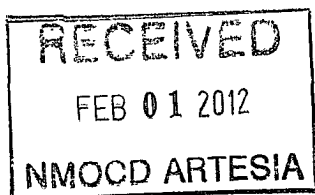


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End Of Well Report



INTEQ

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End of Well Report

Cimarex Energy Co.

Eddy County, NM

Penny Pincher 21 Fed 4H

Cactus 115

Well Specifications

Well Name: Penny Pinchers 21 Fed 4H
Start Date: 7/28/2011
Client: Cimarex Energy Co.
Rig Name: Cactus 115
County: Eddy County, NM
Field: (Penny) Sec 21, T19S, R31E

Well Location:

NAD83 / TM New Mexico State Planes, Eastern Zone (3001)

Grid Coordinates

Easting: 684271.20'
Northing: 601343.70'

Geographical Coordinates

Latitude: 32°39'08.215"N
Longitude: 103°52'08.124"W

RT: 3,519.00' above M.S.L.

Date TD Reached: 9/19/2011

Final Depth MD: 13,511'

Final Depth TVD: 9,035.37'



Cimarex Energy Co.

Location Eddy County, NM
Field (Penny) Sec 21, T19S, R31E
Facility Penny Pincher Fed Com No. 4H

Slot No 4H SHL
Well No 4H
Wellbore No 4H PWB



Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
Tie On	8562.50	0.340	36.420	8559.40	24.23	63.90	0.00	-15.12
Est KOP	8715.00	0.340	36.420	8711.90	24.96	64.43	0.00	-15.77
EOC	9166.87	90.000	172.854	9000.01	-259.55	101.29	19.97	271.10
No 4H PBHL	13557.49	90.000	172.854	9000.00	-4616.07	647.43	0.00	4661.25

Plot reference wellpath is Plan #1

True vertical depths are referenced to Rig on No. 4H SHL (KB)

Measured depths are referenced to Rig on No. 4H SHL (KB)

Rig on No. 4H SHL (KB) to Mean Sea Level 3519 feet

Mean Sea Level to Mud line (At Slot No. 4H SHL) -3499 feet

Coordinates are in feet referenced to Slot

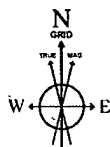
Grid System NAD83 / TM New Mexico SP, Eastern Zone (3001), US feet

North Reference Grid north

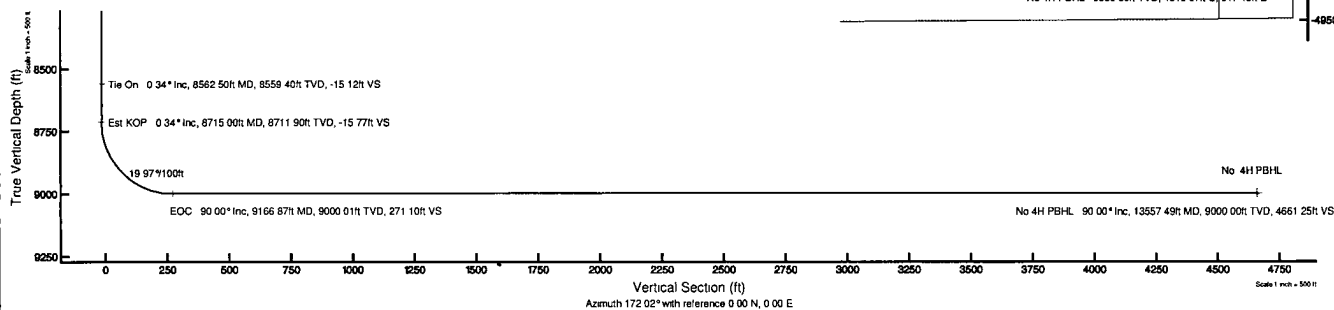
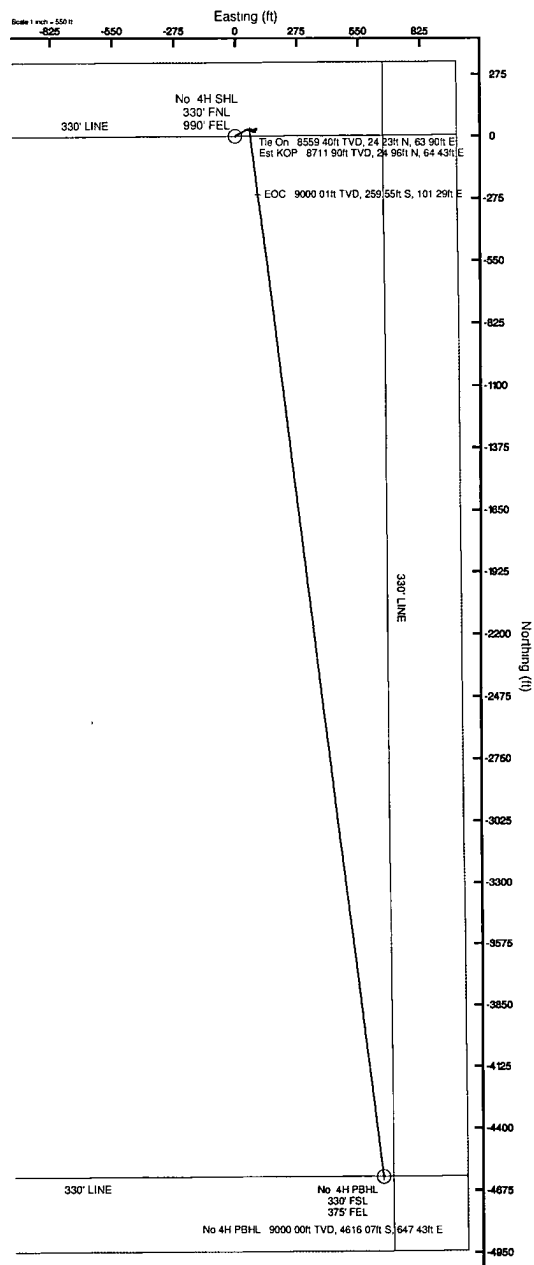
Scale True distance

Depths are in feet

Created by gentry on 7/28/2011



BQGM (1945 to 2012) Dip 60.54° Field 46865.6 nT
Magnetic North is 7.60 degrees East of True North (at 7/7/2011)
Grid North is 0.25 degrees East of True North
To correct azimuth from True to Grid subtract 0.25 degrees
To correct azimuth from Magnetic to Grid add 7.55 degrees
For example if the Magnetic North Azimuth = 90 degs, then the Grid North Azimuth = 90 + 7.55 = 97.55





Planned Wellpath Report

Plan #1
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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Eddy County, NM	Well	No. 4H
Field	(Penny) Sec 21, T19S, R31E	Wellbore	No. 4H PWB
Facility	Penny Pincher Fed Com No. 4H		

REPORT SETUP INFORMATION

Projection System	NAD83 / TM New Mexico SP, Eastern Zone (3001), US feet	Software System	WellArchitect® 3.0.0
North Reference	Grid	User	Gentbry
Scale	0.999932	Report Generated	7/28/2011 at 8:35:09 AM
Convergence at slot	0.25° East	Database/Source file	WA Midland/No. 4H_PWB.xml

WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	0.00	0.00	684271.20	601343.70	32°39'08.215"N	103°52'08.124"W
Facility Reference Pt			684271.20	601343.70	32°39'08.215"N	103°52'08.124"W
Field Reference Pt			681958.50	601329.30	32°39'08.172"N	103°52'35.176"W

WELLPATH DATUM

Calculation method	Minimum curvature	Rig on No. 4H SHL (KB) to GL	20.00ft
Horizontal Reference Pt	Slot	Rig on No. 4H SHL (KB) to Mean Sea Level	3519.00ft
Vertical Reference Pt	Rig on No. 4H SHL (KB)	Rig on No. 4H SHL (KB) to Mud Line at Slot (No. 4H SHL)	20.00ft
MD Reference Pt	Rig on No. 4H SHL (KB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	172.02°



Planned Wellpath Report

Plan #1
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REFERENCE WELLPATH IDENTIFICATION			
Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Eddy County, NM	Well	No. 4H
Field	(Penny) Sec 21, T19S, R31E	Wellbore	No. 4H PWB
Facility	Penny Pincher Fed Com No. 4H		

WELLPATH DATA (148 stations) † = interpolated/extrapolated station												
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]	Comments
0.00†	0.000	143.420	0.00	0.00	0.00	0.00	684271.20	601343.70	32°39'08.215"N	103°52'08.124"W	0.00	
20.00	0.000	143.420	20.00	0.00	0.00	0.00	684271.20	601343.70	32°39'08.215"N	103°52'08.124"W	0.00	
100.00	0.370	143.420	100.00	0.23	-0.21	0.15	684271.35	601343.49	32°39'08.213"N	103°52'08.123"W	0.46	
200.00	0.490	149.020	200.00	0.90	-0.83	0.57	684271.77	601342.87	32°39'08.207"N	103°52'08.118"W	0.13	
300.00	0.500	153.040	299.99	1.71	-1.59	0.98	684272.18	601342.11	32°39'08.199"N	103°52'08.113"W	0.04	
400.00	0.420	169.660	399.99	2.49	-2.34	1.25	684272.45	601341.36	32°39'08.192"N	103°52'08.110"W	0.15	
500.00	0.390	191.830	499.99	3.18	-3.03	1.24	684272.44	601340.67	32°39'08.185"N	103°52'08.110"W	0.16	
600.00	0.470	188.910	599.98	3.89	-3.77	1.11	684272.31	601339.93	32°39'08.178"N	103°52'08.112"W	0.08	
700.00	0.380	192.040	699.98	4.59	-4.50	0.98	684272.18	601339.20	32°39'08.171"N	103°52'08.113"W	0.09	
808.60	0.230	187.650	808.58	5.14	-5.07	0.87	684272.07	601338.63	32°39'08.165"N	103°52'08.114"W	0.14	
903.10	0.370	17.010	903.08	5.05	-4.96	0.94	684272.14	601338.74	32°39'08.166"N	103°52'08.114"W	0.63	
997.70	0.880	9.450	997.67	4.08	-3.96	1.15	684272.35	601339.74	32°39'08.176"N	103°52'08.111"W	0.54	
1092.30	0.990	358.560	1092.26	2.57	-2.42	1.25	684272.45	601341.28	32°39'08.191"N	103°52'08.110"W	0.22	
1186.80	0.880	7.430	1186.75	1.06	-0.89	1.32	684272.52	601342.81	32°39'08.206"N	103°52'08.109"W	0.19	
1281.40	1.010	34.820	1281.34	-0.25	0.52	1.89	684273.09	601344.22	32°39'08.220"N	103°52'08.102"W	0.49	
1375.90	1.430	47.550	1375.81	-1.53	2.00	3.23	684274.43	601345.70	32°39'08.235"N	103°52'08.086"W	0.53	
1470.50	2.320	55.100	1470.36	-3.06	3.89	5.68	684276.88	601347.59	32°39'08.253"N	103°52'08.058"W	0.97	
1565.10	4.350	64.110	1564.80	-5.03	6.55	10.47	684281.67	601350.25	32°39'08.280"N	103°52'08.001"W	2.21	
1659.60	5.430	67.510	1658.95	-7.26	9.83	17.83	684289.03	601353.53	32°39'08.312"N	103°52'07.915"W	1.18	
1754.20	4.970	64.810	1753.16	-9.59	13.28	25.67	684296.87	601356.98	32°39'08.346"N	103°52'07.823"W	0.55	
1848.70	4.640	58.260	1847.33	-12.34	17.04	32.63	684303.83	601360.74	32°39'08.382"N	103°52'07.742"W	0.68	
1943.30	4.450	56.060	1941.64	-15.49	21.10	38.93	684310.12	601364.80	32°39'08.422"N	103°52'07.668"W	0.27	
2037.90	4.210	56.220	2035.97	-18.61	25.08	44.86	684316.05	601368.78	32°39'08.461"N	103°52'07.598"W	0.25	
2132.40	3.250	61.980	2130.26	-21.03	28.27	50.11	684321.30	601371.96	32°39'08.493"N	103°52'07.537"W	1.09	
2227.00	2.410	72.310	2224.75	-22.29	30.13	54.37	684325.56	601373.83	32°39'08.511"N	103°52'07.487"W	1.04	
2321.50	2.220	76.760	2319.17	-22.79	31.15	58.04	684329.24	601374.85	32°39'08.521"N	103°52'07.444"W	0.28	
2416.10	2.230	86.680	2413.70	-22.81	31.68	61.66	684332.86	601375.38	32°39'08.526"N	103°52'07.401"W	0.41	
2510.70	2.010	97.220	2508.24	-22.22	31.58	65.15	684336.34	601375.28	32°39'08.525"N	103°52'07.361"W	0.47	
2605.20	1.790	105.950	2602.68	-21.19	30.96	68.21	684339.41	601374.66	32°39'08.519"N	103°52'07.325"W	0.38	
2699.80	1.650	110.230	2697.24	-19.95	30.09	70.91	684342.10	601373.78	32°39'08.510"N	103°52'07.293"W	0.20	
2794.30	1.400	122.370	2791.71	-18.56	29.00	73.16	684344.36	601372.70	32°39'08.499"N	103°52'07.267"W	0.43	
2888.90	1.140	122.150	2886.28	-17.20	27.88	74.93	684346.13	601371.58	32°39'08.488"N	103°52'07.246"W	0.27	
2983.50	0.860	121.780	2980.87	-16.14	27.00	76.33	684347.53	601370.70	32°39'08.479"N	103°52'07.230"W	0.30	
3078.00	0.800	121.360	3075.36	-15.27	26.29	77.50	684348.69	601369.99	32°39'08.472"N	103°52'07.217"W	0.06	
3172.60	0.800	118.920	3169.95	-14.45	25.62	78.64	684349.84	601369.32	32°39'08.465"N	103°52'07.203"W	0.04	
3267.10	0.790	85.700	3264.44	-14.01	25.35	79.87	684351.06	601369.05	32°39'08.463"N	103°52'07.189"W	0.48	
3361.70	0.660	68.460	3359.04	-14.10	25.60	81.03	684352.22	601369.30	32°39'08.465"N	103°52'07.175"W	0.27	
3456.30	0.590	72.890	3453.63	-14.31	25.95	82.00	684353.19	601369.64	32°39'08.468"N	103°52'07.164"W	0.09	
3550.80	0.830	54.160	3548.12	-14.70	26.49	83.02	684354.21	601370.19	32°39'08.474"N	103°52'07.152"W	0.35	
3645.40	0.970	63.530	3642.71	-15.28	27.25	84.29	684355.48	601370.95	32°39'08.481"N	103°52'07.137"W	0.21	
3739.90	0.570	71.760	3737.20	-15.61	27.75	85.45	684356.65	601371.45	32°39'08.486"N	103°52'07.123"W	0.44	
3834.50	0.270	64.560	3831.80	-15.76	28.00	86.10	684357.29	601371.69	32°39'08.488"N	103°52'07.116"W	0.32	
3929.10	0.530	58.430	3926.40	-16.01	28.32	86.67	684357.87	601372.02	32°39'08.492"N	103°52'07.109"W	0.28	
4023.60	0.700	38.390	4020.89	-16.58	29.00	87.41	684358.60	601372.70	32°39'08.498"N	103°52'07.101"W	0.29	
4118.20	0.760	39.960	4115.48	-17.40	29.93	88.17	684359.36	601373.63	32°39'08.508"N	103°52'07.092"W	0.07	



Planned Wellpath Report

Plan #1
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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Eddy County, NM	Well	No. 4H
Field	(Penny) Sec 21, T19S, R31E	Wellbore	No. 4H PWB
Facility	Penny Pincher Fed Com No. 4H		

WELLPATH DATA (148 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]	Comments
4212.70	0.560	49.860	4209.98	-18.06	30.71	88.92	684360.12	601374.41	32°39'08.515"N	103°52'07.083"W	0.24	
4307.30	0.540	56.490	4304.57	-18.50	31.26	89.65	684360.84	601374.96	32°39'08.521"N	103°52'07.074"W	0.07	
4401.90	0.660	66.490	4399.17	-18.84	31.72	90.52	684361.71	601375.42	32°39'08.525"N	103°52'07.064"W	0.17	
4496.40	0.720	73.810	4493.66	-19.07	32.10	91.59	684362.78	601375.80	32°39'08.529"N	103°52'07.051"W	0.11	
4591.00	0.700	78.940	4588.25	-19.19	32.38	92.73	684363.92	601376.08	32°39'08.532"N	103°52'07.038"W	0.07	
4685.50	0.480	85.940	4682.75	-19.19	32.52	93.69	684364.88	601376.22	32°39'08.533"N	103°52'07.027"W	0.24	
4780.10	0.570	94.810	4777.35	-19.06	32.51	94.55	684365.75	601376.21	32°39'08.533"N	103°52'07.017"W	0.13	
4874.70	0.580	101.640	4871.94	-18.79	32.37	95.49	684366.68	601376.07	32°39'08.531"N	103°52'07.006"W	0.07	
4969.20	0.340	108.950	4966.44	-18.51	32.18	96.22	684367.42	601375.88	32°39'08.529"N	103°52'06.997"W	0.26	
5063.80	0.130	106.150	5061.04	-18.34	32.06	96.59	684367.79	601375.76	32°39'08.528"N	103°52'06.993"W	0.22	
5158.30	0.100	199.480	5155.54	-18.22	31.96	96.67	684367.86	601375.65	32°39'08.527"N	103°52'06.992"W	0.18	
5252.90	0.360	239.900	5250.14	-18.03	31.73	96.38	684367.58	601375.43	32°39'08.525"N	103°52'06.995"W	0.31	
5347.50	0.480	236.620	5344.73	-17.75	31.36	95.80	684366.99	601375.06	32°39'08.521"N	103°52'07.002"W	0.13	
5442.00	0.540	244.170	5439.23	-17.45	30.95	95.06	684366.26	601374.65	32°39'08.517"N	103°52'07.011"W	0.10	
5536.60	0.460	228.620	5533.83	-17.10	30.50	94.38	684365.57	601374.20	32°39'08.513"N	103°52'07.019"W	0.17	
5631.10	0.480	222.400	5628.32	-16.64	29.96	93.83	684365.02	601373.66	32°39'08.508"N	103°52'07.025"W	0.06	
5725.70	0.560	218.970	5722.92	-16.07	29.31	93.27	684364.46	601373.01	32°39'08.501"N	103°52'07.032"W	0.09	
5820.30	0.620	215.170	5817.51	-15.38	28.53	92.68	684363.88	601372.23	32°39'08.494"N	103°52'07.039"W	0.08	
5914.80	0.480	204.300	5912.01	-14.67	27.75	92.23	684363.42	601371.45	32°39'08.486"N	103°52'07.044"W	0.18	
6009.40	0.380	181.050	6006.61	-14.03	27.08	92.06	684363.25	601370.78	32°39'08.479"N	103°52'07.046"W	0.21	
6103.90	0.510	179.000	6101.10	-13.30	26.34	92.06	684363.25	601370.04	32°39'08.472"N	103°52'07.046"W	0.14	
6198.50	0.530	194.010	6195.70	-12.48	25.50	91.96	684363.15	601369.20	32°39'08.464"N	103°52'07.047"W	0.15	
6293.10	0.620	193.530	6290.30	-11.60	24.58	91.73	684362.93	601368.27	32°39'08.454"N	103°52'07.050"W	0.10	
6387.60	0.680	200.930	6384.79	-10.63	23.56	91.41	684362.61	601367.25	32°39'08.444"N	103°52'07.054"W	0.11	
6482.20	0.640	202.790	6479.38	-9.68	22.54	91.01	684362.20	601366.24	32°39'08.434"N	103°52'07.059"W	0.05	
6576.70	0.640	200.380	6573.88	-8.77	21.56	90.62	684361.81	601365.26	32°39'08.425"N	103°52'07.063"W	0.03	
6671.30	0.680	203.810	6668.47	-7.82	20.55	90.21	684361.40	601364.25	32°39'08.415"N	103°52'07.068"W	0.06	
6672.83†	0.680	204.018	6670.00	-7.81	20.54	90.20	684361.40	601364.24	32°39'08.415"N	103°52'07.068"W	0.16	Bone Spring
6765.90	0.680	216.810	6763.06	-6.95	19.59	89.65	684360.84	601363.29	32°39'08.405"N	103°52'07.075"W	0.16	
6860.40	0.610	224.660	6857.56	-6.25	18.78	88.96	684360.15	601362.48	32°39'08.397"N	103°52'07.083"W	0.12	
6955.00	0.780	235.080	6952.15	-5.65	18.06	88.08	684359.27	601361.76	32°39'08.390"N	103°52'07.093"W	0.22	
7049.50	0.830	253.240	7046.64	-5.25	17.49	86.89	684358.09	601361.19	32°39'08.385"N	103°52'07.107"W	0.27	
7144.10	0.840	255.150	7141.23	-5.07	17.12	85.57	684356.76	601360.82	32°39'08.381"N	103°52'07.123"W	0.03	
7238.70	1.090	278.100	7235.82	-5.23	17.07	84.01	684355.20	601360.76	32°39'08.380"N	103°52'07.141"W	0.48	
7333.20	1.030	295.930	7330.30	-5.95	17.56	82.35	684353.55	601361.26	32°39'08.385"N	103°52'07.160"W	0.35	
7427.80	1.250	302.930	7424.88	-7.11	18.50	80.72	684351.92	601362.19	32°39'08.395"N	103°52'07.179"W	0.27	
7522.30	1.420	289.360	7519.36	-8.32	19.44	78.75	684349.95	601363.14	32°39'08.404"N	103°52'07.202"W	0.38	
7572.96†	1.472	292.349	7570.00	-8.93	19.90	77.56	684348.75	601363.60	32°39'08.409"N	103°52'07.216"W	0.18	Upper Bone Spring Shale
7616.90	1.520	294.770	7613.93	-9.54	20.36	76.51	684347.70	601364.06	32°39'08.413"N	103°52'07.228"W	0.18	
7711.50	1.390	303.380	7708.50	-10.97	21.52	74.41	684345.60	601365.21	32°39'08.425"N	103°52'07.253"W	0.27	
7806.00	1.130	306.520	7802.97	-12.38	22.70	72.70	684343.90	601366.40	32°39'08.437"N	103°52'07.273"W	0.28	
7900.60	0.920	304.540	7897.56	-13.55	23.69	71.33	684342.52	601367.39	32°39'08.447"N	103°52'07.289"W	0.23	
7995.10	0.230	327.590	7992.05	-14.24	24.28	70.60	684341.80	601367.98	32°39'08.452"N	103°52'07.297"W	0.76	
8023.05†	0.316	299.447	8020.00	-14.33	24.36	70.50	684341.70	601368.06	32°39'08.453"N	103°52'07.298"W	0.56	1st Bone Spring Shale
8089.70	0.640	275.600	8086.65	-14.53	24.49	69.97	684341.17	601368.19	32°39'08.454"N	103°52'07.305"W	0.56	



Planned Wellpath Report

Plan #1
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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Eddy County, NM	Well	No. 4H
Field	(Penny) Sec 21, T19S, R31E	Wellbore	No. 4H PWB
Facility	Penny Pincher Fed Com No. 4H		

WELLPATH DATA (148 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]	Comments
8184.30	0.850	275.200	8181.24	-14.82	24.60	68.75	684339.94	601368.30	32°39'08.456"N	103°52'07.319"W	0.22	
8278.80	1.080	265.100	8275.73	-15.02	24.59	67.16	684338.36	601368.29	32°39'08.456"N	103°52'07.338"W	0.30	
8373.40	1.070	255.020	8370.31	-14.96	24.29	65.42	684336.62	601367.99	32°39'08.453"N	103°52'07.358"W	0.20	
8467.90	0.510	266.200	8464.80	-14.89	24.03	64.15	684335.34	601367.73	32°39'08.450"N	103°52'07.373"W	0.61	
8562.50	0.340	36.420	8559.40	-15.12	24.23	63.90	684335.09	601367.93	32°39'08.452"N	103°52'07.376"W	0.00	Tie On
8662.50†	0.340	36.420	8659.40	-15.54	24.71	64.25	684335.44	601368.40	32°39'08.457"N	103°52'07.372"W	0.00	
8715.00	0.340	36.420	8711.90	-15.77	24.96	64.43	684335.63	601368.66	32°39'08.459"N	103°52'07.369"W	0.00	Est KOP
8762.50†	9.243	171.414	8759.20	-12.04	21.29	65.09	684336.28	601364.99	32°39'08.423"N	103°52'07.362"W	19.97	
8825.74†	21.872	172.271	8820.00	4.88	4.53	67.44	684338.64	601348.23	32°39'08.257"N	103°52'07.335"W	19.97	2nd Bone Spring Shale
8862.50†	29.213	172.435	8853.14	-20.72	-11.17	69.54	684340.74	601332.53	32°39'08.102"N	103°52'07.312"W	19.97	
8962.50†	49.185	172.652	8930.25	83.60	-73.52	77.68	684348.87	601270.18	32°39'07.484"N	103°52'07.220"W	19.97	
9062.50†	69.157	172.765	8981.24	169.03	-158.27	88.51	684359.71	601185.44	32°39'06.645"N	103°52'07.097"W	19.97	
9162.50†	89.128	172.851	8999.98	266.73	-255.22	100.74	684371.94	601088.50	32°39'05.686"N	103°52'06.959"W	19.97	
9166.87	90.000	172.854	9000.01	271.10	-259.55	101.29	684372.48	601084.17	32°39'05.643"N	103°52'06.953"W	19.97	EOC
9262.50†	90.000	172.854	9000.01	366.72	-354.44	113.18	684384.38	600989.29	32°39'04.703"N	103°52'06.819"W	0.00	
9362.50†	90.000	172.854	9000.01	466.71	-453.66	125.62	684396.81	600890.07	32°39'03.721"N	103°52'06.678"W	0.00	
9462.50†	90.000	172.854	9000.01	566.70	-552.89	138.06	684409.25	600790.85	32°39'02.739"N	103°52'06.538"W	0.00	
9562.50†	90.000	172.854	9000.01	666.69	-652.11	150.50	684421.69	600691.64	32°39'01.756"N	103°52'06.397"W	0.00	
9662.50†	90.000	172.854	9000.01	766.68	-751.33	162.94	684434.13	600592.42	32°39'00.774"N	103°52'06.257"W	0.00	
9762.50†	90.000	172.854	9000.01	866.67	-850.56	175.38	684446.57	600493.20	32°38'59.792"N	103°52'06.117"W	0.00	
9862.50†	90.000	172.854	9000.01	966.66	-949.78	187.82	684459.00	600393.99	32°38'58.810"N	103°52'05.976"W	0.00	
9962.50†	90.000	172.854	9000.01	1066.65	-1049.00	200.26	684471.44	600294.77	32°38'57.827"N	103°52'05.836"W	0.00	
10062.50†	90.000	172.854	9000.01	1166.64	-1148.23	212.69	684483.88	600195.55	32°38'56.845"N	103°52'05.696"W	0.00	
10162.50†	90.000	172.854	9000.01	1266.63	-1247.45	225.13	684496.32	600096.34	32°38'55.863"N	103°52'05.555"W	0.00	
10262.50†	90.000	172.854	9000.01	1366.62	-1346.67	237.57	684508.76	599997.12	32°38'54.880"N	103°52'05.415"W	0.00	
10362.50†	90.000	172.854	9000.01	1466.61	-1445.90	250.01	684521.19	599897.90	32°38'53.898"N	103°52'05.274"W	0.00	
10462.50†	90.000	172.854	9000.01	1566.60	-1545.12	262.45	684533.63	599798.69	32°38'52.916"N	103°52'05.134"W	0.00	
10562.50†	90.000	172.854	9000.01	1666.58	-1644.34	274.89	684546.07	599699.47	32°38'51.934"N	103°52'04.994"W	0.00	
10662.50†	90.000	172.854	9000.01	1766.57	-1743.57	287.33	684558.51	599600.26	32°38'50.951"N	103°52'04.853"W	0.00	
10762.50†	90.000	172.854	9000.01	1866.56	-1842.79	299.77	684570.95	599501.04	32°38'49.969"N	103°52'04.713"W	0.00	
10862.50†	90.000	172.854	9000.01	1966.55	-1942.01	312.21	684583.38	599401.82	32°38'48.987"N	103°52'04.572"W	0.00	
10962.50†	90.000	172.854	9000.01	2066.54	-2041.24	324.65	684595.82	599302.61	32°38'48.004"N	103°52'04.432"W	0.00	
11062.50†	90.000	172.854	9000.01	2166.53	-2140.46	337.08	684608.26	599203.39	32°38'47.022"N	103°52'04.292"W	0.00	
11162.50†	90.000	172.854	9000.01	2266.52	-2239.68	349.52	684620.70	599104.17	32°38'46.040"N	103°52'04.151"W	0.00	
11262.50†	90.000	172.854	9000.01	2366.51	-2338.91	361.96	684633.14	599004.96	32°38'45.058"N	103°52'04.011"W	0.00	
11362.50†	90.000	172.854	9000.01	2466.50	-2438.13	374.40	684645.58	598905.74	32°38'44.075"N	103°52'03.870"W	0.00	
11462.50†	90.000	172.854	9000.01	2566.49	-2537.35	386.84	684658.01	598806.52	32°38'43.093"N	103°52'03.730"W	0.00	
11562.50†	90.000	172.854	9000.01	2666.48	-2636.58	399.28	684670.45	598707.31	32°38'42.111"N	103°52'03.590"W	0.00	
11662.50†	90.000	172.854	9000.00	2766.47	-2735.80	411.72	684682.89	598608.09	32°38'41.128"N	103°52'03.449"W	0.00	
11762.50†	90.000	172.854	9000.00	2866.46	-2835.02	424.16	684695.33	598508.87	32°38'40.146"N	103°52'03.309"W	0.00	
11862.50†	90.000	172.854	9000.00	2966.45	-2934.25	436.60	684707.77	598409.66	32°38'39.164"N	103°52'03.169"W	0.00	
11962.50†	90.000	172.854	9000.00	3066.43	-3033.47	449.03	684720.20	598310.44	32°38'38.181"N	103°52'03.028"W	0.00	
12062.50†	90.000	172.854	9000.00	3166.42	-3132.69	461.47	684732.64	598211.23	32°38'37.199"N	103°52'02.888"W	0.00	
12162.50†	90.000	172.854	9000.00	3266.41	-3231.92	473.91	684745.08	598112.01	32°38'36.217"N	103°52'02.747"W	0.00	
12262.50†	90.000	172.854	9000.00	3366.40	-3331.14	486.35	684757.52	598012.79	32°38'35.235"N	103°52'02.607"W	0.00	



Planned Wellpath Report

Plan #1
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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Eddy County, NM	Well	No. 4H
Field	(Penny) Sec 21, T19S, R31E	Wellbore	No. 4H PWB
Facility	Penny Pincher Fed Com No. 4H		

WELLPATH DATA (148 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]	Comments
12362.50†	90.000	172.854	9000.00	3466.39	-3430.36	498.79	684769.96	597913.58	32°38'34.252"N	103°52'02.467"W	0.00	
12462.50†	90.000	172.854	9000.00	3566.38	-3529.59	511.23	684782.39	597814.36	32°38'33.270"N	103°52'02.326"W	0.00	
12562.50†	90.000	172.854	9000.00	3666.37	-3628.81	523.67	684794.83	597715.14	32°38'32.288"N	103°52'02.186"W	0.00	
12662.50†	90.000	172.854	9000.00	3766.36	-3728.03	536.11	684807.27	597615.93	32°38'31.305"N	103°52'02.046"W	0.00	
12762.50†	90.000	172.854	9000.00	3866.35	-3827.26	548.55	684819.71	597516.71	32°38'30.323"N	103°52'01.905"W	0.00	
12862.50†	90.000	172.854	9000.00	3966.34	-3926.48	560.99	684832.15	597417.49	32°38'29.341"N	103°52'01.765"W	0.00	
12962.50†	90.000	172.854	9000.00	4066.33	-4025.70	573.42	684844.58	597318.28	32°38'28.359"N	103°52'01.624"W	0.00	
13062.50†	90.000	172.854	9000.00	4166.32	-4124.93	585.86	684857.02	597219.06	32°38'27.376"N	103°52'01.484"W	0.00	
13162.50†	90.000	172.854	9000.00	4266.31	-4224.15	598.30	684869.46	597119.84	32°38'26.394"N	103°52'01.344"W	0.00	
13262.50†	90.000	172.854	9000.00	4366.30	-4323.37	610.74	684881.90	597020.63	32°38'25.412"N	103°52'01.203"W	0.00	
13362.50†	90.000	172.854	9000.00	4466.28	-4422.60	623.18	684894.34	596921.41	32°38'24.429"N	103°52'01.063"W	0.00	
13462.50†	90.000	172.854	9000.00	4566.27	-4521.82	635.62	684906.78	596822.19	32°38'23.447"N	103°52'00.923"W	0.00	
13557.49	90.000	172.854	9000.00	4661.25	-4616.07	647.43	684918.59	596727.95	32°38'22.514"N	103°52'00.789"W	0.00	No.4H PBHL

HOLE & CASING SECTIONS - Ref Wellbore: No. 4H PWB Ref Wellpath: Plan #1

String/Diameter	Start MD [ft]	End MD [ft]	Interval [ft]	Start TVD [ft]	End TVD [ft]	Start N/S [ft]	Start E/W [ft]	End N/S [ft]	End E/W [ft]
26in Open Hole	20.00	585.00	565.00	20.00	584.98	0.00	0.00	-3.65	1.13
20in Casing	20.00	585.00	565.00	20.00	584.98	0.00	0.00	-3.65	1.13
17.5in Open Hole	585.00	2170.00	1585.00	584.98	2167.81	-3.65	1.13	29.16	51.91
13.375in Casing	20.00	2170.00	2150.00	20.00	2167.81	0.00	0.00	29.16	51.91
12.25in Open Hole	2170.00	4220.00	2050.00	2167.81	4217.28	29.16	51.91	30.76	88.98
9.625in Casing	20.00	4220.00	4200.00	20.00	4217.28	0.00	0.00	30.76	88.98
8.75in Open Hole	4220.00	13557.49	9337.49	4217.28	9000.00	30.76	88.98	-4616.07	647.43
5.5in Casing	20.00	13557.49	13537.49	20.00	9000.00	0.00	0.00	-4616.07	647.43



Planned Wellpath Report

Plan #1
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REFERENCE WELLPATH IDENTIFICATION			
Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Eddy County, NM	Well	No. 4H
Field	(Penny) Sec 21, T19S, R31E	Wellbore	No. 4H PWB
Facility	Penny Pincher Fed Com No. 4H		

TARGETS									
Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
1) No. 4H PBHL	13557.49	9000.00	4616.07	647.43	684918.59	596727.95	32°38'22.514"N	103°52'00.789"W	point

SURVEY PROGRAM - Ref Wellbore: No. 4H PWB Ref Wellpath: Plan #1				
Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
20.00	8562.50	Generic gyro - northseeking (Standard)		No.4H AWB
8562.50	13557.49	NaviTrak (Standard)		No. 4H PWB



Cimarex Energy Co.

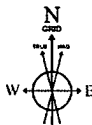
Location: Eddy County, NM
Field: (Penny) Sec 21, T19S, R31E
Facility: Penny Pincher Fed Com No. 4H

Slot: No. 4H SHL
Well: No. 4H
Wellbore: No. 4H ST01



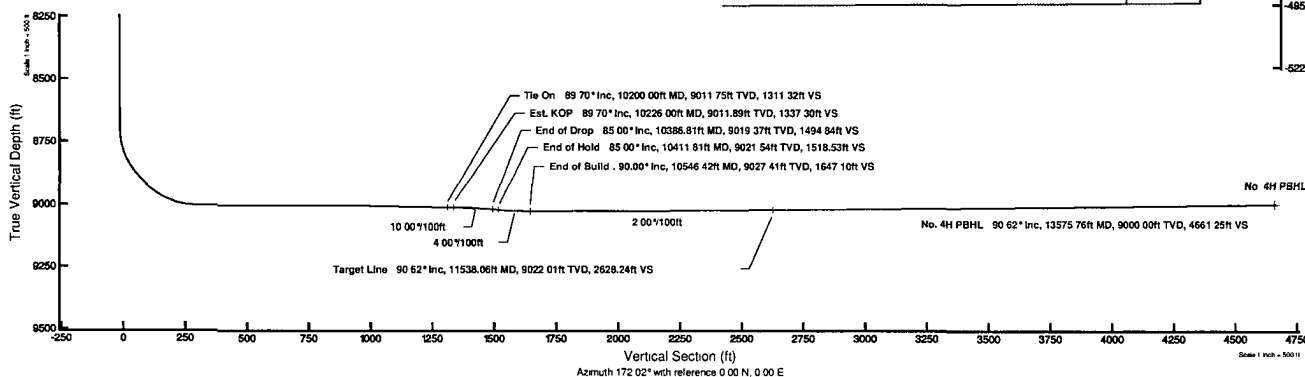
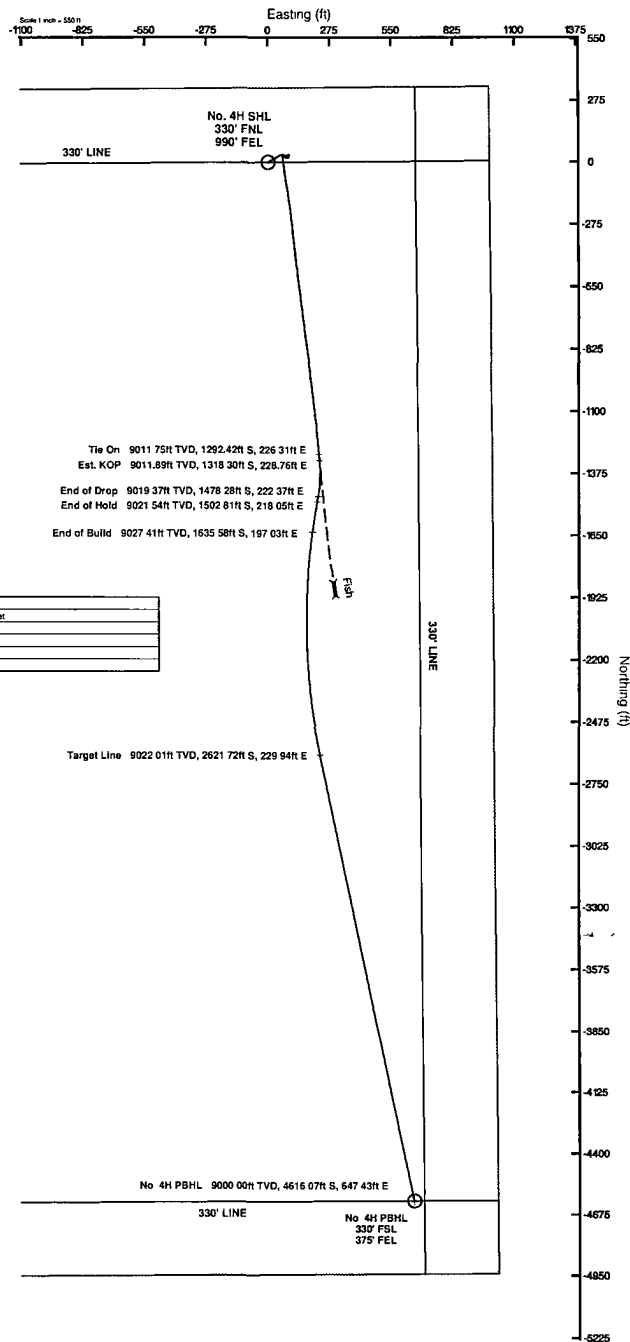
Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
Tie On	10200.00	89.700	174.600	9011.75	-1292.42	226.31	0.00	1311.32
Est. KOP	10226.00	89.700	174.600	9011.89	-1318.30	228.76	0.00	1337.30
End of Drop	10386.81	85.000	190.000	9019.37	-1478.28	222.37	10.00	1494.84
End of Hold	10411.81	85.000	190.000	9021.54	-1502.81	218.05	0.00	1518.53
End of Build	10546.42	90.000	188.000	9027.41	-1635.58	197.03	4.00	1647.10
Target Line	11538.06	90.619	168.176	9022.01	-2621.72	229.94	2.00	2628.24
No. 4H PBHL	13575.76	90.619	168.176	9000.00	-4616.07	647.43	0.00	4661.25



BGGM (1945.0 to 2012.0) Dip: 60.54° Field: 48865.6 nT
Magnetic North is 7.80 degrees East of True North (at 7/7/2011)
Grid North is 0.25 degrees East of True North
To correct azimuth from True to Grid subtract 0.25 degrees
To correct azimuth from Magnetic to Grid add 7.55 degrees
For example if the Magnetic North Azimuth = 90 degrees, then the Grid North Azimuth = 90 + 7.55 = 97.55

Plot reference wellpath is Plan 2 ST01	
True vertical depths are referenced to Rig on No. 4H SHL (KB)	Grid System: NAD83 / TM New Mexico SP, Eastern Zone (3001), US feet
Measured depths are referenced to Rig on No. 4H SHL (KB)	North Reference: Grid north
Rig on No. 4H SHL (KB) to Mean Sea Level: 3519 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: No. 4H SHL): 3499 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: calphik on 8/18/2011





Actual Wellpath Report

No.4H AWP ST01

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REFERENCE WELLPATH IDENTIFICATION			
Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Eddy County, NM	Well	No. 4H
Field	(Penny) Sec 21, T19S, R31E	Wellbore	No.4H AWB ST01
Facility	Penny Pincher Fed Com No. 4H		

REPORT SETUP INFORMATION			
Projection System	NAD83 / TM New Mexico SP, Eastern Zone (3001), US feet	Software System	WellArchitect® 3.0.0
North Reference	Grid	User	Gentbry
Scale	0.999932	Report Generated	8/19/2011 at 7:23:13 AM
Convergence at slot	0.25° East	Database/Source file	WA Midland/No.4H_AWB_ST01.xml

WELLPATH LOCATION						
	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	0.00	0.00	684271.20	601343.70	32°39'08.215"N	103°52'08.124"W
Facility Reference Pt			684271.20	601343.70	32°39'08.215"N	103°52'08.124"W
Field Reference Pt			681958.50	601329.30	32°39'08.172"N	103°52'35.176"W

WELLPATH DATUM			
Calculation method	Minimum curvature	Rig on No. 4H SHL (KB) to GL	20.00ft
Horizontal Reference Pt	Slot	Rig on No. 4H SHL (KB) to Mean Sea Level	3519.00ft
Vertical Reference Pt	Rig on No. 4H SHL (KB)	Rig on No. 4H SHL (KB) to Mud Line at Slot (No. 4H SHL)	20.00ft
MD Reference Pt	Rig on No. 4H SHL (KB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	172.02°



Actual Wellpath Report

No.4H AWP ST01

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REFERENCE WELLPATH IDENTIFICATION			
Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Eddy County, NM	Well	No. 4H
Field	(Penny) Sec 21, T19S, R31E	Wellbore	No.4H AWB ST01
Facility	Penny Pincher Fed Com No. 4H		

WELLPATH DATA (128 stations) † = interpolated/extrapolated station											
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]
0.00†	0.000	143.420	0.00	0.00	0.00	0.00	684271.20	601343.70	32°39'08.215"N	103°52'08.124"W	0.00
20.00	0.000	143.420	20.00	0.00	0.00	0.00	684271.20	601343.70	32°39'08.215"N	103°52'08.124"W	0.00
100.00	0.370	143.420	100.00	0.23	-0.21	0.15	684271.35	601343.49	32°39'08.213"N	103°52'08.123"W	0.46
200.00	0.490	149.020	200.00	0.90	-0.83	0.57	684271.77	601342.87	32°39'08.207"N	103°52'08.118"W	0.13
300.00	0.500	153.040	299.99	1.71	-1.59	0.98	684272.18	601342.11	32°39'08.199"N	103°52'08.113"W	0.04
400.00	0.420	169.660	399.99	2.49	-2.34	1.25	684272.45	601341.36	32°39'08.192"N	103°52'08.110"W	0.15
500.00	0.390	191.830	499.99	3.18	-3.03	1.24	684272.44	601340.67	32°39'08.185"N	103°52'08.110"W	0.16
600.00	0.470	188.910	599.98	3.89	-3.77	1.11	684272.31	601339.93	32°39'08.178"N	103°52'08.112"W	0.08
700.00	0.380	192.040	699.98	4.59	-4.50	0.98	684272.18	601339.20	32°39'08.171"N	103°52'08.113"W	0.09
808.60	0.230	187.650	808.58	5.14	-5.07	0.87	684272.07	601338.63	32°39'08.165"N	103°52'08.114"W	0.14
903.10	0.370	17.010	903.08	5.05	-4.96	0.94	684272.14	601338.74	32°39'08.166"N	103°52'08.114"W	0.63
997.70	0.880	9.450	997.67	4.08	-3.96	1.15	684272.35	601339.74	32°39'08.176"N	103°52'08.111"W	0.54
1092.30	0.990	358.560	1092.26	2.57	-2.42	1.25	684272.45	601341.28	32°39'08.191"N	103°52'08.110"W	0.22
1186.80	0.880	7.430	1186.75	1.06	-0.89	1.32	684272.52	601342.81	32°39'08.206"N	103°52'08.109"W	0.19
1281.40	1.010	34.820	1281.34	-0.25	0.52	1.89	684273.09	601344.22	32°39'08.220"N	103°52'08.102"W	0.49
1375.90	1.430	47.550	1375.81	-1.53	2.00	3.23	684274.43	601345.70	32°39'08.235"N	103°52'08.086"W	0.53
1470.50	2.320	55.100	1470.36	-3.06	3.89	5.68	684276.88	601347.59	32°39'08.253"N	103°52'08.058"W	0.97
1565.10	4.350	64.110	1564.80	-5.03	6.55	10.47	684281.67	601350.25	32°39'08.280"N	103°52'08.001"W	2.21
1659.60	5.430	67.510	1658.95	-7.26	9.83	17.83	684289.03	601353.53	32°39'08.312"N	103°52'07.915"W	1.18
1754.20	4.970	64.810	1753.16	-9.59	13.28	25.67	684296.87	601356.98	32°39'08.346"N	103°52'07.823"W	0.55
1848.70	4.640	58.260	1847.33	-12.34	17.04	32.63	684303.83	601360.74	32°39'08.382"N	103°52'07.742"W	0.68
1943.30	4.450	56.060	1941.64	-15.49	21.10	38.93	684310.12	601364.80	32°39'08.422"N	103°52'07.668"W	0.27
2037.90	4.210	56.220	2035.97	-18.61	25.08	44.86	684316.05	601368.78	32°39'08.461"N	103°52'07.598"W	0.25
2132.40	3.250	61.980	2130.26	-21.03	28.27	50.11	684321.30	601371.96	32°39'08.493"N	103°52'07.537"W	1.09
2227.00	2.410	72.310	2224.75	-22.29	30.13	54.37	684325.56	601373.83	32°39'08.511"N	103°52'07.487"W	1.04
2321.50	2.220	76.760	2319.17	-22.79	31.15	58.04	684329.24	601374.85	32°39'08.521"N	103°52'07.444"W	0.28
2416.10	2.230	86.680	2413.70	-22.81	31.68	61.66	684332.86	601375.38	32°39'08.526"N	103°52'07.401"W	0.41
2510.70	2.010	97.220	2508.24	-22.22	31.58	65.15	684336.34	601375.28	32°39'08.525"N	103°52'07.361"W	0.47
2605.20	1.790	105.950	2602.68	-21.19	30.96	68.21	684339.41	601374.66	32°39'08.519"N	103°52'07.325"W	0.38
2699.80	1.650	110.230	2697.24	-19.95	30.09	70.91	684342.10	601373.78	32°39'08.510"N	103°52'07.293"W	0.20
2794.30	1.400	122.370	2791.71	-18.56	29.00	73.16	684344.36	601372.70	32°39'08.499"N	103°52'07.267"W	0.43
2888.90	1.140	122.150	2886.28	-17.20	27.88	74.93	684346.13	601371.58	32°39'08.488"N	103°52'07.246"W	0.27
2983.50	0.860	121.780	2980.87	-16.14	27.00	76.33	684347.53	601370.70	32°39'08.479"N	103°52'07.230"W	0.30
3078.00	0.800	121.360	3075.36	-15.27	26.29	77.50	684348.69	601369.99	32°39'08.472"N	103°52'07.217"W	0.06
3172.60	0.800	118.920	3169.95	-14.45	25.62	78.64	684349.84	601369.32	32°39'08.465"N	103°52'07.203"W	0.04
3267.10	0.790	85.700	3264.44	-14.01	25.35	79.87	684351.06	601369.05	32°39'08.463"N	103°52'07.189"W	0.48
3361.70	0.660	68.460	3359.04	-14.10	25.60	81.03	684352.22	601369.30	32°39'08.465"N	103°52'07.175"W	0.27
3456.30	0.590	72.890	3453.63	-14.31	25.95	82.00	684353.19	601369.64	32°39'08.468"N	103°52'07.164"W	0.09
3550.80	0.830	54.160	3548.12	-14.70	26.49	83.02	684354.21	601370.19	32°39'08.474"N	103°52'07.152"W	0.35
3645.40	0.970	63.530	3642.71	-15.28	27.25	84.29	684355.48	601370.95	32°39'08.481"N	103°52'07.137"W	0.21
3739.90	0.570	71.760	3737.20	-15.61	27.75	85.45	684356.65	601371.45	32°39'08.486"N	103°52'07.123"W	0.44
3834.50	0.270	64.560	3831.80	-15.76	28.00	86.10	684357.29	601371.69	32°39'08.488"N	103°52'07.116"W	0.32
3929.10	0.530	58.430	3926.40	-16.01	28.32	86.67	684357.87	601372.02	32°39'08.492"N	103°52'07.109"W	0.28
4023.60	0.700	38.390	4020.89	-16.58	29.00	87.41	684358.60	601372.70	32°39'08.498"N	103°52'07.101"W	0.29
4118.20	0.760	39.960	4115.48	-17.40	29.93	88.17	684359.36	601373.63	32°39'08.508"N	103°52'07.092"W	0.07



Actual Wellpath Report

No.4H AWP ST01
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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Eddy County, NM	Well	No. 4H
Field	(Penny) Sec 21, T19S, R31E	Wellbore	No.4H AWP ST01
Facility	Penny Pincher Fed Com No. 4H		

WELLPATH DATA (128 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]
4212.70	0.560	49.860	4209.98	-18.06	30.71	88.92	684360.12	601374.41	32°39'08.515"N	103°52'07.083"W	0.24
4307.30	0.540	56.490	4304.57	-18.50	31.26	89.65	684360.84	601374.96	32°39'08.521"N	103°52'07.074"W	0.07
4401.90	0.660	66.490	4399.17	-18.84	31.72	90.52	684361.71	601375.42	32°39'08.525"N	103°52'07.064"W	0.17
4496.40	0.720	73.810	4493.66	-19.07	32.10	91.59	684362.78	601375.80	32°39'08.529"N	103°52'07.051"W	0.11
4591.00	0.700	78.940	4588.25	-19.19	32.38	92.73	684363.92	601376.08	32°39'08.532"N	103°52'07.038"W	0.07
4685.50	0.480	85.940	4682.75	-19.19	32.52	93.69	684364.88	601376.22	32°39'08.533"N	103°52'07.027"W	0.24
4780.10	0.570	94.810	4777.35	-19.06	32.51	94.55	684365.75	601376.21	32°39'08.533"N	103°52'07.017"W	0.13
4874.70	0.580	101.640	4871.94	-18.79	32.37	95.49	684366.68	601376.07	32°39'08.531"N	103°52'07.006"W	0.07
4969.20	0.340	108.950	4966.44	-18.51	32.18	96.22	684367.42	601375.88	32°39'08.529"N	103°52'06.997"W	0.26
5063.80	0.130	106.150	5061.04	-18.34	32.06	96.59	684367.79	601375.76	32°39'08.528"N	103°52'06.993"W	0.22
5158.30	0.100	199.480	5155.54	-18.22	31.96	96.67	684367.86	601375.65	32°39'08.527"N	103°52'06.992"W	0.18
5252.90	0.360	239.900	5250.14	-18.03	31.73	96.38	684367.58	601375.43	32°39'08.525"N	103°52'06.995"W	0.31
5347.50	0.480	236.620	5344.73	-17.75	31.36	95.80	684366.99	601375.06	32°39'08.521"N	103°52'07.002"W	0.13
5442.00	0.540	244.170	5439.23	-17.45	30.95	95.06	684366.26	601374.65	32°39'08.517"N	103°52'07.011"W	0.10
5536.60	0.460	228.620	5533.83	-17.10	30.50	94.38	684365.57	601374.20	32°39'08.513"N	103°52'07.019"W	0.17
5631.10	0.480	222.400	5628.32	-16.64	29.96	93.83	684365.02	601373.66	32°39'08.508"N	103°52'07.025"W	0.06
5725.70	0.560	218.970	5722.92	-16.07	29.31	93.27	684364.46	601373.01	32°39'08.501"N	103°52'07.032"W	0.09
5820.30	0.620	215.170	5817.51	-15.38	28.53	92.68	684363.88	601372.23	32°39'08.494"N	103°52'07.039"W	0.08
5914.80	0.480	204.300	5912.01	-14.67	27.75	92.23	684363.42	601371.45	32°39'08.486"N	103°52'07.044"W	0.18
6009.40	0.380	181.050	6006.61	-14.03	27.08	92.06	684363.25	601370.78	32°39'08.479"N	103°52'07.046"W	0.21
6103.90	0.510	179.000	6101.10	-13.30	26.34	92.06	684363.25	601370.04	32°39'08.472"N	103°52'07.046"W	0.14
6198.50	0.530	194.010	6195.70	-12.48	25.50	91.96	684363.15	601369.20	32°39'08.464"N	103°52'07.047"W	0.15
6293.10	0.620	193.530	6290.30	-11.60	24.58	91.73	684362.93	601368.27	32°39'08.454"N	103°52'07.050"W	0.10
6387.60	0.680	200.930	6384.79	-10.63	23.56	91.41	684362.61	601367.25	32°39'08.444"N	103°52'07.054"W	0.11
6482.20	0.640	202.790	6479.38	-9.68	22.54	91.01	684362.20	601366.24	32°39'08.434"N	103°52'07.059"W	0.05
6576.70	0.640	200.380	6573.88	-8.77	21.56	90.62	684361.81	601365.26	32°39'08.425"N	103°52'07.063"W	0.03
6671.30	0.680	203.810	6668.47	-7.82	20.55	90.21	684361.40	601364.25	32°39'08.415"N	103°52'07.068"W	0.06
6765.90	0.680	216.810	6763.06	-6.95	19.59	89.65	684360.84	601363.29	32°39'08.405"N	103°52'07.075"W	0.16
6860.40	0.610	224.660	6857.56	-6.25	18.78	88.96	684360.15	601362.48	32°39'08.397"N	103°52'07.083"W	0.12
6955.00	0.780	235.080	6952.15	-5.65	18.06	88.08	684359.27	601361.76	32°39'08.390"N	103°52'07.093"W	0.22
7049.50	0.830	253.240	7046.64	-5.25	17.49	86.89	684358.09	601361.19	32°39'08.385"N	103°52'07.107"W	0.27
7144.10	0.840	255.150	7141.23	-5.07	17.12	85.57	684356.76	601360.82	32°39'08.381"N	103°52'07.123"W	0.03
7238.70	1.090	278.100	7235.82	-5.23	17.07	84.01	684355.20	601360.76	32°39'08.380"N	103°52'07.141"W	0.48
7333.20	1.030	295.930	7330.30	-5.95	17.56	82.35	684353.55	601361.26	32°39'08.385"N	103°52'07.160"W	0.35
7427.80	1.250	302.930	7424.88	-7.11	18.50	80.72	684351.92	601362.19	32°39'08.395"N	103°52'07.179"W	0.27
7522.30	1.420	289.360	7519.36	-8.32	19.44	78.75	684349.95	601363.14	32°39'08.404"N	103°52'07.202"W	0.38
7616.90	1.520	294.770	7613.93	-9.54	20.36	76.51	684347.70	601364.06	32°39'08.413"N	103°52'07.228"W	0.18
7711.50	1.390	303.380	7708.50	-10.97	21.52	74.41	684345.60	601365.21	32°39'08.425"N	103°52'07.253"W	0.27
7806.00	1.130	306.520	7802.97	-12.38	22.70	72.70	684343.90	601366.40	32°39'08.437"N	103°52'07.273"W	0.28
7900.60	0.920	304.540	7897.56	-13.55	23.69	71.33	684342.52	601367.39	32°39'08.447"N	103°52'07.289"W	0.23
7995.10	0.230	327.590	7992.05	-14.24	24.28	70.60	684341.80	601367.98	32°39'08.452"N	103°52'07.297"W	0.76
8089.70	0.640	275.600	8086.65	-14.53	24.49	69.97	684341.17	601368.19	32°39'08.454"N	103°52'07.305"W	0.56
8184.30	0.850	275.200	8181.24	-14.82	24.60	68.75	684339.94	601368.30	32°39'08.456"N	103°52'07.319"W	0.22
8278.80	1.080	265.100	8275.73	-15.02	24.59	67.16	684338.36	601368.29	32°39'08.456"N	103°52'07.338"W	0.30
8373.40	1.070	255.020	8370.31	-14.96	24.29	65.42	684336.62	601367.99	32°39'08.453"N	103°52'07.358"W	0.20



Actual Wellpath Report

No.4H AWP ST01

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Eddy County, NM	Well	No. 4H
Field	(Penny) Sec 21, T19S, R31E	Wellbore	No.4H AWP ST01
Facility	Penny Pincher Fed Com No. 4H		

WELLPATH DATA (128 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]
8467.90	0.510	266.200	8464.80	-14.89	24.03	64.15	684335.34	601367.73	32°39'08.450"N	103°52'07.373"W	0.61
8562.50	0.340	36.420	8559.40	-15.12	24.23	63.90	684335.09	601367.93	32°39'08.452"N	103°52'07.376"W	0.82
8674.00	0.400	184.650	8670.90	-14.98	24.11	64.06	684335.26	601367.81	32°39'08.451"N	103°52'07.374"W	0.64
8706.00	0.700	185.500	8702.90	-14.68	23.80	64.03	684335.23	601367.50	32°39'08.448"N	103°52'07.374"W	0.94
8738.00	5.500	167.700	8734.84	-12.96	22.11	64.34	684335.54	601365.81	32°39'08.431"N	103°52'07.371"W	15.12
8770.00	12.500	168.600	8766.43	-7.96	17.21	65.35	684336.55	601360.91	32°39'08.383"N	103°52'07.359"W	21.88
8802.00	19.900	171.000	8797.14	0.95	8.42	66.89	684338.09	601352.12	32°39'08.296"N	103°52'07.342"W	23.21
8833.00	27.200	173.000	8825.54	13.33	-3.84	68.58	684339.78	601339.86	32°39'08.174"N	103°52'07.322"W	23.69
8865.00	34.100	173.700	8853.05	29.62	-20.03	70.46	684341.66	601323.67	32°39'08.014"N	103°52'07.301"W	21.59
8897.00	39.500	172.200	8878.67	48.78	-39.05	72.83	684344.02	601304.66	32°39'07.826"N	103°52'07.275"W	17.11
8928.00	44.200	171.200	8901.75	69.46	-59.50	75.82	684347.02	601284.20	32°39'07.623"N	103°52'07.241"W	15.31
8960.00	48.700	171.600	8923.79	92.64	-82.43	79.29	684350.48	601261.27	32°39'07.396"N	103°52'07.201"W	14.09
8992.00	52.900	171.000	8944.01	117.43	-106.94	83.04	684354.23	601236.77	32°39'07.154"N	103°52'07.159"W	13.21
9024.00	58.300	170.500	8962.09	143.82	-132.99	87.29	684358.48	601210.72	32°39'06.896"N	103°52'07.110"W	16.92
9055.00	63.800	171.100	8977.09	170.93	-159.75	91.62	684362.81	601183.96	32°39'06.631"N	103°52'07.061"W	17.82
9087.00	71.000	171.800	8989.38	200.45	-188.95	96.00	684367.20	601154.76	32°39'06.342"N	103°52'07.011"W	22.59
9119.00	77.600	172.900	8998.03	231.24	-219.47	100.10	684371.29	601124.25	32°39'06.039"N	103°52'06.965"W	20.89
9151.00	84.500	173.300	9003.01	262.83	-250.83	103.89	684375.08	601092.89	32°39'05.729"N	103°52'06.922"W	21.60
9183.00	88.600	174.100	9004.93	294.75	-282.57	107.39	684378.59	601061.15	32°39'05.415"N	103°52'06.883"W	13.05
9246.00	89.700	174.000	9005.87	357.70	-345.22	113.92	684385.12	600998.50	32°39'04.795"N	103°52'06.810"W	1.75
9310.00	90.000	173.600	9006.03	421.67	-408.85	120.84	684392.03	600934.88	32°39'04.165"N	103°52'06.732"W	0.78
9374.00	90.700	173.100	9005.64	485.65	-472.42	128.25	684399.44	600871.32	32°39'03.535"N	103°52'06.649"W	1.34
9437.00	89.400	173.000	9005.59	548.64	-534.95	135.87	684407.06	600808.79	32°39'02.916"N	103°52'06.563"W	2.07
9501.00	89.500	173.200	9006.20	612.62	-598.49	143.56	684414.75	600745.26	32°39'02.287"N	103°52'06.476"W	0.35
9564.00	90.400	172.800	9006.26	675.61	-661.01	151.24	684422.43	600682.73	32°39'01.668"N	103°52'06.389"W	1.56
9628.00	89.900	173.000	9006.09	739.61	-724.52	159.15	684430.34	600619.23	32°39'01.040"N	103°52'06.300"W	0.84
9691.00	90.900	172.200	9005.65	802.60	-787.00	167.26	684438.45	600556.76	32°39'00.421"N	103°52'06.208"W	2.03
9755.00	89.800	171.800	9005.26	866.60	-850.37	176.17	684447.35	600493.39	32°38'59.794"N	103°52'06.107"W	1.83
9819.00	89.900	172.300	9005.43	930.60	-913.76	185.02	684456.21	600430.01	32°38'59.166"N	103°52'06.007"W	0.80
9882.00	88.900	173.400	9006.08	993.58	-976.26	192.86	684464.05	600367.51	32°38'58.547"N	103°52'05.919"W	2.36
9946.00	88.600	173.100	9007.48	1057.55	-1039.80	200.38	684471.57	600303.97	32°38'57.918"N	103°52'05.834"W	0.66
10009.00	88.600	173.500	9009.02	1120.52	-1102.35	207.73	684478.91	600241.42	32°38'57.299"N	103°52'05.751"W	0.63
10073.00	88.700	174.500	9010.53	1184.46	-1165.98	214.42	684485.60	600177.80	32°38'56.669"N	103°52'05.676"W	1.57
10137.00	89.700	174.700	9011.42	1248.39	-1229.69	220.44	684491.62	600114.09	32°38'56.039"N	103°52'05.609"W	1.59
10200.00	89.700	174.600	9011.75	1311.32	-1292.42	226.31	684497.50	600051.37	32°38'55.418"N	103°52'05.544"W	0.16
10244.00	87.300	176.600	9012.90	1355.22	-1336.27	229.69	684500.87	600007.53	32°38'54.984"N	103°52'05.506"W	7.10
10275.00	86.300	177.300	9014.63	1386.05	-1367.17	231.33	684502.52	599976.62	32°38'54.678"N	103°52'05.489"W	3.94
10307.00	86.700	177.200	9016.59	1417.86	-1399.08	232.87	684504.05	599944.72	32°38'54.362"N	103°52'05.472"W	1.29



Actual Wellpath Report

No.4H AWP ST01

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REFERENCE WELLPATH IDENTIFICATION			
Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Eddy County, NM	Well	No. 4H
Field	(Penny) Sec 21, T19S, R31E	Wellbore	No.4H AWB ST01
Facility	Penny Pincher Fed Com No. 4H		

TARGETS									
Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
No. 4H PBHL		9000.00	-4616.07	647.43	684918.59	596727.95	32°38'22.514"N	103°52'00.789"W	point

WELLPATH COMPOSITION - Ref Wellbore: No.4H AWB ST01					Ref Wellpath: No.4H AWP ST01	
Start MD [ft]	End MD [ft]	Positional Uncertainty Model			Log Name/Comment	Wellbore
20.00	8562.50	Generic gyro - northseeking (Standard)			Gyro	No.4H AWB
8562.50	10009.00	NaviTrak (Standard)			MWD	No.4H AWB
10009.00	10307.00	NaviTrak (Standard)			MWD ST01	No.4H AWB ST01



Cimarex Energy Co.

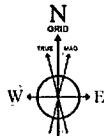
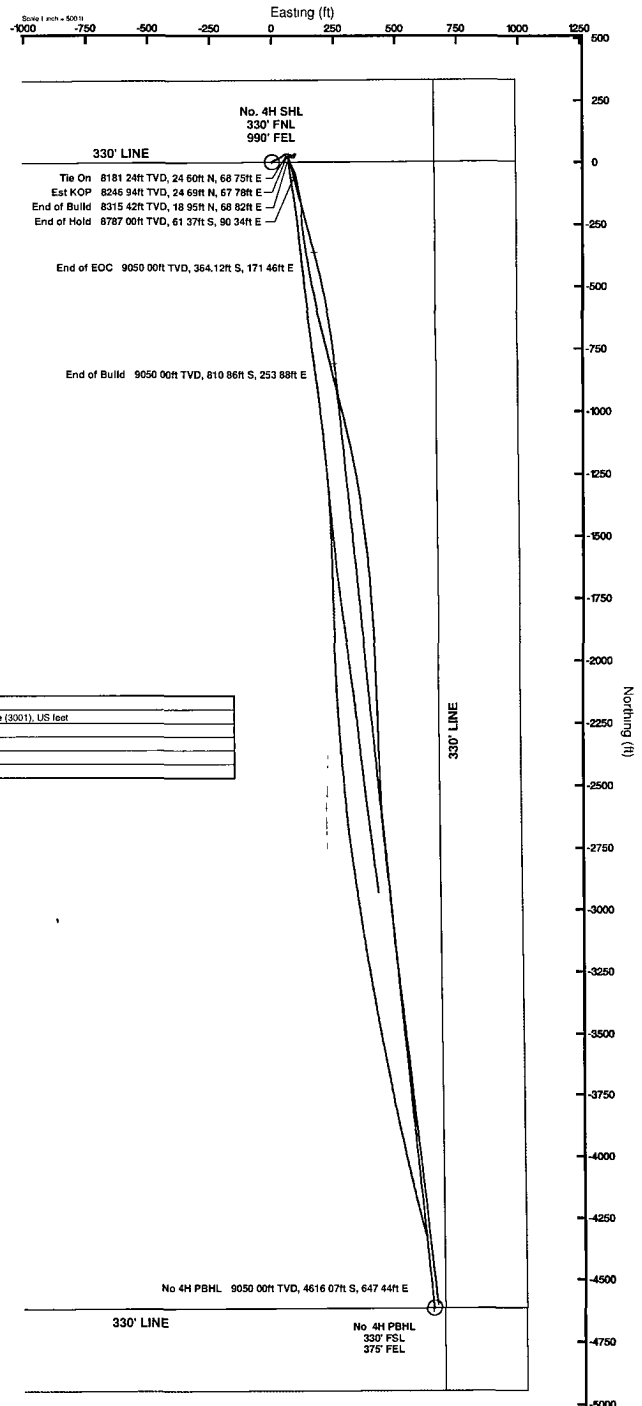
Location Eddy County, NM
Field: (Penny) Sec 21, T19S, R31E
Facility Penny Pincher Fed Com No. 4H

Slot: No. 4H SHL
Well No. 4H
Wellbore No. 4H ST02



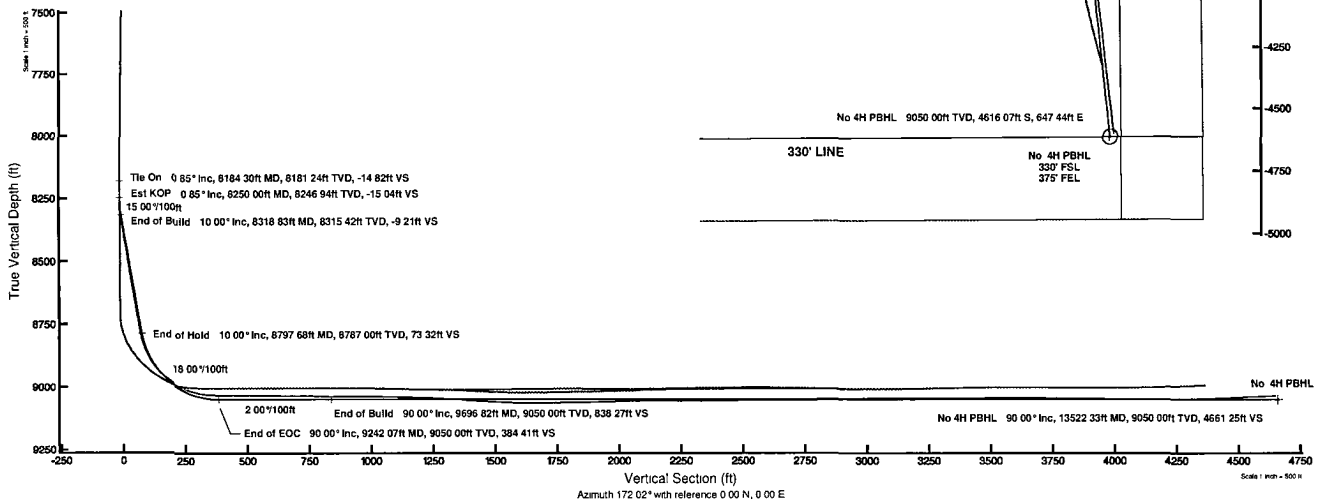
Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
Tie On	8184.30	0.850	275.200	8181.24	24.60	68.75	0.00	-14.82
Est KOP	8250.00	0.850	275.200	8246.94	24.69	67.78	0.00	-15.04
End of Build	8318.83	10.000	165.000	8315.42	18.95	68.82	15.00	-9.21
End of Hold	8797.68	10.000	165.000	8787.00	-61.37	90.34	0.00	73.32
End of EOC	9242.07	90.000	165.000	9050.00	-364.12	171.46	18.00	384.41
End of Build	9696.82	90.000	174.095	9050.00	-810.86	253.88	2.00	838.27
No 4H PBHL	13522.33	90.000	174.095	9050.00	-4616.07	647.44	0.00	4661.25



BGGM (1945.0 to 2012.0) Dip: 60.54° Field: 48965.6 nT
Magnetic North is 7.80 degrees East of True North (at 7/7/2011)
Grid North is 0.23 degrees East of True North
To correct azimuth from True to Grid subtract 0.23 degrees
To correct azimuth from Magnetic to Grid add 7.55 degrees
For example if the Magnetic North Azimuth = 90 degs then the Grid North Azimuth = 90 + 7.55 = 97.55

Plot reference wellpath is Plan #3 ST02	
True vertical depths are referenced to Rig on No. 4H SHL (KB)	Grid System: NAD83 / TM New Mexico SP, Eastern Zone (3001), US feet
Measured depths are referenced to Rig on No. 4H SHL (KB)	North Reference: Grid north
Rig on No. 4H SHL (KB) to Mean Sea Level: 3519 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot No. 4H SHL): 3499 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: calphkh on 9/5/2011





Actual Wellpath Report

No.4H AWP ST02

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Eddy County, NM	Well	No. 4H
Field	(Penny) Sec 21, T19S, R31E	Wellbore	No.4H AWB ST02
Facility	Penny Pincher Fed Com No. 4H	Sidetrack from	No.4H AWB at 8184.30 MD

REPORT SETUP INFORMATION

Projection System	NAD83 / TM New Mexico SP, Eastern Zone (3001), US feet	Software System	WellArchitect® 3.0.0
North Reference	Grid	User	Gentbry
Scale	0.999932	Report Generated	9/19/2011 at 7:54:27 AM
Convergence at slot	0.25° East	Database/Source file	WA Midland/No.4H_AWB_ST02.xml

WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	0.00	0.00	684271.20	601343.70	32°39'08.215"N	103°52'08.124"W
Facility Reference Pt			684271.20	601343.70	32°39'08.215"N	103°52'08.124"W
Field Reference Pt			681958.50	601329.30	32°39'08.172"N	103°52'35.176"W

WELLPATH DATUM

Calculation method	Minimum curvature	Rig on No. 4H SHL (KB) to GL	20.00ft
Horizontal Reference Pt	Slot	Rig on No. 4H SHL (KB) to Mean Sea Level	3519.00ft
Vertical Reference Pt	Rig on No. 4H SHL (KB)	Rig on No. 4H SHL (KB) to Mud Line at Slot (No. 4H SHL)	20.00ft
MD Reference Pt	Rig on No. 4H SHL (KB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	172.02°



Actual Wellpath Report

No.4H AWP ST02

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Eddy County, NM	Well	No. 4H
Field	(Penny) Sec 21, T19S, R31E	Wellbore	No.4H AWP ST02
Facility	Penny Pincher Fed Com No. 4H	Sidetrack from	No.4H AWP at 8184.30 MD

WELLPATH DATA (183 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]
0.00†	0.000	143.420	0.00	0.00	0.00	0.00	684271.20	601343.70	32°39'08.215"N	103°52'08.124"W	0.00
20.00	0.000	143.420	20.00	0.00	0.00	0.00	684271.20	601343.70	32°39'08.215"N	103°52'08.124"W	0.00
100.00	0.370	143.420	100.00	0.23	-0.21	0.15	684271.35	601343.49	32°39'08.213"N	103°52'08.123"W	0.46
200.00	0.490	149.020	200.00	0.90	-0.83	0.57	684271.77	601342.87	32°39'08.207"N	103°52'08.118"W	0.13
300.00	0.500	153.040	299.99	1.71	-1.59	0.98	684272.18	601342.11	32°39'08.199"N	103°52'08.113"W	0.04
400.00	0.420	169.660	399.99	2.49	-2.34	1.25	684272.45	601341.36	32°39'08.192"N	103°52'08.110"W	0.15
500.00	0.390	191.830	499.99	3.18	-3.03	1.24	684272.44	601340.67	32°39'08.185"N	103°52'08.110"W	0.16
600.00	0.470	188.910	599.98	3.89	-3.77	1.11	684272.31	601339.93	32°39'08.178"N	103°52'08.112"W	0.08
700.00	0.380	192.040	699.98	4.59	-4.50	0.98	684272.18	601339.20	32°39'08.171"N	103°52'08.113"W	0.09
808.60	0.230	187.650	808.58	5.14	-5.07	0.87	684272.07	601338.63	32°39'08.165"N	103°52'08.114"W	0.14
903.10	0.370	17.010	903.08	5.05	-4.96	0.94	684272.14	601338.74	32°39'08.166"N	103°52'08.114"W	0.63
997.70	0.880	9.450	997.67	4.08	-3.96	1.15	684272.35	601339.74	32°39'08.176"N	103°52'08.111"W	0.54
1092.30	0.990	358.560	1092.26	2.57	-2.42	1.25	684272.45	601341.28	32°39'08.191"N	103°52'08.110"W	0.22
1186.80	0.880	7.430	1186.75	1.06	-0.89	1.32	684272.52	601342.81	32°39'08.206"N	103°52'08.109"W	0.19
1281.40	1.010	34.820	1281.34	-0.25	0.52	-1.89	684273.09	601344.22	32°39'08.220"N	103°52'08.102"W	-0.49
1375.90	1.430	47.550	1375.81	-1.53	2.00	3.23	684274.43	601345.70	32°39'08.235"N	103°52'08.086"W	0.53
1470.50	2.320	55.100	1470.36	-3.06	3.89	5.68	684276.88	601347.59	32°39'08.253"N	103°52'08.058"W	0.97
1565.10	4.350	64.110	1564.80	-5.03	6.55	10.47	684281.67	601350.25	32°39'08.280"N	103°52'08.001"W	2.21
1659.60	5.430	67.510	1658.95	-7.26	9.83	17.83	684289.03	601353.53	32°39'08.312"N	103°52'07.915"W	1.18
1754.20	4.970	64.810	1753.16	-9.59	13.28	25.67	684296.87	601356.98	32°39'08.346"N	103°52'07.823"W	-0.55
1848.70	4.640	58.260	1847.33	-12.34	17.04	32.63	684303.83	601360.74	32°39'08.382"N	103°52'07.742"W	0.68
1943.30	4.450	56.060	1941.64	-15.49	21.10	38.93	684310.12	601364.80	32°39'08.422"N	103°52'07.668"W	0.27
2037.90	4.210	56.220	2035.97	-18.61	25.08	44.86	684316.05	601368.78	32°39'08.461"N	103°52'07.598"W	0.25
2132.40	3.250	61.980	2130.26	-21.03	28.27	50.11	684321.30	601371.96	32°39'08.493"N	103°52'07.537"W	1.09
2227.00	2.410	72.310	2224.75	-22.29	30.13	54.37	684325.56	601373.83	32°39'08.511"N	103°52'07.487"W	1.04
2321.50	2.220	76.760	2319.17	-22.79	31.15	58.04	684329.24	601374.85	32°39'08.521"N	103°52'07.444"W	0.28
2416.10	2.230	86.680	2413.70	-22.81	31.68	61.66	684332.86	601375.38	32°39'08.526"N	103°52'07.401"W	0.41
2510.70	2.010	97.220	2508.24	-22.22	31.58	65.15	684336.34	601375.28	32°39'08.525"N	103°52'07.361"W	0.47
2605.20	1.790	105.950	2602.68	-21.19	30.96	68.21	684339.41	601374.66	32°39'08.519"N	103°52'07.325"W	0.38
2699.80	1.650	110.230	2697.24	-19.95	30.09	70.91	684342.10	601373.78	32°39'08.510"N	103°52'07.293"W	-0.20
2794.30	1.400	122.370	2791.71	-18.56	29.00	73.16	684344.36	601372.70	32°39'08.499"N	103°52'07.267"W	0.43
2888.90	1.140	122.150	2886.28	-17.20	27.88	74.93	684346.13	601371.58	32°39'08.488"N	103°52'07.246"W	0.27
2983.50	0.860	121.780	2980.87	-16.14	27.00	76.33	684347.53	601370.70	32°39'08.479"N	103°52'07.230"W	0.30
3078.00	0.800	121.360	3075.36	-15.27	26.29	77.50	684348.69	601369.99	32°39'08.472"N	103°52'07.217"W	0.06
3172.60	0.800	118.920	3169.95	-14.45	25.62	78.64	684349.84	601369.32	32°39'08.465"N	103°52'07.203"W	0.04
3267.10	0.790	85.700	3264.44	-14.01	25.35	79.87	684351.06	601369.05	32°39'08.463"N	103°52'07.189"W	0.48
3361.70	0.660	68.460	3359.04	-14.10	25.60	81.03	684352.22	601369.30	32°39'08.465"N	103°52'07.175"W	0.27
3456.30	0.590	72.890	3453.63	-14.31	25.95	82.00	684353.19	601369.64	32°39'08.468"N	103°52'07.164"W	0.09
3550.80	0.830	54.160	3548.12	-14.70	26.49	83.02	684354.21	601370.19	32°39'08.474"N	103°52'07.152"W	0.35
3645.40	0.970	63.530	3642.71	-15.28	27.25	84.29	684355.48	601370.95	32°39'08.481"N	103°52'07.137"W	-0.21
3739.90	0.570	71.760	3737.20	-15.61	27.75	85.45	684356.65	601371.45	32°39'08.486"N	103°52'07.123"W	0.44
3834.50	0.270	64.560	3831.80	-15.76	28.00	86.10	684357.29	601371.69	32°39'08.488"N	103°52'07.116"W	0.32
3929.10	0.530	58.430	3926.40	-16.01	28.32	86.67	684357.87	601372.02	32°39'08.492"N	103°52'07.109"W	0.28
4023.60	0.700	38.390	4020.89	-16.58	29.00	87.41	684358.60	601372.70	32°39'08.498"N	103°52'07.101"W	0.29
4118.20	0.760	39.960	4115.48	-17.40	29.93	88.17	684359.36	601373.63	32°39'08.508"N	103°52'07.092"W	-0.07



Actual Wellpath Report

No.4H AWP ST02

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REFERENCE WELLPATH IDENTIFICATION			
Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Eddy County, NM	Well	No. 4H
Field	(Penny) Sec 21, T19S, R31E	Wellbore	No.4H AWP ST02
Facility	Penny Pincher Fed Com No. 4H	Sidetrack from	No.4H AWP at 8184.30 MD

WELLPATH DATA (183 stations)											
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]
4212.70	0.560	49.860	4209.98	-18.06	30.71	88.92	684360.12	601374.41	32°39'08.515"N	103°52'07.083"W	0.24
4307.30	0.540	56.490	4304.57	-18.50	31.26	89.65	684360.84	601374.96	32°39'08.521"N	103°52'07.074"W	0.07
4401.90	0.660	66.490	4399.17	-18.84	31.72	90.52	684361.71	601375.42	32°39'08.525"N	103°52'07.064"W	0.17
4496.40	0.720	73.810	4493.66	-19.07	32.10	91.59	684362.78	601375.80	32°39'08.529"N	103°52'07.051"W	0.11
4591.00	0.700	78.940	4588.25	-19.19	32.38	92.73	684363.92	601376.08	32°39'08.532"N	103°52'07.038"W	0.07
4685.50	0.480	85.940	4682.75	-19.19	32.52	93.69	684364.88	601376.22	32°39'08.533"N	103°52'07.027"W	0.24
4780.10	0.570	94.810	4777.35	-19.06	32.51	94.55	684365.75	601376.21	32°39'08.533"N	103°52'07.017"W	0.13
4874.70	0.580	101.640	4871.94	-18.79	32.37	95.49	684366.68	601376.07	32°39'08.531"N	103°52'07.006"W	0.07
4969.20	0.340	108.950	4966.44	-18.51	32.18	96.22	684367.42	601375.88	32°39'08.529"N	103°52'06.997"W	0.26
5063.80	0.130	106.150	5061.04	-18.34	32.06	96.59	684367.79	601375.76	32°39'08.528"N	103°52'06.993"W	0.22
5158.30	0.100	199.480	5155.54	-18.22	31.96	96.67	684367.86	601375.65	32°39'08.527"N	103°52'06.992"W	0.18
5252.90	0.360	239.900	5250.14	-18.03	31.73	96.38	684367.58	601375.43	32°39'08.525"N	103°52'06.995"W	0.31
5347.50	0.480	236.620	5344.73	-17.75	31.36	95.80	684366.99	601375.06	32°39'08.521"N	103°52'07.002"W	0.13
5442.00	0.540	244.170	5439.23	-17.45	30.95	95.06	684366.26	601374.65	32°39'08.517"N	103°52'07.011"W	0.10
5536.60	0.460	228.620	5533.83	-17.10	30.50	94.38	684365.57	601374.20	32°39'08.513"N	103°52'07.019"W	0.17
5631.10	0.480	222.400	5628.32	-16.64	29.96	93.83	684365.02	601373.66	32°39'08.508"N	103°52'07.025"W	0.06
5725.70	0.560	218.970	5722.92	-16.07	29.31	93.27	684364.46	601373.01	32°39'08.501"N	103°52'07.032"W	0.09
5820.30	0.620	215.170	5817.51	-15.38	28.53	92.68	684363.88	601372.23	32°39'08.494"N	103°52'07.039"W	0.08
5914.80	0.480	204.300	5912.01	-14.67	27.75	92.23	684363.42	601371.45	32°39'08.486"N	103°52'07.044"W	0.18
6009.40	0.380	181.050	6006.61	-14.03	27.08	92.06	684363.25	601370.78	32°39'08.479"N	103°52'07.046"W	0.21
6103.90	0.510	179.000	6101.10	-13.30	26.34	92.06	684363.25	601370.04	32°39'08.472"N	103°52'07.046"W	0.14
6198.50	0.530	194.010	6195.70	-12.48	25.50	91.96	684363.15	601369.20	32°39'08.464"N	103°52'07.047"W	0.15
6293.10	0.620	193.530	6290.30	-11.60	24.58	91.73	684362.93	601368.27	32°39'08.454"N	103°52'07.050"W	0.10
6387.60	0.680	200.930	6384.79	-10.63	23.56	91.41	684362.61	601367.25	32°39'08.444"N	103°52'07.054"W	0.11
6482.20	0.640	202.790	6479.38	-9.68	22.54	91.01	684362.20	601366.24	32°39'08.434"N	103°52'07.059"W	0.05
6576.70	0.640	200.380	6573.88	-8.77	21.56	90.62	684361.81	601365.26	32°39'08.425"N	103°52'07.063"W	0.03
6671.30	0.680	203.810	6668.47	-7.82	20.55	90.21	684361.40	601364.25	32°39'08.415"N	103°52'07.068"W	0.06
6765.90	0.680	216.810	6763.06	-6.95	19.59	89.65	684360.84	601363.29	32°39'08.405"N	103°52'07.075"W	0.16
6860.40	0.610	224.660	6857.56	-6.25	18.78	88.96	684360.15	601362.48	32°39'08.397"N	103°52'07.083"W	0.12
6955.00	0.780	235.080	6952.15	-5.65	18.06	88.08	684359.27	601361.76	32°39'08.390"N	103°52'07.093"W	0.22
7049.50	0.830	253.240	7046.64	-5.25	17.49	86.89	684358.09	601361.19	32°39'08.385"N	103°52'07.107"W	0.27
7144.10	0.840	255.150	7141.23	-5.07	17.12	85.57	684356.76	601360.82	32°39'08.381"N	103°52'07.123"W	0.03
7238.70	1.090	278.100	7235.82	-5.23	17.07	84.01	684355.20	601360.76	32°39'08.380"N	103°52'07.141"W	0.48
7333.20	1.030	295.930	7330.30	-5.95	17.56	82.35	684353.55	601361.26	32°39'08.385"N	103°52'07.160"W	0.35
7427.80	1.250	302.930	7424.88	-7.11	18.50	80.72	684351.92	601362.19	32°39'08.395"N	103°52'07.179"W	0.27
7522.30	1.420	289.360	7519.36	-8.32	19.44	78.75	684349.95	601363.14	32°39'08.404"N	103°52'07.202"W	0.38
7616.90	1.520	294.770	7613.93	-9.54	20.36	76.51	684347.70	601364.06	32°39'08.413"N	103°52'07.228"W	0.18
7711.50	1.390	303.380	7708.50	-10.97	21.52	74.41	684345.60	601365.21	32°39'08.425"N	103°52'07.253"W	0.27
7806.00	1.130	306.520	7802.97	-12.38	22.70	72.70	684343.90	601366.40	32°39'08.437"N	103°52'07.273"W	0.28
7900.60	0.920	304.540	7897.56	-13.55	23.69	71.33	684342.52	601367.39	32°39'08.447"N	103°52'07.289"W	0.23
7995.10	0.230	327.590	7992.05	-14.24	24.28	70.60	684341.80	601367.98	32°39'08.452"N	103°52'07.297"W	0.76
8089.70	0.640	275.600	8086.65	-14.53	24.49	69.97	684341.17	601368.19	32°39'08.454"N	103°52'07.305"W	0.56
8184.30	0.850	275.200	8181.24	-14.82	24.60	68.75	684339.94	601368.30	32°39'08.456"N	103°52'07.319"W	0.22
8267.00	2.300	179.100	8263.92	-13.31	23.00	68.16	684339.36	601366.70	32°39'08.440"N	103°52'07.326"W	3.07
8298.00	5.000	174.800	8294.85	-11.34	21.03	68.30	684339.49	601364.73	32°39'08.420"N	103°52'07.324"W	8.75



Actual Wellpath Report

No.4H AWP ST02

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Eddy County, NM	Well	No. 4H
Field	(Penny) Sec 21, T19S, R31E	Wellbore	No.4H AWP ST02
Facility	Penny Pincher Fed Com No. 4H	Sidetrack from	No.4H AWP at 8184.30 MD

WELLPATH DATA (183 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]
8330.00	5.500	174.500	8326.72	-8.42	18.12	68.57	684339.76	601361.82	32°39'08.392"N	103°52'07.321"W	1.56
8359.00	7.500	166.300	8355.53	-5.15	14.89	69.15	684340.35	601358.59	32°39'08.360"N	103°52'07.315"W	7.59
8424.00	10.300	159.600	8419.74	4.75	5.32	72.18	684343.38	601349.02	32°39'08.265"N	103°52'07.280"W	4.59
8488.00	9.500	156.400	8482.79	15.43	-4.88	76.29	684347.49	601338.82	32°39'08.164"N	103°52'07.232"W	1.52
8551.00	10.200	154.800	8544.86	25.76	-14.69	80.75	684351.94	601329.01	32°39'08.066"N	103°52'07.181"W	-1.19
8583.00	10.100	156.600	8576.36	31.17	-19.83	83.07	684354.26	601323.87	32°39'08.015"N	103°52'07.154"W	1.04
8614.00	10.200	157.300	8606.88	36.45	-24.86	85.21	684356.40	601318.85	32°39'07.966"N	103°52'07.129"W	0.51
8646.00	10.000	157.400	8638.38	41.88	-30.03	87.37	684358.56	601313.67	32°39'07.914"N	103°52'07.104"W	0.63
8678.00	9.600	156.300	8669.91	47.14	-35.04	89.51	684360.70	601308.66	32°39'07.865"N	103°52'07.079"W	1.38
8709.00	9.900	156.500	8700.47	52.19	-39.85	91.61	684362.80	601303.85	32°39'07.817"N	103°52'07.055"W	0.97
8741.00	10.300	160.300	8731.97	57.64	-45.07	93.67	684364.86	601298.63	32°39'07.765"N	103°52'07.031"W	2.43
8774.00	10.200	161.300	8764.44	63.40	-50.61	95.60	684366.80	601293.09	32°39'07.710"N	103°52'07.009"W	0.62
8805.00	12.500	162.900	8794.83	69.41	-56.42	97.47	684368.66	601287.28	32°39'07.653"N	103°52'06.987"W	7.49
8837.00	17.300	166.900	8825.75	77.58	-64.37	99.57	684370.76	601279.33	32°39'07.574"N	103°52'06.963"W	15.33
8869.00	23.700	168.700	8855.71	88.75	-75.32	101.91	684373.10	601268.38	32°39'07.466"N	103°52'06.936"W	20.09
8901.00	29.800	170.500	8884.27	103.13	-89.49	104.48	684375.68	601254.22	32°39'07.325"N	103°52'06.907"W	19.23
8933.00	35.800	171.900	8911.16	120.46	-106.61	107.12	684378.31	601237.10	32°39'07.156"N	103°52'06.877"W	18.90
8964.00	42.600	166.600	8935.17	140.00	-125.82	110.83	684382.02	601217.89	32°39'06.966"N	103°52'06.835"W	24.44
8996.00	49.200	168.100	8957.43	162.89	-148.23	115.84	684387.04	601195.48	32°39'06.744"N	103°52'06.777"W	20.90
9027.00	55.200	174.100	8976.43	187.35	-172.41	119.58	684390.77	601171.30	32°39'06.504"N	103°52'06.735"W	24.65
9059.00	61.200	183.700	8993.32	214.28	-199.54	120.02	684391.22	601144.17	32°39'06.236"N	103°52'06.731"W	31.62
9091.00	66.600	176.800	9007.40	242.69	-228.24	119.94	684391.13	601115.47	32°39'05.952"N	103°52'06.733"W	25.67
9172.00	82.000	170.600	9029.28	320.36	-305.46	128.62	684399.82	601038.26	32°39'05.187"N	103°52'06.636"W	20.38
9196.00	86.600	171.300	9031.66	344.23	-329.03	132.38	684403.57	601014.69	32°39'04.954"N	103°52'06.593"W	19.39
9258.00	89.900	169.600	9033.55	406.17	-390.14	142.66	684413.85	600953.59	32°39'04.349"N	103°52'06.476"W	-5.99
9291.00	89.700	171.500	9033.67	439.16	-422.69	148.08	684419.27	600921.04	32°39'04.027"N	103°52'06.414"W	5.79
9323.00	89.300	169.300	9033.95	471.14	-454.24	153.41	684424.60	600889.50	32°39'03.714"N	103°52'06.353"W	6.99
9386.00	89.400	167.400	9034.66	534.00	-515.93	166.13	684437.32	600827.81	32°39'03.103"N	103°52'06.208"W	3.02
9449.00	89.400	168.100	9035.32	596.83	-577.49	179.50	684450.69	600766.25	32°39'02.494"N	103°52'06.055"W	1.11
9512.00	89.500	166.600	9035.93	659.61	-638.96	193.30	684464.48	600704.79	32°39'01.885"N	103°52'05.896"W	2.39
9576.00	89.400	166.300	9036.54	723.31	-701.17	208.29	684479.48	600642.57	32°39'01.269"N	103°52'05.724"W	0.49
9639.00	88.600	165.900	9037.64	785.96	-762.32	223.42	684494.61	600581.43	32°39'00.663"N	103°52'05.550"W	1.42
9702.00	89.400	165.700	9038.74	848.58	-823.38	238.87	684510.06	600520.37	32°39'00.058"N	103°52'05.373"W	1.31
9765.00	90.000	165.900	9039.07	911.21	-884.46	254.33	684525.51	600459.30	32°38'59.453"N	103°52'05.195"W	1.00
9828.00	89.800	165.600	9039.18	973.83	-945.52	269.84	684541.02	600398.25	32°38'58.848"N	103°52'05.017"W	-0.57
9891.00	89.400	165.700	9039.62	1036.44	-1006.55	285.45	684556.63	600337.22	32°38'58.244"N	103°52'04.837"W	0.65
9955.00	88.700	166.700	9040.68	1100.10	-1068.70	300.71	684571.89	600275.08	32°38'57.628"N	103°52'04.662"W	1.91
10018.00	88.600	167.400	9042.16	1162.85	-1130.08	314.83	684586.01	600213.70	32°38'57.020"N	103°52'04.500"W	1.12
10082.00	88.100	168.400	9044.01	1226.66	-1192.63	328.24	684599.41	600151.16	32°38'56.401"N	103°52'04.346"W	1.75
10145.00	86.800	169.600	9046.81	1289.51	-1254.41	340.25	684611.42	600089.38	32°38'55.789"N	103°52'04.209"W	2.81
10209.00	86.100	171.400	9050.77	1353.36	-1317.40	350.79	684621.96	600026.39	32°38'55.165"N	103°52'04.089"W	3.01
10272.00	86.000	172.500	9055.11	1416.21	-1379.63	359.59	684630.77	599964.16	32°38'54.549"N	103°52'03.989"W	1.75
10336.00	86.600	173.000	9059.24	1480.07	-1442.99	367.65	684638.82	599900.81	32°38'53.922"N	103°52'03.898"W	1.22
10399.00	87.900	172.700	9062.27	1542.99	-1505.43	375.48	684646.66	599838.38	32°38'53.304"N	103°52'03.810"W	2.12
10463.00	89.400	173.500	9063.77	1606.96	-1568.94	383.17	684654.34	599774.87	32°38'52.675"N	103°52'03.723"W	2.66



Actual Wellpath Report

No.4H AWP ST02

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Eddy County, NM	Well	No. 4H
Field	(Penny) Sec 21, T19S, R31E	Wellbore	No.4H AWP ST02
Facility	Penny Pincher Fed Com No. 4H	Sidetrack from	No.4H AWP at 8184.30 MD

WELLPATH DATA (183 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]
10526.00	90.400	174.800	9063.88	1669.91	-1631.61	389.59	684660.76	599712.20	32°38'52.055"N	103°52'03.651"W	2.60
10590.00	90.400	175.300	9063.44	1733.82	-1695.37	395.11	684666.28	599648.45	32°38'51.423"N	103°52'03.590"W	0.78
10653.00	90.700	175.500	9062.83	1796.71	-1758.17	400.16	684671.34	599585.66	32°38'50.802"N	103°52'03.534"W	0.57
10717.00	90.900	175.900	9061.94	1860.57	-1821.98	404.96	684676.13	599521.85	32°38'50.170"N	103°52'03.481"W	0.70
10779.00	91.500	176.500	9060.64	1922.39	-1883.83	409.07	684680.24	599460.00	32°38'49.558"N	103°52'03.437"W	1.37
10842.00	91.400	176.100	9059.05	1985.19	-1946.68	413.13	684684.31	599397.16	32°38'48.936"N	103°52'03.392"W	0.65
10906.00	90.600	177.400	9057.93	2048.96	-2010.56	416.76	684687.93	599333.28	32°38'48.304"N	103°52'03.353"W	2.38
10970.00	90.900	177.500	9057.09	2112.67	-2074.49	419.61	684690.78	599269.35	32°38'47.671"N	103°52'03.323"W	0.49
11034.00	89.400	177.800	9056.92	2176.36	-2138.44	422.23	684693.40	599205.41	32°38'47.038"N	103°52'03.296"W	2.39
11098.00	89.100	178.200	9057.76	2240.00	-2202.39	424.47	684695.64	599141.46	32°38'46.406"N	103°52'03.273"W	0.78
11162.00	90.400	178.000	9058.04	2303.64	-2266.36	426.59	684697.76	599077.50	32°38'45.773"N	103°52'03.251"W	2.06
11226.00	91.600	178.500	9056.92	2367.25	-2330.31	428.54	684699.71	599013.55	32°38'45.140"N	103°52'03.232"W	2.03
11290.00	91.000	177.900	9055.47	2430.86	-2394.27	430.55	684701.72	598949.60	32°38'44.507"N	103°52'03.212"W	1.33
11354.00	90.200	176.900	9054.80	2494.57	-2458.20	433.46	684704.63	598885.68	32°38'43.874"N	103°52'03.181"W	2.00
11417.00	89.700	177.300	9054.86	2557.33	-2521.11	436.64	684707.81	598822.76	32°38'43.251"N	103°52'03.147"W	1.02
11481.00	90.400	176.100	9054.80	2621.11	-2585.01	440.33	684711.50	598758.87	32°38'42.619"N	103°52'03.107"W	2.17
11546.00	90.300	174.700	9054.40	2685.99	-2649.79	445.54	684716.71	598694.09	32°38'41.978"N	103°52'03.049"W	2.16
11608.00	91.200	173.900	9053.59	2747.94	-2711.48	451.70	684722.87	598632.41	32°38'41.367"N	103°52'02.981"W	1.94
11672.00	91.700	173.800	9051.97	2811.88	-2775.09	458.55	684729.72	598568.80	32°38'40.738"N	103°52'02.904"W	0.80
11737.00	91.600	174.600	9050.10	2876.81	-2839.73	465.12	684736.28	598504.16	32°38'40.098"N	103°52'02.830"W	1.24
11800.00	91.500	174.300	9048.40	2939.73	-2902.41	471.21	684742.37	598441.49	32°38'39.477"N	103°52'02.762"W	0.50
11864.00	91.600	174.200	9046.67	3003.66	-2966.07	477.62	684748.78	598377.84	32°38'38.847"N	103°52'02.690"W	0.22
11928.00	90.500	174.300	9045.49	3067.60	-3029.74	484.03	684755.19	598314.18	32°38'38.217"N	103°52'02.619"W	1.73
11992.00	90.700	174.200	9044.82	3131.55	-3093.41	490.44	684761.61	598250.51	32°38'37.587"N	103°52'02.547"W	0.35
12056.00	89.800	173.800	9044.54	3195.51	-3157.06	497.13	684768.29	598186.86	32°38'36.957"N	103°52'02.472"W	1.54
12120.00	89.700	173.800	9044.82	3259.47	-3220.68	504.04	684775.21	598123.24	32°38'36.327"N	103°52'02.394"W	0.16
12184.00	90.000	173.100	9044.99	3323.45	-3284.26	511.34	684782.51	598059.66	32°38'35.697"N	103°52'02.312"W	1.19
12248.00	90.400	173.400	9044.77	3387.44	-3347.82	518.86	684790.03	597996.11	32°38'35.068"N	103°52'02.228"W	0.78
12312.00	90.500	173.600	9044.26	3451.41	-3411.41	526.11	684797.27	597932.53	32°38'34.439"N	103°52'02.146"W	0.35
12376.00	90.500	172.800	9043.71	3515.40	-3474.95	533.69	684804.85	597868.99	32°38'33.810"N	103°52'02.061"W	1.25
12440.00	90.500	173.400	9043.15	3579.38	-3538.49	541.37	684812.54	597805.46	32°38'33.181"N	103°52'01.974"W	0.94
12504.00	89.600	173.600	9043.09	3643.36	-3602.08	548.62	684819.78	597741.88	32°38'32.551"N	103°52'01.893"W	1.44
12568.00	89.100	173.700	9043.82	3707.33	-3665.68	555.70	684826.86	597678.28	32°38'31.922"N	103°52'01.813"W	0.80
12632.00	89.300	173.700	9044.71	3771.30	-3729.29	562.72	684833.88	597614.67	32°38'31.292"N	103°52'01.734"W	0.31
12696.00	89.300	173.600	9045.49	3835.27	-3792.89	569.80	684840.96	597551.08	32°38'30.662"N	103°52'01.655"W	0.16
12760.00	89.000	173.100	9046.44	3899.24	-3856.45	577.21	684848.37	597487.52	32°38'30.033"N	103°52'01.571"W	0.91
12824.00	89.200	173.400	9047.45	3963.22	-3920.00	584.73	684855.89	597423.97	32°38'29.404"N	103°52'01.487"W	0.56
12888.00	89.200	173.000	9048.34	4027.20	-3983.54	592.31	684863.47	597360.43	32°38'28.775"N	103°52'01.401"W	0.62
12952.00	89.900	173.600	9048.84	4091.18	-4047.10	599.77	684870.93	597296.88	32°38'28.146"N	103°52'01.317"W	1.44
13016.00	89.800	173.500	9049.01	4155.16	-4110.70	606.96	684878.12	597233.29	32°38'27.516"N	103°52'01.237"W	0.22
13080.00	90.500	173.800	9048.84	4219.13	-4174.30	614.04	684885.20	597169.69	32°38'26.886"N	103°52'01.157"W	1.19
13144.00	90.500	174.000	9048.29	4283.09	-4237.94	620.84	684892.00	597106.06	32°38'26.257"N	103°52'01.081"W	0.31
13208.00	91.800	173.700	9047.00	4347.05	-4301.56	627.70	684898.85	597042.44	32°38'25.627"N	103°52'01.004"W	2.08
13272.00	92.200	173.600	9044.77	4410.98	-4365.12	634.77	684905.93	596978.88	32°38'24.997"N	103°52'00.924"W	0.64
13335.00	92.200	173.600	9042.35	4473.91	-4427.69	641.79	684912.94	596916.32	32°38'24.378"N	103°52'00.846"W	0.00



Actual Wellpath Report

No.4H AWP ST02

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Eddy County, NM	Well	No. 4H
Field	(Penny) Sec 21, T19S, R31E	Wellbore	No.4H AWB ST02
Facility	Penny Pincher Fed Com No. 4H	Sidetrack from	No.4H AWB at 8184.30 MD

WELLPATH DATA (183 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]
13398.00	92.400	173.500	9039.82	4536.84	-4490.24	648.86	684920.02	596853.78	32°38'23.759"N	103°52'00.766"W	0.35
13462.00	92.200	173.400	9037.25	4600.77	-4553.77	656.15	684927.31	596790.25	32°38'23.130"N	103°52'00.684"W	0.35
13511.00	92.200	173.400	9035.37	4649.71	-4602.41	661.78	684932.94	596741.61	32°38'22.649"N	103°52'00.621"W	0.00

TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
No. 4H PBHL		9050.00	-4616.07	647.43	684918.59	596727.95	32°38'22.514"N	103°52'00.789"W	point

WELLPATH COMPOSITION - Ref Wellbore: No.4H AWB ST02 Ref Wellpath: No.4H AWP ST02

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
20.00	8184.30	Generic gyro - northseeking (Standard)	Gyro	No.4H AWB
8184.30	13511.00	NaviTrak (Standard)	MWD NaviTrak ST02 <8184.3-XXXX>	No.4H AWB ST02