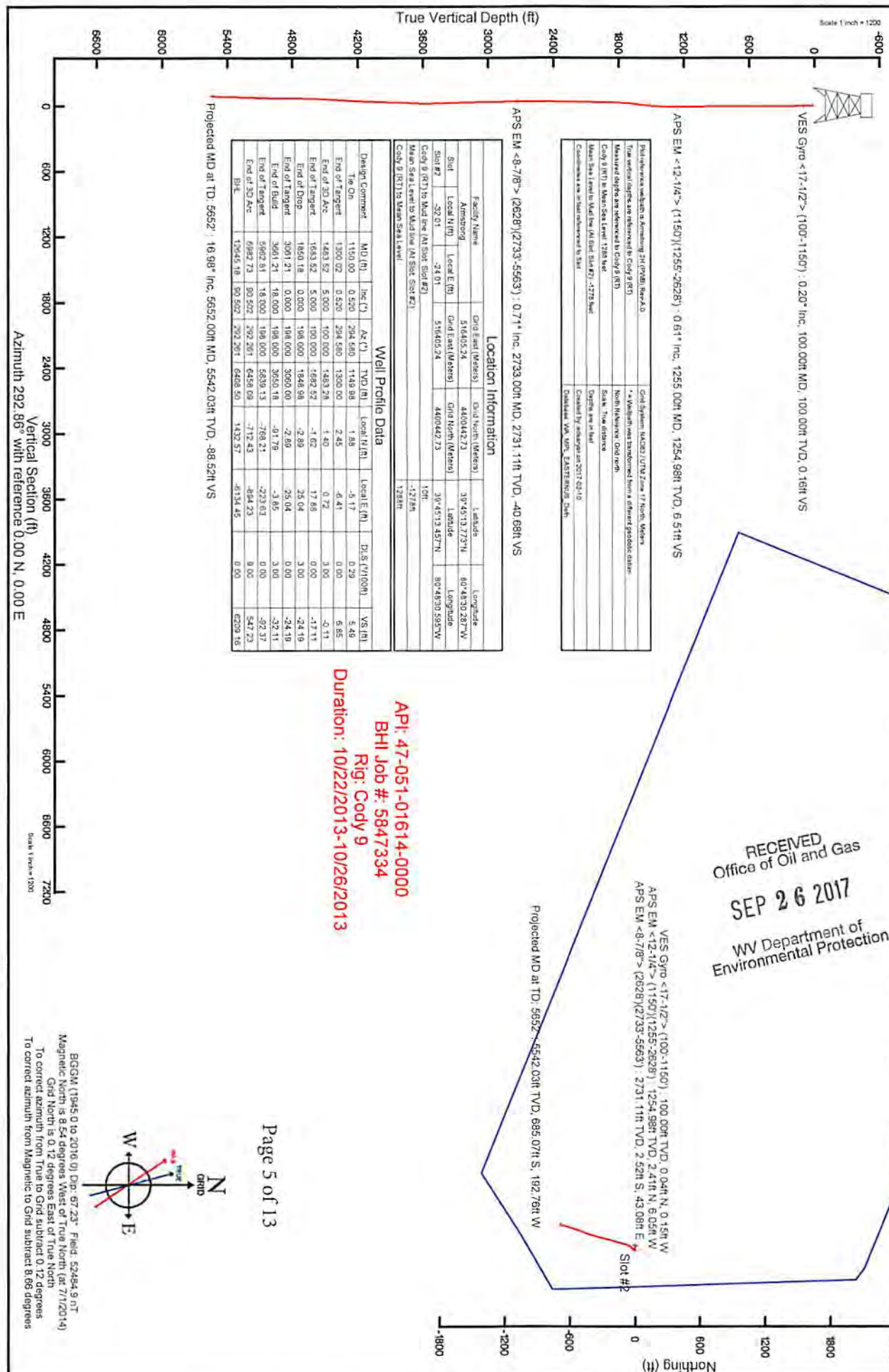


Location: Marshall County, WV  
Field: Marshall  
Facility: Armstrong

Slot: Slot #2  
Well: Armstrong 2H  
Wellbore: Armstrong 2H (PWB)

Scale 1 inch = 100'

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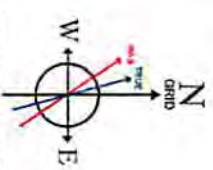


True vertical depth is referenced to Coidy 9 RTD	Grid System: NAD83 UTM Zone 17 North, Meters
Measured depths are referenced to Coidy 9 RTD	** Wellbore was determined from a different geologic core
Coidy 9 RTD is Mean Sea Level 1285 MSL	North Magnetic Grid north
Mean Sea Level to Mud Line (Mud Line Slot #2) = -275 feet	Scale: True distance
	Depth: see in Well
	Created by Anderson on 2017-09-10
	Published via WPN, EASTERNVA, Dash

Location Information

Facility Name	MD (ft)	Inc (%)	AZ (°)	TVD (ft)	Local E (ft)	Local N (ft)	Local S (ft)	Dist. (ft/100ft)	VS (ft)
Armstrong	1150.00	0.520	294.560	1148.98	1.88	-5.17	0.00	0.29	5.48
Slot	1300.00	0.520	294.560	1300.00	2.45	-6.41	0.00	0.00	6.85
Slot #2	1643.52	5.000	100.000	1483.24	-1.40	0.72	3.00	3.00	-4.11
Coidy 9 (RTD) to Mud Line (Mud Line Slot #2)	1650.18	0.000	198.000	1848.98	-2.89	25.04	0.00	0.00	-24.19
Mean Sea Level to Mud Line (Mud Line Slot #2)	3061.21	18.000	198.000	3050.18	-0.179	-3.85	3.00	0.00	-32.11
	5802.81	18.000	198.000	5839.13	-7.68.21	-223.63	0.00	0.00	-547.23
	6882.73	80.500	292.201	6459.09	-1432.57	-6134.45	0.00	0.00	-6239.18
BHL	12845.18	80.500	292.201	6459.50	-1432.57	-6134.45	0.00	0.00	-6239.18

API: 47-051-01614-0000  
BHL Job #: 5847334  
Rig: Coidy 9  
Duration: 10/22/2013-10/26/2013



BGGM (1945.0 to 2016.0) Dip: 67.23° Field: 52484.9 nT  
Magnetic North is 8.54 degrees West of True North (at 7/1/2014)  
Grid North is 0.12 degrees East of True North  
To correct azimuth from True to Grid subtract 0.12 degrees  
To correct azimuth from Magnetic to Grid subtract 8.66 degrees

Actual Wellpath Report (CSV ver.)  
 Prepared by Baker Hughes  
 Software System: WellArchitect 4.0.1

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REFERENCE WELLPATH IDENTIFICATION			
Operator	GASTAR EXPLORATION USA, INC.	Slot	Slot #2
Area	Marshall County, WV	Well	Armstrong 2H
Field	Marshall	Wellbore	Armstrong 2H (AWB)
Facility	Armstrong Unit	Wellpath	Armstrong 2H (AWP) Proj: 5652'
		Sidetrack	(none)

**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]
0.00	0.00	285.50	0.00	0.00	0.00	0.00	516405.24	4400442.73	39°45'13.457"N	80°48'30.595"W	0.00	0.00	0.00
10.00	0.00	285.50	10.00	0.00	0.00	0.00	516405.24	4400442.73	39°45'13.457"N	80°48'30.595"W	0.00	0.00	0.00
100.00	0.20	285.50	100.00	0.16	0.04	-0.15	516405.24	4400442.73	39°45'13.458"N	80°48'30.597"W	0.16	285.50	0.22
200.00	0.14	294.21	200.00	0.45	0.14	-0.43	516404.95	4400442.72	39°45'13.459"N	80°48'30.600"W	0.45	287.84	0.07
300.00	0.21	301.74	300.00	0.75	0.29	-0.70	516404.87	4400442.76	39°45'13.460"N	80°48'30.604"W	0.75	292.22	0.07
400.00	0.14	280.69	400.00	1.05	0.40	-0.97	516404.78	4400442.79	39°45'13.461"N	80°48'30.607"W	1.05	292.54	0.09
500.00	0.26	279.70	500.00	1.40	0.47	-1.32	516404.68	4400442.82	39°45'13.462"N	80°48'30.612"W	1.40	289.44	0.12
600.00	0.37	295.54	600.00	1.94	0.64	-1.83	516404.52	4400442.87	39°45'13.464"N	80°48'30.618"W	1.94	289.32	0.14
700.00	0.33	307.17	699.99	2.54	0.96	-2.35	516404.36	4400442.97	39°45'13.467"N	80°48'30.625"W	2.54	292.10	0.08
800.00	0.39	300.64	799.99	3.16	1.30	-2.88	516404.21	4400443.07	39°45'13.470"N	80°48'30.632"W	3.16	294.38	0.07
900.00	0.23	291.29	899.99	3.69	1.55	-3.36	516404.06	4400443.15	39°45'13.473"N	80°48'30.638"W	3.70	294.79	0.17
1000.00	0.49	274.18	999.99	4.30	1.65	-3.97	516403.87	4400443.18	39°45'13.474"N	80°48'30.646"W	4.30	292.62	0.28
1100.00	0.44	280.06	1099.99	5.08	1.75	-4.77	516403.63	4400443.21	39°45'13.475"N	80°48'30.656"W	5.09	290.15	0.07
1150.00	0.52	294.58	1149.98	5.49	1.88	-5.17	516403.50	4400443.25	39°45'13.476"N	80°48'30.661"W	5.50	289.98	0.29
1255.00	0.61	307.06	1254.98	6.51	2.41	-6.05	516403.24	4400443.41	39°45'13.481"N	80°48'30.672"W	6.51	291.76	0.14
1286.00	0.21	346.42	1285.98	6.71	2.57	-6.19	516403.19	4400443.46	39°45'13.483"N	80°48'30.674"W	6.71	292.53	1.51
1317.00	0.40	74.26	1316.98	6.65	2.65	-6.10	516403.22	4400443.48	39°45'13.484"N	80°48'30.673"W	6.65	293.50	1.43
1349.00	0.81	94.40	1348.98	6.35	2.67	-5.77	516403.32	4400443.49	39°45'13.484"N	80°48'30.669"W	6.36	294.81	1.42
1380.00	1.51	95.45	1379.97	5.75	2.61	-5.14	516403.51	4400443.47	39°45'13.483"N	80°48'30.661"W	5.77	296.91	2.26
1411.00	2.47	98.45	1410.95	4.72	2.47	-4.08	516403.84	4400443.43	39°45'13.482"N	80°48'30.647"W	4.77	301.25	3.11
1442.00	3.46	100.47	1441.91	3.16	2.21	-2.50	516404.32	4400443.35	39°45'13.479"N	80°48'30.627"W	3.33	311.47	3.21
1475.00	4.17	100.76	1474.84	1.01	1.80	-0.34	516404.98	4400443.22	39°45'13.475"N	80°48'30.599"W	1.83	349.36	2.15
1506.00	4.61	99.00	1505.74	-1.30	1.40	2.00	516405.69	4400443.10	39°45'13.471"N	80°48'30.569"W	2.44	55.07	1.48
1538.00	5.27	97.82	1537.63	-3.97	0.99	4.73	516406.52	4400442.97	39°45'13.467"N	80°48'30.534"W	4.83	78.11	2.09
1569.00	6.15	98.75	1568.47	-6.95	0.55	7.78	516407.45	4400442.84	39°45'13.462"N	80°48'30.495"W	7.80	85.97	2.85

Actual Wellpath Report (CSV ver.)  
 Prepared by Baker Hughes  
 Software System: WellArchitect 4.0.1

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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]
1600.00	7.02	98.72	1599.27	-10.40	0.01	11.29	516408.52	4400442.68	39°45'13.457"N	80°48'30.450"W	11.29	89.96	2.81
1632.00	7.23	99.21	1631.02	-14.25	-0.61	15.21	516409.72	4400442.49	39°45'13.451"N	80°48'30.400"W	15.22	92.30	0.68
1664.00	6.45	98.19	1662.79	-17.95	-1.19	18.98	516410.86	4400442.31	39°45'13.445"N	80°48'30.352"W	19.02	93.58	2.47
1695.00	5.97	98.17	1693.61	-21.19	-1.67	22.30	516411.87	4400442.17	39°45'13.440"N	80°48'30.309"W	22.36	94.27	1.55
1726.00	5.35	100.02	1724.46	-24.16	-2.15	25.32	516412.80	4400442.02	39°45'13.435"N	80°48'30.271"W	25.41	94.85	2.08
1758.00	4.08	102.11	1756.35	-26.73	-2.64	27.90	516413.58	4400441.87	39°45'13.430"N	80°48'30.238"W	28.02	95.42	4.00
1789.00	3.09	107.52	1787.29	-28.65	-3.13	29.77	516414.15	4400441.72	39°45'13.426"N	80°48'30.214"W	29.94	96.00	3.37
1821.00	2.56	108.32	1819.25	-30.22	-3.61	31.27	516414.61	4400441.57	39°45'13.421"N	80°48'30.195"W	31.48	96.59	1.66
1853.00	2.15	108.57	1851.22	-31.53	-4.03	32.52	516414.99	4400441.44	39°45'13.417"N	80°48'30.179"W	32.77	97.06	1.28
1885.00	1.90	111.92	1883.20	-32.66	-4.42	33.58	516415.31	4400441.33	39°45'13.413"N	80°48'30.165"W	33.87	97.49	0.86
1948.00	0.98	116.21	1946.18	-34.24	-5.04	35.04	516415.75	4400441.14	39°45'13.407"N	80°48'30.146"W	35.40	98.19	1.47
2012.00	0.91	122.89	2010.17	-35.29	-5.56	35.95	516416.04	4400440.98	39°45'13.401"N	80°48'30.135"W	36.38	98.79	0.20
2074.00	1.01	115.47	2072.16	-36.32	-6.06	36.86	516416.31	4400440.83	39°45'13.396"N	80°48'30.123"W	37.36	99.34	0.26
2137.00	0.88	111.13	2135.16	-37.36	-6.48	37.81	516416.60	4400440.70	39°45'13.392"N	80°48'30.111"W	38.36	99.72	0.24
2169.00	0.56	94.37	2167.15	-37.75	-6.58	38.20	516416.72	4400440.67	39°45'13.391"N	80°48'30.106"W	38.76	99.77	1.19
2233.00	0.50	71.89	2231.15	-38.26	-6.52	38.77	516416.89	4400440.69	39°45'13.392"N	80°48'30.099"W	39.32	99.54	0.34
2296.00	0.60	69.31	2294.15	-38.71	-6.31	39.34	516417.07	4400440.75	39°45'13.394"N	80°48'30.091"W	39.85	99.12	0.16
2359.00	0.62	64.51	2357.14	-39.17	-6.05	39.96	516417.25	4400440.83	39°45'13.397"N	80°48'30.083"W	40.42	98.61	0.09
2423.00	0.80	75.37	2421.14	-39.76	-5.79	40.71	516417.48	4400440.91	39°45'13.399"N	80°48'30.074"W	41.12	98.09	0.35
2486.00	0.99	55.44	2484.13	-40.40	-5.37	41.58	516417.75	4400441.04	39°45'13.403"N	80°48'30.063"W	41.92	97.36	0.57
2550.00	0.85	36.87	2548.12	-40.81	-4.67	42.32	516417.97	4400441.25	39°45'13.410"N	80°48'30.053"W	42.58	96.30	0.51
2628.00	0.70	21.90	2626.12	-40.94	-3.77	42.84	516418.14	4400441.52	39°45'13.419"N	80°48'30.046"W	43.01	95.03	0.32
2733.00	0.71	359.49	2731.11	-40.68	-2.52	43.08	516418.21	4400441.90	39°45'13.431"N	80°48'30.043"W	43.15	93.35	0.26
2795.00	0.50	297.81	2793.11	-40.25	-2.01	42.84	516418.13	4400442.06	39°45'13.436"N	80°48'30.046"W	42.88	92.69	1.04
2859.00	1.02	248.90	2857.10	-39.56	-2.09	42.06	516417.89	4400442.04	39°45'13.436"N	80°48'30.056"W	42.11	92.84	1.23
2921.00	2.04	224.78	2919.08	-38.76	-3.07	40.76	516417.50	4400441.74	39°45'13.426"N	80°48'30.073"W	40.88	94.31	1.91
2984.00	2.89	220.36	2982.02	-37.86	-5.08	38.95	516416.95	4400441.13	39°45'13.406"N	80°48'30.096"W	39.28	97.43	1.38
3047.00	4.00	217.26	3044.90	-36.84	-8.04	36.59	516416.23	4400440.23	39°45'13.377"N	80°48'30.127"W	37.46	102.39	1.79
3079.00	4.37	216.46	3076.82	-36.27	-9.90	35.19	516415.80	4400439.66	39°45'13.359"N	80°48'30.145"W	36.55	105.72	1.17
3111.00	4.86	215.24	3108.71	-35.69	-11.99	33.68	516415.34	4400439.02	39°45'13.338"N	80°48'30.164"W	35.75	109.60	1.56
3142.00	5.57	214.05	3139.59	-35.12	-14.31	32.08	516414.86	4400438.31	39°45'13.315"N	80°48'30.184"W	35.13	114.04	2.32

Actual Wellpath Report (CSV ver.)  
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 Software System: WellArchitect 4.0.1

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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]
3174.00	6.31	215.27	3171.41	-34.44	-17.03	30.20	516414.28	4400437.48	39°45'13.288"N	80°48'30.209"W	34.67	119.43	2.35
3205.00	6.95	216.41	3202.21	-33.64	-19.93	28.10	516413.64	4400436.60	39°45'13.260"N	80°48'30.236"W	34.45	125.35	2.11
3237.00	7.35	217.17	3233.96	-32.68	-23.12	25.71	516412.91	4400435.63	39°45'13.228"N	80°48'30.266"W	34.58	131.97	1.28
3268.00	7.89	217.54	3264.68	-31.65	-26.39	23.22	516412.15	4400434.63	39°45'13.196"N	80°48'30.298"W	35.15	138.66	1.75
3300.00	8.51	216.91	3296.36	-30.52	-30.03	20.46	516411.31	4400433.53	39°45'13.160"N	80°48'30.334"W	36.33	145.73	1.96
3331.00	9.25	217.59	3326.98	-29.32	-33.83	17.56	516410.43	4400432.36	39°45'13.122"N	80°48'30.371"W	38.12	152.57	2.41
3363.00	9.75	216.05	3358.55	-28.05	-38.06	14.40	516409.47	4400431.07	39°45'13.081"N	80°48'30.412"W	40.69	159.28	1.75
3395.00	10.38	214.27	3390.05	-26.86	-42.64	11.18	516408.49	4400429.68	39°45'13.036"N	80°48'30.453"W	44.08	165.31	2.20
3427.00	11.49	211.84	3421.47	-25.80	-47.73	7.87	516407.48	4400428.13	39°45'12.985"N	80°48'30.495"W	48.37	170.63	3.76
3458.00	11.65	210.62	3451.84	-24.89	-53.04	4.65	516406.50	4400426.51	39°45'12.933"N	80°48'30.537"W	53.25	174.99	0.94
3490.00	12.34	208.13	3483.14	-24.14	-58.84	1.39	516405.50	4400424.75	39°45'12.876"N	80°48'30.579"W	58.85	178.64	2.69
3521.00	12.61	207.59	3513.41	-23.56	-64.76	-1.74	516404.55	4400422.94	39°45'12.817"N	80°48'30.619"W	64.78	181.54	0.95
3553.00	13.19	206.02	3544.60	-23.07	-71.14	-4.96	516403.57	4400421.00	39°45'12.754"N	80°48'30.660"W	71.31	183.99	2.12
3585.00	14.08	204.13	3575.70	-22.78	-77.97	-8.15	516402.60	4400418.92	39°45'12.687"N	80°48'30.701"W	78.39	185.97	3.11
3617.00	14.42	200.67	3606.72	-22.85	-85.25	-11.15	516401.69	4400416.70	39°45'12.615"N	80°48'30.740"W	85.97	187.45	2.87
3648.00	14.74	197.60	3636.72	-23.36	-92.62	-13.70	516400.90	4400414.45	39°45'12.542"N	80°48'30.773"W	93.63	188.41	2.70
3680.00	15.22	193.98	3667.63	-24.38	-100.58	-15.95	516400.22	4400412.03	39°45'12.464"N	80°48'30.802"W	101.83	189.01	3.29
3712.00	15.77	192.22	3698.47	-25.83	-108.90	-17.88	516399.63	4400409.49	39°45'12.381"N	80°48'30.827"W	110.36	189.33	2.26
3744.00	16.38	193.01	3729.22	-27.40	-117.55	-19.82	516399.04	4400406.86	39°45'12.296"N	80°48'30.852"W	119.21	189.57	2.03
3775.00	16.91	194.27	3758.92	-28.83	-126.18	-21.91	516398.41	4400404.23	39°45'12.211"N	80°48'30.879"W	128.07	189.85	2.07
3806.00	17.68	195.84	3788.52	-30.07	-135.08	-24.31	516397.67	4400401.52	39°45'12.123"N	80°48'30.910"W	137.25	190.20	2.90
3837.00	17.97	196.46	3818.03	-31.18	-144.19	-26.95	516396.87	4400398.74	39°45'12.033"N	80°48'30.944"W	146.69	190.59	1.12
3901.00	17.32	196.45	3879.02	-33.35	-162.79	-32.44	516395.20	4400393.07	39°45'11.849"N	80°48'31.015"W	166.00	191.27	1.02
3964.00	18.23	196.69	3939.01	-35.45	-181.23	-37.93	516393.52	4400387.45	39°45'11.667"N	80°48'31.085"W	185.16	191.82	1.45
4028.00	18.97	196.80	3999.67	-37.63	-200.78	-43.81	516391.73	4400381.50	39°45'11.474"N	80°48'31.161"W	205.50	192.31	1.16
4090.00	18.67	196.46	4058.35	-39.80	-219.94	-49.54	516389.99	4400375.66	39°45'11.285"N	80°48'31.235"W	225.45	192.69	0.52
4153.00	18.62	196.01	4118.05	-42.12	-239.28	-55.17	516388.27	4400369.77	39°45'11.094"N	80°48'31.308"W	245.56	192.98	0.24
4216.00	18.45	195.50	4177.78	-44.60	-258.55	-60.61	516386.62	4400363.90	39°45'10.903"N	80°48'31.378"W	265.56	193.19	0.37
4279.00	17.83	194.63	4237.65	-47.25	-277.49	-65.71	516385.06	4400358.13	39°45'10.716"N	80°48'31.444"W	285.16	193.32	1.07
4343.00	17.15	192.83	4298.69	-50.30	-296.17	-70.28	516383.67	4400352.44	39°45'10.532"N	80°48'31.503"W	304.40	193.35	1.36
4405.00	18.67	192.70	4357.68	-53.64	-314.77	-74.49	516382.39	4400346.77	39°45'10.348"N	80°48'31.557"W	323.46	193.31	2.45

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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]
4468.00	18.97	194.51	4417.31	-56.91	-334.52	-79.27	516380.93	4400340.75	39°45'10.153"N	80°48'31.619"W	343.78	193.33	1.04
4531.00	18.19	192.93	4477.03	-60.09	-354.02	-84.04	516379.48	4400334.81	39°45'09.960"N	80°48'31.681"W	363.85	193.35	1.47
4593.00	18.94	196.32	4535.81	-62.91	-373.10	-89.03	516377.96	4400328.99	39°45'09.772"N	80°48'31.745"W	383.58	193.42	2.12
4656.00	19.89	200.36	4595.23	-64.54	-392.97	-95.63	516375.94	4400322.94	39°45'09.576"N	80°48'31.830"W	404.43	193.68	2.61
4716.00	19.70	198.71	4651.68	-65.72	-412.11	-102.43	516373.87	4400317.11	39°45'09.387"N	80°48'31.918"W	424.65	193.96	0.98
4778.00	19.37	196.59	4710.11	-67.60	-431.86	-108.71	516371.96	4400311.09	39°45'09.192"N	80°48'31.999"W	445.34	194.13	1.26
4841.00	19.38	198.98	4769.55	-69.44	-451.76	-115.10	516370.01	4400305.03	39°45'08.995"N	80°48'32.081"W	466.19	194.29	1.26
4904.00	19.17	201.74	4829.02	-70.35	-471.25	-122.33	516367.81	4400299.09	39°45'08.803"N	80°48'32.174"W	486.87	194.55	1.48
4966.00	18.84	202.67	4887.64	-70.59	-489.95	-129.96	516365.48	4400293.40	39°45'08.618"N	80°48'32.272"W	506.89	194.86	0.72
5029.00	18.82	202.73	4947.26	-70.64	-508.71	-137.80	516363.09	4400287.68	39°45'08.433"N	80°48'32.373"W	527.04	195.16	0.04
5092.00	18.95	200.22	5006.87	-71.14	-527.68	-145.27	516360.82	4400281.90	39°45'08.245"N	80°48'32.469"W	547.31	195.39	1.31
5154.00	19.15	197.59	5065.48	-72.53	-546.82	-151.82	516358.82	4400276.07	39°45'08.056"N	80°48'32.554"W	567.50	195.52	1.42
5218.00	18.43	196.37	5126.07	-74.64	-566.53	-157.84	516356.99	4400270.06	39°45'07.862"N	80°48'32.631"W	588.11	195.57	1.28
5281.00	18.11	196.72	5185.89	-76.81	-585.46	-163.47	516355.28	4400264.29	39°45'07.675"N	80°48'32.704"W	607.86	195.60	0.54
5344.00	15.95	198.48	5246.13	-78.52	-603.05	-169.03	516353.58	4400258.94	39°45'07.501"N	80°48'32.775"W	626.29	195.66	3.52
5406.00	15.14	198.06	5305.86	-79.85	-618.83	-174.24	516351.99	4400254.13	39°45'07.345"N	80°48'32.843"W	642.89	195.73	1.32
5470.00	15.61	196.58	5367.57	-81.49	-635.03	-179.29	516350.46	4400249.19	39°45'07.185"N	80°48'32.908"W	659.85	195.77	0.96
5532.00	16.19	195.15	5427.20	-83.56	-651.37	-183.93	516349.04	4400244.21	39°45'07.024"N	80°48'32.968"W	676.84	195.77	1.13
5652.00	16.98	194.62	5542.03	-88.52	-685.07	-192.76	516346.35	4400233.95	39°45'06.691"N	80°48'33.082"W	711.67	195.72	0.00