



DIRECTIONAL TECHNOLOGIES INC.

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WPX Energy Rocky Mountain, LLC

RU 23-06S-094W

RWF 43-23 Pad

RWF 342-23 - Slot A07

14-09-147

Final Surveys - Feb.5,2015

License:

UWI:

Survey Report

05 February, 2015





Company:	WPX Energy Rocky Mountain, LLC	Local Co-ordinate Reference:	Well RWF 342-23 - Slot A07
Project:	RU 23-06S-094W	TVD Reference:	KELLY BUSHING @ 5625.00usft (Nabors 577 (26' RKB) mab)
Site:	RWF 43-23 Pad	MD Reference:	KELLY BUSHING @ 5625.00usft (Nabors 577 (26' RKB) mab)
Well:	RWF 342-23	North Reference:	True
Wellbore:	14-09-147	Survey Calculation Method:	Minimum Curvature
Design:	Final Surveys - Feb.5,2015	Database:	EDM_2011

Project	RU 23-06S-094W, Garfield County, CO, 23-06S-094W		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		Using geodetic scale factor

Site	RWF 43-23 Pad				
Site Position:		Northing:	1,619,204.50 usft	Latitude:	39° 30' 36.053 N
From:	Map	Easting:	2,337,897.00 usft	Longitude:	107° 50' 48.996 W
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence:	-1.48 °

Well	RWF 342-23 - Slot A07					
Well Position	+N/-S	0.00 usft	Northing:	1,619,204.50 usft	Latitude:	39° 30' 36.051 N
	+E/-W	0.00 usft	Easting:	2,337,889.00 usft	Longitude:	107° 50' 49.098 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	5,599.00 usft

Wellbore	14-09-147	Well UWI		License	
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/25/2014	9.86	65.69	51,949

Design	Final Surveys - Feb.5,2015				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	337.90	

Survey Program	Date	2/5/2015			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
72.00	8,523.00	Final Surveys (14-09-147)	MWD+sag	/D v3:standard declination + s	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	5,625.00	0.00	0.00	0.00	0.00	0.00	0.00
72.00	0.26	106.17	72.00	5,553.00	-0.05	0.16	-0.10	0.36	0.36	0.00
102.00	0.62	118.48	102.00	5,523.00	-0.14	0.36	-0.27	1.23	1.20	41.03
KOP										
107.00	0.55	106.48	107.00	5,518.00	-0.16	0.41	-0.30	2.81	-1.38	-239.98
132.00	0.70	39.46	132.00	5,493.00	-0.08	0.62	-0.31	2.81	0.60	-268.08
162.00	1.50	3.96	161.99	5,463.01	0.46	0.77	0.13	3.38	2.67	-118.33
193.00	2.46	356.48	192.97	5,432.03	1.52	0.75	1.13	3.20	3.10	-24.13
223.00	2.46	354.20	222.95	5,402.05	2.81	0.65	2.36	0.33	0.00	-7.60



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Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
254.00	2.99	356.66	253.91	5,371.09	4.28	0.54	3.76	1.75	1.71	7.94
284.00	3.52	347.78	283.86	5,341.14	5.96	0.30	5.41	2.43	1.77	-29.60
313.00	4.31	345.94	312.79	5,312.21	7.88	-0.16	7.36	2.76	2.72	-6.34
344.00	4.40	338.20	343.70	5,281.30	10.12	-0.88	9.71	1.92	0.29	-24.97
374.00	4.93	331.44	373.61	5,251.39	12.32	-1.93	12.14	2.54	1.77	-22.53
405.00	5.63	329.06	404.47	5,220.53	14.79	-3.34	14.97	2.37	2.26	-7.68
435.00	7.04	333.28	434.29	5,190.71	17.70	-4.93	18.25	4.95	4.70	14.07
465.00	8.01	332.84	464.03	5,160.97	21.20	-6.71	22.17	3.24	3.23	-1.47
495.00	9.15	333.46	493.70	5,131.30	25.19	-8.73	26.63	3.81	3.80	2.07
525.00	10.38	335.83	523.26	5,101.74	29.79	-10.90	31.71	4.31	4.10	7.90
555.00	10.91	336.27	552.74	5,072.26	34.86	-13.15	37.24	1.79	1.77	1.47
616.00	12.05	337.24	612.52	5,012.48	46.02	-17.94	49.38	1.90	1.87	1.59
708.00	13.81	339.79	702.19	4,922.81	65.18	-25.45	69.96	2.01	1.91	2.77
779.00	14.72	338.60	771.00	4,854.00	81.53	-31.66	87.45	1.35	1.28	-1.68
869.00	15.71	337.34	857.84	4,767.16	103.42	-40.53	111.07	1.16	1.10	-1.40
959.00	17.11	336.48	944.17	4,680.83	126.80	-50.51	136.49	1.58	1.56	-0.96
1,055.00	15.51	334.40	1,036.31	4,588.69	151.33	-61.69	163.42	1.77	-1.67	-2.17
1,087.00	15.53	333.98	1,067.14	4,557.86	159.04	-65.42	171.97	0.36	0.06	-1.31
Interpolated Casing Point - Surface Casing										
1,142.00	15.12	332.82	1,120.18	4,504.82	172.04	-71.93	186.46	0.92	-0.74	-2.11
1,166.00	14.95	332.29	1,143.36	4,481.64	177.56	-74.80	192.66	0.92	-0.73	-2.19
1,261.00	15.08	336.77	1,235.12	4,389.88	199.77	-85.37	217.21	1.23	0.14	4.72
1,355.00	14.86	335.72	1,325.93	4,299.07	221.99	-95.15	241.48	0.37	-0.23	-1.12
1,450.00	13.85	338.53	1,417.97	4,207.03	243.68	-104.32	265.02	1.29	-1.06	2.96
1,546.00	14.02	337.74	1,511.14	4,113.86	265.13	-112.93	288.14	0.27	0.18	-0.82
1,642.00	14.24	341.61	1,604.24	4,020.76	287.10	-121.06	311.55	1.01	0.23	4.03
1,737.00	14.29	341.61	1,696.31	3,928.69	309.31	-128.45	334.91	0.05	0.05	0.00
1,833.00	14.11	341.52	1,789.38	3,835.62	331.65	-135.89	358.41	0.19	-0.19	-0.09
1,928.00	15.03	339.23	1,881.32	3,743.68	354.16	-143.93	382.29	1.14	0.97	-2.41
2,023.00	14.86	337.83	1,973.11	3,651.89	376.95	-152.90	406.78	0.42	-0.18	-1.47
2,117.00	14.64	337.92	2,064.01	3,560.99	399.12	-161.91	430.71	0.24	-0.23	0.10
2,213.00	14.29	337.21	2,156.97	3,468.03	421.29	-171.06	454.69	0.41	-0.36	-0.74
2,308.00	13.80	335.54	2,249.13	3,375.87	442.41	-180.29	477.74	0.67	-0.52	-1.76
2,404.00	13.49	334.31	2,342.42	3,282.58	462.92	-189.89	500.35	0.44	-0.32	-1.28
2,499.00	13.93	337.56	2,434.71	3,190.29	483.48	-199.06	522.85	0.93	0.46	3.42
2,595.00	13.80	335.89	2,527.91	3,097.09	504.61	-208.15	545.85	0.44	-0.14	-1.74
2,690.00	14.42	340.55	2,620.05	3,004.95	526.11	-216.71	568.99	1.36	0.65	4.91
2,786.00	14.02	338.44	2,713.11	2,911.89	548.19	-224.97	592.55	0.68	-0.42	-2.20
2,881.00	13.71	336.42	2,805.34	2,819.66	569.21	-233.70	615.32	0.61	-0.33	-2.13
2,977.00	14.77	339.06	2,898.39	2,726.61	591.07	-242.62	638.92	1.29	1.10	2.75
3,071.00	14.20	338.62	2,989.40	2,635.60	613.00	-251.11	662.43	0.62	-0.61	-0.47



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3,166.00	13.76	338.27	3,081.59	2,543.41	634.34	-259.54	685.38	0.47	-0.46	-0.37
3,262.00	13.01	337.21	3,174.98	2,450.02	654.91	-267.95	707.60	0.82	-0.78	-1.10
3,358.00	13.63	339.76	3,268.40	2,356.60	675.49	-276.05	729.71	0.89	0.65	2.66
3,453.00	15.16	339.23	3,360.41	2,264.59	697.60	-284.33	753.32	1.62	1.61	-0.56
3,548.00	15.03	337.74	3,452.14	2,172.86	720.62	-293.40	778.06	0.43	-0.14	-1.57
3,644.00	14.73	336.68	3,544.92	2,080.08	743.35	-302.95	802.71	0.42	-0.31	-1.10
3,739.00	15.82	337.21	3,636.56	1,988.44	766.38	-312.75	827.73	1.16	1.15	0.56
3,835.00	15.74	336.77	3,728.94	1,896.06	790.41	-322.95	853.84	0.15	-0.08	-0.46
3,928.00	15.08	335.63	3,818.60	1,806.40	813.02	-332.92	878.54	0.78	-0.71	-1.23
4,024.00	14.42	338.97	3,911.44	1,713.56	835.55	-342.36	902.97	1.12	-0.69	3.48
4,119.00	13.89	337.83	4,003.55	1,621.45	857.15	-350.91	926.20	0.63	-0.56	-1.20
4,215.00	13.93	339.15	4,096.74	1,528.26	878.62	-359.37	949.27	0.33	0.04	1.38
4,310.00	12.70	338.18	4,189.18	1,435.82	899.00	-367.32	971.15	1.32	-1.29	-1.02
4,405.00	12.18	338.62	4,281.95	1,343.05	918.03	-374.86	991.61	0.56	-0.55	0.46
4,500.00	11.12	336.86	4,374.99	1,250.01	935.79	-382.11	1,010.79	1.18	-1.12	-1.85
4,595.00	10.77	336.42	4,468.26	1,156.74	952.35	-389.26	1,028.82	0.38	-0.37	-0.46
4,691.00	10.95	335.19	4,562.55	1,062.45	968.84	-396.67	1,046.90	0.31	0.19	-1.28
4,786.00	11.12	332.38	4,655.79	969.21	985.15	-404.71	1,065.03	0.59	0.18	-2.96
4,881.00	10.64	335.72	4,749.08	875.92	1,001.26	-412.56	1,082.91	0.83	-0.51	3.52
4,976.00	9.93	339.15	4,842.56	782.44	1,016.91	-419.08	1,099.87	0.99	-0.75	3.61
5,071.00	9.80	339.06	4,936.15	688.85	1,032.12	-424.89	1,116.14	0.14	-0.14	-0.09
5,165.00	8.97	336.77	5,028.89	596.11	1,046.32	-430.64	1,131.46	0.97	-0.88	-2.44
5,261.00	7.65	335.54	5,123.88	501.12	1,059.02	-436.23	1,145.33	1.39	-1.38	-1.28
5,358.00	6.95	332.99	5,220.10	404.90	1,070.12	-441.57	1,157.63	0.80	-0.72	-2.63
5,453.00	4.75	336.42	5,314.60	310.40	1,078.85	-445.76	1,167.29	2.34	-2.32	3.61
5,549.00	3.30	353.74	5,410.36	214.64	1,085.24	-447.65	1,173.92	1.95	-1.51	18.04
5,644.00	2.55	11.93	5,505.24	119.76	1,090.03	-447.51	1,178.30	1.25	-0.79	19.15
5,740.00	1.80	5.34	5,601.17	23.83	1,093.62	-446.93	1,181.41	0.82	-0.78	-6.86
5,835.00	1.32	359.10	5,696.13	-71.13	1,096.20	-446.81	1,183.76	0.54	-0.51	-6.57
5,930.00	1.32	0.50	5,791.11	-166.11	1,098.38	-446.81	1,185.79	0.03	0.00	1.47
6,025.00	1.05	352.15	5,886.09	-261.09	1,100.34	-446.92	1,187.64	0.34	-0.28	-8.79
6,120.00	0.70	312.08	5,981.08	-356.08	1,101.59	-447.47	1,189.01	0.72	-0.37	-42.18
6,215.00	0.35	340.99	6,076.07	-451.07	1,102.25	-448.00	1,189.82	0.45	-0.37	30.43
6,311.00	1.54	47.09	6,172.06	-547.06	1,103.41	-447.15	1,190.57	1.49	1.24	68.85
6,406.00	1.10	50.87	6,267.03	-642.03	1,104.85	-445.51	1,191.29	0.47	-0.46	3.98
6,502.00	2.02	48.84	6,363.00	-738.00	1,106.55	-443.52	1,192.11	0.96	0.96	-2.11
6,597.00	2.02	48.93	6,457.94	-832.94	1,108.75	-441.00	1,193.20	0.00	0.00	0.09
6,693.00	1.67	47.79	6,553.89	-928.89	1,110.80	-438.68	1,194.23	0.37	-0.36	-1.19
6,788.00	1.05	51.57	6,648.86	-1,023.86	1,112.27	-436.98	1,194.95	0.66	-0.65	3.98
6,888.00	1.01	51.66	6,728.85	-1,103.85	1,113.17	-435.85	1,195.36	0.05	-0.05	0.11
6,965.00	0.75	52.27	6,825.84	-1,200.84	1,114.09	-434.68	1,195.77	0.27	-0.27	0.63

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7,060.00	0.44	73.72	6,920.83	-1,295.83	1,114.57	-433.84	1,195.90	0.40	-0.33	22.58
7,155.00	0.40	188.33	7,015.83	-1,390.83	1,114.34	-433.53	1,195.58	0.74	-0.04	120.64
7,251.00	0.88	211.97	7,111.82	-1,486.82	1,113.39	-433.97	1,194.85	0.56	0.50	24.63
7,346.00	1.10	122.58	7,206.81	-1,581.81	1,112.28	-433.59	1,193.68	1.48	0.23	-94.09
7,442.00	1.23	210.91	7,302.80	-1,677.80	1,110.90	-433.34	1,192.31	1.69	0.14	92.01
7,537.00	1.50	212.94	7,397.77	-1,772.77	1,108.98	-434.54	1,190.98	0.29	0.28	2.14
7,633.00	1.50	211.00	7,493.74	-1,868.74	1,106.85	-435.87	1,189.51	0.05	0.00	-2.02
7,728.00	1.54	203.88	7,588.71	-1,963.71	1,104.61	-437.03	1,187.88	0.20	0.04	-7.49
7,823.00	1.80	209.60	7,683.67	-2,058.67	1,102.15	-438.28	1,186.06	0.32	0.27	6.02
7,918.00	1.50	210.56	7,778.63	-2,153.63	1,099.78	-439.65	1,184.39	0.32	-0.32	1.01
8,014.00	1.58	216.89	7,874.59	-2,249.59	1,097.64	-441.09	1,182.94	0.20	0.08	6.59
8,109.00	1.36	216.63	7,969.56	-2,344.56	1,095.69	-442.55	1,181.68	0.23	-0.23	-0.27
8,205.00	1.71	220.23	8,065.53	-2,440.53	1,093.68	-444.15	1,180.43	0.38	0.36	3.75
8,301.00	2.37	226.65	8,161.47	-2,536.47	1,091.22	-446.52	1,179.04	0.73	0.69	6.69
8,396.00	2.90	222.95	8,256.37	-2,631.37	1,088.12	-449.58	1,177.32	0.59	0.56	-3.89
Last Survey										
8,473.00	2.94	228.67	8,333.27	-2,708.27	1,085.39	-452.39	1,175.84	0.38	0.05	7.43
Extrapolation to TD										
8,523.00	2.94	228.67	8,383.20	-2,758.20	1,083.69	-454.32	1,175.00	0.00	0.00	0.00

Casing Points				
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)
1,142.00	1,120.18	Surface Casing		

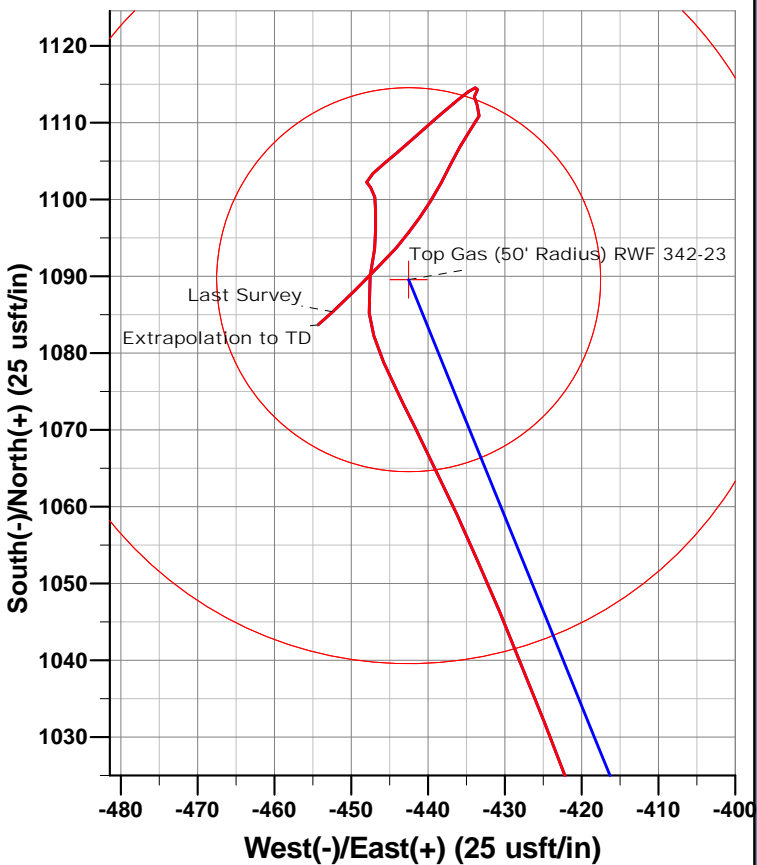
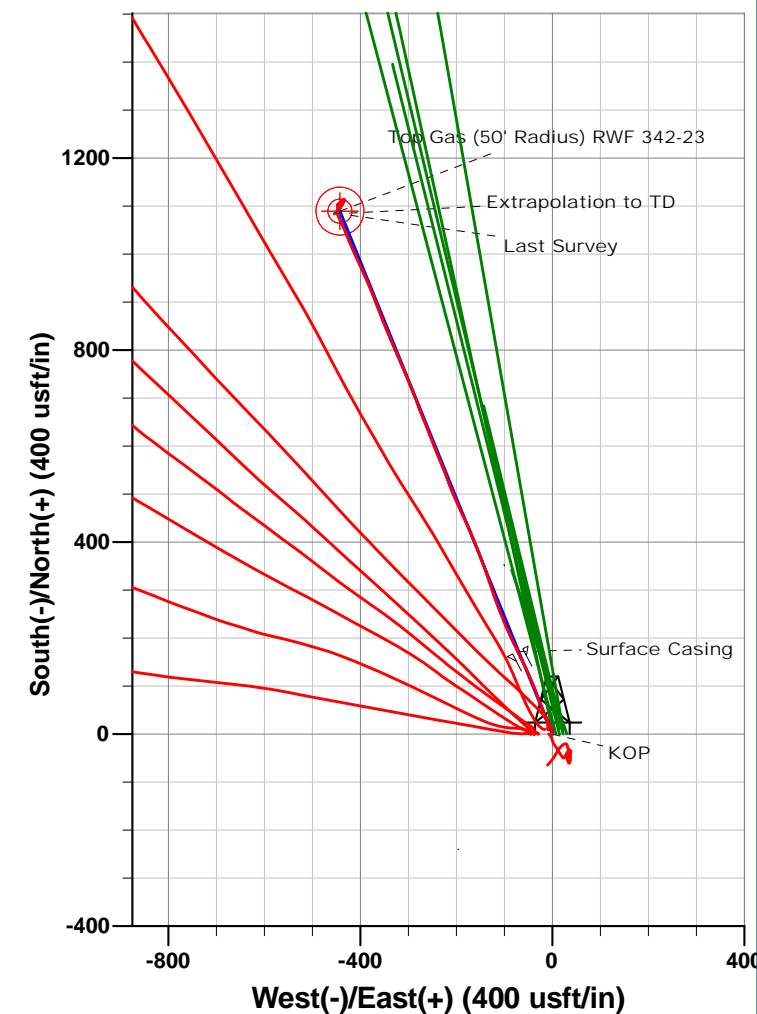
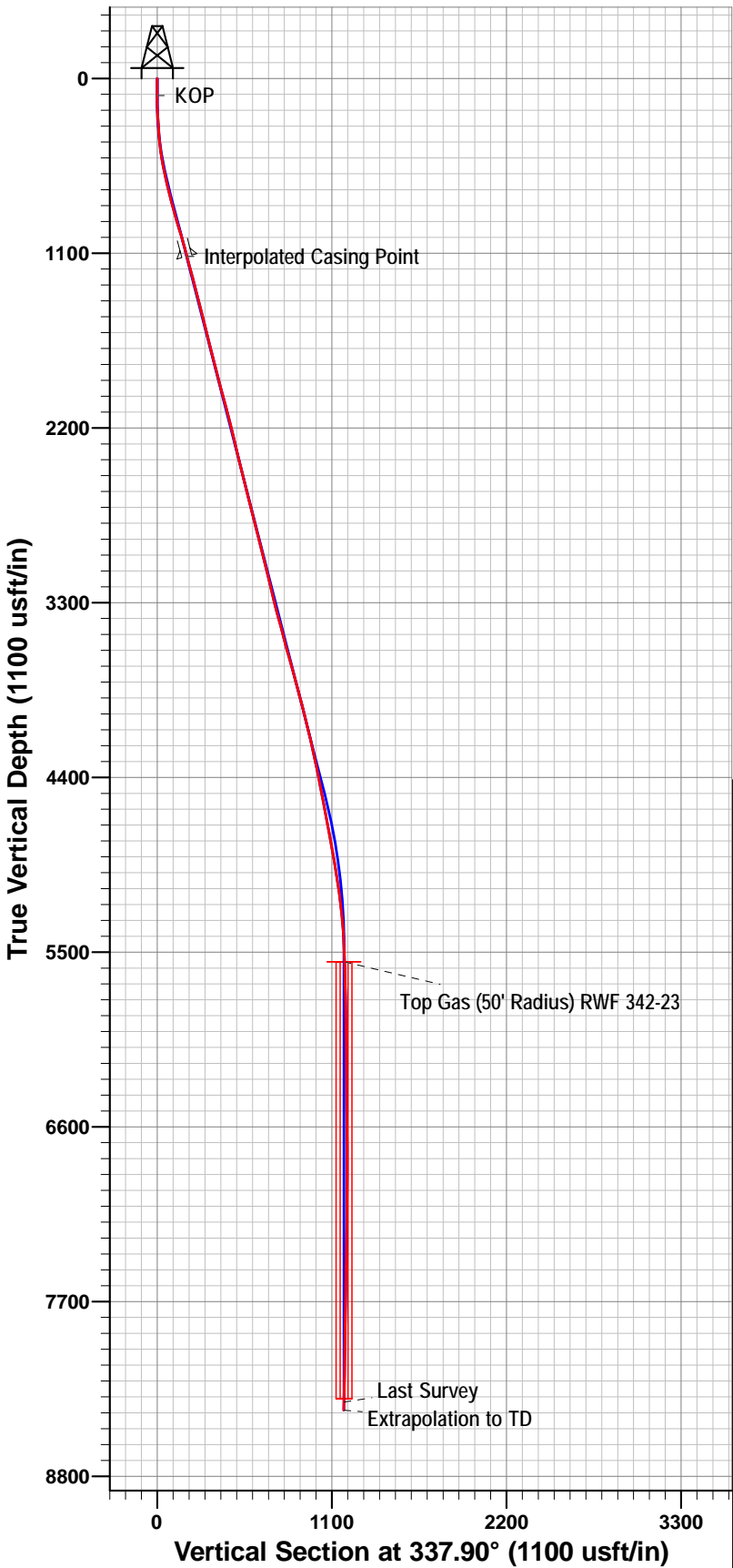
Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
107.00	107.00	-0.16	0.41	KOP
1,142.00	1,120.18	172.04	-71.93	Interpolated Casing Point
8,473.00	8,333.27	1,085.39	-452.39	Last Survey
8,523.00	8,383.20	1,083.69	-454.32	Extrapolation to TD



REFERENCE INFORMATION
Magnetic Declination - 9.86°
Magnetic Dip Angle - 65.69°
Field Strength - 51949
KB Elevation - KELLY BUSHING @ 5625.00usft (Nabors 577 (26' RKB) mab)
Ground Level - 5599.00
Well Center Northing - 1619204.50
Well Center Easting - 2337889.00
Calculation Method - Minimum Curvature
Geodetic System - US State Plane 1983
Geodetic Datum - North American Datum 1983
Map Zone - Colorado Central Zone

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W
W/C_RWF_32-23	0.00	9.03	-37.76
W/C_RWF_331-23	0.00	9.61	-15.25
W/C_RWF_332-23	0.00	-0.77	-29.99
W/C_RWF_341-23	0.00	10.00	-0.26
W/C_RWF_342-23	0.00	0.00	0.00
W/C_RWF_41-23	0.00	10.39	14.74
W/C_RWF_42-23	0.00	0.39	15.00
W/C_RWF_431-23	0.00	8.83	-45.25
W/C_RWF_432-23	0.00	-1.16	-44.99
W/C_RWF_43-23	0.00	-0.19	-7.50
W/C_RWF_441-23	0.00	0.19	7.50
W/C_RWF_442-23	0.00	0.58	22.49
W/C_RWF_531-23	0.00	9.80	-7.76
W/C_RWF_541-23	0.00	10.58	22.24
W/C_RWF_542-23	0.00	0.77	29.99
W/C_RWF_633-23	0.00	-0.97	-37.49
Top Gas (25' Radius) RWF 342-23	5561.00	1089.58	-442.51
Top Gas (50' Radius) RWF 342-23	5561.00	1089.58	-442.51



CASING DETAILS

TVD	MD	Name
1120.18	1142.00	Surface Casing

Survey: Final Surveys (RWF 342-23/14-09-147)