



Company: Red Willow Production Co.
Project: Archuleta County, CO NAD83
Site: North Carracas 7F Pad
Well: NC 32-4 7F-1
Wellbore: Lateral 2
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: 50078.5snT
Dip Angle: 63.55°
Date: 1/12/2018
Model: HDGM

WELL DETAILS: NC 32-4 7F-1

Plan: Plan #5 (NC 32-4 7F-1/Lateral 2)

Created By: Janie Collins Date: 11:07, February 05 2019

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	1135994.45	2464727.53	37.0257222	-107.3335757

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
NC 7F-1 Lat 2 BHL	2779.00	3199.25	-5862.92	1139308.17	2458928.54	37.0345068	-107.3536602

SECTION DETAILS

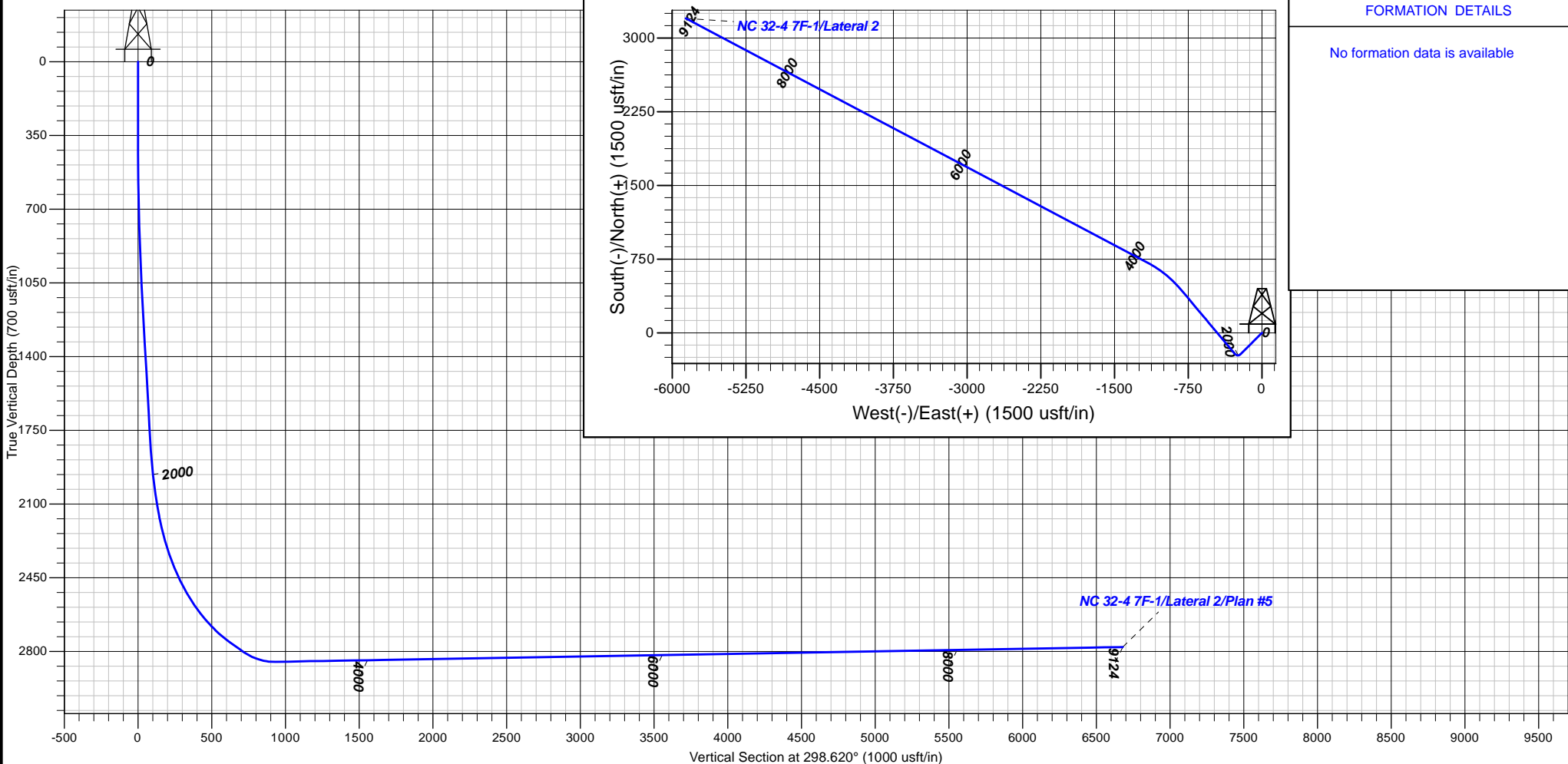
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
3113.00	65.00	320.000	2796.51	249.45	-665.44	0.00	0.00	703.62	
3366.20	90.70	320.000	2849.35	437.48	-823.22	10.15	0.00	932.19	
3808.52	90.70	297.882	2843.88	713.75	-1165.10	5.00	-89.86	1364.62	
9123.74	90.70	297.882	2779.00	3199.25	-5862.92	0.00	0.00	6679.00	NC 7F-1 Lat 2 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-1 - Slot 7F-1

Lateral 2

Plan: Plan #5

Standard Planning Report

05 February, 2019





Scientific Drilling, Intl

Planning Report



Database:	Grand Junction District	Local Co-ordinate Reference:	Well NC 32-4 7F-1 - Slot 7F-1
Company:	Red Willow Production Co.	TVD Reference:	GL 6159.10' & RKB 14' @ 6173.10usft
Project:	Archuleta County, CO NAD83	MD Reference:	GL 6159.10' & RKB 14' @ 6173.10usft
Site:	North Carracas 7F Pad	North Reference:	True
Well:	NC 32-4 7F-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral 2		
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-1 - Slot 7F-1			
Well Position	+N/-S	0.00 usft	Northing:	1,135,994.45 usft
	+E/-W	0.00 usft	Easting:	2,464,727.53 usft
Position Uncertainty	0.00 usft		Wellhead Elevation:	0.00 usft
			Ground Level:	6,159.10 usft

Wellbore	Lateral 2				
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:	3,113.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	298.620

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
3,113.00	65.00	320.000	2,796.51	249.45	-665.44	0.00	0.00	0.00	0.00	
3,366.20	90.70	320.000	2,849.35	437.48	-823.22	10.15	10.15	0.00	0.00	
3,808.52	90.70	297.882	2,843.88	713.75	-1,165.10	5.00	0.00	-5.00	-89.86	
9,123.74	90.70	297.882	2,779.00	3,199.25	-5,862.92	0.00	0.00	0.00	0.00	NC 7F-1 Lat 2 BHL



Scientific Drilling, Intl Planning Report



Database:	Grand Junction District	Local Co-ordinate Reference:	Well NC 32-4 7F-1 - Slot 7F-1
Company:	Red Willow Production Co.	TVD Reference:	GL 6159.10' & RKB 14' @ 6173.10usft
Project:	Archuleta County, CO NAD83	MD Reference:	GL 6159.10' & RKB 14' @ 6173.10usft
Site:	North Carracas 7F Pad	North Reference:	True
Well:	NC 32-4 7F-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral 2		
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)	
3,113.00	65.00	320.000	2,796.51	249.45	-665.44	703.62	0.00	0.00	0.00	
3,200.00	73.83	320.000	2,827.07	311.78	-717.74	779.39	10.15	10.15	0.00	
3,300.00	83.98	320.000	2,846.28	386.85	-780.74	870.64	10.15	10.15	0.00	
3,366.20	90.70	320.000	2,849.35	437.48	-823.22	932.19	10.15	10.15	0.00	
3,400.00	90.70	318.310	2,848.94	463.05	-845.32	963.84	5.00	0.01	-5.00	
3,500.00	90.71	313.310	2,847.70	534.72	-915.00	1,059.33	5.00	0.01	-5.00	
3,600.00	90.71	308.309	2,846.46	600.05	-990.66	1,157.04	5.00	0.00	-5.00	
3,700.00	90.71	303.309	2,845.22	658.54	-1,071.72	1,256.21	5.00	0.00	-5.00	
3,800.00	90.70	298.308	2,843.99	709.73	-1,157.58	1,356.10	5.00	-0.01	-5.00	
3,808.52	90.70	297.882	2,843.88	713.75	-1,165.10	1,364.62	5.00	-0.01	-5.00	
3,900.00	90.70	297.882	2,842.77	756.52	-1,245.95	1,456.09	0.00	0.00	0.00	
4,000.00	90.70	297.882	2,841.55	803.29	-1,334.33	1,556.07	0.00	0.00	0.00	
4,100.00	90.70	297.882	2,840.33	850.05	-1,422.72	1,656.05	0.00	0.00	0.00	
4,200.00	90.70	297.882	2,839.11	896.81	-1,511.10	1,756.04	0.00	0.00	0.00	
4,300.00	90.70	297.882	2,837.88	943.57	-1,599.49	1,856.02	0.00	0.00	0.00	
4,400.00	90.70	297.882	2,836.66	990.33	-1,687.87	1,956.01	0.00	0.00	0.00	
4,500.00	90.70	297.882	2,835.44	1,037.10	-1,776.25	2,055.99	0.00	0.00	0.00	
4,600.00	90.70	297.882	2,834.22	1,083.86	-1,864.64	2,155.98	0.00	0.00	0.00	
4,700.00	90.70	297.882	2,833.00	1,130.62	-1,953.02	2,255.96	0.00	0.00	0.00	
4,800.00	90.70	297.882	2,831.78	1,177.38	-2,041.41	2,355.94	0.00	0.00	0.00	
4,900.00	90.70	297.882	2,830.56	1,224.15	-2,129.79	2,455.93	0.00	0.00	0.00	
5,000.00	90.70	297.882	2,829.34	1,270.91	-2,218.18	2,555.91	0.00	0.00	0.00	
5,100.00	90.70	297.882	2,828.12	1,317.67	-2,306.56	2,655.90	0.00	0.00	0.00	
5,200.00	90.70	297.882	2,826.90	1,364.43	-2,394.95	2,755.88	0.00	0.00	0.00	
5,300.00	90.70	297.882	2,825.68	1,411.19	-2,483.33	2,855.87	0.00	0.00	0.00	
5,400.00	90.70	297.882	2,824.46	1,457.96	-2,571.71	2,955.85	0.00	0.00	0.00	
5,500.00	90.70	297.882	2,823.24	1,504.72	-2,660.10	3,055.83	0.00	0.00	0.00	
5,600.00	90.70	297.882	2,822.02	1,551.48	-2,748.48	3,155.82	0.00	0.00	0.00	
5,700.00	90.70	297.882	2,820.79	1,598.24	-2,836.87	3,255.80	0.00	0.00	0.00	
5,800.00	90.70	297.882	2,819.57	1,645.00	-2,925.25	3,355.79	0.00	0.00	0.00	
5,900.00	90.70	297.882	2,818.35	1,691.77	-3,013.64	3,455.77	0.00	0.00	0.00	
6,000.00	90.70	297.882	2,817.13	1,738.53	-3,102.02	3,555.76	0.00	0.00	0.00	
6,100.00	90.70	297.882	2,815.91	1,785.29	-3,190.41	3,655.74	0.00	0.00	0.00	
6,200.00	90.70	297.882	2,814.69	1,832.05	-3,278.79	3,755.72	0.00	0.00	0.00	
6,300.00	90.70	297.882	2,813.47	1,878.81	-3,367.17	3,855.71	0.00	0.00	0.00	
6,400.00	90.70	297.882	2,812.25	1,925.58	-3,455.56	3,955.69	0.00	0.00	0.00	
6,500.00	90.70	297.882	2,811.03	1,972.34	-3,543.94	4,055.68	0.00	0.00	0.00	
6,600.00	90.70	297.882	2,809.81	2,019.10	-3,632.33	4,155.66	0.00	0.00	0.00	
6,700.00	90.70	297.882	2,808.59	2,065.86	-3,720.71	4,255.65	0.00	0.00	0.00	
6,800.00	90.70	297.882	2,807.37	2,112.63	-3,809.10	4,355.63	0.00	0.00	0.00	
6,900.00	90.70	297.882	2,806.15	2,159.39	-3,897.48	4,455.61	0.00	0.00	0.00	
7,000.00	90.70	297.882	2,804.93	2,206.15	-3,985.87	4,555.60	0.00	0.00	0.00	
7,100.00	90.70	297.882	2,803.70	2,252.91	-4,074.25	4,655.58	0.00	0.00	0.00	
7,200.00	90.70	297.882	2,802.48	2,299.67	-4,162.63	4,755.57	0.00	0.00	0.00	
7,300.00	90.70	297.882	2,801.26	2,346.44	-4,251.02	4,855.55	0.00	0.00	0.00	
7,400.00	90.70	297.882	2,800.04	2,393.20	-4,339.40	4,955.54	0.00	0.00	0.00	
7,500.00	90.70	297.882	2,798.82	2,439.96	-4,427.79	5,055.52	0.00	0.00	0.00	
7,600.00	90.70	297.882	2,797.60	2,486.72	-4,516.17	5,155.50	0.00	0.00	0.00	
7,700.00	90.70	297.882	2,796.38	2,533.48	-4,604.56	5,255.49	0.00	0.00	0.00	
7,800.00	90.70	297.882	2,795.16	2,580.25	-4,692.94	5,355.47	0.00	0.00	0.00	
7,900.00	90.70	297.882	2,793.94	2,627.01	-4,781.33	5,455.46	0.00	0.00	0.00	
8,000.00	90.70	297.882	2,792.72	2,673.77	-4,869.71	5,555.44	0.00	0.00	0.00	
8,100.00	90.70	297.882	2,791.50	2,720.53	-4,958.10	5,655.43	0.00	0.00	0.00	
8,200.00	90.70	297.882	2,790.28	2,767.30	-5,046.48	5,755.41	0.00	0.00	0.00	



Scientific Drilling, Intl

Planning Report



Database:	Grand Junction District	Local Co-ordinate Reference:	Well NC 32-4 7F-1 - Slot 7F-1
Company:	Red Willow Production Co.	TVD Reference:	GL 6159.10' & RKB 14' @ 6173.10usft
Project:	Archuleta County, CO NAD83	MD Reference:	GL 6159.10' & RKB 14' @ 6173.10usft
Site:	North Carracas 7F Pad	North Reference:	True
Well:	NC 32-4 7F-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral 2		
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)	
8,300.00	90.70	297.882	2,789.06	2,814.06	-5,134.86	5,855.39	0.00	0.00	0.00	
8,400.00	90.70	297.882	2,787.83	2,860.82	-5,223.25	5,955.38	0.00	0.00	0.00	
8,500.00	90.70	297.882	2,786.61	2,907.58	-5,311.63	6,055.36	0.00	0.00	0.00	
8,600.00	90.70	297.882	2,785.39	2,954.34	-5,400.02	6,155.35	0.00	0.00	0.00	
8,700.00	90.70	297.882	2,784.17	3,001.11	-5,488.40	6,255.33	0.00	0.00	0.00	
8,800.00	90.70	297.882	2,782.95	3,047.87	-5,576.79	6,355.31	0.00	0.00	0.00	
8,900.00	90.70	297.882	2,781.73	3,094.63	-5,665.17	6,455.30	0.00	0.00	0.00	
9,000.00	90.70	297.882	2,780.51	3,141.39	-5,753.56	6,555.28	0.00	0.00	0.00	
9,100.00	90.70	297.882	2,779.29	3,188.15	-5,841.94	6,655.27	0.00	0.00	0.00	
9,123.74	90.70	297.882	2,779.00	3,199.25	-5,862.92	6,679.00	0.00	0.00	0.00	

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
- hit/miss target										
- Shape										
NC 7F-1 Lat 2 BHL	0.00	0.000	2,779.00	3,199.25	-5,862.92	1,139,308.16	2,458,928.54	37.0345068	-107.3536603	
- plan hits target center										
- Point										