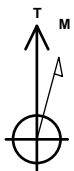




Company: Red Willow Production Co.
Project: Archuleta County, CO NAD83
Site: North Carracas 7F Pad
Well: NC 32-4 7F-2
Wellbore: Lateral 4
Design: Plan #5

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

GL 6159' & RKB 14' @ 6173.00usft

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	
0.00	0.00	1135962.08	2464751.04	37.0256346	-107.3334930	7F-2

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

Created By: Janie Collins Date: 16:31, February 08 2019

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
7F-2 Lat 4 BHL	2769.00	-896.04	-6344.68	1135190.74	2458390.00	37.0231717	-107.3552246

SECTION DETAILS

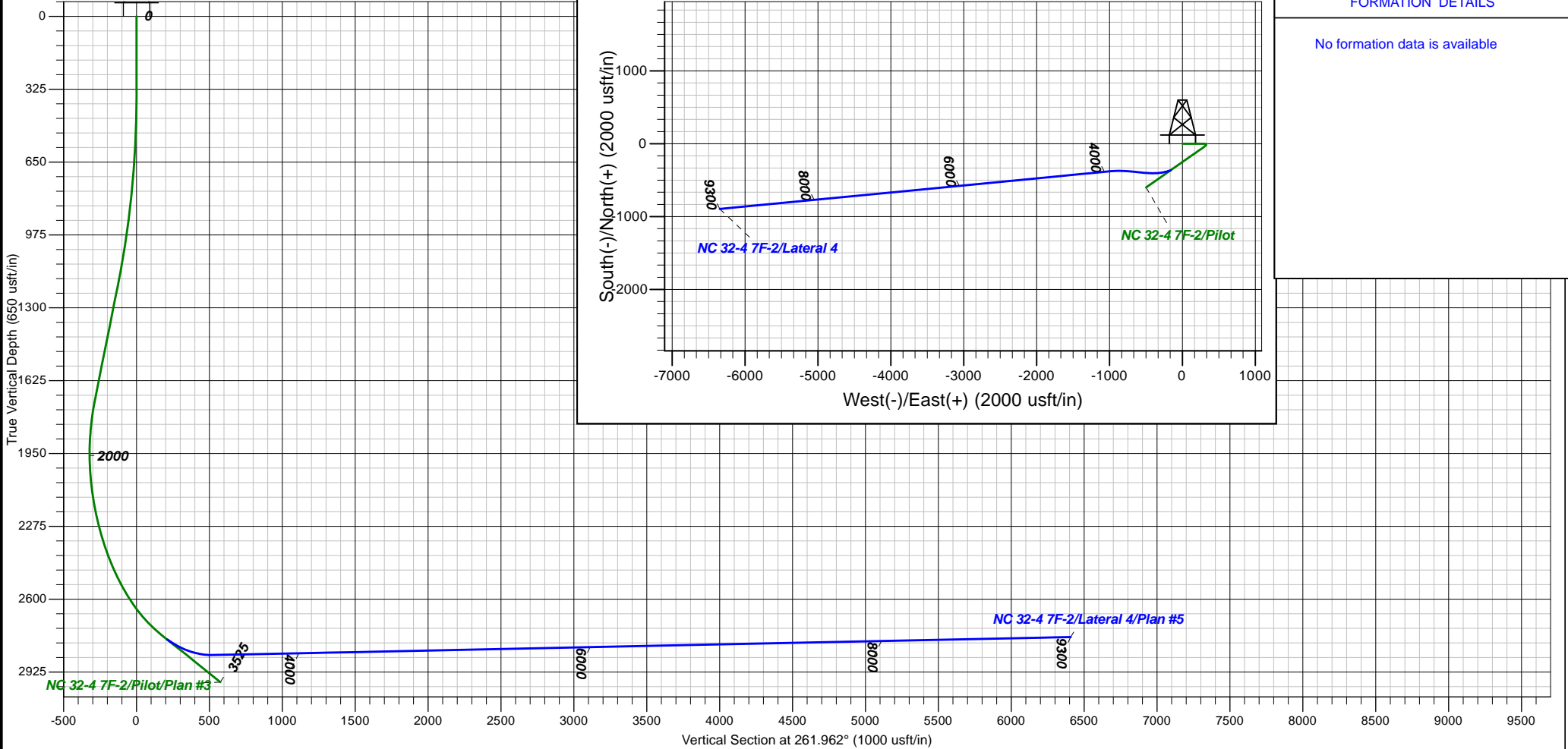
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
3075.00	65.00	250.000	2780.04	-365.04	-162.25	0.00	0.00	211.70	
3403.90	90.78	275.000	2849.52	-402.89	-476.14	10.75	46.91	527.80	
3703.90	90.78	275.000	2845.44	-376.75	-774.97	0.00	0.00	820.04	
3914.36	90.78	264.476	2842.56	-377.71	-985.11	5.00	-89.91	1028.25	
9299.43	90.78	264.476	2769.00	-896.04	-6344.68	0.00	0.00	6407.64	7F-2 Lat 4 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 4

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 4		
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
	+E/-W	24.14 usft	Easting:	2,464,751.04 usft
Position Uncertainty	0.00 usft		Wellhead Elevation:	0.00 usft
			Ground Level:	6,159.00 usft

Wellbore	Lateral 4				
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:	3,075.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	261.962

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
3,075.00	65.00	250.000	2,780.04	-365.04	-162.25	0.00	0.00	0.00	0.00	
3,403.90	90.78	275.000	2,849.52	-402.89	-476.14	10.75	7.84	7.60	46.91	
3,703.90	90.78	275.000	2,845.44	-376.75	-774.97	0.00	0.00	0.00	0.00	
3,914.36	90.78	264.476	2,842.56	-377.71	-985.11	5.00	0.00	-5.00	-89.91	
9,299.43	90.78	264.476	2,769.00	-896.04	-6,344.68	0.00	0.00	0.00	0.00	7F-2 Lat 4 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 4		
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)
3,075.00	65.00	250.000	2,780.04	-365.04	-162.25	211.70	0.00	0.00	0.00
3,100.00	66.85	252.134	2,790.24	-372.44	-183.84	234.11	10.75	7.40	8.54
3,200.00	74.50	260.143	2,823.35	-394.86	-275.34	327.85	10.75	7.65	8.01
3,300.00	82.42	267.568	2,843.36	-405.24	-372.61	425.62	10.75	7.92	7.43
3,400.00	90.47	274.722	2,849.57	-403.22	-472.25	524.00	10.75	8.04	7.15
3,403.90	90.78	275.000	2,849.52	-402.89	-476.14	527.80	10.75	8.06	7.12
3,500.00	90.78	275.000	2,848.21	-394.52	-571.86	621.41	0.00	0.00	0.00
3,600.00	90.78	275.000	2,846.85	-385.80	-671.47	718.83	0.00	0.00	0.00
3,700.00	90.78	275.000	2,845.49	-377.09	-771.08	816.24	0.00	0.00	0.00
3,703.90	90.78	275.000	2,845.44	-376.75	-774.97	820.04	0.00	0.00	0.00
3,800.00	90.78	270.195	2,844.13	-372.39	-870.93	914.45	5.00	0.00	-5.00
3,900.00	90.78	265.194	2,842.76	-376.41	-970.81	1,013.91	5.00	0.00	-5.00
3,914.36	90.78	264.476	2,842.56	-377.71	-985.11	1,028.25	5.00	0.00	-5.00
4,000.00	90.78	264.476	2,841.39	-385.95	-1,070.35	1,113.80	0.00	0.00	0.00
4,100.00	90.78	264.476	2,840.03	-395.58	-1,169.87	1,213.69	0.00	0.00	0.00
4,200.00	90.78	264.476	2,838.66	-405.20	-1,269.40	1,313.59	0.00	0.00	0.00
4,300.00	90.78	264.476	2,837.29	-414.83	-1,368.92	1,413.48	0.00	0.00	0.00
4,400.00	90.78	264.476	2,835.93	-424.45	-1,468.45	1,513.38	0.00	0.00	0.00
4,500.00	90.78	264.476	2,834.56	-434.08	-1,567.98	1,613.27	0.00	0.00	0.00
4,600.00	90.78	264.476	2,833.20	-443.70	-1,667.50	1,713.17	0.00	0.00	0.00
4,700.00	90.78	264.476	2,831.83	-453.33	-1,767.03	1,813.06	0.00	0.00	0.00
4,800.00	90.78	264.476	2,830.46	-462.95	-1,866.56	1,912.95	0.00	0.00	0.00
4,900.00	90.78	264.476	2,829.10	-472.58	-1,966.08	2,012.85	0.00	0.00	0.00
5,000.00	90.78	264.476	2,827.73	-482.20	-2,065.61	2,112.74	0.00	0.00	0.00
5,100.00	90.78	264.476	2,826.37	-491.83	-2,165.14	2,212.64	0.00	0.00	0.00
5,200.00	90.78	264.476	2,825.00	-501.45	-2,264.66	2,312.53	0.00	0.00	0.00
5,300.00	90.78	264.476	2,823.63	-511.08	-2,364.19	2,412.43	0.00	0.00	0.00
5,400.00	90.78	264.476	2,822.27	-520.71	-2,463.71	2,512.32	0.00	0.00	0.00
5,500.00	90.78	264.476	2,820.90	-530.33	-2,563.24	2,612.22	0.00	0.00	0.00
5,600.00	90.78	264.476	2,819.53	-539.96	-2,662.77	2,712.11	0.00	0.00	0.00
5,700.00	90.78	264.476	2,818.17	-549.58	-2,762.29	2,812.00	0.00	0.00	0.00
5,800.00	90.78	264.476	2,816.80	-559.21	-2,861.82	2,911.90	0.00	0.00	0.00
5,900.00	90.78	264.476	2,815.44	-568.83	-2,961.35	3,011.79	0.00	0.00	0.00
6,000.00	90.78	264.476	2,814.07	-578.46	-3,060.87	3,111.69	0.00	0.00	0.00
6,100.00	90.78	264.476	2,812.70	-588.08	-3,160.40	3,211.58	0.00	0.00	0.00
6,200.00	90.78	264.476	2,811.34	-597.71	-3,259.92	3,311.48	0.00	0.00	0.00
6,300.00	90.78	264.476	2,809.97	-607.33	-3,359.45	3,411.37	0.00	0.00	0.00
6,400.00	90.78	264.476	2,808.61	-616.96	-3,458.98	3,511.27	0.00	0.00	0.00
6,500.00	90.78	264.476	2,807.24	-626.58	-3,558.50	3,611.16	0.00	0.00	0.00
6,600.00	90.78	264.476	2,805.87	-636.21	-3,658.03	3,711.05	0.00	0.00	0.00
6,700.00	90.78	264.476	2,804.51	-645.84	-3,757.56	3,810.95	0.00	0.00	0.00
6,800.00	90.78	264.476	2,803.14	-655.46	-3,857.08	3,910.84	0.00	0.00	0.00
6,900.00	90.78	264.476	2,801.78	-665.09	-3,956.61	4,010.74	0.00	0.00	0.00
7,000.00	90.78	264.476	2,800.41	-674.71	-4,056.14	4,110.63	0.00	0.00	0.00
7,100.00	90.78	264.476	2,799.04	-684.34	-4,155.66	4,210.53	0.00	0.00	0.00
7,200.00	90.78	264.476	2,797.68	-693.96	-4,255.19	4,310.42	0.00	0.00	0.00
7,300.00	90.78	264.476	2,796.31	-703.59	-4,354.71	4,410.31	0.00	0.00	0.00
7,400.00	90.78	264.476	2,794.95	-713.21	-4,454.24	4,510.21	0.00	0.00	0.00
7,500.00	90.78	264.476	2,793.58	-722.84	-4,553.77	4,610.10	0.00	0.00	0.00
7,600.00	90.78	264.476	2,792.21	-732.46	-4,653.29	4,710.00	0.00	0.00	0.00
7,700.00	90.78	264.476	2,790.85	-742.09	-4,752.82	4,809.89	0.00	0.00	0.00
7,800.00	90.78	264.476	2,789.48	-751.71	-4,852.35	4,909.79	0.00	0.00	0.00
7,900.00	90.78	264.476	2,788.12	-761.34	-4,951.87	5,009.68	0.00	0.00	0.00
8,000.00	90.78	264.476	2,786.75	-770.97	-5,051.40	5,109.58	0.00	0.00	0.00



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 4		
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	90.78	264.476	2,785.38	-780.59	-5,150.92	5,209.47	0.00	0.00	0.00	
8,200.00	90.78	264.476	2,784.02	-790.22	-5,250.45	5,309.36	0.00	0.00	0.00	
8,300.00	90.78	264.476	2,782.65	-799.84	-5,349.98	5,409.26	0.00	0.00	0.00	
8,400.00	90.78	264.476	2,781.29	-809.47	-5,449.50	5,509.15	0.00	0.00	0.00	
8,500.00	90.78	264.476	2,779.92	-819.09	-5,549.03	5,609.05	0.00	0.00	0.00	
8,600.00	90.78	264.476	2,778.55	-828.72	-5,648.56	5,708.94	0.00	0.00	0.00	
8,700.00	90.78	264.476	2,777.19	-838.34	-5,748.08	5,808.84	0.00	0.00	0.00	
8,800.00	90.78	264.476	2,775.82	-847.97	-5,847.61	5,908.73	0.00	0.00	0.00	
8,900.00	90.78	264.476	2,774.46	-857.59	-5,947.14	6,008.63	0.00	0.00	0.00	
9,000.00	90.78	264.476	2,773.09	-867.22	-6,046.66	6,108.52	0.00	0.00	0.00	
9,100.00	90.78	264.476	2,771.72	-876.84	-6,146.19	6,208.41	0.00	0.00	0.00	
9,200.00	90.78	264.476	2,770.36	-886.47	-6,245.71	6,308.31	0.00	0.00	0.00	
9,299.43	90.78	264.476	2,769.00	-896.04	-6,344.68	6,407.64	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										
7F-2 Lat 4 BHL	0.00	0.000	2,769.00	-896.04	-6,344.68	1,135,190.74	2,458,390.00	37.0231717	-107.3552246	
- plan hits target center										
- Point										