



C O N C H O

NORTHERN DELAWARE BASIN

LEA COUNTY, NM

BULLDOG

HENNIN FED #12H

OWB

Design: ACTUAL WELLPATH

Standard Survey Report

16 July, 2018

HOBBS OCD
DEC 17 2018
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Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well HENNIN FED #12H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3170+30 @ 3200.0usft (NABORS 894)
Site:	BULLDOG	MD Reference:	RKB=3170+30 @ 3200.0usft (NABORS 894)
Well:	HENNIN FED #12H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM_Users

Project	LEA COUNTY, NM		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	BULLDOG		
Site Position:		Northing:	398,637.10 usft
From:	Map	Easting:	741,887.40 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 5' 36.820 N
		Longitude:	103° 33' 8.116 W
		Grid Convergence:	0.42 °

Well	HENNIN FED #12H		
Well Position	+N-S	0.0 usft	Northing: 393,796.40 usft
	+E-W	0.0 usft	Easting: 803,558.80 usft
Position Uncertainty	3.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 4' 43.937 N
		Longitude:	103° 21' 11.793 W
		Ground Level:	3,170.0 usft

Wellbore	OWB		
Magnetics:	Model Name	Sample Date	Declination
			(°)
	WMM2015	2/21/2018	6.79
			Dip Angle (°)
			59.94
			Field Strength (nT)
			47,793.00959251

Design	ACTUAL WELLPATH		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N-S	+E-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction (°)
			177.69

Survey Program	Date 7/10/2018		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
96.0	11,549.0	GYRO (OWB)	Standard Keeper 104
11,735.0	17,199.0	MWD-CURVE/LATERAL (OWB)	MWD+IFR1+MS
			Description
			Standard Wireline Keeper ver 1.0.4
			OWSG MWD + IFR1 + Multi-Station Correction

Survey									
Measured Depth	Inclination	Azimuth	Vertical Depth	+N-S	+E-W	Vertical Section	Dogleg Rate	Build Rate	Turn Rate
(usft)	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(°/100usft)	(°/100usft)	(°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
96.0	0.71	194.00	96.0	-0.6	-0.1	0.6	0.74	0.74	0.00
100.0	0.71	193.94	100.0	-0.6	-0.2	0.6	0.02	0.00	-1.50
125.0	0.69	194.10	125.0	-0.9	-0.2	0.9	0.08	-0.08	0.64
150.0	0.82	196.89	150.0	-1.2	-0.3	1.2	0.54	0.52	11.16
175.0	0.85	195.42	175.0	-1.6	-0.4	1.6	0.15	0.12	-5.88
200.0	0.81	194.04	200.0	-1.9	-0.5	1.9	0.18	-0.16	-5.52
225.0	0.82	193.27	225.0	-2.3	-0.6	2.3	0.06	0.04	-3.08
250.0	0.83	195.71	250.0	-2.6	-0.7	2.6	0.15	0.04	9.76
275.0	0.83	194.35	275.0	-3.0	-0.8	2.9	0.08	0.00	-5.44

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Well:	HENNIN FED #12H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM_Users

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)
300.0	0.84	192.96	300.0	-3.3	-0.9	3.3	0.09	0.04	-5.56
325.0	0.81	193.05	325.0	-3.7	-0.9	3.6	0.12	-0.12	0.36
350.0	0.73	193.88	350.0	-4.0	-1.0	4.0	0.32	-0.32	3.32
375.0	0.58	185.13	375.0	-4.3	-1.1	4.2	0.72	-0.60	-35.00
400.0	0.61	187.48	400.0	-4.6	-1.1	4.5	0.15	0.12	9.40
425.0	0.65	195.24	425.0	-4.8	-1.2	4.8	0.38	0.16	31.04
450.0	0.61	191.49	450.0	-5.1	-1.2	5.0	0.23	-0.16	-15.00
475.0	0.58	185.71	475.0	-5.3	-1.3	5.3	0.27	-0.12	-23.12
500.0	0.70	188.16	500.0	-5.6	-1.3	5.6	0.49	0.48	9.80
525.0	0.66	191.21	525.0	-5.9	-1.3	5.9	0.22	-0.16	12.20
550.0	0.52	198.00	550.0	-6.2	-1.4	6.1	0.63	-0.56	27.16
575.0	0.59	194.26	575.0	-6.4	-1.5	6.3	0.32	0.28	-14.96
600.0	0.49	184.08	600.0	-6.6	-1.5	6.6	0.55	-0.40	-40.72
625.0	0.52	188.22	625.0	-6.8	-1.5	6.8	0.19	0.12	16.56
650.0	0.60	190.11	650.0	-7.1	-1.6	7.0	0.33	0.32	7.56
675.0	0.47	184.60	675.0	-7.3	-1.6	7.2	0.56	-0.52	-22.04
700.0	0.39	176.29	700.0	-7.5	-1.6	7.4	0.40	-0.32	-33.24
725.0	0.45	186.77	725.0	-7.7	-1.6	7.6	0.39	0.24	41.92
750.0	0.45	186.40	750.0	-7.9	-1.6	7.8	0.01	0.00	-1.48
775.0	0.45	186.38	775.0	-8.1	-1.7	8.0	0.00	0.00	-0.08
800.0	0.62	199.91	800.0	-8.3	-1.7	8.2	0.84	0.68	54.12
825.0	0.33	163.37	825.0	-8.5	-1.7	8.4	1.62	-1.16	-146.16
850.0	0.26	182.17	849.9	-8.6	-1.7	8.5	0.47	-0.28	75.20
875.0	0.25	185.42	874.9	-8.7	-1.7	8.7	0.07	-0.04	13.00
900.0	0.42	197.91	899.9	-8.9	-1.8	8.8	0.74	0.68	49.96
925.0	0.28	203.66	924.9	-9.0	-1.8	8.9	0.58	-0.56	23.00
950.0	0.16	170.62	949.9	-9.1	-1.8	9.0	0.68	-0.48	-132.16
975.0	0.15	181.08	974.9	-9.2	-1.8	9.1	0.12	-0.04	41.84
1,000.0	0.07	121.29	999.9	-9.2	-1.8	9.1	0.52	-0.32	-239.16
1,025.0	0.01	275.89	1,024.9	-9.2	-1.8	9.1	0.32	-0.24	618.40
1,050.0	0.26	238.67	1,049.9	-9.3	-1.9	9.2	1.01	1.00	-148.88
1,075.0	0.02	242.61	1,074.9	-9.3	-1.9	9.2	0.96	-0.96	15.76
1,100.0	0.06	220.55	1,099.9	-9.3	-1.9	9.2	0.17	0.16	-88.24
1,125.0	0.10	333.90	1,124.9	-9.3	-1.9	9.2	0.54	0.16	453.40
1,150.0	0.17	342.27	1,149.9	-9.2	-2.0	9.1	0.29	0.28	33.48
1,175.0	0.13	276.47	1,174.9	-9.2	-2.0	9.1	0.67	-0.16	-263.20
1,200.0	0.08	347.03	1,199.9	-9.2	-2.0	9.1	0.51	-0.20	282.24
1,225.0	0.05	311.63	1,224.9	-9.2	-2.0	9.1	0.20	-0.12	-141.60
1,250.0	0.07	11.52	1,249.9	-9.1	-2.1	9.0	0.25	0.08	239.56
1,275.0	0.19	240.73	1,274.9	-9.1	-2.1	9.0	0.97	0.48	-523.16
1,300.0	0.15	235.83	1,299.9	-9.2	-2.1	9.1	0.17	-0.16	-19.60
1,325.0	0.14	334.42	1,324.9	-9.2	-2.2	9.1	0.88	-0.04	394.36
1,350.0	0.17	15.89	1,349.9	-9.1	-2.2	9.0	0.45	0.12	165.88

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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)	
1,375.0	0.06	61.88	1,374.9	-9.1	-2.2	9.0	0.54	-0.44	183.96	
1,400.0	0.05	296.62	1,399.9	-9.0	-2.2	9.0	0.39	-0.04	-501.04	
1,425.0	0.06	246.41	1,424.9	-9.0	-2.2	9.0	0.19	0.04	-200.84	
1,450.0	0.11	339.40	1,449.9	-9.0	-2.2	8.9	0.51	0.20	371.96	
1,475.0	0.06	241.90	1,474.9	-9.0	-2.2	8.9	0.53	-0.20	-390.00	
1,500.0	0.03	308.15	1,499.9	-9.0	-2.2	8.9	0.22	-0.12	265.00	
1,525.0	0.04	293.75	1,524.9	-9.0	-2.3	8.9	0.05	0.04	-57.60	
1,550.0	0.08	314.38	1,549.9	-9.0	-2.3	8.9	0.18	0.16	82.52	
1,575.0	0.11	308.70	1,574.9	-9.0	-2.3	8.9	0.13	0.12	-22.72	
1,600.0	0.08	8.09	1,599.9	-8.9	-2.3	8.8	0.39	-0.12	237.56	
1,625.0	0.11	65.49	1,624.9	-8.9	-2.3	8.8	0.38	0.12	229.60	
1,650.0	0.11	55.82	1,649.9	-8.9	-2.3	8.8	0.07	0.00	-38.68	
1,675.0	0.04	22.53	1,674.9	-8.9	-2.2	8.8	0.32	-0.28	-133.16	
1,700.0	0.15	42.46	1,699.9	-8.8	-2.2	8.7	0.45	0.44	79.72	
1,725.0	0.17	26.97	1,724.9	-8.8	-2.2	8.7	0.19	0.08	-61.96	
1,750.0	0.08	76.27	1,749.9	-8.7	-2.1	8.6	0.53	-0.36	197.20	
1,775.0	0.31	71.28	1,774.9	-8.7	-2.1	8.6	0.92	0.92	-19.96	
1,800.0	0.25	63.81	1,799.9	-8.7	-1.9	8.6	0.28	-0.24	-29.88	
1,825.0	0.14	46.09	1,824.9	-8.6	-1.9	8.5	0.50	-0.44	-70.88	
1,850.0	0.15	83.92	1,849.9	-8.6	-1.8	8.5	0.38	0.04	151.32	
1,875.0	0.25	88.34	1,874.9	-8.6	-1.7	8.5	0.40	0.40	17.68	
1,900.0	0.26	52.60	1,899.9	-8.6	-1.6	8.5	0.63	0.04	-142.96	
1,925.0	0.13	94.88	1,924.9	-8.5	-1.6	8.5	0.74	-0.52	169.12	
1,950.0	0.18	75.51	1,949.9	-8.5	-1.5	8.4	0.29	0.20	-77.48	
1,975.0	0.27	52.47	1,974.9	-8.5	-1.4	8.4	0.50	0.36	-92.16	
2,000.0	0.33	6.85	1,999.9	-8.4	-1.4	8.3	0.96	0.24	-182.48	
2,025.0	0.28	80.21	2,024.9	-8.3	-1.3	8.2	1.47	-0.20	293.44	
2,050.0	0.28	99.06	2,049.9	-8.3	-1.2	8.2	0.37	0.00	75.40	
2,075.0	0.30	105.64	2,074.9	-8.3	-1.0	8.3	0.16	0.08	26.32	
2,100.0	0.49	99.32	2,099.9	-8.3	-0.9	8.3	0.78	0.76	-25.28	
2,125.0	0.41	94.17	2,124.9	-8.4	-0.7	8.3	0.36	-0.32	-20.60	
2,150.0	0.52	94.35	2,149.9	-8.4	-0.5	8.4	0.44	0.44	0.72	
2,175.0	0.51	101.10	2,174.9	-8.4	-0.3	8.4	0.25	-0.04	27.00	
2,200.0	0.55	110.25	2,199.9	-8.5	0.0	8.5	0.37	0.16	36.60	
2,225.0	0.61	104.68	2,224.9	-8.5	0.2	8.5	0.33	0.24	-22.28	
2,250.0	0.60	97.93	2,249.9	-8.6	0.5	8.6	0.29	-0.04	-27.00	
2,275.0	0.89	97.34	2,274.9	-8.6	0.8	8.7	1.16	1.16	-2.36	
2,300.0	0.82	94.83	2,299.9	-8.7	1.2	8.7	0.32	-0.28	-10.04	
2,325.0	0.84	92.53	2,324.9	-8.7	1.5	8.8	0.16	0.08	-9.20	
2,350.0	0.85	90.40	2,349.9	-8.7	1.9	8.8	0.13	0.04	-8.52	
2,375.0	0.69	94.86	2,374.9	-8.7	2.2	8.8	0.68	-0.64	17.84	
2,400.0	0.97	95.27	2,399.9	-8.8	2.6	8.9	1.12	1.12	1.64	
2,425.0	0.99	94.41	2,424.9	-8.8	3.0	8.9	0.10	0.08	-3.44	

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2,450.0	1.09	88.34	2,449.9	-8.8	3.5	8.9	0.59	0.40	-24.28	
2,475.0	1.50	86.55	2,474.9	-8.8	4.0	8.9	1.65	1.64	-7.16	
2,500.0	1.30	87.41	2,499.9	-8.7	4.6	8.9	0.80	-0.80	3.44	
2,525.0	1.28	84.13	2,524.9	-8.7	5.2	8.9	0.31	-0.08	-13.12	
2,550.0	1.39	85.00	2,549.9	-8.7	5.8	8.9	0.45	0.44	3.48	
2,575.0	1.36	85.76	2,574.9	-8.6	6.4	8.9	0.14	-0.12	3.04	
2,600.0	1.39	79.14	2,599.9	-8.5	7.0	8.8	0.65	0.12	-26.48	
2,625.0	1.16	72.64	2,624.9	-8.4	7.5	8.7	1.09	-0.92	-26.00	
2,650.0	1.12	52.92	2,649.9	-8.2	7.9	8.5	1.57	-0.16	-78.88	
2,675.0	1.17	49.18	2,674.9	-7.9	8.3	8.2	0.36	0.20	-14.96	
2,700.0	1.12	50.37	2,699.9	-7.5	8.7	7.9	0.22	-0.20	4.76	
2,725.0	1.17	50.51	2,724.8	-7.2	9.1	7.6	0.20	0.20	0.56	
2,750.0	1.27	44.66	2,749.8	-6.9	9.5	7.2	0.64	0.40	-23.40	
2,775.0	1.06	51.01	2,774.8	-6.5	9.9	6.9	0.98	-0.84	25.40	
2,800.0	0.87	29.63	2,799.8	-6.2	10.1	6.6	1.62	-0.76	-85.52	
2,825.0	0.96	1.37	2,824.8	-5.8	10.2	6.2	1.82	0.36	-113.04	
2,850.0	1.15	341.79	2,849.8	-5.4	10.2	5.8	1.62	0.76	-78.32	
2,875.0	1.09	351.65	2,874.8	-4.9	10.1	5.3	0.81	-0.24	39.44	
2,900.0	0.97	350.60	2,899.8	-4.5	10.0	4.9	0.49	-0.48	-4.20	
2,925.0	1.11	355.01	2,924.8	-4.0	9.9	4.4	0.64	0.56	17.64	
2,950.0	1.09	357.44	2,949.8	-3.5	9.9	3.9	0.20	-0.08	9.72	
2,975.0	1.26	3.35	2,974.8	-3.0	9.9	3.4	0.83	0.68	23.64	
3,000.0	1.24	13.94	2,999.8	-2.5	10.0	2.9	0.93	-0.08	42.36	
3,025.0	1.43	23.03	3,024.8	-1.9	10.2	2.3	1.14	0.76	36.36	
3,050.0	1.42	26.56	3,049.8	-1.4	10.4	1.8	0.35	-0.04	14.12	
3,075.0	1.70	25.59	3,074.8	-0.8	10.7	1.2	1.12	1.12	-3.88	
3,100.0	1.73	31.90	3,099.8	-0.1	11.1	0.5	0.76	0.12	25.24	
3,125.0	1.56	32.13	3,124.8	0.5	11.5	0.0	0.68	-0.68	0.92	
3,150.0	1.51	41.02	3,149.7	1.0	11.9	-0.6	0.97	-0.20	35.56	
3,175.0	1.46	53.13	3,174.7	1.5	12.3	-1.0	1.27	-0.20	48.44	
3,200.0	1.51	71.98	3,199.7	1.8	12.9	-1.3	1.96	0.20	75.40	
3,225.0	1.48	85.92	3,224.7	1.9	13.5	-1.4	1.46	-0.12	55.76	
3,250.0	1.40	86.61	3,249.7	1.9	14.2	-1.4	0.33	-0.32	2.76	
3,275.0	1.04	99.14	3,274.7	1.9	14.7	-1.3	1.78	-1.44	50.12	
3,300.0	0.77	115.51	3,299.7	1.8	15.1	-1.2	1.48	-1.08	65.48	
3,325.0	0.61	136.59	3,324.7	1.6	15.3	-1.0	1.19	-0.64	84.32	
3,350.0	0.52	142.42	3,349.7	1.5	15.5	-0.8	0.43	-0.36	23.32	
3,375.0	0.62	146.60	3,374.7	1.3	15.6	-0.6	0.43	0.40	16.72	
3,400.0	0.56	141.41	3,399.7	1.0	15.8	-0.4	0.32	-0.24	-20.76	
3,425.0	0.56	143.90	3,424.7	0.9	15.9	-0.2	0.10	0.00	9.96	
3,450.0	0.54	161.78	3,449.7	0.6	16.0	0.0	0.69	-0.08	71.52	
3,475.0	0.46	198.82	3,474.7	0.4	16.0	0.2	1.31	-0.32	148.16	
3,500.0	0.43	242.17	3,499.7	0.3	15.9	0.3	1.32	-0.12	173.40	
3,525.0	0.31	240.43	3,524.7	0.2	15.8	0.4	0.48	-0.48	-6.96	

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well HENNIN FED #12H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3170+30 @ 3200.0usft (NABORS 894)
Site:	BULLDOG	MD Reference:	RKB=3170+30 @ 3200.0usft (NABORS 894)
Well:	HENNIN FED #12H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM_Users

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)
3,550.0	0.34	232.86	3,549.7	0.1	15.7	0.5	0.21	0.12	-30.28
3,575.0	0.30	232.96	3,574.7	0.1	15.5	0.6	0.16	-0.16	0.40
3,600.0	0.25	236.56	3,599.7	0.0	15.4	0.6	0.21	-0.20	14.40
3,625.0	0.29	273.36	3,624.7	0.0	15.3	0.7	0.70	0.16	147.20
3,650.0	0.27	268.85	3,649.7	0.0	15.2	0.6	0.12	-0.08	-18.04
3,675.0	0.26	292.26	3,674.7	0.0	15.1	0.6	0.43	-0.04	93.64
3,700.0	0.49	283.42	3,699.7	0.0	15.0	0.6	0.95	0.92	-35.36
3,725.0	0.26	265.92	3,724.7	0.1	14.8	0.5	1.02	-0.92	-70.00
3,750.0	0.42	290.95	3,749.7	0.1	14.6	0.5	0.86	0.64	100.12
3,775.0	0.47	290.21	3,774.7	0.1	14.5	0.4	0.20	0.20	-2.96
3,800.0	0.46	281.04	3,799.7	0.2	14.3	0.4	0.30	-0.04	-36.68
3,825.0	0.60	272.81	3,824.7	0.2	14.0	0.3	0.64	0.56	-32.92
3,850.0	0.74	280.15	3,849.7	0.3	13.8	0.3	0.66	0.56	29.36
3,875.0	0.74	274.49	3,874.7	0.3	13.4	0.2	0.29	0.00	-22.64
3,900.0	0.77	273.75	3,899.7	0.3	13.1	0.2	0.13	0.12	-2.96
3,925.0	0.80	275.97	3,924.7	0.4	12.8	0.2	0.17	0.12	8.88
3,950.0	0.77	275.28	3,949.7	0.4	12.4	0.1	0.13	-0.12	-2.76
3,975.0	0.62	266.27	3,974.7	0.4	12.1	0.1	0.74	-0.60	-36.04
4,000.0	0.69	271.41	3,999.7	0.4	11.8	0.1	0.37	0.28	20.56
4,025.0	0.76	272.29	4,024.7	0.4	11.5	0.1	0.28	0.28	3.52
4,050.0	0.75	277.66	4,049.7	0.4	11.2	0.0	0.29	-0.04	21.48
4,075.0	0.73	289.44	4,074.7	0.5	10.9	-0.1	0.61	-0.08	47.12
4,100.0	0.80	283.02	4,099.7	0.6	10.6	-0.2	0.44	0.28	-25.68
4,125.0	0.76	283.24	4,124.7	0.7	10.2	-0.3	0.16	-0.16	0.88
4,150.0	0.72	276.22	4,149.7	0.7	9.9	-0.3	0.40	-0.16	-28.08
4,175.0	0.68	273.37	4,174.7	0.8	9.6	-0.4	0.21	-0.16	-11.40
4,200.0	0.84	280.95	4,199.7	0.8	9.3	-0.4	0.75	0.64	30.32
4,225.0	0.80	283.79	4,224.7	0.9	8.9	-0.5	0.23	-0.16	11.36
4,250.0	0.73	282.64	4,249.6	1.0	8.6	-0.6	0.29	-0.28	-4.60
4,275.0	0.64	280.04	4,274.6	1.0	8.3	-0.7	0.38	-0.36	-10.40
4,300.0	0.31	299.33	4,299.6	1.1	8.1	-0.7	1.45	-1.32	77.16
4,325.0	0.27	28.01	4,324.6	1.2	8.1	-0.8	1.63	-0.16	354.72
4,350.0	0.21	76.12	4,349.6	1.2	8.2	-0.9	0.81	-0.24	192.44
4,375.0	0.28	76.75	4,374.6	1.2	8.3	-0.9	0.28	0.28	2.52
4,400.0	0.32	76.22	4,399.6	1.3	8.4	-0.9	0.16	0.16	-2.12
4,425.0	0.25	53.85	4,424.6	1.3	8.5	-1.0	0.52	-0.28	-89.48
4,450.0	0.50	345.10	4,449.6	1.5	8.5	-1.1	1.88	1.00	-275.00
4,475.0	0.48	342.76	4,474.6	1.7	8.5	-1.3	0.11	-0.08	-9.36
4,500.0	0.52	340.64	4,499.6	1.9	8.4	-1.5	0.18	0.16	-8.48
4,525.0	0.51	343.18	4,524.6	2.1	8.3	-1.7	0.10	-0.04	10.16
4,550.0	0.61	3.96	4,549.6	2.3	8.3	-2.0	0.90	0.40	83.12
4,575.0	0.43	14.17	4,574.6	2.5	8.3	-2.2	0.81	-0.72	40.84
4,600.0	0.56	32.89	4,599.6	2.7	8.4	-2.4	0.82	0.52	74.88

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well HENNIN FED #12H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3170+30 @ 3200.0usft (NABORS 894)
Site:	BULLDOG	MD Reference:	RKB=3170+30 @ 3200.0usft (NABORS 894)
Well:	HENNIN FED #12H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM_Users

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)	
4,625.0	0.71	54.32	4,624.6	2.9	8.6	-2.6	1.11	0.60	85.72	
4,650.0	0.83	68.51	4,649.6	3.1	8.9	-2.7	0.90	0.48	56.76	
4,675.0	1.26	70.40	4,674.6	3.3	9.3	-2.9	1.73	1.72	7.56	
4,700.0	1.36	72.25	4,699.6	3.4	9.9	-3.0	0.43	0.40	7.40	
4,725.0	1.23	67.77	4,724.6	3.6	10.4	-3.2	0.66	-0.52	-17.92	
4,750.0	1.27	68.86	4,749.6	3.8	10.9	-3.4	0.19	0.16	4.36	
4,775.0	1.35	71.22	4,774.6	4.0	11.4	-3.6	0.39	0.32	9.44	
4,800.0	1.19	88.49	4,799.6	4.1	12.0	-3.6	1.65	-0.64	69.08	
4,825.0	1.31	92.35	4,824.6	4.1	12.5	-3.6	0.59	0.48	15.44	
4,850.0	1.44	105.19	4,849.6	4.0	13.1	-3.5	1.33	0.52	51.36	
4,875.0	1.39	107.60	4,874.6	3.9	13.7	-3.3	0.31	-0.20	9.64	
4,900.0	1.29	114.60	4,899.6	3.6	14.3	-3.1	0.77	-0.40	28.00	
4,925.0	1.04	128.45	4,924.6	3.4	14.7	-2.8	1.50	-1.00	55.40	
4,950.0	1.36	173.84	4,949.6	2.9	14.9	-2.3	3.89	1.28	181.56	
4,975.0	1.06	175.46	4,974.6	2.4	14.9	-1.8	1.21	-1.20	6.48	
5,000.0	1.20	176.14	4,999.6	1.9	15.0	-1.3	0.56	0.56	2.72	
5,025.0	1.21	174.75	5,024.5	1.4	15.0	-0.8	0.12	0.04	-5.56	
5,050.0	1.19	174.56	5,049.5	0.9	15.1	-0.3	0.08	-0.08	-0.76	
5,075.0	1.07	177.67	5,074.5	0.4	15.1	0.2	0.54	-0.48	12.44	
5,100.0	0.92	192.36	5,099.5	0.0	15.1	0.6	1.18	-0.60	58.76	
5,125.0	0.86	203.36	5,124.5	-0.4	15.0	1.0	0.72	-0.24	44.00	
5,150.0	0.87	217.87	5,149.5	-0.7	14.8	1.3	0.87	0.04	58.04	
5,175.0	1.14	250.19	5,174.5	-1.0	14.4	1.5	2.47	1.08	129.28	
5,200.0	1.53	273.27	5,199.5	-1.0	13.8	1.6	2.63	1.56	92.32	
5,225.0	1.64	273.85	5,224.5	-1.0	13.2	1.5	0.44	0.44	2.32	
5,250.0	1.83	275.19	5,249.5	-0.9	12.4	1.4	0.78	0.76	5.36	
5,275.0	1.71	278.01	5,274.5	-0.8	11.6	1.3	0.59	-0.48	11.28	
5,300.0	1.81	279.05	5,299.5	-0.7	10.9	1.2	0.42	0.40	4.16	
5,325.0	1.63	276.07	5,324.5	-0.6	10.1	1.0	0.80	-0.72	-11.92	
5,350.0	1.61	274.95	5,349.4	-0.6	9.4	0.9	0.15	-0.08	-4.48	
5,375.0	1.82	274.52	5,374.4	-0.5	8.7	0.8	0.84	0.84	-1.72	
5,400.0	1.58	274.87	5,399.4	-0.4	7.9	0.8	0.96	-0.96	1.40	
5,425.0	1.83	277.29	5,424.4	-0.4	7.2	0.6	1.04	1.00	9.68	
5,450.0	1.74	277.39	5,449.4	-0.3	6.4	0.5	0.36	-0.36	0.40	
5,475.0	1.72	276.25	5,474.4	-0.2	5.7	0.4	0.16	-0.08	-4.56	
5,500.0	1.66	275.72	5,499.4	-0.1	5.0	0.3	0.25	-0.24	-2.12	
5,525.0	1.72	275.20	5,524.4	0.0	4.2	0.2	0.25	-0.24	-2.08	
5,550.0	1.71	277.26	5,549.4	0.1	3.5	0.1	0.25	-0.04	8.24	
5,575.0	1.71	276.69	5,574.3	0.2	2.7	0.0	0.07	0.00	-2.28	
5,600.0	1.67	276.65	5,599.3	0.2	2.0	-0.2	0.16	-0.16	-0.16	
5,625.0	1.47	280.36	5,624.3	0.3	1.3	-0.3	0.90	-0.80	14.84	
5,650.0	1.04	304.82	5,649.3	0.5	0.8	-0.5	2.71	-1.72	97.84	
5,675.0	0.89	23.02	5,674.3	0.8	0.7	-0.8	4.89	-0.60	312.80	

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well HENNIN FED #12H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3170+30 @ 3200.0usft (NABORS 894)
Site:	BULLDOG	MD Reference:	RKB=3170+30 @ 3200.0usft (NABORS 894)
Well:	HENNIN FED #12H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM_Users

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)	
5,700.0	0.70	19.75	5,699.3	1.2	0.8	-1.1	0.78	-0.76	-13.08	
5,725.0	0.51	17.39	5,724.3	1.4	0.9	-1.4	0.77	-0.76	-9.44	
5,750.0	0.40	21.21	5,749.3	1.6	1.0	-1.6	0.46	-0.44	15.28	
5,775.0	0.20	279.06	5,774.3	1.7	1.0	-1.6	1.93	-0.80	-408.60	
5,800.0	0.36	195.27	5,799.3	1.6	0.9	-1.6	1.57	0.64	-335.16	
5,825.0	0.36	220.99	5,824.3	1.5	0.8	-1.4	0.64	0.00	102.88	
5,850.0	0.34	223.73	5,849.3	1.4	0.7	-1.3	0.10	-0.08	10.96	
5,875.0	0.35	204.31	5,874.3	1.2	0.7	-1.2	0.47	0.04	-77.68	
5,900.0	0.36	209.89	5,899.3	1.1	0.6	-1.1	0.14	0.04	22.32	
5,925.0	0.35	209.65	5,924.3	1.0	0.5	-1.0	0.04	-0.04	-0.96	
5,950.0	0.33	227.26	5,949.3	0.9	0.4	-0.8	0.42	-0.08	70.44	
5,975.0	0.32	219.15	5,974.3	0.8	0.3	-0.7	0.19	-0.04	-32.44	
6,000.0	0.30	215.41	5,999.3	0.6	0.2	-0.6	0.11	-0.08	-14.96	
6,025.0	0.21	221.57	6,024.3	0.6	0.2	-0.6	0.38	-0.36	24.64	
6,050.0	0.12	223.34	6,049.3	0.5	0.1	-0.5	0.36	-0.36	7.08	
6,075.0	0.15	207.50	6,074.3	0.5	0.1	-0.5	0.19	0.12	-63.36	
6,100.0	0.19	200.26	6,099.3	0.4	0.1	-0.4	0.18	0.16	-28.96	
6,125.0	0.13	219.43	6,124.3	0.3	0.0	-0.3	0.32	-0.24	76.68	
6,150.0	0.14	221.13	6,149.3	0.3	0.0	-0.3	0.04	0.04	6.80	
6,175.0	0.08	233.73	6,174.3	0.3	0.0	-0.3	0.26	-0.24	50.40	
6,200.0	0.06	112.42	6,199.3	0.2	0.0	-0.2	0.49	-0.08	-485.24	
6,225.0	0.05	224.21	6,224.3	0.2	0.0	-0.2	0.37	-0.04	447.16	
6,250.0	0.11	298.69	6,249.3	0.2	-0.1	-0.2	0.43	0.24	297.92	
6,275.0	0.04	319.08	6,274.3	0.2	-0.1	-0.2	0.30	-0.28	81.56	
6,300.0	0.14	305.83	6,299.3	0.3	-0.1	-0.3	0.41	0.40	-53.00	
6,325.0	0.13	59.12	6,324.3	0.3	-0.1	-0.3	0.90	-0.04	453.16	
6,350.0	0.09	51.50	6,349.3	0.3	-0.1	-0.3	0.17	-0.16	-30.48	
6,375.0	0.09	43.34	6,374.3	0.4	-0.1	-0.4	0.05	0.00	-32.64	
6,400.0	0.12	58.90	6,399.3	0.4	0.0	-0.4	0.16	0.12	62.24	
6,425.0	0.09	345.82	6,424.3	0.4	0.0	-0.4	0.51	-0.12	-292.32	
6,450.0	0.15	70.04	6,449.3	0.4	0.0	-0.4	0.67	0.24	336.88	
6,475.0	0.21	26.39	6,474.3	0.5	0.1	-0.5	0.58	0.24	-174.60	
6,500.0	0.40	57.22	6,499.3	0.6	0.2	-0.6	0.98	0.76	123.32	
6,525.0	0.78	70.85	6,524.3	0.7	0.4	-0.7	1.61	1.52	54.52	
6,550.0	0.70	70.03	6,549.3	0.8	0.7	-0.8	0.32	-0.32	-3.28	
6,575.0	0.86	87.20	6,574.3	0.9	1.0	-0.8	1.13	0.64	68.68	
6,600.0	1.24	115.56	6,599.3	0.8	1.5	-0.7	2.53	1.52	113.44	
6,625.0	1.33	118.85	6,624.3	0.5	2.0	-0.4	0.47	0.36	13.16	
6,650.0	1.47	120.47	6,649.3	0.2	2.5	-0.1	0.58	0.56	6.48	
6,675.0	1.30	117.50	6,674.3	-0.1	3.0	0.2	0.74	-0.68	-11.88	
6,700.0	1.41	100.13	6,699.3	-0.3	3.6	0.4	1.69	0.44	-69.48	
6,725.0	1.72	83.68	6,724.3	-0.3	4.3	0.5	2.17	1.24	-65.80	
6,750.0	1.99	72.84	6,749.2	-0.1	5.0	0.3	1.77	1.08	-43.36	
6,775.0	2.16	63.67	6,774.2	0.2	5.9	0.0	1.49	0.68	-36.68	

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well HENNIN FED #12H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3170+30 @ 3200.0usft (NABORS 894)
Site:	BULLDOG	MD Reference:	RKB=3170+30 @ 3200.0usft (NABORS 894)
Well:	HENNIN FED #12H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM_Users

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)
6,800.0	2.52	47.03	6,799.2	0.8	6.7	-0.5	3.06	1.44	-66.56
6,825.0	2.85	43.24	6,824.2	1.6	7.5	-1.3	1.50	1.32	-15.16
6,850.0	2.83	42.97	6,849.2	2.5	8.4	-2.2	0.10	-0.08	-1.08
6,875.0	2.84	40.89	6,874.1	3.4	9.2	-3.1	0.41	0.04	-8.32
6,900.0	2.81	40.76	6,899.1	4.4	10.0	-4.0	0.12	-0.12	-0.52
6,925.0	2.80	41.32	6,924.1	5.3	10.8	-4.9	0.12	-0.04	2.24
6,950.0	2.75	41.10	6,949.0	6.2	11.6	-5.7	0.20	-0.20	-0.88
6,975.0	2.67	38.48	6,974.0	7.1	12.4	-6.6	0.59	-0.32	-10.48
7,000.0	2.74	39.43	6,999.0	8.0	13.1	-7.5	0.33	0.28	3.80
7,025.0	2.62	40.58	7,024.0	8.9	13.9	-8.4	0.53	-0.48	4.60
7,050.0	2.64	38.44	7,048.9	9.8	14.6	-9.2	0.40	0.08	-8.56
7,075.0	2.64	39.86	7,073.9	10.7	15.3	-10.1	0.26	0.00	5.68
7,100.0	2.64	42.67	7,098.9	11.6	16.1	-10.9	0.52	0.00	11.24
7,125.0	2.52	40.27	7,123.8	12.4	16.8	-11.7	0.65	-0.48	-9.60
7,150.0	2.44	37.57	7,148.8	13.3	17.5	-12.5	0.57	-0.32	-10.80
7,175.0	2.42	37.77	7,173.8	14.1	18.1	-13.4	0.09	-0.08	0.80
7,200.0	2.34	38.72	7,198.8	14.9	18.8	-14.1	0.36	-0.32	3.80
7,225.0	2.38	36.61	7,223.8	15.7	19.4	-14.9	0.38	0.16	-8.44
7,250.0	2.29	34.96	7,248.7	16.6	20.0	-15.7	0.45	-0.36	-6.60
7,275.0	2.19	35.99	7,273.7	17.3	20.6	-16.5	0.43	-0.40	4.12
7,300.0	2.16	37.04	7,298.7	18.1	21.1	-17.2	0.20	-0.12	4.20
7,325.0	2.11	35.85	7,323.7	18.9	21.7	-18.0	0.27	-0.20	-4.76
7,350.0	1.92	34.23	7,348.7	19.6	22.2	-18.7	0.79	-0.76	-6.48
7,375.0	2.17	33.32	7,373.7	20.3	22.7	-19.4	1.01	1.00	-3.64
7,400.0	1.96	34.42	7,398.6	21.1	23.2	-20.1	0.85	-0.84	4.40
7,425.0	1.93	34.05	7,423.6	21.8	23.7	-20.8	0.13	-0.12	-1.48
7,450.0	2.02	35.11	7,448.6	22.5	24.2	-21.5	0.39	0.36	4.24
7,475.0	2.12	35.19	7,473.6	23.2	24.7	-22.2	0.40	0.40	0.32
7,500.0	1.96	32.49	7,498.6	24.0	25.2	-22.9	0.75	-0.64	-10.80
7,525.0	2.02	36.99	7,523.6	24.7	25.7	-23.6	0.67	0.24	18.00
7,550.0	2.32	34.81	7,548.5	25.4	26.2	-24.4	1.24	1.20	-8.72
7,575.0	2.86	35.54	7,573.5	26.4	26.9	-25.3	2.16	2.16	2.92
7,600.0	2.88	33.57	7,598.5	27.4	27.6	-26.3	0.40	0.08	-7.88
7,625.0	2.72	33.22	7,623.5	28.4	28.3	-27.2	0.64	-0.64	-1.40
7,650.0	2.77	35.61	7,648.4	29.4	28.9	-28.2	0.50	0.20	9.56
7,675.0	2.71	32.90	7,673.4	30.4	29.6	-29.2	0.57	-0.24	-10.84
7,700.0	2.84	32.03	7,698.4	31.4	30.3	-30.2	0.55	0.52	-3.48
7,725.0	2.79	32.48	7,723.3	32.4	30.9	-31.2	0.22	-0.20	1.80
7,750.0	3.24	29.39	7,748.3	33.6	31.6	-32.3	1.91	1.80	-12.36
7,775.0	2.51	30.67	7,773.3	34.7	32.2	-33.3	2.93	-2.92	5.12
7,800.0	2.47	30.14	7,798.2	35.6	32.8	-34.2	0.18	-0.16	-2.12
7,825.0	2.37	30.29	7,823.2	36.5	33.3	-35.1	0.40	-0.40	0.60
7,850.0	2.39	25.13	7,848.2	37.4	33.8	-36.0	0.86	0.08	-20.64

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well HENNIN FED #12H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3170+30 @ 3200.0usft (NABORS 894)
Site:	BULLDOG	MD Reference:	RKB=3170+30 @ 3200.0usft (NABORS 894)
Well:	HENNIN FED #12H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM_Users

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)	
7,875.0	2.35	27.69	7,873.2	38.4	34.2	-36.9	0.45	-0.16	10.24	
7,900.0	2.24	25.05	7,898.2	39.2	34.7	-37.8	0.61	-0.44	-10.56	
7,925.0	2.30	29.08	7,923.1	40.1	35.1	-38.7	0.68	0.24	16.12	
7,950.0	2.26	27.15	7,948.1	41.0	35.6	-39.5	0.35	-0.16	-7.72	
7,975.0	2.29	21.24	7,973.1	41.9	36.0	-40.4	0.95	0.12	-23.64	
8,000.0	2.13	25.21	7,998.1	42.8	36.4	-41.3	0.89	-0.64	15.88	
8,025.0	2.16	25.24	8,023.1	43.6	36.8	-42.1	0.12	0.12	0.12	
8,050.0	2.10	26.04	8,048.0	44.5	37.2	-42.9	0.27	-0.24	3.20	
8,075.0	2.18	23.44	8,073.0	45.3	37.6	-43.8	0.50	0.32	-10.40	
8,100.0	2.40	25.64	8,098.0	46.2	38.0	-44.7	0.95	0.88	8.80	
8,125.0	2.34	39.20	8,123.0	47.1	38.5	-45.5	2.25	-0.24	54.24	
8,150.0	2.47	41.60	8,148.0	47.9	39.2	-46.3	0.66	0.52	9.60	
8,175.0	2.71	38.84	8,172.9	48.8	40.0	-47.1	1.08	0.96	-11.04	
8,200.0	2.60	41.81	8,197.9	49.6	40.7	-48.0	0.70	-0.44	11.88	
8,225.0	2.43	39.49	8,222.9	50.5	41.4	-48.8	0.79	-0.68	-9.28	
8,250.0	2.34	38.68	8,247.9	51.3	42.1	-49.6	0.38	-0.36	-3.24	
8,275.0	2.32	40.55	8,272.8	52.1	42.7	-50.3	0.31	-0.08	7.48	
8,300.0	2.35	33.66	8,297.8	52.9	43.3	-51.1	1.13	0.12	-27.56	
8,325.0	2.38	37.51	8,322.8	53.7	43.9	-51.9	0.65	0.12	15.40	
8,350.0	2.29	35.27	8,347.8	54.5	44.5	-52.7	0.51	-0.36	-8.96	
8,375.0	2.32	37.10	8,372.8	55.4	45.1	-53.5	0.32	0.12	7.32	
8,400.0	2.36	34.64	8,397.7	56.2	45.7	-54.3	0.43	0.16	-9.84	
8,425.0	2.30	36.06	8,422.7	57.0	46.3	-55.1	0.33	-0.24	5.68	
8,450.0	2.13	35.78	8,447.7	57.8	46.9	-55.9	0.68	-0.68	-1.12	
8,475.0	2.15	34.65	8,472.7	58.6	47.4	-56.6	0.19	0.08	-4.52	
8,500.0	2.13	36.60	8,497.7	59.3	48.0	-57.3	0.30	-0.08	7.80	
8,525.0	2.15	35.74	8,522.7	60.1	48.5	-58.1	0.15	0.08	-3.44	
8,550.0	2.11	33.67	8,547.6	60.8	49.0	-58.8	0.35	-0.16	-8.28	
8,575.0	2.08	38.23	8,572.6	61.6	49.6	-59.5	0.68	-0.12	18.24	
8,600.0	1.95	37.80	8,597.6	62.3	50.1	-60.2	0.52	-0.52	-1.72	
8,625.0	1.94	38.29	8,622.6	62.9	50.6	-60.8	0.08	-0.04	1.96	
8,650.0	1.97	36.58	8,647.6	63.6	51.2	-61.5	0.26	0.12	-6.84	
8,675.0	2.04	37.74	8,672.6	64.3	51.7	-62.2	0.32	0.28	4.64	
8,700.0	1.84	37.49	8,697.5	65.0	52.2	-62.8	0.80	-0.80	-1.00	
8,725.0	1.86	39.71	8,722.5	65.6	52.7	-63.4	0.30	0.08	8.88	
8,750.0	1.84	35.35	8,747.5	66.2	53.2	-64.0	0.57	-0.08	-17.44	
8,775.0	1.75	38.42	8,772.5	66.9	53.7	-64.7	0.53	-0.36	12.28	
8,800.0	1.82	35.38	8,797.5	67.5	54.1	-65.3	0.47	0.28	-12.16	
8,825.0	1.93	35.14	8,822.5	68.2	54.6	-65.9	0.44	0.44	-0.96	
8,850.0	1.83	37.49	8,847.5	68.8	55.1	-66.5	0.50	-0.40	9.40	
8,875.0	1.74	41.11	8,872.5	69.4	55.6	-67.1	0.58	-0.36	14.48	
8,900.0	1.87	33.26	8,897.4	70.0	56.1	-67.7	1.12	0.52	-31.40	
8,925.0	1.86	38.34	8,922.4	70.7	56.5	-68.4	0.66	-0.04	20.32	

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well HENNIN FED #12H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3170+30 @ 3200.0usft (NABORS 894)
Site:	BULLDOG	MD Reference:	RKB=3170+30 @ 3200.0usft (NABORS 894)
Well:	HENNIN FED #12H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM_Users

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)
8,950.0	1.82	35.08	8,947.4	71.4	57.0	-69.0	0.45	-0.16	-13.04
8,975.0	1.83	33.61	8,972.4	72.0	57.5	-69.6	0.19	0.04	-5.88
9,000.0	1.92	36.10	8,997.4	72.7	57.9	-70.3	0.49	0.36	9.96
9,025.0	1.87	31.24	9,022.4	73.4	58.4	-71.0	0.67	-0.20	-19.44
9,050.0	1.97	35.31	9,047.4	74.1	58.9	-71.6	0.68	0.40	16.28
9,075.0	2.44	36.32	9,072.3	74.8	59.4	-72.4	1.89	1.88	4.04
9,100.0	2.56	34.28	9,097.3	75.7	60.0	-73.3	0.60	0.48	-8.16
9,125.0	2.49	34.69	9,122.3	76.6	60.7	-74.1	0.29	-0.28	1.64
9,150.0	2.59	35.39	9,147.3	77.6	61.3	-75.0	0.42	0.40	2.80
9,175.0	2.61	36.30	9,172.2	78.5	62.0	-75.9	0.18	0.08	3.64
9,200.0	2.51	40.17	9,197.2	79.3	62.7	-76.8	0.80	-0.40	15.48
9,225.0	2.47	40.59	9,222.2	80.2	63.4	-77.6	0.18	-0.16	1.68
9,250.0	2.51	40.24	9,247.2	81.0	64.1	-78.4	0.17	0.16	-1.40
9,275.0	2.77	39.47	9,272.1	81.9	64.8	-79.2	1.05	1.04	-3.08
9,300.0	2.67	39.67	9,297.1	82.8	65.6	-80.1	0.40	-0.40	0.80
9,325.0	2.50	41.02	9,322.1	83.7	66.3	-80.9	0.72	-0.68	5.40
9,350.0	2.68	41.83	9,347.1	84.5	67.0	-81.7	0.73	0.72	3.24
9,375.0	2.82	41.51	9,372.0	85.4	67.8	-82.6	0.56	0.56	-1.28
9,400.0	2.74	39.99	9,397.0	86.3	68.6	-83.5	0.44	-0.32	-6.08
9,425.0	2.62	37.39	9,422.0	87.2	69.4	-84.4	0.68	-0.48	-10.40
9,450.0	2.57	38.64	9,447.0	88.1	70.1	-85.2	0.30	-0.20	5.00
9,475.0	2.49	38.49	9,471.9	89.0	70.7	-86.1	0.32	-0.32	-0.60
9,500.0	2.71	34.80	9,496.9	89.9	71.4	-87.0	1.11	0.88	-14.76
9,525.0	2.85	36.44	9,521.9	90.9	72.1	-87.9	0.64	0.56	6.56
9,550.0	2.84	37.14	9,546.8	91.9	72.9	-88.9	0.14	-0.04	2.80
9,575.0	3.00	36.96	9,571.8	92.9	73.6	-89.9	0.64	0.64	-0.72
9,600.0	3.27	38.98	9,596.8	94.0	74.5	-90.9	1.17	1.08	8.08
9,625.0	3.36	35.52	9,621.7	95.1	75.4	-92.0	0.88	0.36	-13.84
9,650.0	3.70	31.76	9,646.7	96.4	76.2	-93.3	1.64	1.36	-15.04
9,675.0	3.60	31.43	9,671.6	97.8	77.0	-94.6	0.41	-0.40	-1.32
9,700.0	3.54	31.67	9,696.6	99.1	77.9	-95.9	0.25	-0.24	0.96
9,725.0	3.55	30.76	9,721.5	100.4	78.7	-97.2	0.23	0.04	-3.64
9,750.0	3.66	30.92	9,746.5	101.8	79.5	-98.5	0.44	0.44	0.64
9,775.0	3.59	30.17	9,771.4	103.1	80.3	-99.8	0.34	-0.28	-3.00
9,800.0	3.43	29.23	9,796.4	104.4	81.0	-101.1	0.68	-0.64	-3.76
9,825.0	2.95	28.53	9,821.4	105.7	81.7	-102.3	1.93	-1.92	-2.80
9,850.0	2.73	26.55	9,846.3	106.8	82.3	-103.4	0.96	-0.88	-7.92
9,875.0	2.50	19.00	9,871.3	107.8	82.7	-104.4	1.65	-0.92	-30.20
9,900.0	2.56	15.10	9,896.3	108.9	83.0	-105.4	0.73	0.24	-15.60
9,925.0	2.39	19.24	9,921.3	109.9	83.4	-106.5	0.99	-0.68	16.56
9,950.0	2.37	18.18	9,946.2	110.9	83.7	-107.4	0.19	-0.08	-4.24
9,975.0	2.35	18.10	9,971.2	111.9	84.0	-108.4	0.08	-0.08	-0.32
10,000.0	2.39	20.49	9,996.2	112.8	84.3	-109.4	0.43	0.16	9.56
10,025.0	2.32	27.75	10,021.2	113.8	84.8	-110.3	1.22	-0.28	29.04

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well HENNIN FED #12H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3170+30 @ 3200.0usft (NABORS 894)
Site:	BULLDOG	MD Reference:	RKB=3170+30 @ 3200.0usft (NABORS 894)
Well:	HENNIN FED #12H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM_Users

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)
10,050.0	2.24	29.51	10,046.1	114.6	85.2	-111.1	0.43	-0.32	7.04
10,075.0	2.13	30.20	10,071.1	115.5	85.7	-111.9	0.45	-0.44	2.76
10,100.0	1.94	34.28	10,096.1	116.2	86.2	-112.7	0.96	-0.76	16.32
10,125.0	1.43	38.53	10,121.1	116.8	86.6	-113.2	2.10	-2.04	17.00
10,150.0	1.56	35.75	10,146.1	117.3	87.0	-113.7	0.60	0.52	-11.12
10,175.0	1.50	38.50	10,171.1	117.9	87.4	-114.3	0.38	-0.24	11.00
10,200.0	1.61	41.31	10,196.1	118.4	87.9	-114.8	0.54	0.44	11.24
10,225.0	1.75	50.70	10,221.1	118.9	88.4	-115.2	1.23	0.56	37.56
10,250.0	1.92	57.45	10,246.1	119.4	89.0	-115.7	1.10	0.68	27.00
10,275.0	2.00	62.54	10,271.0	119.8	89.8	-116.1	0.77	0.32	20.36
10,300.0	1.98	68.00	10,296.0	120.1	90.6	-116.4	0.76	-0.08	21.84
10,325.0	2.32	59.82	10,321.0	120.6	91.4	-116.8	1.83	1.36	-32.72
10,350.0	2.11	60.23	10,346.0	121.0	92.2	-117.2	0.84	-0.84	1.64
10,375.0	2.06	55.19	10,371.0	121.5	93.0	-117.7	0.76	-0.20	-20.16
10,400.0	1.82	46.41	10,396.0	122.1	93.7	-118.2	1.53	-0.96	-35.12
10,425.0	1.85	42.41	10,420.9	122.6	94.2	-118.7	0.53	0.12	-16.00
10,450.0	1.82	41.97	10,445.9	123.2	94.8	-119.3	0.13	-0.12	-1.76
10,475.0	1.87	38.52	10,470.9	123.8	95.3	-119.9	0.49	0.20	-13.80
10,500.0	1.89	39.15	10,495.9	124.5	95.8	-120.5	0.12	0.08	2.52
10,525.0	1.98	39.48	10,520.9	125.1	96.3	-121.2	0.36	0.36	1.32
10,550.0	1.92	39.93	10,545.9	125.8	96.9	-121.8	0.25	-0.24	1.80
10,575.0	1.87	40.10	10,570.9	126.4	97.4	-122.4	0.20	-0.20	0.68
10,600.0	1.80	38.48	10,595.8	127.0	97.9	-123.0	0.35	-0.28	-6.48
10,625.0	1.77	43.03	10,620.8	127.6	98.4	-123.6	0.58	-0.12	18.20
10,650.0	1.66	41.66	10,645.8	128.2	98.9	-124.1	0.47	-0.44	-5.48
10,675.0	1.66	41.80	10,670.8	128.7	99.4	-124.6	0.02	0.00	0.56
10,700.0	1.67	39.45	10,695.8	129.3	99.9	-125.2	0.28	0.04	-9.40
10,725.0	1.77	38.73	10,720.8	129.9	100.3	-125.7	0.41	0.40	-2.88
10,750.0	1.65	40.96	10,745.8	130.4	100.8	-126.3	0.55	-0.48	8.92
10,775.0	1.70	37.54	10,770.8	131.0	101.3	-126.8	0.45	0.20	-13.68
10,800.0	1.83	35.58	10,795.8	131.6	101.7	-127.4	0.57	0.52	-7.84
10,825.0	1.76	33.65	10,820.7	132.3	102.2	-128.0	0.37	-0.28	-7.72
10,850.0	1.83	34.87	10,845.7	132.9	102.6	-128.7	0.32	0.28	4.88
10,875.0	1.94	32.66	10,870.7	133.6	103.1	-129.3	0.53	0.44	-8.84
10,900.0	2.05	28.93	10,895.7	134.3	103.5	-130.1	0.68	0.44	-14.92
10,925.0	2.10	24.65	10,920.7	135.1	103.9	-130.9	0.65	0.20	-17.12
10,950.0	2.25	21.84	10,945.7	136.0	104.3	-131.7	0.74	0.60	-11.24
10,975.0	2.22	23.29	10,970.7	136.9	104.7	-132.6	0.26	-0.12	5.80
11,000.0	2.33	22.70	10,995.6	137.8	105.1	-133.5	0.45	0.44	-2.36
11,025.0	2.52	25.69	11,020.6	138.8	105.5	-134.4	0.91	0.76	11.96
11,050.0	2.78	32.66	11,045.6	139.8	106.1	-135.4	1.65	1.04	27.88
11,075.0	3.00	35.08	11,070.6	140.8	106.8	-136.4	1.01	0.88	9.68
11,100.0	3.22	32.87	11,095.5	142.0	107.5	-137.5	1.00	0.88	-8.84

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well HENNIN FED #12H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3170+30 @ 3200.0usft (NABORS 894)
Site:	BULLDOG	MD Reference:	RKB=3170+30 @ 3200.0usft (NABORS 894)
Well:	HENNIN FED #12H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM_Users

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)	
11,125.0	3.38	23.70	11,120.5	143.2	108.2	-138.8	2.20	0.64	-36.68	
11,150.0	3.79	27.69	11,145.4	144.6	108.9	-140.1	1.92	1.64	15.96	
11,175.0	3.93	24.36	11,170.4	146.2	109.6	-141.6	1.06	0.56	-13.32	
11,200.0	4.15	20.75	11,195.3	147.8	110.3	-143.2	1.34	0.88	-14.44	
11,225.0	4.22	17.07	11,220.2	149.5	110.9	-144.9	1.11	0.28	-14.72	
11,250.0	4.89	10.39	11,245.2	151.4	111.4	-146.8	3.41	2.68	-26.72	
11,275.0	4.46	9.20	11,270.1	153.4	111.7	-148.8	1.76	-1.72	-4.76	
11,300.0	4.59	7.11	11,295.0	155.4	112.0	-150.8	0.84	0.52	-8.36	
11,325.0	4.81	5.09	11,319.9	157.4	112.2	-152.8	1.10	0.88	-8.08	
11,350.0	4.87	0.96	11,344.8	159.5	112.3	-154.9	1.41	0.24	-16.52	
11,375.0	4.93	358.22	11,369.7	161.7	112.3	-157.0	0.97	0.24	-10.96	
11,400.0	4.95	353.60	11,394.6	163.8	112.1	-159.2	1.59	0.08	-18.48	
11,425.0	4.91	347.84	11,419.5	165.9	111.8	-161.3	1.99	-0.16	-23.04	
11,450.0	4.79	341.68	11,444.5	168.0	111.2	-163.4	2.14	-0.48	-24.64	
11,475.0	4.74	340.63	11,469.4	169.9	110.6	-165.4	0.40	-0.20	-4.20	
11,500.0	4.40	338.84	11,494.3	171.8	109.9	-167.2	1.47	-1.36	-7.16	
11,525.0	3.88	339.22	11,519.2	173.5	109.2	-169.0	2.08	-2.08	1.52	
11,549.0	3.63	338.74	11,543.2	175.0	108.7	-170.4	1.05	-1.04	-2.00	
11,735.0	3.30	348.22	11,728.8	185.7	105.4	-181.3	0.35	-0.18	5.10	
11,756.0	3.28	343.00	11,749.8	186.9	105.1	-182.5	1.43	-0.10	-24.86	
11,787.0	2.30	338.35	11,780.8	188.3	104.7	-183.9	3.24	-3.16	-15.00	
11,818.0	0.91	287.83	11,811.8	188.9	104.2	-184.6	6.00	-4.48	-162.97	
11,850.0	2.50	176.06	11,843.7	188.3	104.0	-184.0	9.25	4.97	-349.28	
11,881.0	4.44	193.04	11,874.7	186.5	103.8	-182.1	7.02	6.26	54.77	
11,912.0	7.75	183.10	11,905.5	183.2	103.4	-178.9	11.17	10.68	-32.06	
11,944.0	12.48	184.98	11,937.0	177.6	103.0	-173.3	14.82	14.78	5.88	
11,975.0	15.83	186.59	11,967.1	170.1	102.2	-165.8	10.88	10.81	5.19	
12,007.0	20.56	186.21	11,997.4	160.1	101.1	-155.9	14.79	14.78	-1.19	
12,038.0	25.51	184.25	12,026.0	148.1	100.0	-143.9	16.16	15.97	-6.32	
12,069.0	30.04	183.37	12,053.4	133.7	99.0	-129.6	14.67	14.61	-2.84	
12,100.0	32.99	182.83	12,079.8	117.5	98.2	-113.4	9.56	9.52	-1.74	
12,132.0	35.82	181.40	12,106.2	99.4	97.5	-95.4	9.20	8.84	-4.47	
12,164.0	39.20	180.53	12,131.6	79.9	97.2	-76.0	10.69	10.56	-2.72	
12,195.0	42.75	179.30	12,155.0	59.6	97.2	-55.6	11.74	11.45	-3.97	
12,225.0	44.75	180.20	12,176.7	38.9	97.3	-34.9	6.98	6.67	3.00	
12,257.0	46.55	179.61	12,199.0	16.0	97.4	-12.1	5.78	5.63	-1.84	
12,288.0	49.27	179.74	12,219.8	-7.0	97.5	10.9	8.78	8.77	0.42	
12,320.0	52.84	181.05	12,239.9	-31.9	97.3	35.8	11.60	11.16	4.09	
12,351.0	57.42	181.53	12,257.6	-57.3	96.7	61.2	14.83	14.77	1.55	
12,383.0	62.91	180.49	12,273.6	-85.1	96.3	88.9	17.39	17.16	-3.25	
12,414.0	67.50	179.71	12,286.6	-113.2	96.2	117.0	14.98	14.81	-2.52	
12,445.0	70.84	178.85	12,297.6	-142.2	96.6	145.9	11.08	10.77	-2.77	
12,477.0	73.34	178.33	12,307.4	-172.6	97.3	176.4	7.96	7.81	-1.63	

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well HENNIN FED #12H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3170+30 @ 3200.0usft (NABORS 894)
Site:	BULLDOG	MD Reference:	RKB=3170+30 @ 3200.0usft (NABORS 894)
Well:	HENNIN FED #12H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM_Users

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)
12,508.0	75.87	177.96	12,315.6	-202.5	98.3	206.3	8.24	8.16	-1.19
12,540.0	79.46	177.82	12,322.5	-233.7	99.4	237.5	11.23	11.22	-0.44
12,571.0	84.13	177.85	12,326.9	-264.4	100.6	268.2	15.06	15.06	0.10
12,603.0	87.90	179.18	12,329.1	-296.3	101.4	300.1	12.49	11.78	4.16
12,634.0	89.38	179.50	12,329.9	-327.3	101.8	331.1	4.88	4.77	1.03
12,725.0	87.89	175.67	12,332.0	-418.1	105.6	422.0	4.51	-1.64	-4.21
12,819.0	87.53	174.31	12,335.8	-511.7	113.8	515.9	1.50	-0.38	-1.45
12,913.0	87.36	174.28	12,340.0	-605.1	123.2	609.6	0.18	-0.18	-0.03
13,007.0	87.51	174.19	12,344.2	-698.6	132.6	703.3	0.19	0.16	-0.10
13,100.0	86.75	173.02	12,348.8	-790.9	142.9	796.0	1.50	-0.82	-1.26
13,193.0	86.83	172.31	12,354.0	-883.0	154.8	888.5	0.77	0.09	-0.76
13,287.0	87.70	173.20	12,358.5	-976.1	166.6	982.0	1.32	0.93	0.95
13,381.0	89.72	175.04	12,360.7	-1,069.6	176.3	1,075.8	2.91	2.15	1.96
13,474.0	88.82	176.48	12,361.8	-1,162.3	183.1	1,168.7	1.83	-0.97	1.55
13,569.0	89.44	177.48	12,363.3	-1,257.2	188.1	1,263.7	1.24	0.65	1.05
13,662.0	90.06	180.31	12,363.7	-1,350.1	189.9	1,358.7	3.12	0.67	3.04
13,756.0	90.08	179.94	12,363.6	-1,444.1	189.7	1,450.6	0.39	0.02	-0.39
13,851.0	90.64	179.96	12,363.0	-1,539.1	189.8	1,545.5	0.59	0.59	0.02
13,945.0	90.64	179.72	12,361.9	-1,633.1	190.1	1,639.5	0.26	0.00	-0.26
14,038.0	91.29	181.47	12,360.4	-1,726.1	189.1	1,732.3	2.01	0.70	1.88
14,133.0	89.22	180.40	12,359.9	-1,821.1	187.5	1,827.2	2.45	-2.18	-1.13
14,227.0	89.47	180.75	12,361.0	-1,915.1	186.6	1,921.0	0.46	0.27	0.37
14,322.0	88.85	179.87	12,362.4	-2,010.1	186.1	2,015.9	1.13	-0.65	-0.93
14,416.0	88.66	178.34	12,364.4	-2,104.0	187.6	2,109.9	1.64	-0.20	-1.63
14,509.0	90.03	179.55	12,365.5	-2,197.0	189.3	2,202.8	1.97	1.47	1.30
14,603.0	86.95	179.10	12,368.0	-2,290.9	190.4	2,296.8	3.31	-3.28	-0.48
14,697.0	86.12	179.72	12,373.7	-2,384.8	191.3	2,390.5	1.10	-0.88	0.66
14,790.0	85.40	179.89	12,380.5	-2,477.5	191.7	2,483.2	0.80	-0.77	0.18
14,884.0	85.32	180.09	12,388.1	-2,571.2	191.7	2,576.8	0.23	-0.09	0.21
14,977.0	84.76	180.23	12,396.2	-2,663.9	191.4	2,669.4	0.62	-0.60	0.15
15,070.0	84.76	180.07	12,404.7	-2,756.5	191.2	2,761.9	0.17	0.00	-0.17
15,163.0	85.29	179.62	12,412.7	-2,849.1	191.4	2,854.5	0.75	0.57	-0.48
15,258.0	85.57	179.07	12,420.3	-2,943.8	192.5	2,949.2	0.65	0.29	-0.58
15,352.0	84.96	178.72	12,428.1	-3,037.5	194.3	3,042.8	0.75	-0.65	-0.37
15,446.0	86.19	179.17	12,435.3	-3,131.2	196.0	3,136.5	1.39	1.31	0.48
15,539.0	86.41	179.03	12,441.3	-3,224.0	197.5	3,229.3	0.28	0.24	-0.15
15,635.0	86.47	178.69	12,447.3	-3,319.8	199.4	3,325.1	0.36	0.06	-0.35
15,728.0	86.16	178.44	12,453.3	-3,412.5	201.7	3,417.9	0.43	-0.33	-0.27
15,822.0	86.13	179.67	12,459.6	-3,506.3	203.3	3,511.7	1.31	-0.03	1.31
15,915.0	88.21	181.72	12,464.2	-3,599.2	202.1	3,604.4	3.14	2.24	2.20
16,009.0	88.93	181.54	12,466.5	-3,693.1	199.5	3,698.1	0.79	0.77	-0.19
16,102.0	87.62	179.76	12,469.3	-3,786.1	198.4	3,791.0	2.38	-1.41	-1.91
16,197.0	88.35	180.62	12,472.7	-3,881.0	198.1	3,885.8	1.19	0.77	0.91
16,291.0	87.61	182.95	12,476.0	-3,974.9	195.2	3,979.5	2.60	-0.79	2.48

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well HENNIN FED #12H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3170+30 @ 3200.0usft (NABORS 894)
Site:	BULLDOG	MD Reference:	RKB=3170+30 @ 3200.0usft (NABORS:894)
Well:	HENNIN FED #12H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM_Users

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)
16,386.0	89.94	177.98	12,478.0	-4,069.8	194.4	4,074.4	5.78	2.45	-5.23
16,480.0	85.94	176.73	12,481.4	-4,163.6	198.7	4,168.3	4.46	-4.26	-1.33
16,574.0	84.00	173.78	12,489.6	-4,256.9	206.5	4,261.8	3.75	-2.06	-3.14
16,669.0	86.75	175.21	12,497.3	-4,351.2	215.6	4,356.3	3.26	2.89	1.51
16,764.0	88.43	178.03	12,501.3	-4,445.9	221.2	4,451.2	3.45	1.77	2.97
16,859.0	90.11	180.19	12,502.5	-4,540.9	222.6	4,546.2	2.88	1.77	2.27
16,953.0	89.72	179.41	12,502.6	-4,634.9	223.0	4,640.1	0.93	-0.41	-0.83
17,047.0	89.89	180.28	12,503.0	-4,728.9	223.2	4,734.0	0.94	0.18	0.93
17,140.0	91.12	181.27	12,502.1	-4,821.9	222.0	4,826.9	1.70	1.32	1.06
17,199.0	91.12	181.27	12,501.0	-4,880.9	220.7	4,885.8	0.00	0.00	0.00

Checked By: _____ Approved By: _____ Date: _____