

NORTHERN DELAWARE BASIN

LEA COUNTY, NM

BULLDOG

PICKELHAUBE ST #702H

OWB

Design: AWP

Standard Survey Report

26 November, 2019

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well PICKELHAUBE ST #702H
Project:	LEA COUNTY, NM	TVD Reference:	KB=27' @ 3437.0usft (Nabors 893)
Site:	BULLDOG	MD Reference:	KB=27' @ 3437.0usft (Nabors 893)
Well:	PICKELHAUBE ST #702H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	AWP	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	PICKELHAUBE ST #702H		
Well Position	+N/-S	0.0 usft	Northing: 430,461.00 usft
	+E/-W	0.0 usft	Easting: 780,206.50 usft
Position Uncertainty	3.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 10' 48.762 N
		Longitude:	103° 25' 39.599 W
		Ground Level:	3,410.0 usft

Wellbore	OWB		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF2015	9/4/2019	6.64
			Dip Angle (°) 60.02
			Field Strength (nT) 47,699.26948442

Design	AWP		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.0	0.0	0.0
			Direction (°) 186.49

Survey Program	Date	11/26/2019		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	12,202.0	GYRO-INTERMEDIATE (OWB)	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4
12,370.0	17,911.0	MWD-CURVE/LAT (OWB)	MWD+IFR1+FDIR	OWSG MWD + IFR1 + FDIR Correction

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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.26	334.35	100.0	0.2	-0.1	-0.2	0.26	0.26	0.00
125.0	0.13	328.76	125.0	0.3	-0.1	-0.3	0.52	-0.52	-22.36
150.0	0.19	337.84	150.0	0.3	-0.2	-0.3	0.26	0.24	36.32
175.0	0.23	338.97	175.0	0.4	-0.2	-0.4	0.16	0.16	4.52
200.0	0.14	341.11	200.0	0.5	-0.2	-0.5	0.36	-0.36	8.56
225.0	0.34	332.55	225.0	0.6	-0.3	-0.6	0.81	0.80	-34.24
250.0	0.29	316.99	250.0	0.7	-0.4	-0.7	0.39	-0.20	-62.24
275.0	0.29	316.84	275.0	0.8	-0.4	-0.7	0.00	0.00	-0.60
300.0	0.24	304.36	300.0	0.9	-0.5	-0.8	0.30	-0.20	-49.92

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Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	AWP	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)
325.0	0.22	276.17	325.0	0.9	-0.6	-0.8	0.45	-0.08	-112.76
350.0	0.22	269.49	350.0	0.9	-0.7	-0.8	0.10	0.00	-26.72
375.0	0.26	267.57	375.0	0.9	-0.8	-0.8	0.16	0.16	-7.68
400.0	0.21	271.06	400.0	0.9	-0.9	-0.8	0.21	-0.20	13.96
425.0	0.22	255.90	425.0	0.9	-1.0	-0.8	0.23	0.04	-60.64
450.0	0.25	241.43	450.0	0.9	-1.1	-0.7	0.27	0.12	-57.88
475.0	0.29	231.88	475.0	0.8	-1.2	-0.7	0.24	0.16	-38.20
500.0	0.36	207.88	500.0	0.7	-1.3	-0.5	0.61	0.28	-96.00
525.0	0.37	211.41	525.0	0.6	-1.4	-0.4	0.10	0.04	14.12
550.0	0.38	206.80	550.0	0.4	-1.4	-0.2	0.13	0.04	-18.44
575.0	0.42	208.88	575.0	0.3	-1.5	-0.1	0.17	0.16	8.32
600.0	0.46	205.74	600.0	0.1	-1.6	0.1	0.19	0.16	-12.56
625.0	0.37	204.31	625.0	-0.1	-1.7	0.3	0.36	-0.36	-5.72
650.0	0.40	202.51	650.0	-0.2	-1.8	0.4	0.13	0.12	-7.20
675.0	0.44	193.50	675.0	-0.4	-1.8	0.6	0.31	0.16	-36.04
700.0	0.41	200.88	700.0	-0.6	-1.9	0.8	0.25	-0.12	29.52
725.0	0.43	206.10	725.0	-0.8	-1.9	1.0	0.17	0.08	20.88
750.0	0.40	200.75	750.0	-0.9	-2.0	1.1	0.20	-0.12	-21.40
775.0	0.36	205.54	775.0	-1.1	-2.1	1.3	0.20	-0.16	19.16
800.0	0.22	213.96	800.0	-1.2	-2.1	1.4	0.58	-0.56	33.68
825.0	0.21	222.33	825.0	-1.3	-2.2	1.5	0.13	-0.04	33.48
850.0	0.23	217.92	850.0	-1.3	-2.3	1.6	0.10	0.08	-17.64
875.0	0.19	220.58	875.0	-1.4	-2.3	1.7	0.16	-0.16	10.64
900.0	0.25	209.97	900.0	-1.5	-2.4	1.7	0.29	0.24	-42.44
925.0	0.24	226.41	925.0	-1.6	-2.4	1.8	0.28	-0.04	65.76
950.0	0.26	246.31	950.0	-1.6	-2.5	1.9	0.35	0.08	79.60
975.0	0.21	238.99	975.0	-1.7	-2.6	2.0	0.23	-0.20	-29.28
1,000.0	0.28	230.74	1,000.0	-1.7	-2.7	2.0	0.31	0.28	-33.00
1,025.0	0.24	234.87	1,025.0	-1.8	-2.8	2.1	0.18	-0.16	16.52
1,050.0	0.25	223.62	1,050.0	-1.9	-2.9	2.2	0.20	0.04	-45.00
1,075.0	0.38	191.19	1,075.0	-2.0	-2.9	2.3	0.86	0.52	-129.72
1,100.0	0.73	174.79	1,100.0	-2.2	-2.9	2.5	1.52	1.40	-65.60
1,125.0	0.90	170.75	1,125.0	-2.6	-2.9	2.9	0.72	0.68	-16.16
1,150.0	0.95	170.97	1,150.0	-3.0	-2.8	3.3	0.20	0.20	0.88
1,175.0	0.90	170.17	1,175.0	-3.4	-2.8	3.7	0.21	-0.20	-3.20
1,200.0	0.92	173.28	1,200.0	-3.8	-2.7	4.1	0.21	0.08	12.44
1,225.0	0.92	173.47	1,225.0	-4.2	-2.7	4.4	0.01	0.00	0.76
1,250.0	0.93	172.69	1,250.0	-4.6	-2.6	4.8	0.06	0.04	-3.12
1,275.0	0.92	173.20	1,275.0	-5.0	-2.6	5.2	0.05	-0.04	2.04
1,300.0	0.97	170.81	1,300.0	-5.4	-2.5	5.6	0.25	0.20	-9.56
1,325.0	0.95	169.60	1,325.0	-5.8	-2.4	6.0	0.11	-0.08	-4.84
1,350.0	0.93	168.87	1,350.0	-6.2	-2.3	6.4	0.09	-0.08	-2.92
1,375.0	0.85	169.41	1,374.9	-6.6	-2.3	6.8	0.32	-0.32	2.16

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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)	
1,400.0	0.43	178.93	1,399.9	-6.9	-2.2	7.1	1.73	-1.68	38.08	
1,425.0	0.56	331.84	1,424.9	-6.8	-2.3	7.1	3.85	0.52	611.64	
1,450.0	0.81	335.68	1,449.9	-6.6	-2.4	6.8	1.02	1.00	15.36	
1,475.0	1.19	335.64	1,474.9	-6.2	-2.6	6.4	1.52	1.52	-0.16	
1,500.0	1.62	335.65	1,499.9	-5.6	-2.9	5.9	1.72	1.72	0.04	
1,525.0	1.71	336.68	1,524.9	-4.9	-3.2	5.3	0.38	0.36	4.12	
1,550.0	1.70	335.57	1,549.9	-4.3	-3.5	4.6	0.14	-0.04	-4.44	
1,575.0	1.70	335.12	1,574.9	-3.6	-3.8	4.0	0.05	0.00	-1.80	
1,600.0	1.78	336.65	1,599.9	-2.9	-4.1	3.3	0.37	0.32	6.12	
1,625.0	1.80	335.40	1,624.9	-2.2	-4.4	2.7	0.18	0.08	-5.00	
1,650.0	1.78	334.06	1,649.9	-1.5	-4.7	2.0	0.19	-0.08	-5.36	
1,675.0	1.70	334.59	1,674.9	-0.8	-5.1	1.4	0.33	-0.32	2.12	
1,700.0	1.78	335.88	1,699.8	-0.1	-5.4	0.7	0.36	0.32	5.16	
1,725.0	1.72	335.86	1,724.8	0.6	-5.7	0.1	0.24	-0.24	-0.08	
1,750.0	1.73	335.08	1,749.8	1.3	-6.0	-0.6	0.10	0.04	-3.12	
1,775.0	1.75	335.82	1,774.8	2.0	-6.3	-1.2	0.12	0.08	2.96	
1,800.0	1.74	334.98	1,799.8	2.7	-6.6	-1.9	0.11	-0.04	-3.36	
1,825.0	1.79	335.88	1,824.8	3.4	-6.9	-2.6	0.23	0.20	3.60	
1,850.0	1.75	335.60	1,849.8	4.1	-7.3	-3.2	0.16	-0.16	-1.12	
1,875.0	1.73	336.36	1,874.8	4.8	-7.6	-3.9	0.12	-0.08	3.04	
1,900.0	1.70	336.66	1,899.8	5.4	-7.9	-4.5	0.13	-0.12	1.20	
1,925.0	1.72	336.96	1,924.7	6.1	-8.2	-5.2	0.09	0.08	1.20	
1,950.0	1.81	336.85	1,949.7	6.8	-8.5	-5.8	0.36	0.36	-0.44	
1,975.0	1.79	337.40	1,974.7	7.6	-8.8	-6.5	0.11	-0.08	2.20	
2,000.0	1.79	337.89	1,999.7	8.3	-9.1	-7.2	0.06	0.00	1.96	
2,025.0	1.78	336.20	2,024.7	9.0	-9.4	-7.9	0.21	-0.04	-6.76	
2,050.0	1.81	336.73	2,049.7	9.7	-9.7	-8.6	0.14	0.12	2.12	
2,075.0	1.76	336.48	2,074.7	10.4	-10.0	-9.2	0.20	-0.20	-1.00	
2,100.0	1.83	336.47	2,099.7	11.1	-10.3	-9.9	0.28	0.28	-0.04	
2,125.0	2.07	335.83	2,124.6	11.9	-10.7	-10.6	0.96	0.96	-2.56	
2,150.0	2.19	335.23	2,149.6	12.8	-11.0	-11.4	0.49	0.48	-2.40	
2,175.0	1.30	341.63	2,174.6	13.5	-11.3	-12.1	3.64	-3.56	25.60	
2,200.0	0.77	349.37	2,199.6	13.9	-11.4	-12.5	2.19	-2.12	30.96	
2,225.0	0.43	16.24	2,224.6	14.2	-11.4	-12.8	1.73	-1.36	107.48	
2,250.0	0.36	15.24	2,249.6	14.3	-11.4	-12.9	0.28	-0.28	-4.00	
2,275.0	0.38	20.66	2,274.6	14.5	-11.4	-13.1	0.16	0.08	21.68	
2,300.0	0.36	18.25	2,299.6	14.6	-11.3	-13.3	0.10	-0.08	-9.64	
2,325.0	0.38	15.51	2,324.6	14.8	-11.3	-13.4	0.11	0.08	-10.96	
2,350.0	0.32	17.03	2,349.6	14.9	-11.2	-13.6	0.24	-0.24	6.08	
2,375.0	0.30	17.53	2,374.6	15.1	-11.2	-13.7	0.08	-0.08	2.00	
2,400.0	0.30	24.66	2,399.6	15.2	-11.1	-13.8	0.15	0.00	28.52	
2,425.0	0.28	33.83	2,424.6	15.3	-11.1	-13.9	0.20	-0.08	36.68	
2,450.0	0.28	42.44	2,449.6	15.4	-11.0	-14.1	0.17	0.00	34.44	

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2,475.0	0.32	57.01	2,474.6	15.5	-10.9	-14.1	0.34	0.16	58.28	
2,500.0	0.29	61.70	2,499.6	15.5	-10.8	-14.2	0.16	-0.12	18.76	
2,525.0	0.30	64.55	2,524.6	15.6	-10.7	-14.3	0.07	0.04	11.40	
2,550.0	0.36	84.29	2,549.6	15.6	-10.5	-14.3	0.51	0.24	78.96	
2,575.0	0.41	76.55	2,574.6	15.7	-10.4	-14.4	0.29	0.20	-30.96	
2,600.0	0.50	83.11	2,599.6	15.7	-10.2	-14.5	0.42	0.36	26.24	
2,625.0	0.62	89.69	2,624.6	15.7	-9.9	-14.5	0.54	0.48	26.32	
2,650.0	0.65	83.86	2,649.6	15.7	-9.6	-14.5	0.28	0.12	-23.32	
2,675.0	0.76	95.24	2,674.6	15.7	-9.3	-14.6	0.71	0.44	45.52	
2,700.0	0.82	96.73	2,699.6	15.7	-9.0	-14.6	0.25	0.24	5.96	
2,725.0	0.86	99.25	2,724.6	15.6	-8.6	-14.6	0.22	0.16	10.08	
2,750.0	0.87	97.97	2,749.6	15.6	-8.3	-14.6	0.09	0.04	-5.12	
2,775.0	0.85	96.25	2,774.6	15.5	-7.9	-14.6	0.13	-0.08	-6.88	
2,800.0	0.82	99.34	2,799.6	15.5	-7.5	-14.5	0.22	-0.12	12.36	
2,825.0	0.46	98.49	2,824.6	15.4	-7.2	-14.5	1.44	-1.44	-3.40	
2,850.0	0.50	264.28	2,849.6	15.4	-7.3	-14.5	3.81	0.16	663.16	
2,875.0	0.59	264.75	2,874.6	15.4	-7.5	-14.5	0.36	0.36	1.88	
2,900.0	0.56	262.40	2,899.6	15.4	-7.7	-14.4	0.15	-0.12	-9.40	
2,925.0	0.57	262.31	2,924.6	15.3	-8.0	-14.3	0.04	0.04	-0.36	
2,950.0	0.50	258.49	2,949.6	15.3	-8.2	-14.3	0.31	-0.28	-15.28	
2,975.0	0.53	256.92	2,974.6	15.3	-8.4	-14.2	0.13	0.12	-6.28	
3,000.0	0.68	269.08	2,999.6	15.2	-8.7	-14.1	0.79	0.60	48.64	
3,025.0	1.32	284.45	3,024.6	15.3	-9.1	-14.2	2.75	2.56	61.48	
3,050.0	1.91	292.01	3,049.6	15.5	-9.8	-14.3	2.50	2.36	30.24	
3,075.0	1.92	292.26	3,074.5	15.8	-10.6	-14.5	0.05	0.04	1.00	
3,100.0	1.91	292.27	3,099.5	16.2	-11.3	-14.8	0.04	-0.04	0.04	
3,125.0	1.72	289.82	3,124.5	16.4	-12.1	-15.0	0.82	-0.76	-9.80	
3,150.0	1.65	294.54	3,149.5	16.7	-12.8	-15.2	0.62	-0.28	18.88	
3,175.0	1.55	292.54	3,174.5	17.0	-13.4	-15.4	0.46	-0.40	-8.00	
3,200.0	1.53	293.90	3,199.5	17.3	-14.0	-15.6	0.17	-0.08	5.44	
3,225.0	1.47	293.76	3,224.5	17.5	-14.6	-15.8	0.24	-0.24	-0.56	
3,250.0	1.33	293.65	3,249.5	17.8	-15.2	-15.9	0.56	-0.56	-0.44	
3,275.0	1.31	293.83	3,274.5	18.0	-15.7	-16.1	0.08	-0.08	0.72	
3,300.0	1.34	295.64	3,299.5	18.2	-16.2	-16.3	0.21	0.12	7.24	
3,325.0	1.35	295.78	3,324.5	18.5	-16.8	-16.5	0.04	0.04	0.56	
3,350.0	1.68	294.37	3,349.4	18.8	-17.3	-16.7	1.33	1.32	-5.64	
3,375.0	2.22	294.49	3,374.4	19.1	-18.1	-17.0	2.16	2.16	0.48	
3,400.0	2.31	293.58	3,399.4	19.5	-19.0	-17.3	0.39	0.36	-3.64	
3,425.0	2.30	293.03	3,424.4	19.9	-19.9	-17.5	0.10	-0.04	-2.20	
3,450.0	2.34	293.76	3,449.4	20.3	-20.9	-17.8	0.20	0.16	2.92	
3,475.0	2.43	295.82	3,474.3	20.8	-21.8	-18.2	0.50	0.36	8.24	
3,500.0	2.32	295.67	3,499.3	21.2	-22.8	-18.5	0.44	-0.44	-0.60	
3,525.0	2.29	298.29	3,524.3	21.7	-23.7	-18.9	0.44	-0.12	10.48	
3,550.0	2.29	299.49	3,549.3	22.2	-24.5	-19.2	0.19	0.00	4.80	

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well PICKELHAUBE ST #702H
Project:	LEA COUNTY, NM	TVD Reference:	KB=27' @ 3437.0usft (Nabors 893)
Site:	BULLDOG	MD Reference:	KB=27' @ 3437.0usft (Nabors 893)
Well:	PICKELHAUBE ST #702H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	AWP	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)
3,575.0	2.29	299.32	3,574.3	22.6	-25.4	-19.6	0.03	0.00	-0.68
3,600.0	2.30	299.76	3,599.2	23.1	-26.3	-20.0	0.08	0.04	1.76
3,625.0	2.42	302.94	3,624.2	23.7	-27.1	-20.5	0.71	0.48	12.72
3,650.0	2.41	305.76	3,649.2	24.3	-28.0	-20.9	0.48	-0.04	11.28
3,675.0	2.38	305.70	3,674.2	24.9	-28.9	-21.5	0.12	-0.12	-0.24
3,700.0	2.46	306.53	3,699.2	25.5	-29.7	-22.0	0.35	0.32	3.32
3,725.0	2.48	307.24	3,724.1	26.1	-30.6	-22.5	0.15	0.08	2.84
3,750.0	2.44	307.60	3,749.1	26.8	-31.4	-23.1	0.17	-0.16	1.44
3,775.0	2.59	312.13	3,774.1	27.5	-32.3	-23.7	1.00	0.60	18.12
3,800.0	2.46	316.29	3,799.1	28.3	-33.1	-24.4	0.90	-0.52	16.64
3,825.0	2.46	318.06	3,824.0	29.1	-33.8	-25.1	0.30	0.00	7.08
3,850.0	2.52	318.30	3,849.0	29.9	-34.5	-25.8	0.24	0.24	0.96
3,875.0	2.45	319.06	3,874.0	30.7	-35.2	-26.5	0.31	-0.28	3.04
3,900.0	2.25	320.24	3,899.0	31.5	-35.9	-27.2	0.82	-0.80	4.72
3,925.0	2.25	320.36	3,924.0	32.2	-36.5	-27.9	0.02	0.00	0.48
3,950.0	2.19	320.22	3,948.9	33.0	-37.1	-28.6	0.24	-0.24	-0.56
3,975.0	2.23	313.93	3,973.9	33.7	-37.8	-29.2	0.98	0.16	-25.16
4,000.0	2.50	301.21	3,998.9	34.3	-38.6	-29.7	2.35	1.08	-50.88
4,025.0	2.57	302.86	4,023.9	34.9	-39.5	-30.2	0.40	0.28	6.60
4,050.0	2.50	301.53	4,048.8	35.5	-40.5	-30.7	0.37	-0.28	-5.32
4,075.0	2.47	302.00	4,073.8	36.0	-41.4	-31.1	0.15	-0.12	1.88
4,100.0	2.50	302.48	4,098.8	36.6	-42.3	-31.6	0.15	0.12	1.92
4,125.0	2.37	303.90	4,123.8	37.2	-43.2	-32.1	0.57	-0.52	5.68
4,150.0	2.44	305.12	4,148.8	37.8	-44.1	-32.6	0.35	0.28	4.88
4,175.0	2.26	304.43	4,173.7	38.4	-44.9	-33.0	0.73	-0.72	-2.76
4,200.0	2.36	305.02	4,198.7	38.9	-45.7	-33.5	0.41	0.40	2.36
4,225.0	2.18	305.84	4,223.7	39.5	-46.6	-34.0	0.73	-0.72	3.28
4,250.0	2.07	305.56	4,248.7	40.1	-47.3	-34.5	0.44	-0.44	-1.12
4,275.0	1.93	306.09	4,273.7	40.6	-48.0	-34.9	0.56	-0.56	2.12
4,300.0	1.80	305.58	4,298.6	41.0	-48.7	-35.3	0.52	-0.52	-2.04
4,325.0	1.69	306.57	4,323.6	41.5	-49.3	-35.7	0.46	-0.44	3.96
4,350.0	1.57	307.01	4,348.6	41.9	-49.9	-36.0	0.48	-0.48	1.76
4,375.0	1.65	306.67	4,373.6	42.3	-50.4	-36.4	0.32	0.32	-1.36
4,400.0	1.47	303.72	4,398.6	42.7	-51.0	-36.7	0.79	-0.72	-11.80
4,425.0	1.47	303.53	4,423.6	43.1	-51.5	-37.0	0.02	0.00	-0.76
4,450.0	1.38	302.29	4,448.6	43.4	-52.0	-37.3	0.38	-0.36	-4.96
4,475.0	0.88	300.68	4,473.6	43.7	-52.5	-37.5	2.00	-2.00	-6.44
4,500.0	0.59	300.81	4,498.6	43.9	-52.7	-37.6	1.16	-1.16	0.52
4,525.0	0.46	297.82	4,523.6	44.0	-52.9	-37.7	0.53	-0.52	-11.96
4,550.0	0.43	294.30	4,548.6	44.0	-53.1	-37.8	0.16	-0.12	-14.08
4,575.0	0.28	298.37	4,573.6	44.1	-53.2	-37.8	0.61	-0.60	16.28
4,600.0	0.21	86.27	4,598.6	44.1	-53.2	-37.8	1.89	-0.28	591.60
4,625.0	0.31	76.80	4,623.6	44.2	-53.1	-37.9	0.43	0.40	-37.88

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well PICKELHAUBE ST #702H
Project:	LEA COUNTY, NM	TVD Reference:	KB=27' @ 3437.0usft (Nabors 893)
Site:	BULLDOG	MD Reference:	KB=27' @ 3437.0usft (Nabors 893)
Well:	PICKELHAUBE ST #702H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	AWP	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)	
4,650.0	0.33	56.55	4,648.6	44.2	-53.0	-37.9	0.46	0.08	-81.00	
4,675.0	0.26	63.41	4,673.6	44.3	-52.9	-38.0	0.31	-0.28	27.44	
4,700.0	0.88	314.85	4,698.6	44.4	-53.0	-38.2	3.98	2.48	-434.24	
4,725.0	0.90	314.15	4,723.6	44.7	-53.3	-38.4	0.09	0.08	-2.80	
4,750.0	0.94	315.05	4,748.6	45.0	-53.5	-38.7	0.17	0.16	3.60	
4,775.0	1.06	317.48	4,773.6	45.3	-53.8	-38.9	0.51	0.48	9.72	
4,800.0	1.09	316.51	4,798.6	45.7	-54.2	-39.2	0.14	0.12	-3.88	
4,825.0	1.06	311.36	4,823.6	46.0	-54.5	-39.5	0.40	-0.12	-20.60	
4,850.0	1.51	300.07	4,848.6	46.3	-55.0	-39.8	2.06	1.80	-45.16	
4,875.0	2.48	290.21	4,873.5	46.7	-55.8	-40.1	4.10	3.88	-39.44	
4,900.0	2.97	286.67	4,898.5	47.0	-56.9	-40.3	2.07	1.96	-14.16	
4,925.0	2.97	287.00	4,923.5	47.4	-58.1	-40.5	0.07	0.00	1.32	
4,950.0	3.08	287.66	4,948.4	47.8	-59.4	-40.8	0.46	0.44	2.64	
4,975.0	2.87	286.40	4,973.4	48.2	-60.6	-41.0	0.88	-0.84	-5.04	
5,000.0	2.53	284.61	4,998.4	48.5	-61.8	-41.2	1.40	-1.36	-7.16	
5,025.0	2.18	283.28	5,023.4	48.7	-62.8	-41.3	1.42	-1.40	-5.32	
5,050.0	1.74	279.63	5,048.3	48.9	-63.6	-41.4	1.83	-1.76	-14.60	
5,075.0	1.38	280.55	5,073.3	49.0	-64.3	-41.5	1.44	-1.44	3.68	
5,100.0	1.07	281.69	5,098.3	49.1	-64.8	-41.5	1.24	-1.24	4.56	
5,125.0	0.78	287.41	5,123.3	49.2	-65.2	-41.6	1.22	-1.16	22.88	
5,150.0	0.42	287.20	5,148.3	49.3	-65.4	-41.6	1.44	-1.44	-0.84	
5,175.0	0.41	297.53	5,173.3	49.4	-65.6	-41.7	0.30	-0.04	41.32	
5,200.0	0.30	307.72	5,198.3	49.5	-65.7	-41.7	0.51	-0.44	40.76	
5,225.0	0.19	313.62	5,223.3	49.5	-65.8	-41.8	0.45	-0.44	23.60	
5,250.0	0.10	334.32	5,248.3	49.6	-65.8	-41.8	0.41	-0.36	82.80	
5,275.0	0.27	343.32	5,273.3	49.7	-65.9	-41.9	0.69	0.68	36.00	
5,300.0	0.56	317.71	5,298.3	49.8	-66.0	-42.0	1.35	1.16	-102.44	
5,325.0	1.83	290.00	5,323.3	50.0	-66.4	-42.2	5.44	5.08	-110.84	
5,350.0	2.72	286.97	5,348.3	50.3	-67.4	-42.4	3.59	3.56	-12.12	
5,375.0	2.77	285.30	5,373.3	50.7	-68.5	-42.6	0.38	0.20	-6.68	
5,400.0	2.75	285.38	5,398.2	51.0	-69.7	-42.8	0.08	-0.08	0.32	
5,425.0	2.84	286.80	5,423.2	51.3	-70.9	-43.0	0.45	0.36	5.68	
5,450.0	2.94	288.61	5,448.2	51.7	-72.1	-43.2	0.54	0.40	7.24	
5,475.0	2.84	287.79	5,473.1	52.1	-73.3	-43.5	0.43	-0.40	-3.28	
5,500.0	3.08	285.39	5,498.1	52.5	-74.5	-43.7	1.08	0.96	-9.60	
5,525.0	4.51	281.27	5,523.1	52.8	-76.1	-43.9	5.82	5.72	-16.48	
5,550.0	4.95	282.10	5,548.0	53.3	-78.1	-44.1	1.78	1.76	3.32	
5,575.0	5.04	283.74	5,572.9	53.7	-80.2	-44.3	0.68	0.36	6.56	
5,600.0	4.99	282.82	5,597.8	54.2	-82.4	-44.6	0.38	-0.20	-3.68	
5,625.0	5.04	283.37	5,622.7	54.7	-84.5	-44.8	0.28	0.20	2.20	
5,650.0	5.04	283.77	5,647.6	55.3	-86.6	-45.1	0.14	0.00	1.60	
5,675.0	5.09	284.47	5,672.5	55.8	-88.8	-45.4	0.32	0.20	2.80	
5,700.0	5.03	283.18	5,697.4	56.3	-90.9	-45.7	0.51	-0.24	-5.16	

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well PICKELHAUBE ST #702H
Project:	LEA COUNTY, NM	TVD Reference:	KB=27' @ 3437.0usft (Nabors 893)
Site:	BULLDOG	MD Reference:	KB=27' @ 3437.0usft (Nabors 893)
Well:	PICKELHAUBE ST #702H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	AWP	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)	
5,725.0	4.99	283.83	5,722.3	56.8	-93.0	-46.0	0.28	-0.16	2.60	
5,750.0	4.94	283.31	5,747.2	57.3	-95.1	-46.2	0.27	-0.20	-2.08	
5,775.0	4.94	284.43	5,772.1	57.9	-97.2	-46.5	0.39	0.00	4.48	
5,800.0	5.04	283.50	5,797.0	58.4	-99.3	-46.8	0.51	0.40	-3.72	
5,825.0	4.97	283.41	5,821.9	58.9	-101.5	-47.0	0.28	-0.28	-0.36	
5,850.0	4.92	284.35	5,846.8	59.4	-103.6	-47.3	0.38	-0.20	3.76	
5,875.0	4.88	284.08	5,871.7	59.9	-105.6	-47.6	0.18	-0.16	-1.08	
5,900.0	4.80	283.98	5,896.6	60.4	-107.7	-47.9	0.32	-0.32	-0.40	
5,925.0	4.75	283.62	5,921.6	60.9	-109.7	-48.2	0.23	-0.20	-1.44	
5,950.0	4.68	283.04	5,946.5	61.4	-111.7	-48.4	0.34	-0.28	-2.32	
5,975.0	4.65	284.09	5,971.4	61.9	-113.7	-48.6	0.36	-0.12	4.20	
6,000.0	4.56	284.79	5,996.3	62.4	-115.6	-48.9	0.42	-0.36	2.80	
6,025.0	4.53	283.39	6,021.2	62.9	-117.5	-49.2	0.46	-0.12	-5.60	
6,050.0	4.29	283.97	6,046.2	63.3	-119.4	-49.4	0.98	-0.96	2.32	
6,075.0	4.26	284.23	6,071.1	63.8	-121.2	-49.7	0.14	-0.12	1.04	
6,100.0	4.21	284.83	6,096.0	64.2	-123.0	-49.9	0.27	-0.20	2.40	
6,125.0	4.22	285.88	6,121.0	64.7	-124.8	-50.2	0.31	0.04	4.20	
6,150.0	4.31	286.91	6,145.9	65.3	-126.5	-50.5	0.47	0.36	4.12	
6,175.0	4.31	286.68	6,170.8	65.8	-128.3	-50.9	0.07	0.00	-0.92	
6,200.0	4.33	286.23	6,195.7	66.3	-130.2	-51.2	0.16	0.08	-1.80	
6,225.0	4.37	285.83	6,220.7	66.9	-132.0	-51.5	0.20	0.16	-1.60	
6,250.0	4.50	291.04	6,245.6	67.5	-133.8	-51.9	1.69	0.52	20.84	
6,275.0	4.79	296.66	6,270.5	68.3	-135.7	-52.5	2.16	1.16	22.48	
6,300.0	5.13	300.15	6,295.4	69.3	-137.6	-53.3	1.82	1.36	13.96	
6,325.0	5.04	299.55	6,320.3	70.4	-139.5	-54.2	0.42	-0.36	-2.40	
6,350.0	5.12	299.59	6,345.2	71.5	-141.4	-55.1	0.32	0.32	0.16	
6,375.0	5.13	300.61	6,370.1	72.6	-143.3	-56.0	0.37	0.04	4.08	
6,400.0	5.13	299.85	6,395.0	73.8	-145.3	-56.9	0.27	0.00	-3.04	
6,425.0	5.13	299.37	6,419.9	74.9	-147.2	-57.7	0.17	0.00	-1.92	
6,450.0	4.96	298.16	6,444.8	75.9	-149.1	-58.6	0.80	-0.68	-4.84	
6,475.0	4.95	298.57	6,469.7	76.9	-151.0	-59.4	0.15	-0.04	1.64	
6,500.0	4.86	297.61	6,494.6	78.0	-152.9	-60.2	0.49	-0.36	-3.84	
6,525.0	4.89	298.29	6,519.6	78.9	-154.8	-61.0	0.26	0.12	2.72	
6,550.0	4.75	297.68	6,544.5	79.9	-156.7	-61.7	0.60	-0.56	-2.44	
6,575.0	4.80	298.30	6,569.4	80.9	-158.5	-62.5	0.29	0.20	2.48	
6,600.0	4.77	297.58	6,594.3	81.9	-160.3	-63.2	0.27	-0.12	-2.88	
6,625.0	4.71	298.12	6,619.2	82.9	-162.2	-64.0	0.30	-0.24	2.16	
6,650.0	4.66	297.89	6,644.1	83.8	-164.0	-64.7	0.21	-0.20	-0.92	
6,675.0	4.59	296.83	6,669.0	84.7	-165.8	-65.5	0.44	-0.28	-4.24	
6,700.0	4.60	297.36	6,694.0	85.7	-167.5	-66.2	0.17	0.04	2.12	
6,725.0	4.47	296.36	6,718.9	86.5	-169.3	-66.9	0.61	-0.52	-4.00	
6,750.0	4.41	297.31	6,743.8	87.4	-171.0	-67.5	0.38	-0.24	3.80	
6,775.0	4.36	297.69	6,768.7	88.3	-172.7	-68.2	0.23	-0.20	1.52	
6,800.0	4.24	297.20	6,793.7	89.2	-174.4	-68.9	0.50	-0.48	-1.96	

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well PICKELHAUBE ST #702H
Project:	LEA COUNTY, NM	TVD Reference:	KB=27' @ 3437.0usft (Nabors 893)
Site:	BULLDOG	MD Reference:	KB=27' @ 3437.0usft (Nabors 893)
Well:	PICKELHAUBE ST #702H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	AWP	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)
6,825.0	4.21	298.87	6,818.6	90.0	-176.0	-69.6	0.51	-0.12	6.68
6,850.0	4.10	297.83	6,843.5	90.9	-177.6	-70.2	0.53	-0.44	-4.16
6,875.0	4.13	297.17	6,868.5	91.7	-179.2	-70.9	0.22	0.12	-2.64
6,900.0	4.21	297.05	6,893.4	92.5	-180.8	-71.5	0.32	0.32	-0.48
6,925.0	4.06	296.28	6,918.3	93.4	-182.4	-72.1	0.64	-0.60	-3.08
6,950.0	3.99	296.31	6,943.3	94.1	-184.0	-72.7	0.28	-0.28	0.12
6,975.0	3.98	296.44	6,968.2	94.9	-185.6	-73.3	0.05	-0.04	0.52
7,000.0	4.04	297.66	6,993.1	95.7	-187.1	-73.9	0.42	0.24	4.88
7,025.0	3.99	296.82	7,018.1	96.5	-188.7	-74.6	0.31	-0.20	-3.36
7,050.0	4.04	297.38	7,043.0	97.3	-190.2	-75.2	0.25	0.20	2.24
7,075.0	4.10	296.99	7,068.0	98.1	-191.8	-75.8	0.26	0.24	-1.56
7,100.0	4.08	297.04	7,092.9	98.9	-193.4	-76.4	0.08	-0.08	0.20
7,125.0	4.05	296.49	7,117.8	99.7	-195.0	-77.0	0.20	-0.12	-2.20
7,150.0	3.98	296.12	7,142.8	100.5	-196.5	-77.6	0.30	-0.28	-1.48
7,175.0	4.08	296.40	7,167.7	101.3	-198.1	-78.2	0.41	0.40	1.12
7,200.0	4.20	297.59	7,192.6	102.1	-199.7	-78.9	0.59	0.48	4.76
7,225.0	4.58	298.46	7,217.6	103.0	-201.4	-79.6	1.54	1.52	3.48
7,250.0	5.08	300.18	7,242.5	104.0	-203.3	-80.4	2.08	2.00	6.88
7,275.0	5.11	299.74	7,267.4	105.1	-205.2	-81.3	0.20	0.12	-1.76
7,300.0	5.14	300.13	7,292.3	106.2	-207.1	-82.2	0.18	0.12	1.56
7,325.0	5.03	300.14	7,317.2	107.4	-209.0	-83.1	0.44	-0.44	0.04
7,350.0	5.12	300.83	7,342.1	108.5	-210.9	-84.0	0.43	0.36	2.76
7,375.0	4.98	300.64	7,367.0	109.6	-212.8	-84.9	0.56	-0.56	-0.76
7,400.0	4.89	300.26	7,391.9	110.7	-214.7	-85.7	0.38	-0.36	-1.52
7,425.0	4.96	301.02	7,416.8	111.8	-216.5	-86.6	0.38	0.28	3.04
7,450.0	4.85	300.32	7,441.7	112.9	-218.4	-87.5	0.50	-0.44	-2.80
7,475.0	4.70	299.74	7,466.6	113.9	-220.2	-88.3	0.63	-0.60	-2.32
7,500.0	4.60	299.40	7,491.5	114.9	-221.9	-89.1	0.41	-0.40	-1.36
7,525.0	4.59	299.97	7,516.5	115.9	-223.7	-89.9	0.19	-0.04	2.28
7,550.0	4.46	299.23	7,541.4	116.9	-225.4	-90.7	0.57	-0.52	-2.96
7,575.0	4.38	299.16	7,566.3	117.8	-227.1	-91.4	0.32	-0.32	-0.28
7,600.0	4.22	297.64	7,591.2	118.7	-228.7	-92.1	0.79	-0.64	-6.08
7,625.0	4.11	297.82	7,616.2	119.6	-230.3	-92.8	0.44	-0.44	0.72
7,650.0	4.12	297.54	7,641.1	120.4	-231.9	-93.4	0.09	0.04	-1.12
7,675.0	4.13	297.18	7,666.0	121.2	-233.5	-94.1	0.11	0.04	-1.44
7,700.0	4.05	296.27	7,691.0	122.0	-235.1	-94.7	0.41	-0.32	-3.64
7,725.0	3.97	296.01	7,715.9	122.8	-236.7	-95.3	0.33	-0.32	-1.04
7,750.0	3.91	296.89	7,740.9	123.6	-238.2	-95.9	0.34	-0.24	3.52
7,775.0	3.90	294.18	7,765.8	124.3	-239.7	-96.4	0.74	-0.04	-10.84
7,800.0	3.80	294.67	7,790.8	125.0	-241.3	-96.9	0.42	-0.40	1.96
7,825.0	3.72	294.76	7,815.7	125.7	-242.8	-97.4	0.32	-0.32	0.36
7,850.0	3.63	292.45	7,840.6	126.3	-244.2	-97.9	0.69	-0.36	-9.24
7,875.0	3.64	294.76	7,865.6	127.0	-245.7	-98.4	0.59	0.04	9.24

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well PICKELHAUBE ST #702H
Project:	LEA COUNTY, NM	TVD Reference:	KB=27' @ 3437.0usft (Nabors 893)
Site:	BULLDOG	MD Reference:	KB=27' @ 3437.0usft (Nabors 893)
Well:	PICKELHAUBE ST #702H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	AWP	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)	
7,900.0	3.60	293.09	7,890.5	127.6	-247.1	-98.8	0.45	-0.16	-6.68	
7,925.0	3.63	293.26	7,915.5	128.2	-248.6	-99.3	0.13	0.12	0.68	
7,950.0	3.48	291.48	7,940.4	128.8	-250.0	-99.7	0.74	-0.60	-7.12	
7,975.0	3.49	291.31	7,965.4	129.4	-251.4	-100.1	0.06	0.04	-0.68	
8,000.0	3.52	291.56	7,990.4	129.9	-252.8	-100.5	0.13	0.12	1.00	
8,025.0	3.53	292.15	8,015.3	130.5	-254.3	-100.9	0.15	0.04	2.36	
8,050.0	3.49	290.65	8,040.3	131.0	-255.7	-101.3	0.40	-0.16	-6.00	
8,075.0	3.59	288.48	8,065.2	131.6	-257.1	-101.7	0.67	0.40	-8.68	
8,100.0	3.87	284.07	8,090.2	132.0	-258.7	-101.9	1.60	1.12	-17.64	
8,125.0	3.86	283.40	8,115.1	132.4	-260.3	-102.1	0.19	-0.04	-2.68	
8,150.0	3.93	283.53	8,140.0	132.8	-262.0	-102.4	0.28	0.28	0.52	
8,175.0	3.81	283.55	8,165.0	133.2	-263.6	-102.6	0.48	-0.48	0.08	
8,200.0	3.80	282.46	8,189.9	133.6	-265.3	-102.7	0.29	-0.04	-4.36	
8,225.0	3.69	283.33	8,214.9	133.9	-266.8	-102.9	0.50	-0.44	3.48	
8,250.0	3.72	283.61	8,239.8	134.3	-268.4	-103.1	0.14	0.12	1.12	
8,275.0	3.78	283.28	8,264.8	134.7	-270.0	-103.3	0.26	0.24	-1.32	
8,300.0	3.75	283.20	8,289.7	135.1	-271.6	-103.5	0.12	-0.12	-0.32	
8,325.0	3.74	283.77	8,314.7	135.5	-273.2	-103.7	0.15	-0.04	2.28	
8,350.0	3.82	283.53	8,339.6	135.8	-274.8	-103.9	0.33	0.32	-0.96	
8,375.0	3.80	283.32	8,364.6	136.2	-276.4	-104.1	0.10	-0.08	-0.84	
8,400.0	3.84	283.18	8,389.5	136.6	-278.0	-104.3	0.16	0.16	-0.56	
8,425.0	3.77	283.44	8,414.4	137.0	-279.6	-104.5	0.29	-0.28	1.04	
8,450.0	3.88	284.15	8,439.4	137.4	-281.3	-104.7	0.48	0.44	2.84	
8,475.0	3.93	283.85	8,464.3	137.8	-282.9	-105.0	0.22	0.20	-1.20	
8,500.0	3.96	283.93	8,489.3	138.2	-284.6	-105.2	0.12	0.12	0.32	
8,525.0	3.92	281.93	8,514.2	138.6	-286.3	-105.4	0.57	-0.16	-8.00	
8,550.0	3.92	282.84	8,539.2	139.0	-287.9	-105.5	0.25	0.00	3.64	
8,575.0	3.85	283.79	8,564.1	139.4	-289.6	-105.7	0.38	-0.28	3.80	
8,600.0	3.78	283.34	8,589.0	139.7	-291.2	-105.9	0.30	-0.28	-1.80	
8,625.0	3.83	285.58	8,614.0	140.2	-292.8	-106.2	0.63	0.20	8.96	
8,650.0	3.82	283.58	8,638.9	140.6	-294.4	-106.4	0.54	-0.04	-8.00	
8,675.0	3.93	284.92	8,663.9	141.0	-296.1	-106.6	0.57	0.44	5.36	
8,700.0	3.97	284.84	8,688.8	141.4	-297.7	-106.9	0.16	0.16	-0.32	
8,725.0	4.03	285.51	8,713.8	141.9	-299.4	-107.2	0.30	0.24	2.68	
8,750.0	4.64	285.22	8,738.7	142.4	-301.2	-107.4	2.44	2.44	-1.16	
8,775.0	5.29	287.40	8,763.6	143.0	-303.3	-107.8	2.71	2.60	8.72	
8,800.0	5.50	288.58	8,788.5	143.7	-305.5	-108.3	0.95	0.84	4.72	
8,825.0	5.49	288.63	8,813.4	144.5	-307.8	-108.8	0.04	-0.04	0.20	
8,850.0	5.49	288.13	8,838.2	145.3	-310.1	-109.3	0.19	0.00	-2.00	
8,875.0	5.59	288.98	8,863.1	146.0	-312.4	-109.8	0.52	0.40	3.40	
8,900.0	5.47	288.78	8,888.0	146.8	-314.6	-110.3	0.49	-0.48	-0.80	
8,925.0	5.40	289.66	8,912.9	147.6	-316.9	-110.8	0.44	-0.28	3.52	
8,950.0	5.38	289.60	8,937.8	148.4	-319.1	-111.4	0.08	-0.08	-0.24	

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well PICKELHAUBE ST #702H
Project:	LEA COUNTY, NM	TVD Reference:	KB=27' @ 3437.0usft (Nabors 893)
Site:	BULLDOG	MD Reference:	KB=27' @ 3437.0usft (Nabors 893)
Well:	PICKELHAUBE ST #702H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	AWP	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)	
8,975.0	5.31	289.75	8,962.7	149.2	-321.3	-111.9	0.29	-0.28	0.60	
9,000.0	5.20	290.52	8,987.6	149.9	-323.4	-112.4	0.52	-0.44	3.08	
9,025.0	5.17	291.40	9,012.5	150.7	-325.5	-113.0	0.34	-0.12	3.52	
9,050.0	5.31	292.86	9,037.4	151.6	-327.7	-113.6	0.77	0.56	5.84	
9,075.0	5.20	292.25	9,062.3	152.5	-329.8	-114.2	0.49	-0.44	-2.44	
9,100.0	5.19	292.51	9,087.2	153.3	-331.9	-114.9	0.10	-0.04	1.04	
9,125.0	5.14	292.66	9,112.1	154.2	-333.9	-115.5	0.21	-0.20	0.60	
9,150.0	5.09	294.28	9,137.0	155.1	-336.0	-116.1	0.61	-0.20	6.48	
9,175.0	5.19	294.84	9,161.9	156.0	-338.0	-116.8	0.45	0.40	2.24	
9,200.0	5.10	294.16	9,186.8	157.0	-340.1	-117.5	0.43	-0.36	-2.72	
9,225.0	5.16	294.75	9,211.7	157.9	-342.1	-118.2	0.32	0.24	2.36	
9,250.0	5.12	295.07	9,236.6	158.8	-344.1	-118.9	0.20	-0.16	1.28	
9,275.0	5.17	294.48	9,261.5	159.8	-346.2	-119.6	0.29	0.20	-2.36	
9,300.0	5.16	295.91	9,286.4	160.7	-348.2	-120.4	0.52	-0.04	5.72	
9,325.0	5.17	295.58	9,311.3	161.7	-350.2	-121.1	0.13	0.04	-1.32	
9,350.0	5.19	297.25	9,336.2	162.7	-352.2	-121.9	0.61	0.08	6.68	
9,375.0	5.30	297.49	9,361.1	163.8	-354.3	-122.7	0.45	0.44	0.96	
9,400.0	5.24	297.16	9,385.9	164.8	-356.3	-123.5	0.27	-0.24	-1.32	
9,425.0	5.36	297.84	9,410.8	165.9	-358.4	-124.3	0.54	0.48	2.72	
9,450.0	5.29	296.29	9,435.7	166.9	-360.4	-125.1	0.64	-0.28	-6.20	
9,475.0	5.41	296.14	9,460.6	168.0	-362.5	-125.9	0.48	0.48	-0.60	
9,500.0	5.40	296.97	9,485.5	169.0	-364.6	-126.7	0.32	-0.04	3.32	
9,525.0	5.51	296.64	9,510.4	170.1	-366.7	-127.6	0.46	0.44	-1.32	
9,550.0	5.65	296.26	9,535.3	171.2	-368.9	-128.4	0.58	0.56	-1.52	
9,575.0	5.75	295.75	9,560.2	172.3	-371.2	-129.2	0.45	0.40	-2.04	
9,600.0	5.83	296.60	9,585.0	173.4	-373.4	-130.1	0.47	0.32	3.40	
9,625.0	6.07	296.14	9,609.9	174.5	-375.7	-130.9	0.98	0.96	-1.84	
9,650.0	6.11	296.11	9,634.8	175.7	-378.1	-131.8	0.16	0.16	-0.12	
9,675.0	6.26	296.63	9,659.6	176.9	-380.5	-132.8	0.64	0.60	2.08	
9,700.0	6.22	296.07	9,684.5	178.1	-383.0	-133.7	0.29	-0.16	-2.24	
9,725.0	6.55	296.70	9,709.3	179.3	-385.5	-134.6	1.35	1.32	2.52	
9,750.0	6.93	298.22	9,734.1	180.7	-388.1	-135.7	1.68	1.52	6.08	
9,775.0	6.98	297.98	9,758.9	182.1	-390.7	-136.8	0.23	0.20	-0.96	
9,800.0	7.08	297.92	9,783.8	183.5	-393.4	-137.9	0.40	0.40	-0.24	
9,825.0	7.27	298.14	9,808.6	185.0	-396.2	-139.1	0.77	0.76	0.88	
9,850.0	7.39	298.17	9,833.4	186.5	-399.0	-140.2	0.48	0.48	0.12	
9,875.0	7.70	298.21	9,858.1	188.1	-401.9	-141.4	1.24	1.24	0.16	
9,900.0	7.67	297.73	9,882.9	189.6	-404.9	-142.7	0.28	-0.12	-1.92	
9,925.0	7.75	298.51	9,907.7	191.2	-407.8	-143.9	0.53	0.32	3.12	
9,950.0	7.80	298.28	9,932.5	192.8	-410.8	-145.2	0.24	0.20	-0.92	
9,975.0	7.96	297.92	9,957.2	194.4	-413.8	-146.4	0.67	0.64	-1.44	
10,000.0	7.92	296.57	9,982.0	196.0	-416.9	-147.7	0.76	-0.16	-5.40	
10,025.0	8.04	296.71	10,006.7	197.6	-420.0	-148.9	0.49	0.48	0.56	
10,050.0	8.07	295.44	10,031.5	199.1	-423.1	-150.0	0.72	0.12	-5.08	

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well PICKELHAUBE ST #702H
Project:	LEA COUNTY, NM	TVD Reference:	KB=27' @ 3437.0usft (Nabors 893)
Site:	BULLDOG	MD Reference:	KB=27' @ 3437.0usft (Nabors 893)
Well:	PICKELHAUBE ST #702H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	AWP	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)
10,075.0	8.04	294.43	10,056.3	200.6	-426.3	-151.1	0.58	-0.12	-4.04
10,100.0	8.18	293.57	10,081.0	202.0	-429.5	-152.2	0.74	0.56	-3.44
10,125.0	8.23	293.37	10,105.7	203.4	-432.8	-153.2	0.23	0.20	-0.80
10,150.0	8.30	293.09	10,130.5	204.9	-436.1	-154.3	0.32	0.28	-1.12
10,175.0	8.36	292.40	10,155.2	206.3	-439.4	-155.3	0.47	0.24	-2.76
10,200.0	8.28	292.22	10,180.0	207.6	-442.8	-156.3	0.34	-0.32	-0.72
10,225.0	8.18	291.26	10,204.7	209.0	-446.1	-157.2	0.68	-0.40	-3.84
10,250.0	8.21	289.91	10,229.4	210.2	-449.4	-158.1	0.78	0.12	-5.40
10,275.0	7.96	288.27	10,254.2	211.4	-452.8	-158.9	1.36	-1.00	-6.56
10,300.0	8.12	288.89	10,279.0	212.5	-456.1	-159.6	0.73	0.64	2.48
10,325.0	8.12	288.56	10,303.7	213.6	-459.4	-160.3	0.19	0.00	-1.32
10,350.0	8.21	288.61	10,328.4	214.7	-462.8	-161.1	0.36	0.36	0.20
10,375.0	8.13	288.20	10,353.2	215.9	-466.2	-161.8	0.40	-0.32	-1.64
10,400.0	8.14	289.23	10,377.9	217.0	-469.5	-162.6	0.58	0.04	4.12
10,425.0	8.21	288.70	10,402.7	218.2	-472.9	-163.3	0.41	0.28	-2.12
10,450.0	8.14	288.21	10,427.4	219.3	-476.2	-164.1	0.40	-0.28	-1.96
10,475.0	8.02	288.47	10,452.2	220.4	-479.6	-164.8	0.50	-0.48	1.04
10,500.0	7.69	287.72	10,477.0	221.5	-482.8	-165.5	1.38	-1.32	-3.00
10,525.0	7.65	287.34	10,501.7	222.5	-486.0	-166.1	0.26	-0.16	-1.52
10,550.0	7.32	288.03	10,526.5	223.4	-489.1	-166.7	1.37	-1.32	2.76
10,575.0	7.08	288.00	10,551.3	224.4	-492.1	-167.4	0.96	-0.96	-0.12
10,600.0	6.88	287.93	10,576.1	225.4	-495.0	-168.0	0.80	-0.80	-0.28
10,625.0	6.51	286.30	10,601.0	226.2	-497.8	-168.5	1.66	-1.48	-6.52
10,650.0	6.21	285.59	10,625.8	227.0	-500.4	-169.0	1.24	-1.20	-2.84
10,675.0	6.11	285.43	10,650.7	227.7	-503.0	-169.4	0.41	-0.40	-0.64
10,700.0	6.00	286.31	10,675.5	228.4	-505.6	-169.8	0.58	-0.44	3.52
10,725.0	5.82	285.87	10,700.4	229.1	-508.0	-170.2	0.74	-0.72	-1.76
10,750.0	5.57	286.30	10,725.3	229.8	-510.4	-170.7	1.01	-1.00	1.72
10,775.0	5.29	285.33	10,750.2	230.5	-512.7	-171.0	1.18	-1.12	-3.88
10,800.0	5.25	285.45	10,775.0	231.1	-514.9	-171.4	0.17	-0.16	0.48
10,825.0	5.22	285.45	10,799.9	231.7	-517.1	-171.8	0.12	-0.12	0.00
10,850.0	5.07	285.94	10,824.8	232.3	-519.3	-172.1	0.63	-0.60	1.96
10,875.0	5.00	286.31	10,849.7	232.9	-521.4	-172.5	0.31	-0.28	1.48
10,900.0	4.75	286.29	10,874.7	233.5	-523.4	-172.8	1.00	-1.00	-0.08
10,925.0	4.57	286.49	10,899.6	234.1	-525.4	-173.2	0.72	-0.72	0.80
10,950.0	4.33	286.21	10,924.5	234.6	-527.2	-173.5	0.96	-0.96	-1.12
10,975.0	4.18	284.44	10,949.4	235.1	-529.0	-173.8	0.80	-0.60	-7.08
11,000.0	4.26	284.07	10,974.4	235.5	-530.8	-174.1	0.34	0.32	-1.48
11,025.0	4.19	285.43	10,999.3	236.0	-532.6	-174.3	0.49	-0.28	5.44
11,050.0	4.01	283.90	11,024.2	236.5	-534.3	-174.6	0.84	-0.72	-6.12
11,075.0	3.72	282.29	11,049.2	236.9	-535.9	-174.8	1.24	-1.16	-6.44
11,100.0	3.65	279.09	11,074.1	237.2	-537.5	-174.9	0.87	-0.28	-12.80
11,125.0	3.63	276.83	11,099.1	237.4	-539.1	-174.9	0.58	-0.08	-9.04

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well PICKELHAUBE ST #702H
Project:	LEA COUNTY, NM	TVD Reference:	KB=27' @ 3437.0usft (Nabors 893)
Site:	BULLDOG	MD Reference:	KB=27' @ 3437.0usft (Nabors 893)
Well:	PICKELHAUBE ST #702H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	AWP	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)
11,150.0	3.59	273.65	11,124.0	237.5	-540.7	-174.9	0.82	-0.16	-12.72
11,175.0	3.44	268.65	11,149.0	237.5	-542.2	-174.8	1.36	-0.60	-20.00
11,200.0	3.47	262.79	11,173.9	237.4	-543.7	-174.5	1.42	0.12	-23.44
11,225.0	3.43	263.09	11,198.9	237.3	-545.2	-174.1	0.18	-0.16	1.20
11,250.0	3.48	264.74	11,223.8	237.1	-546.7	-173.8	0.45	0.20	6.60
11,275.0	3.42	266.55	11,248.8	237.0	-548.2	-173.5	0.50	-0.24	7.24
11,300.0	3.40	267.92	11,273.7	236.9	-549.7	-173.3	0.34	-0.08	5.48
11,325.0	3.33	267.32	11,298.7	236.8	-551.1	-173.0	0.31	-0.28	-2.40
11,350.0	3.17	266.86	11,323.7	236.8	-552.5	-172.8	0.65	-0.64	-1.84
11,375.0	2.88	264.71	11,348.6	236.7	-553.9	-172.6	1.25	-1.16	-8.60
11,400.0	2.83	265.42	11,373.6	236.6	-555.1	-172.3	0.24	-0.20	2.84
11,425.0	2.87	266.00	11,398.6	236.5	-556.3	-172.1	0.20	0.16	2.32
11,450.0	2.85	268.37	11,423.5	236.4	-557.6	-171.9	0.48	-0.08	9.48
11,475.0	2.71	271.02	11,448.5	236.4	-558.8	-171.7	0.76	-0.56	10.60
11,500.0	2.70	271.59	11,473.5	236.4	-560.0	-171.6	0.11	-0.04	2.28
11,525.0	2.73	274.01	11,498.5	236.5	-561.2	-171.6	0.47	0.12	9.68
11,550.0	2.74	273.83	11,523.4	236.6	-562.3	-171.5	0.05	0.04	-0.72
11,575.0	2.76	275.09	11,548.4	236.7	-563.5	-171.5	0.25	0.08	5.04
11,600.0	2.76	274.94	11,573.4	236.8	-564.7	-171.4	0.03	0.00	-0.60
11,625.0	2.74	273.63	11,598.3	236.9	-565.9	-171.4	0.26	-0.08	-5.24
11,650.0	2.75	274.52	11,623.3	236.9	-567.1	-171.3	0.18	0.04	3.56
11,675.0	2.77	276.38	11,648.3	237.1	-568.3	-171.3	0.37	0.08	7.44
11,700.0	2.70	276.91	11,673.3	237.2	-569.5	-171.3	0.30	-0.28	2.12
11,725.0	2.55	272.68	11,698.2	237.3	-570.7	-171.3	0.98	-0.60	-16.92
11,750.0	2.37	269.61	11,723.2	237.3	-571.7	-171.2	0.89	-0.72	-12.28
11,775.0	2.37	269.22	11,748.2	237.3	-572.8	-171.1	0.06	0.00	-1.56
11,800.0	2.39	272.24	11,773.2	237.3	-573.8	-171.0	0.51	0.08	12.08
11,825.0	2.45	276.75	11,798.1	237.4	-574.9	-170.9	0.80	0.24	18.04
11,850.0	2.56	279.55	11,823.1	237.6	-575.9	-171.0	0.66	0.44	11.20
11,875.0	2.44	279.16	11,848.1	237.7	-577.0	-171.0	0.48	-0.48	-1.56
11,900.0	2.43	278.07	11,873.1	237.9	-578.1	-171.1	0.19	-0.04	-4.36
11,925.0	2.30	278.19	11,898.0	238.0	-579.1	-171.1	0.52	-0.52	0.48
11,950.0	2.01	284.73	11,923.0	238.2	-580.0	-171.2	1.52	-1.16	26.16
11,975.0	1.84	292.09	11,948.0	238.5	-580.8	-171.3	1.20	-0.68	29.44
12,000.0	1.72	293.35	11,973.0	238.8	-581.5	-171.5	0.50	-0.48	5.04
12,025.0	1.68	295.81	11,998.0	239.1	-582.2	-171.8	0.33	-0.16	9.84
12,050.0	1.55	295.15	12,023.0	239.4	-582.8	-172.0	0.53	-0.52	-2.64
12,075.0	1.47	295.38	12,048.0	239.7	-583.4	-172.2	0.32	-0.32	0.92
12,100.0	1.28	288.80	12,073.0	239.9	-584.0	-172.4	0.99	-0.76	-26.32
12,125.0	1.23	285.56	12,098.0	240.1	-584.5	-172.5	0.35	-0.20	-12.96
12,150.0	1.36	286.60	12,123.0	240.2	-585.0	-172.6	0.53	0.52	4.16
12,175.0	1.42	287.35	12,147.9	240.4	-585.6	-172.7	0.25	0.24	3.00
12,200.0	1.41	290.87	12,172.9	240.6	-586.2	-172.8	0.35	-0.04	14.08

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well PICKELHAUBE ST #702H
Project:	LEA COUNTY, NM	TVD Reference:	KB=27' @ 3437.0usft (Nabors 893)
Site:	BULLDOG	MD Reference:	KB=27' @ 3437.0usft (Nabors 893)
Well:	PICKELHAUBE ST #702H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	AWP	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)
12,202.0	1.41	290.99	12,174.9	240.6	-586.2	-172.8	0.15	0.00	6.00
12,370.0	0.49	271.56	12,342.9	241.4	-588.9	-173.3	0.57	-0.55	-11.57
12,420.0	0.26	236.91	12,392.9	241.3	-589.2	-173.2	0.63	-0.46	-69.30
12,451.0	1.35	154.98	12,423.9	241.0	-589.1	-172.8	4.32	3.52	-264.29
12,482.0	3.31	156.68	12,454.9	239.8	-588.6	-171.8	6.33	6.32	5.48
12,514.0	5.25	160.10	12,486.8	237.6	-587.7	-169.6	6.11	6.06	10.69
12,546.0	8.30	165.70	12,518.6	234.0	-586.7	-166.2	9.74	9.53	17.50
12,577.0	10.40	164.67	12,549.2	229.1	-585.4	-161.5	6.80	6.77	-3.32
12,597.9	12.31	167.33	12,569.6	225.1	-584.4	-157.6	9.48	9.15	12.73
FTP @ 12597.9'MD / 12569.6'TVD									
12,607.0	13.15	168.25	12,578.5	223.1	-584.0	-155.7	9.48	9.22	10.10
12,639.0	18.67	170.73	12,609.3	214.5	-582.4	-147.3	17.38	17.25	7.75
12,671.0	23.05	173.76	12,639.2	203.2	-580.9	-136.3	14.09	13.69	9.47
12,703.0	26.36	172.27	12,668.2	190.0	-579.3	-123.3	10.52	10.34	-4.66
12,735.0	31.31	173.68	12,696.3	174.6	-577.4	-108.3	15.61	15.47	4.41
12,766.0	34.87	172.82	12,722.2	157.8	-575.4	-91.8	11.58	11.48	-2.77
12,798.0	38.98	174.58	12,747.8	138.7	-573.3	-73.1	13.26	12.84	5.50
12,829.0	41.79	176.35	12,771.4	118.7	-571.7	-53.4	9.79	9.06	5.71
12,861.0	45.75	176.83	12,794.5	96.6	-570.4	-31.5	12.42	12.38	1.50
12,893.0	48.91	178.30	12,816.2	73.1	-569.4	-8.3	10.44	9.88	4.59
12,924.0	54.09	178.80	12,835.5	48.9	-568.8	15.7	16.76	16.71	1.61
12,956.0	57.89	180.08	12,853.4	22.4	-568.5	42.0	12.33	11.88	4.00
12,987.0	61.68	179.49	12,869.0	-4.4	-568.4	68.6	12.34	12.23	-1.90
13,019.0	66.73	179.83	12,882.9	-33.2	-568.3	97.2	15.81	15.78	1.06
13,051.0	71.04	179.66	12,894.4	-63.1	-568.1	126.9	13.48	13.47	-0.53
13,082.0	74.74	178.95	12,903.6	-92.7	-567.8	156.3	12.13	11.94	-2.29
13,113.0	80.21	178.95	12,910.3	-122.9	-567.2	186.2	17.65	17.65	0.00
13,174.0	86.49	178.67	12,917.3	-183.5	-566.0	246.3	10.31	10.30	-0.46
13,269.0	92.67	178.90	12,918.0	-278.4	-564.0	340.4	6.51	6.51	0.24
13,363.0	95.17	179.02	12,911.6	-372.2	-562.3	433.3	2.66	2.66	0.13
13,459.0	93.70	179.24	12,904.2	-467.9	-560.8	528.2	1.55	-1.53	0.23
13,554.0	90.74	178.23	12,900.5	-562.8	-558.7	622.3	3.29	-3.12	-1.06
13,649.0	91.46	180.39	12,898.7	-657.7	-557.6	716.5	2.40	0.76	2.27
13,742.0	88.88	180.35	12,898.4	-750.7	-558.2	809.0	2.77	-2.77	-0.04
13,838.0	90.57	181.35	12,898.9	-846.7	-559.6	904.5	2.05	1.76	1.04
13,932.0	88.42	179.43	12,899.7	-940.7	-560.2	998.0	3.07	-2.29	-2.04
14,026.0	91.00	180.11	12,900.2	-1,034.7	-559.8	1,091.3	2.84	2.74	0.72
14,121.0	91.92	179.46	12,897.8	-1,129.6	-559.5	1,185.6	1.19	0.97	-0.68
14,216.0	92.70	179.85	12,893.9	-1,224.6	-558.9	1,279.9	0.92	0.82	0.41
14,309.0	90.89	179.08	12,891.0	-1,317.5	-558.0	1,372.1	2.11	-1.95	-0.83
14,404.0	90.17	179.19	12,890.1	-1,412.5	-556.6	1,466.3	0.77	-0.76	0.12
14,497.0	90.57	180.08	12,889.5	-1,505.5	-556.0	1,558.7	1.05	0.43	0.96
14,592.0	91.32	180.96	12,888.0	-1,600.5	-556.9	1,653.2	1.22	0.79	0.93
14,686.0	88.04	180.76	12,888.5	-1,694.4	-558.3	1,746.7	3.50	-3.49	-0.21

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well PICKELHAUBE ST #702H
Project:	LEA COUNTY, NM	TVD Reference:	KB=27' @ 3437.0usft (Nabors 893)
Site:	BULLDOG	MD Reference:	KB=27' @ 3437.0usft (Nabors 893)
Well:	PICKELHAUBE ST #702H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	AWP	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)
14,781.0	87.70	181.02	12,892.0	-1,789.4	-559.8	1,841.2	0.45	-0.36	0.27
14,876.0	88.33	180.37	12,895.3	-1,884.3	-560.9	1,935.6	0.95	0.66	-0.68
14,970.0	87.15	179.20	12,899.0	-1,978.2	-560.6	2,028.9	1.77	-1.26	-1.24
15,065.0	88.39	180.20	12,902.7	-2,073.2	-560.1	2,123.2	1.68	1.31	1.05
15,159.0	86.92	178.97	12,906.6	-2,167.1	-559.4	2,216.4	2.04	-1.56	-1.31
15,254.0	85.68	178.96	12,912.7	-2,261.9	-557.7	2,310.4	1.31	-1.31	-0.01
15,348.0	88.70	180.08	12,917.3	-2,355.7	-556.9	2,403.6	3.43	3.21	1.19
15,442.0	92.18	180.91	12,916.6	-2,449.7	-557.7	2,497.0	3.81	3.70	0.88
15,535.0	90.40	179.84	12,914.5	-2,542.7	-558.3	2,589.5	2.23	-1.91	-1.15
15,631.0	91.92	179.68	12,912.5	-2,638.6	-557.9	2,684.8	1.59	1.58	-0.17
15,725.0	90.05	177.66	12,910.9	-2,732.6	-555.7	2,777.9	2.93	-1.99	-2.15
15,820.0	89.19	177.27	12,911.6	-2,827.5	-551.5	2,871.7	0.99	-0.91	-0.41
15,916.0	90.57	173.51	12,911.8	-2,923.2	-543.8	2,965.9	4.17	1.44	-3.92
16,010.0	88.82	170.34	12,912.3	-3,016.2	-530.6	3,056.9	3.85	-1.86	-3.37
16,104.0	89.13	173.53	12,913.9	-3,109.3	-517.4	3,147.8	3.41	0.33	3.39
16,199.0	86.52	179.23	12,917.5	-3,204.0	-511.4	3,241.2	6.59	-2.75	6.00
16,294.0	90.34	180.96	12,920.2	-3,298.9	-511.6	3,335.6	4.41	4.02	1.82
16,387.0	90.63	187.38	12,919.4	-3,391.6	-518.4	3,428.5	6.91	0.31	6.90
16,480.0	90.46	190.78	12,918.5	-3,483.4	-533.0	3,521.3	3.66	-0.18	3.66
16,575.0	89.48	191.64	12,918.5	-3,576.6	-551.5	3,616.0	1.37	-1.03	0.91
16,669.0	90.05	188.88	12,918.9	-3,669.1	-568.2	3,709.8	3.00	0.61	-2.94
16,763.0	90.80	186.17	12,918.2	-3,762.3	-580.5	3,803.8	2.99	0.80	-2.88
16,858.0	86.00	184.31	12,920.9	-3,856.8	-589.2	3,898.7	5.42	-5.05	-1.96
16,953.0	90.34	183.32	12,923.9	-3,951.5	-595.5	3,993.5	4.69	4.57	-1.04
17,047.0	87.67	181.71	12,925.5	-4,045.4	-599.7	4,087.3	3.32	-2.84	-1.71
17,142.0	89.97	178.41	12,927.5	-4,140.4	-599.8	4,181.6	4.23	2.42	-3.47
17,236.0	91.89	177.37	12,926.0	-4,234.3	-596.3	4,274.5	2.32	2.04	-1.11
17,330.0	88.07	175.98	12,926.0	-4,328.1	-590.8	4,367.2	4.32	-4.06	-1.48
17,426.0	91.43	176.27	12,926.4	-4,423.9	-584.4	4,461.6	3.51	3.50	0.30
17,521.0	91.03	175.36	12,924.4	-4,518.6	-577.4	4,554.9	1.05	-0.42	-0.96
17,615.0	88.27	172.73	12,925.0	-4,612.1	-567.7	4,646.7	4.06	-2.94	-2.80
17,711.0	88.70	170.27	12,927.5	-4,707.0	-553.5	4,739.4	2.60	0.45	-2.56
17,806.0	87.61	167.99	12,930.5	-4,800.2	-535.6	4,830.0	2.66	-1.15	-2.40
17,850.0	88.18	166.07	12,932.2	-4,843.1	-525.7	4,871.5	4.55	1.30	-4.36
FINAL MWD SVY @ 17850'MD									
17,859.9	88.18	166.07	12,932.5	-4,852.7	-523.3	4,880.7	0.00	0.00	0.00
LTP @ 17859.9'MD / 12932.5'TVD									
17,911.0	88.18	166.07	12,934.1	-4,902.2	-511.0	4,928.6	0.00	0.00	0.00
PTD @ 17911'MD									

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well PICKELHAUBE ST #702H
Project:	LEA COUNTY, NM	TVD Reference:	KB=27' @ 3437.0usft (Nabors 893)
Site:	BULLDOG	MD Reference:	KB=27' @ 3437.0usft (Nabors 893)
Well:	PICKELHAUBE ST #702H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	AWP	Database:	EDM_Users

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
12,597.9	12,569.6	225.1	-584.4	FTP @ 12597.9'MD / 12569.6'TVD
17,850.0	12,932.2	-4,843.1	-525.7	FINAL MWD SVY @ 17850'MD
17,859.9	12,932.5	-4,852.7	-523.3	LTP @ 17859.9'MD / 12932.5'TVD
17,911.0	12,934.1	-4,902.2	-511.0	PTD @ 17911'MD

Checked By: _____ Approved By: _____ Date: _____