



Company: Red Willow Production Co.
Project: Archuleta County, CO NAD83
Site: North Carracas 7F Pad
Well: NC 32-4 7F-2
Wellbore: Lateral 3
Design: Plan #5

PROJECT DETAILS: Archuleta County, CO NAD83

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Colorado Southern Zone
System Datum: Mean Sea Level
Local North: True



Azimuths to True North
Magnetic North: 9.07°

Magnetic Field
Strength: 50078.9snT
Dip Angle: 63.55°
Date: 1/12/2018
Model: HDGM

WELL DETAILS: NC 32-4 7F-2

Plan: Plan #5 (NC 32-4 7F-2/Lateral 3)

Created By: Janie Collins Date: 16:23, February 08 2019

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
7F-2 Lat 3 BHL	2759.00	-2165.51	-6359.56	1133921.81	2458350.20	37.0196853	-107.3552746

SECTION DETAILS

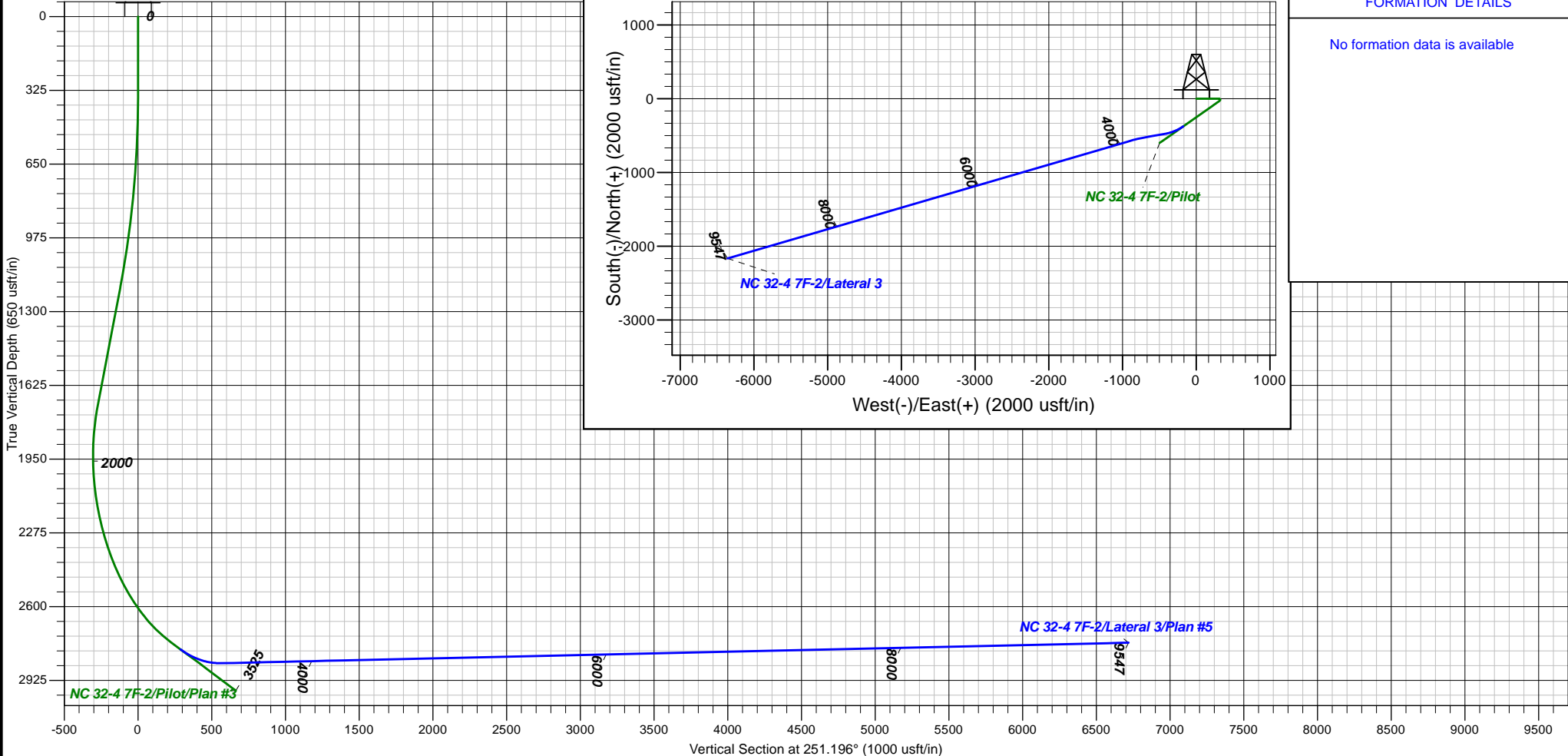
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
3095.00	65.00	235.000	2788.50	-375.43	-177.10	0.00	0.00	288.66	
3383.93	90.83	260.000	2849.41	-478.93	-434.86	12.25	46.85	566.02	
3683.93	90.83	260.000	2845.06	-531.02	-730.27	0.00	0.00	862.46	
3809.07	90.84	253.742	2843.23	-559.42	-852.06	5.00	-89.85	986.91	
9546.59	90.84	253.742	2759.00	-2165.51	-6359.56	0.00	0.00	6718.14	7F-2 Lat 3 BHL

CASING DETAILS

No casing data is available

FORMATION DETAILS

No formation data is available





Red Willow Production Co.

Archuleta County, CO NAD83

North Carracas 7F Pad

NC 32-4 7F-2 - Slot 7F-2

Lateral 3

Plan: Plan #5

Standard Planning Report

08 February, 2019





Scientific Drilling, Intl Planning Report



Database:	Grand Junction District	Local Co-ordinate Reference:	Well NC 32-4 7F-2 - Slot 7F-2
Company:	Red Willow Production Co.	TVD Reference:	GL 6159' & RKB 14' @ 6173.00usft
Project:	Archuleta County, CO NAD83	MD Reference:	GL 6159' & RKB 14' @ 6173.00usft
Site:	North Carracas 7F Pad	North Reference:	True
Well:	NC 32-4 7F-2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral 3		
Design:	Plan #5		

Project	Archuleta County, CO NAD83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Southern Zone		

Site	North Carracas 7F Pad			
Site Position:		Northing:	1,135,994.45 usft	Latitude: 37.0257222
From:	Map	Easting:	2,464,727.53 usft	Longitude: -107.3335758
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence: -1.12 °

Well	NC 32-4 7F-2 - Slot 7F-2					
Well Position	+N/-S	-31.90 usft	Northing:	1,135,962.08 usft	Latitude:	37.0256346
	+E/-W	24.14 usft	Easting:	2,464,751.04 usft	Longitude:	-107.3334931
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	6,159.00 usft

Wellbore	Lateral 3				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	1/12/2018	9.07	63.55	50,079

Design	Plan #5			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	3,095.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	251.196

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
3,095.00	65.00	235.000	2,788.50	-375.43	-177.10	0.00	0.00	0.00	0.00	
3,383.93	90.83	260.000	2,849.41	-478.93	-434.86	12.25	8.94	8.65	46.85	
3,683.93	90.83	260.000	2,845.06	-531.02	-730.27	0.00	0.00	0.00	0.00	
3,809.07	90.84	253.742	2,843.23	-559.42	-852.06	5.00	0.01	-5.00	-89.85	
9,546.59	90.84	253.742	2,759.00	-2,165.51	-6,359.56	0.00	0.00	0.00	0.00	7F-2 Lat 3 BHL



Scientific Drilling, Intl Planning Report



Database:	Grand Junction District	Local Co-ordinate Reference:	Well NC 32-4 7F-2 - Slot 7F-2
Company:	Red Willow Production Co.	TVD Reference:	GL 6159' & RKB 14' @ 6173.00usft
Project:	Archuleta County, CO NAD83	MD Reference:	GL 6159' & RKB 14' @ 6173.00usft
Site:	North Carracas 7F Pad	North Reference:	True
Well:	NC 32-4 7F-2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral 3		
Design:	Plan #5		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
3,095.00	65.00	235.000	2,788.50	-375.43	-177.10	288.66	0.00	0.00	0.00	
3,100.00	65.42	235.491	2,790.59	-378.02	-180.83	293.03	12.25	8.39	9.83	
3,200.00	74.10	244.723	2,825.22	-424.49	-262.09	384.93	12.25	8.68	9.23	
3,300.00	83.13	253.172	2,844.98	-459.53	-353.43	482.69	12.25	9.03	8.45	
3,383.93	90.83	260.000	2,849.41	-478.93	-434.86	566.02	12.25	9.17	8.13	
3,400.00	90.83	260.000	2,849.17	-481.72	-450.68	581.90	0.00	0.00	0.00	
3,500.00	90.83	260.000	2,847.73	-499.08	-549.15	680.71	0.00	0.00	0.00	
3,600.00	90.83	260.000	2,846.28	-516.44	-647.62	779.52	0.00	0.00	0.00	
3,683.93	90.83	260.000	2,845.06	-531.02	-730.27	862.46	0.00	0.00	0.00	
3,700.00	90.83	259.197	2,844.83	-533.92	-746.07	878.35	5.00	0.01	-5.00	
3,800.00	90.84	254.196	2,843.37	-556.92	-843.35	977.85	5.00	0.01	-5.00	
3,809.07	90.84	253.742	2,843.23	-559.42	-852.06	986.91	5.00	0.01	-5.00	
3,900.00	90.84	253.742	2,841.90	-584.88	-939.35	1,077.74	0.00	0.00	0.00	
4,000.00	90.84	253.742	2,840.43	-612.87	-1,035.34	1,177.63	0.00	0.00	0.00	
4,100.00	90.84	253.742	2,838.96	-640.86	-1,131.33	1,277.52	0.00	0.00	0.00	
4,200.00	90.84	253.742	2,837.49	-668.86	-1,227.32	1,377.41	0.00	0.00	0.00	
4,300.00	90.84	253.742	2,836.03	-696.85	-1,323.31	1,477.30	0.00	0.00	0.00	
4,400.00	90.84	253.742	2,834.56	-724.84	-1,419.30	1,577.19	0.00	0.00	0.00	
4,500.00	90.84	253.742	2,833.09	-752.83	-1,515.29	1,677.08	0.00	0.00	0.00	
4,600.00	90.84	253.742	2,831.62	-780.83	-1,611.28	1,776.97	0.00	0.00	0.00	
4,700.00	90.84	253.742	2,830.15	-808.82	-1,707.27	1,876.86	0.00	0.00	0.00	
4,800.00	90.84	253.742	2,828.69	-836.81	-1,803.26	1,976.75	0.00	0.00	0.00	
4,900.00	90.84	253.742	2,827.22	-864.80	-1,899.26	2,076.64	0.00	0.00	0.00	
5,000.00	90.84	253.742	2,825.75	-892.80	-1,995.25	2,176.53	0.00	0.00	0.00	
5,100.00	90.84	253.742	2,824.28	-920.79	-2,091.24	2,276.42	0.00	0.00	0.00	
5,200.00	90.84	253.742	2,822.81	-948.78	-2,187.23	2,376.31	0.00	0.00	0.00	
5,300.00	90.84	253.742	2,821.35	-976.77	-2,283.22	2,476.20	0.00	0.00	0.00	
5,400.00	90.84	253.742	2,819.88	-1,004.77	-2,379.21	2,576.09	0.00	0.00	0.00	
5,500.00	90.84	253.742	2,818.41	-1,032.76	-2,475.20	2,675.98	0.00	0.00	0.00	
5,600.00	90.84	253.742	2,816.94	-1,060.75	-2,571.19	2,775.87	0.00	0.00	0.00	
5,700.00	90.84	253.742	2,815.47	-1,088.75	-2,667.18	2,875.77	0.00	0.00	0.00	
5,800.00	90.84	253.742	2,814.00	-1,116.74	-2,763.17	2,975.66	0.00	0.00	0.00	
5,900.00	90.84	253.742	2,812.54	-1,144.73	-2,859.16	3,075.55	0.00	0.00	0.00	
6,000.00	90.84	253.742	2,811.07	-1,172.72	-2,955.16	3,175.44	0.00	0.00	0.00	
6,100.00	90.84	253.742	2,809.60	-1,200.72	-3,051.15	3,275.33	0.00	0.00	0.00	
6,200.00	90.84	253.742	2,808.13	-1,228.71	-3,147.14	3,375.22	0.00	0.00	0.00	
6,300.00	90.84	253.742	2,806.66	-1,256.70	-3,243.13	3,475.11	0.00	0.00	0.00	
6,400.00	90.84	253.742	2,805.20	-1,284.69	-3,339.12	3,575.00	0.00	0.00	0.00	
6,500.00	90.84	253.742	2,803.73	-1,312.69	-3,435.11	3,674.89	0.00	0.00	0.00	
6,600.00	90.84	253.742	2,802.26	-1,340.68	-3,531.10	3,774.78	0.00	0.00	0.00	
6,700.00	90.84	253.742	2,800.79	-1,368.67	-3,627.09	3,874.67	0.00	0.00	0.00	
6,800.00	90.84	253.742	2,799.32	-1,396.66	-3,723.08	3,974.56	0.00	0.00	0.00	
6,900.00	90.84	253.742	2,797.86	-1,424.66	-3,819.07	4,074.45	0.00	0.00	0.00	
7,000.00	90.84	253.742	2,796.39	-1,452.65	-3,915.07	4,174.34	0.00	0.00	0.00	
7,100.00	90.84	253.742	2,794.92	-1,480.64	-4,011.06	4,274.23	0.00	0.00	0.00	
7,200.00	90.84	253.742	2,793.45	-1,508.63	-4,107.05	4,374.12	0.00	0.00	0.00	
7,300.00	90.84	253.742	2,791.98	-1,536.63	-4,203.04	4,474.01	0.00	0.00	0.00	
7,400.00	90.84	253.742	2,790.51	-1,564.62	-4,299.03	4,573.90	0.00	0.00	0.00	
7,500.00	90.84	253.742	2,789.05	-1,592.61	-4,395.02	4,673.79	0.00	0.00	0.00	
7,600.00	90.84	253.742	2,787.58	-1,620.61	-4,491.01	4,773.68	0.00	0.00	0.00	
7,700.00	90.84	253.742	2,786.11	-1,648.60	-4,587.00	4,873.57	0.00	0.00	0.00	
7,800.00	90.84	253.742	2,784.64	-1,676.59	-4,682.99	4,973.46	0.00	0.00	0.00	
7,900.00	90.84	253.742	2,783.17	-1,704.58	-4,778.98	5,073.36	0.00	0.00	0.00	
8,000.00	90.84	253.742	2,781.71	-1,732.58	-4,874.97	5,173.25	0.00	0.00	0.00	



Scientific Drilling, Intl Planning Report



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Project:	Archuleta County, CO NAD83	MD Reference:	GL 6159' & RKB 14' @ 6173.00usft
Site:	North Carracas 7F Pad	North Reference:	True
Well:	NC 32-4 7F-2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral 3		
Design:	Plan #5		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
8,100.00	90.84	253.742	2,780.24	-1,760.57	-4,970.97	5,273.14	0.00	0.00	0.00	
8,200.00	90.84	253.742	2,778.77	-1,788.56	-5,066.96	5,373.03	0.00	0.00	0.00	
8,300.00	90.84	253.742	2,777.30	-1,816.55	-5,162.95	5,472.92	0.00	0.00	0.00	
8,400.00	90.84	253.742	2,775.83	-1,844.55	-5,258.94	5,572.81	0.00	0.00	0.00	
8,500.00	90.84	253.742	2,774.37	-1,872.54	-5,354.93	5,672.70	0.00	0.00	0.00	
8,600.00	90.84	253.742	2,772.90	-1,900.53	-5,450.92	5,772.59	0.00	0.00	0.00	
8,700.00	90.84	253.742	2,771.43	-1,928.52	-5,546.91	5,872.48	0.00	0.00	0.00	
8,800.00	90.84	253.742	2,769.96	-1,956.52	-5,642.90	5,972.37	0.00	0.00	0.00	
8,900.00	90.84	253.742	2,768.49	-1,984.51	-5,738.89	6,072.26	0.00	0.00	0.00	
9,000.00	90.84	253.742	2,767.02	-2,012.50	-5,834.88	6,172.15	0.00	0.00	0.00	
9,100.00	90.84	253.742	2,765.56	-2,040.49	-5,930.87	6,272.04	0.00	0.00	0.00	
9,200.00	90.84	253.742	2,764.09	-2,068.49	-6,026.87	6,371.93	0.00	0.00	0.00	
9,300.00	90.84	253.742	2,762.62	-2,096.48	-6,122.86	6,471.82	0.00	0.00	0.00	
9,400.00	90.84	253.742	2,761.15	-2,124.47	-6,218.85	6,571.71	0.00	0.00	0.00	
9,500.00	90.84	253.742	2,759.68	-2,152.46	-6,314.84	6,671.60	0.00	0.00	0.00	
9,546.59	90.84	253.742	2,759.00	-2,165.51	-6,359.56	6,718.14	0.00	0.00	0.00	

Design Targets										
Target Name										
- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude		Longitude
- Shape										
7F-2 Lat 3 BHL	0.00	0.000	2,759.00	-2,165.51	-6,359.56	1,133,921.81	2,458,350.20	37.0196852		-107.3552746
- plan hits target center										
- Point										