



INTEQ

INTEQ

2105 MARKET STREET
MIDLAND, TX 79703
24 HR (432) 694-9517

STATE OF NEW MEXICO

COUNTY OF

I, **BEAU JONES**, DD Field Coordinator certify that I am employed by INTEQ ; did conduct or supervise on the day(s) of **Nov 10, 2009** through **Nov 26, 2009** the taking of MWD surveys from a depth of **6,702** to a depth of **14,132** that the data is true, correct, complete and within the limitations of the tool as set forth by Baker Hughes INTEQ ; that I am authorized and qualified to make this report; that this survey was conducted at the request of **BOPCO, L.P.** for the **JAMES RANCH UNIT 104H** Well, API No. **30-015-37271** in **EDDY** County, NM; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by INTEQ.

BOPCO, L.P.

Location Eddy County, NM
Field Quahada Ridge, S E (Delaware) Field
Facility James Ranch Unit No 104H

Slot	No	104H SHL
Well	No	104H
Wellbore	No	104H PWB



Plot reference wellpath is Plan #5_Rav1 Vs Actual < FINAL >

True vertical depths are referenced to Rig on No 104H SHL (RT)

Measured depths are referenced to Rsp on No. 104H SHL (RT)

Box on No. 104H SHL (BT) to Mean Sea Level 3335 feet

Mean Sea Level to Midline (Faculty James Ranch Unit No. 104H) 3316 (99)

Coordinates are in feet referenced to Family Center

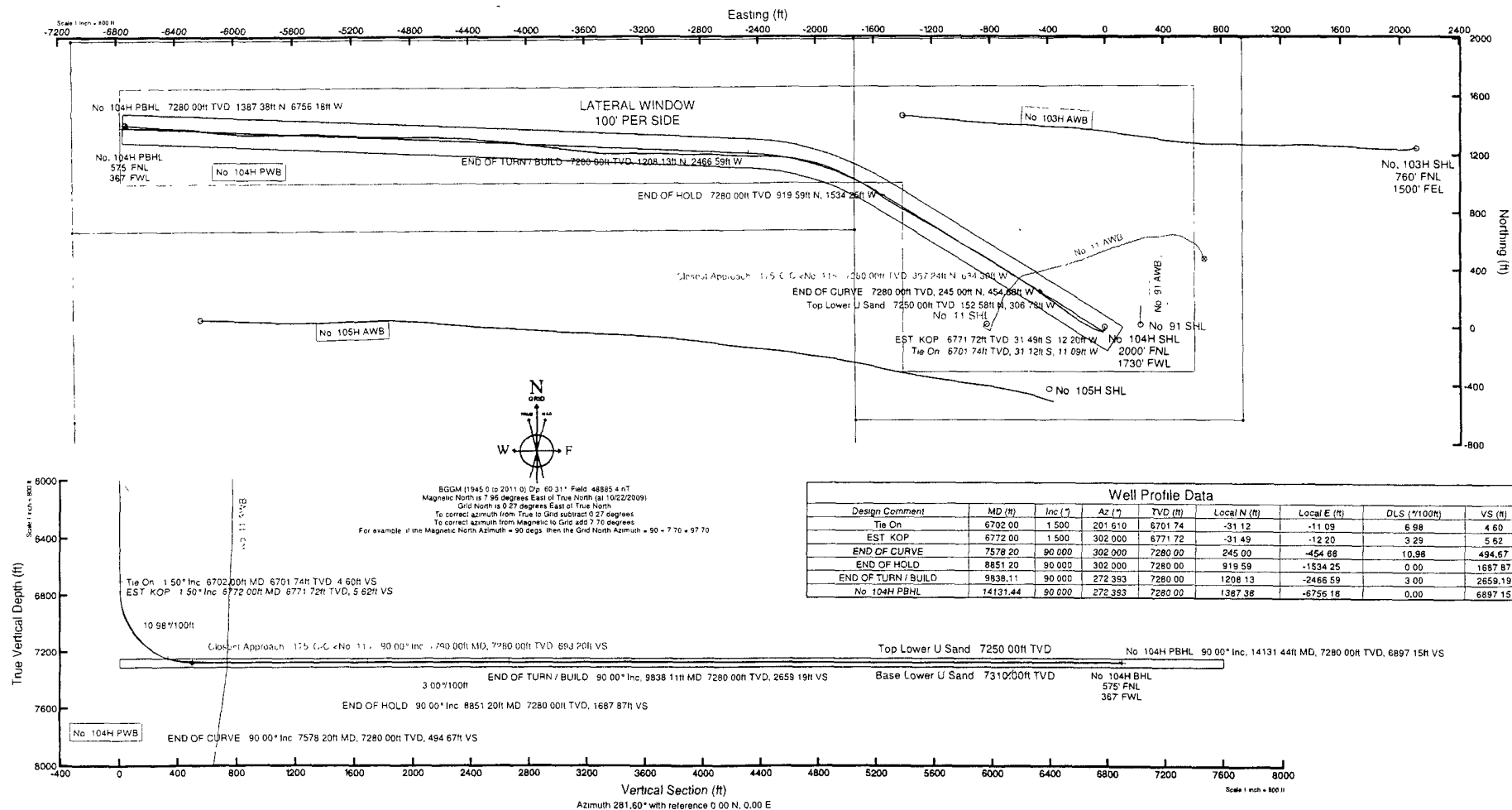
Grid System: NAD83 / TM New Mexico State Planes, Eastern Zone (3001) US 1001

North Reference Grid north

[illegible]

Depth in feet

Created by Victor Hernandez on 11/09/2009





Actual Wellpath Report

No. 104H AWP

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REFERENCE WELLPATH IDENTIFICATION

Operator	BOPCO, L.P.	Slot	No. 104H SHL
Area	Eddy County, NM	Well	No. 104H
Field	Quahada Ridge, S.E. (Delaware) Field	Wellbore	No. 104H AWB
Facility	James Ranch Unit No. 104H		

REPORT SETUP INFORMATION

Projection System	NAD83 / TM New Mexico State Planes, Eastern Zone (3001), US feet	Software System	WellArchitect® 2.0
North Reference	Grid	User	Victor Hernandez
Scale	0.999936	Report Generated	11/30/2009 at 2:07:19 PM
Convergence at slot	0.27° East	Database/Source file	WA_Midland/No._104H_AWB.xml

WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[USft]	Northing[USft]	Latitude	Longitude
Slot Location	0.00	0.00	694505.40	491539.80	32°21'01.219"N	103°50'14.394"W
Facility Reference Pt			694505.40	491539.80	32°21'01.219"N	103°50'14.394"W
Field Reference Pt			696627.35	492798.47	32°21'13.576"N	103°49'49.589"W

WELLPATH DATUM

Calculation method	Minimum curvature	Rig on No. 104H SHL (RT) to Facility Vertical Datum	19.00ft
Horizontal Reference Pt	Facility Center	Rig on No. 104H SHL (RT) to Mean Sea Level	3335.00ft
Vertical Reference Pt	Rig on No. 104H SHL (RT)	Facility Vertical Datum to Mud Line (Facility)	0.00ft
MD Reference Pt	Rig on No. 104H SHL (RT)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	281.60°



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REFERENCE WELLPATH IDENTIFICATION			
Operator	BOPCO, L.P.	Slot	No. 104H SHL
Area	Eddy County, NM	Well	No. 104H
Field	Quahada Ridge, S.E. (Delaware) Field	Wellbore	No. 104H AWB
Facility	James Ranch Unit No. 104H		

WELLPATH DATA (168 stations)									
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	DLS [°/100ft]
0.00	0.000	158.990	0.00	0.00	0.00	0.00	694505.40	491539.80	0.00
100.00	0.310	158.990	100.00	-0.15	-0.25	0.10	694505.50	491539.55	0.31
200.00	0.190	207.870	200.00	-0.25	-0.65	0.12	694505.52	491539.15	0.23
300.00	0.250	266.530	300.00	0.01	-0.81	-0.18	694505.22	491538.99	0.22
400.00	0.460	270.960	400.00	1.05	-0.90	-1.26	694504.14	491538.90	0.20
500.00	0.420	303.280	500.00	1.79	-0.69	-1.97	694503.43	491539.11	0.25
600.00	0.130	231.460	600.00	2.20	-0.56	-2.36	694503.04	491539.24	0.40
700.00	0.170	328.360	700.00	2.38	-0.51	-2.53	694502.87	491539.29	0.23
800.00	0.170	259.360	800.00	2.46	-0.48	-2.61	694502.79	491539.32	0.25
900.00	0.170	323.720	900.00	2.71	-0.39	-2.85	694502.55	491539.41	0.18
1000.00	0.200	217.030	1000.00	2.90	-0.41	-3.04	694502.36	491539.39	0.30
1100.00	0.150	342.980	1100.00	3.03	-0.42	-3.18	694502.22	491539.38	0.31
1200.00	0.170	233.970	1200.00	3.09	-0.62	-3.28	694502.12	491539.18	0.17
1300.00	0.240	264.460	1300.00	3.39	-0.73	-3.61	694501.79	491539.07	0.13
1400.00	0.060	134.500	1400.00	3.55	-0.78	-3.78	694501.62	491539.02	0.28
1500.00	0.180	193.710	1500.00	3.51	-0.97	-3.78	694501.62	491538.83	0.16
1600.00	0.160	70.310	1600.00	3.56	-0.95	-3.83	694501.57	491538.85	0.23
1700.00	0.130	253.110	1700.00	3.54	-0.93	-3.81	694501.59	491538.87	0.29
1800.00	0.180	2.150	1800.00	3.67	-0.81	-3.91	694501.49	491538.99	0.25
1900.00	0.100	200.800	1900.00	3.71	-0.73	-3.93	694501.47	491539.07	0.28
2000.00	0.180	62.440	2000.00	3.84	-0.71	-4.07	694501.33	491539.09	0.31
2100.00	0.350	159.030	2100.00	3.56	-0.92	-3.82	694501.58	491538.88	0.41
2200.00	0.560	150.080	2200.00	3.07	-1.63	-3.47	694501.93	491538.17	0.22
2300.00	0.360	140.480	2300.00	2.50	-2.30	-3.02	694502.38	491537.50	0.21



Actual Wellpath Report

No. 104H AWP

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REFERENCE WELLPATH IDENTIFICATION

Operator	BOPCO, L.P.	Slot	No. 104H SHL
Area	Eddy County, NM	Well	No. 104H
Field	Quahada Ridge, S.E. (Delaware) Field	Wellbore	No. 104H AWB
Facility	James Ranch Unit No. 104H		

WELLPATH DATA (168 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	DLS [°/100ft]
3000.00	1.200	151.180	2999.96	0.57	-4.56	-1.52	694503.88	491535.24	0.44
3100.00	1.480	145.160	3099.93	-1.04	-6.54	-0.28	694505.12	491533.26	0.31
3200.00	0.710	144.730	3199.91	-2.43	-8.10	0.82	694506.22	491531.70	0.77
3300.00	0.670	160.080	3299.91	-3.19	-9.16	1.38	694506.78	491530.64	0.19
3400.00	0.660	142.160	3399.89	-4.80	-11.32	2.58	694507.98	491528.48	0.15
3500.00	0.360	189.090	3499.89	-5.25	-12.09	2.88	694508.28	491527.72	0.49
3600.00	0.370	213.240	3599.88	-5.15	-12.67	2.66	694508.06	491527.14	0.15
3700.00	0.150	198.540	3699.88	-5.01	-13.06	2.44	694507.84	491526.74	0.23
3800.00	0.340	186.770	3799.88	-5.26	-13.86	2.53	694507.93	491525.94	0.18
3900.00	0.160	226.850	3899.88	-5.21	-14.25	2.39	694507.79	491525.55	0.24
4000.00	0.250	217.790	3999.88	-5.03	-14.52	2.15	694507.55	491525.28	0.10
4100.00	0.270	243.830	4099.88	-4.75	-14.80	1.81	694507.21	491525.00	0.12
4200.00	0.200	180.120	4199.88	-4.29	-15.24	1.25	694506.65	491524.56	0.22
4300.00	0.380	192.390	4299.88	-4.32	-15.74	1.18	694506.58	491524.06	0.19
4400.00	0.500	194.460	4399.87	-4.29	-16.49	1.00	694506.40	491523.31	0.12
4500.00	0.210	236.730	4499.87	-4.14	-17.01	0.74	694506.14	491522.79	0.37
4600.00	0.370	210.660	4599.87	-3.79	-17.85	0.21	694505.61	491521.95	0.09
4700.00	0.400	264.220	4699.87	-3.35	-18.16	-0.31	694505.09	491521.64	0.35
4800.00	0.300	223.060	4799.87	-2.88	-18.39	-0.83	694504.57	491521.41	0.26
4900.00	0.270	229.230	4899.86	-2.60	-18.73	-1.19	694504.21	491521.07	0.04
5000.00	0.310	289.090	4999.86	-1.97	-18.82	-1.85	694503.55	491520.98	0.20
5100.00	0.190	270.170	5099.86	-1.54	-18.73	-2.27	694503.13	491521.07	0.14
5200.00	0.310	226.060	5199.86	-1.23	-18.92	-2.63	694502.77	491520.89	0.22
5300.00	0.490	225.940	5299.86	-0.83	-19.40	-3.13	694502.27	491520.40	0.18



Actual Wellpath Report

No. 104H AWP

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INTEQ

REFERENCE WELLPATH IDENTIFICATION

Operator	BOPCO, L.P.	Slot	No. 104H SHL
Area	Eddy County, NM	Well	No. 104H
Field	Quahada Ridge, S.E. (Delaware) Field	Wellbore	No. 104H AWB
Facility	James Ranch Unit No. 104H		

WELLPATH DATA (168 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	DLS [°/100ft]
6000.00	0.780	210.600	5999.85	-0.05	-20.96	-4.25	694501.15	491518.84	0.31
6100.00	0.830	206.940	6099.84	0.36	-22.19	-4.93	694500.47	491517.61	0.07
6200.00	0.930	218.840	6199.83	0.93	-23.47	-5.77	694499.63	491516.33	0.21
6300.00	0.830	223.990	6299.82	1.69	-24.62	-6.78	694498.62	491515.18	0.13
6500.00	1.000	214.360	6499.79	3.26	-27.14	-8.90	694496.50	491512.66	0.12
6600.00	1.260	210.180	6599.77	3.95	-28.82	-9.95	694495.45	491510.99	0.27
6700.00	1.630	203.480	6699.74	4.59	-31.07	-11.07	694494.33	491508.73	0.41
6702.00	1.500	201.610	6701.74	4.60	-31.12	-11.09	694494.31	491508.68	6.98
6773.00	2.000	215.000	6772.70	5.12	-33.09	-12.02	694493.38	491506.72	1.46
6804.00	3.500	255.700	6803.67	6.19	-33.76	-13.25	694492.15	491506.04	7.66
6835.00	5.400	281.000	6834.58	8.50	-33.72	-15.60	694489.80	491506.08	8.67
6865.00	7.900	287.600	6864.37	11.96	-32.82	-18.95	694486.45	491506.98	8.70
6928.00	15.600	284.400	6926.04	24.58	-29.43	-31.14	694474.27	491510.37	13.26
6959.00	20.300	286.200	6955.52	34.11	-26.89	-40.34	694465.06	491512.91	15.26
6991.00	24.900	288.800	6985.06	46.33	-23.17	-52.06	694453.35	491516.63	14.71
7022.00	28.800	292.700	7012.71	60.14	-18.19	-65.13	694440.28	491521.62	13.80
7084.00	35.800	299.500	7064.97	92.23	-3.12	-94.79	694410.61	491536.68	10.72
7115.00	39.600	298.200	7089.50	110.33	6.01	-111.40	694394.01	491545.81	12.52
7147.00	43.700	298.500	7113.40	130.69	16.11	-130.11	694375.30	491555.91	12.83
7177.00	47.600	299.000	7134.37	151.19	26.43	-148.91	694356.50	491566.23	13.05
7240.00	53.500	303.100	7174.30	197.30	50.99	-190.94	694314.47	491590.79	12.64
7272.00	57.000	304.400	7192.54	221.64	65.60	-212.80	694292.62	491605.40	11.44
7304.00	61.100	305.000	7208.99	246.88	81.23	-235.35	694270.06	491621.02	12.91
7335.00	65.400	304.700	7222.94	272.31	97.04	-258.07	694247.35	491636.83	13.90



Actual Wellpath Report

No. 104H AWP

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INTEQ

REFERENCE WELLPATH IDENTIFICATION

Operator	BOPCO, L.P.	Slot	No. 104H SHL
Area	Eddy County, NM	Well	No. 104H
Field	Quahada Ridge, S.E. (Delaware) Field	Wellbore	No. 104H AWP
Facility	James Ranch Unit No. 104H		

WELLPATH DATA (168 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	DLS [°/100ft]
7397.00	72.700	305.300	7244.98	325.42	130.33	-305.44	694199.98	491670.13	11.00
7429.00	76.400	305.600	7253.50	353.62	148.22	-330.57	694174.86	491688.01	11.60
7460.00	79.900	306.900	7259.87	381.19	166.16	-355.03	694150.40	491705.95	12.01
7491.00	82.700	305.600	7264.55	409.04	184.28	-379.74	694125.69	491724.06	9.94
7554.00	88.100	304.100	7269.64	466.69	220.21	-431.21	694074.22	491759.99	9.19
7585.00	89.400	304.100	7270.31	495.32	237.58	-456.87	694048.56	491777.36	4.19
7617.00	89.800	304.700	7270.54	524.82	255.66	-483.27	694022.16	491795.44	2.25
7649.00	88.000	304.000	7271.15	554.32	273.71	-509.68	693995.75	491813.49	6.04
7761.00	89.900	304.700	7274.33	657.38	337.28	-601.83	693903.61	491877.06	5.39
7858.00	89.800	302.700	7274.59	747.25	391.10	-682.53	693822.92	491930.87	2.06
7953.00	89.900	302.600	7274.84	835.91	442.35	-762.52	693742.93	491982.12	0.15
8048.00	89.900	301.800	7275.00	924.84	492.97	-842.90	693662.55	492032.74	0.84
8240.00	89.800	298.900	7275.59	1106.71	589.78	-1008.69	693496.78	492129.54	1.37
8336.00	89.900	303.600	7275.84	1197.09	639.57	-1090.74	693414.74	492179.33	4.90
8432.00	89.700	300.000	7276.17	1287.17	690.15	-1172.31	693333.17	492229.90	3.76
8528.00	90.400	299.600	7276.09	1378.37	737.86	-1255.62	693249.87	492277.61	0.84
8720.00	90.300	300.900	7275.00	1560.42	834.22	-1421.68	693083.82	492373.96	0.94
8815.00	90.500	303.400	7274.34	1649.37	884.76	-1502.10	693003.40	492424.51	2.64
8911.00	90.300	303.900	7273.67	1738.35	937.96	-1582.01	692923.49	492477.70	0.56
9007.00	90.500	303.400	7273.00	1827.33	991.15	-1661.92	692843.58	492530.89	0.56
9198.00	89.900	294.000	7273.17	2010.45	1080.38	-1830.55	692674.97	492620.11	3.24
9294.00	90.300	291.100	7273.00	2104.70	1117.20	-1919.20	692586.33	492656.92	3.05
9390.00	89.900	284.200	7272.83	2200.10	1146.29	-2010.62	692494.91	492686.01	7.20
9486.00	90.000	279.500	7272.92	2296.08	1165.99	-2104.55	692400.99	492705.72	4.90



Actual Wellpath Report

No. 104H AWP

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REFERENCE WELLPATH IDENTIFICATION			
Operator	BOPCO, L.P.	Slot	No. 104H SHL
Area	Eddy County, NM	Well	No. 104H
Field	Quahada Ridge, S.E. (Delaware) Field	Wellbore	No. 104H AWB
Facility	James Ranch Unit No. 104H		

WELLPATH DATA (168 stations)									
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	DLS [°/100ft]
9688.00	89.700	272.100	7273.34	2496.92	1186.60	-2305.36	692200.20	492726.32	3.80
9785.00	89.700	270.600	7273.85	2592.37	1188.89	-2402.33	692103.23	492728.61	1.55
9881.00	89.700	272.000	7274.35	2686.82	1191.07	-2498.30	692007.27	492730.79	1.46
9978.00	90.100	273.100	7274.52	2782.61	1195.38	-2595.20	691910.37	492735.10	1.21
10168.00	90.300	268.600	7275.02	2969.97	1202.59	-2784.99	691720.59	492742.31	5.23
10264.00	90.400	271.200	7274.43	3063.97	1202.42	-2880.98	691624.61	492742.14	2.71
10358.00	90.400	271.700	7273.78	3156.49	1204.80	-2974.95	691530.65	492744.52	0.53
10455.00	90.300	272.900	7273.18	3252.21	1208.69	-3071.87	691433.73	492748.41	1.24
10647.00	90.100	268.500	7272.17	3440.35	1209.27	-3263.82	691241.80	492748.99	1.21
10741.00	90.000	270.000	7272.09	3532.17	1208.04	-3357.80	691147.82	492747.76	1.60
10837.00	89.900	272.900	7272.18	3626.66	1210.47	-3453.76	691051.86	492750.19	3.02
10933.00	89.800	276.100	7272.43	3721.91	1218.00	-3549.46	690956.18	492757.72	3.33
11123.00	89.900	276.700	7272.84	3911.18	1239.84	-3738.19	690767.45	492779.56	0.11
11219.00	90.000	276.400	7272.93	4006.81	1250.79	-3833.57	690672.09	492790.51	0.33
11313.00	90.000	278.300	7272.93	4100.55	1262.82	-3926.79	690578.87	492802.53	2.02
11408.00	89.900	277.400	7273.01	4195.34	1275.79	-4020.90	690484.77	492815.51	0.95
11599.00	90.100	274.000	7273.18	4385.16	1293.45	-4211.05	690294.63	492833.16	0.97
11695.00	89.900	275.700	7273.18	4480.49	1301.56	-4306.70	690198.98	492841.28	1.78
11790.00	89.900	275.000	7273.34	4574.92	1310.42	-4401.29	690104.40	492850.13	0.74
11887.00	89.900	272.400	7273.51	4670.99	1316.68	-4498.08	690007.62	492856.39	2.68
12078.00	89.700	270.500	7274.01	4859.01	1321.62	-4689.01	689816.70	492861.33	1.08
12172.00	88.700	270.500	7275.32	4951.24	1322.44	-4782.99	689722.72	492862.15	1.06
12269.00	89.500	270.500	7276.84	5046.41	1323.29	-4879.98	689625.75	492863.00	0.82
12366.00	90.000	269.900	7277.27	5141.49	1323.62	-4976.97	689528.76	492863.34	0.81



Actual Wellpath Report

No. 104H AWP

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REFERENCE WELLPATH IDENTIFICATION

Operator	BOPCO, L.P.	Slot	No. 104H SHL
Area	Eddy County, NM	Well	No. 104H
Field	Quahada Ridge, S.E. (Delaware) Field	Wellbore	No. 104H AWB
Facility	James Ranch Unit No. 104H		

WELLPATH DATA (168 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	DLS [°/100ft]
12559.00	90.100	272.900	7277.01	5331.68	1329.87	-5169.85	689335.89	492869.58	0.62
12654.00	90.200	272.800	7276.77	5425.58	1334.59	-5264.73	689241.02	492874.30	0.15
12756.00	90.100	273.900	7276.50	5526.52	1340.55	-5366.55	689139.20	492880.26	1.08
12846.00	90.200	271.800	7276.26	5615.46	1345.03	-5456.44	689049.32	492884.74	2.34
13040.00	90.000	267.400	7275.92	5804.36	1339.99	-5650.31	688855.46	492879.70	0.10
13136.00	90.000	271.200	7275.92	5898.14	1338.81	-5746.29	688759.49	492878.53	3.96
13232.00	89.900	269.300	7276.01	5992.26	1339.23	-5842.28	688663.50	492878.95	1.98
13328.00	90.000	272.300	7276.09	6086.54	1340.57	-5938.26	688567.53	492880.29	3.13
13517.00	90.200	276.200	7276.42	6274.22	1356.78	-6126.52	688379.28	492896.49	0.83
13614.00	90.500	277.700	7275.83	6370.89	1368.52	-6222.81	688283.01	492908.23	1.58
13710.00	90.100	273.500	7275.33	6466.34	1377.88	-6318.32	688187.49	492917.59	4.39
13806.00	90.200	273.600	7275.07	6561.39	1383.83	-6414.14	688091.68	492923.53	0.15
13995.00	90.200	275.300	7274.41	6748.53	1395.62	-6602.76	687903.08	492935.33	2.74
14075.00	90.100	275.500	7274.21	6828.06	1403.15	-6682.40	687823.44	492942.85	0.28
14132.00	90.100	275.500	7274.11	6884.74	1408.61	-6739.14	687766.71	492948.32	0.00



Actual Wellpath Report

No. 104H AWP

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INTEQ

REFERENCE WELLPATH IDENTIFICATION

Operator	BOPCO, L.P.	Slot	No. 104H SHL
Area	Eddy County, NM	Well	No. 104H
Field	Quahada Ridge, S.E. (Delaware) Field	Wellbore	No. 104H AWB
Facility	James Ranch Unit No. 104H		

TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	Latitude	Longitude	Shape
No. 104H PBHL		7280.00	1387.38	-6756.18	687749.67	492927.09	32°21'15.250"N	103°51'33.077"W	point

WELLPATH COMPOSITION

Ref Wellbore: No. 104H AWB Ref Wellpath: No. 104H AWP

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
0.00	6702.00	Gyrodata standard - Drop gyro or Multi-shot	GYRO <100 - 6702>	No. 104H AWB
6702.00	14075.00	NaviTrak (Standard)	ATKe <6741 - 14075>	No. 104H AWB
14075.00	14132.00	Blind Drilling (std)	Projection to bit	No. 104H AWB