

NORTHERN DELAWARE BASIN

LEA COUNTY, NM

BULLDOG

PICKELHAUBE ST #701H

OWB

Design: AWP

Standard Survey Report

05 December, 2019

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well PICKELHAUBE ST #701H
Project:	LEA COUNTY, NM	TVD Reference:	KB=31' @ 3419.0usft (Precision 106)
Site:	BULLDOG	MD Reference:	KB=31' @ 3419.0usft (Precision 106)
Well:	PICKELHAUBE ST #701H	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 #701H		
Well Position	+N/-S	0.0 usft	Northing: 430,478.10 usft
	+E/-W	0.0 usft	Easting: 781,722.60 usft
Position Uncertainty	3.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 10' 48.805 N
		Longitude:	103° 25' 21.959 W
		Ground Level:	3,388.0 usft

Wellbore	OWB				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	WMM2015	9/9/2019	6.67	59.99	47,680.67548974

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)	Direction (°)	
	0.0	0.0	0.0	184.94	

Survey Program	Date	12/5/2019		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	12,270.0	GYRO-INTER (OWB)	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4
12,362.0	17,817.0	MWD-CURVE/LATERAL (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	0.17	281.93	100.0	0.0	-0.1	0.0	0.17	0.17	0.00
125.0	0.23	283.30	125.0	0.0	-0.2	0.0	0.24	0.24	5.48
150.0	0.24	286.59	150.0	0.1	-0.3	0.0	0.07	0.04	13.16
175.0	0.24	292.31	175.0	0.1	-0.4	-0.1	0.10	0.00	22.88
200.0	0.25	271.35	200.0	0.1	-0.5	-0.1	0.36	0.04	-83.84
225.0	0.31	295.29	225.0	0.2	-0.6	-0.1	0.52	0.24	95.76
250.0	0.40	309.76	250.0	0.2	-0.8	-0.2	0.51	0.36	57.88
275.0	0.51	308.09	275.0	0.4	-0.9	-0.3	0.44	0.44	-6.68
300.0	0.57	309.74	300.0	0.5	-1.1	-0.4	0.25	0.24	6.60

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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	0.61	309.83	325.0	0.7	-1.3	-0.6	0.16	0.16	0.36
350.0	0.70	309.21	350.0	0.9	-1.5	-0.7	0.36	0.36	-2.48
375.0	0.74	301.91	375.0	1.0	-1.8	-0.9	0.40	0.16	-29.20
400.0	0.85	313.93	400.0	1.3	-2.1	-1.1	0.80	0.44	48.08
425.0	0.94	309.60	425.0	1.5	-2.3	-1.3	0.45	0.36	-17.32
450.0	0.90	312.92	450.0	1.8	-2.7	-1.6	0.27	-0.16	13.28
475.0	1.01	306.47	475.0	2.1	-3.0	-1.8	0.61	0.44	-25.80
500.0	1.02	304.05	500.0	2.3	-3.3	-2.0	0.18	0.04	-9.68
525.0	0.90	304.07	525.0	2.5	-3.7	-2.2	0.48	-0.48	0.08
550.0	0.57	286.72	550.0	2.7	-4.0	-2.3	1.58	-1.32	-69.40
575.0	0.27	219.00	575.0	2.7	-4.1	-2.3	2.12	-1.20	-270.88
600.0	0.44	195.70	600.0	2.5	-4.2	-2.2	0.88	0.68	-93.20
625.0	0.56	187.44	625.0	2.3	-4.2	-2.0	0.56	0.48	-33.04
650.0	0.63	183.83	650.0	2.1	-4.2	-1.7	0.32	0.28	-14.44
675.0	0.75	179.51	675.0	1.8	-4.3	-1.4	0.52	0.48	-17.28
700.0	0.78	179.76	700.0	1.4	-4.3	-1.1	0.12	0.12	1.00
725.0	0.78	179.29	725.0	1.1	-4.3	-0.7	0.03	0.00	-1.88
750.0	0.78	180.12	750.0	0.8	-4.2	-0.4	0.05	0.00	3.32
775.0	0.81	181.16	775.0	0.4	-4.3	0.0	0.13	0.12	4.16
800.0	0.92	180.03	800.0	0.0	-4.3	0.3	0.45	0.44	-4.52
825.0	0.99	179.62	824.9	-0.4	-4.3	0.8	0.28	0.28	-1.64
850.0	1.02	178.69	849.9	-0.8	-4.2	1.2	0.14	0.12	-3.72
875.0	1.02	177.56	874.9	-1.3	-4.2	1.6	0.08	0.00	-4.52
900.0	1.03	177.78	899.9	-1.7	-4.2	2.1	0.04	0.04	0.88
925.0	1.11	177.37	924.9	-2.2	-4.2	2.5	0.32	0.32	-1.64
950.0	1.08	174.65	949.9	-2.7	-4.2	3.0	0.24	-0.12	-10.88
975.0	1.09	174.61	974.9	-3.1	-4.1	3.5	0.04	0.04	-0.16
1,000.0	1.09	173.89	999.9	-3.6	-4.1	3.9	0.05	0.00	-2.88
1,025.0	1.08	173.34	1,024.9	-4.1	-4.0	4.4	0.06	-0.04	-2.20
1,050.0	1.15	172.76	1,049.9	-4.6	-4.0	4.9	0.28	0.28	-2.32
1,075.0	1.20	168.32	1,074.9	-5.1	-3.9	5.4	0.42	0.20	-17.76
1,100.0	1.22	163.87	1,099.9	-5.6	-3.7	5.9	0.38	0.08	-17.80
1,125.0	1.32	160.89	1,124.9	-6.1	-3.6	6.4	0.48	0.40	-11.92
1,150.0	1.37	155.97	1,149.9	-6.7	-3.4	6.9	0.50	0.20	-19.68
1,175.0	1.40	156.30	1,174.9	-7.2	-3.1	7.4	0.12	0.12	1.32
1,200.0	1.41	157.35	1,199.9	-7.8	-2.9	8.0	0.11	0.04	4.20
1,225.0	1.43	156.33	1,224.9	-8.3	-2.6	8.5	0.13	0.08	-4.08
1,250.0	1.32	155.08	1,249.9	-8.9	-2.4	9.1	0.46	-0.44	-5.00
1,275.0	1.18	149.74	1,274.9	-9.4	-2.1	9.5	0.73	-0.56	-21.36
1,300.0	1.05	149.55	1,299.8	-9.8	-1.9	9.9	0.52	-0.52	-0.76
1,325.0	0.96	145.21	1,324.8	-10.2	-1.7	10.3	0.47	-0.36	-17.36
1,350.0	0.97	143.15	1,349.8	-10.5	-1.4	10.6	0.14	0.04	-8.24
1,375.0	0.87	140.06	1,374.8	-10.8	-1.2	10.9	0.45	-0.40	-12.36

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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	0.79	136.41	1,399.8	-11.1	-0.9	11.1	0.38	-0.32	-14.60	
1,425.0	0.73	137.23	1,424.8	-11.3	-0.7	11.3	0.24	-0.24	3.28	
1,450.0	0.67	133.91	1,449.8	-11.5	-0.5	11.5	0.29	-0.24	-13.28	
1,475.0	0.59	133.95	1,474.8	-11.7	-0.3	11.7	0.32	-0.32	0.16	
1,500.0	0.51	128.47	1,499.8	-11.9	-0.1	11.9	0.38	-0.32	-21.92	
1,525.0	0.50	135.00	1,524.8	-12.0	0.1	12.0	0.23	-0.04	26.12	
1,550.0	0.49	132.31	1,549.8	-12.2	0.2	12.1	0.10	-0.04	-10.76	
1,575.0	0.48	128.11	1,574.8	-12.3	0.4	12.2	0.15	-0.04	-16.80	
1,600.0	0.46	132.78	1,599.8	-12.5	0.5	12.4	0.17	-0.08	18.68	
1,625.0	0.50	137.01	1,624.8	-12.6	0.7	12.5	0.21	0.16	16.92	
1,650.0	0.47	137.86	1,649.8	-12.8	0.8	12.6	0.12	-0.12	3.40	
1,675.0	0.43	142.18	1,674.8	-12.9	1.0	12.8	0.21	-0.16	17.28	
1,700.0	0.43	143.80	1,699.8	-13.1	1.1	12.9	0.05	0.00	6.48	
1,725.0	0.45	130.78	1,724.8	-13.2	1.2	13.0	0.41	0.08	-52.08	
1,750.0	0.45	134.87	1,749.8	-13.3	1.3	13.2	0.13	0.00	16.36	
1,775.0	0.46	130.05	1,774.8	-13.5	1.5	13.3	0.16	0.04	-19.28	
1,800.0	0.53	136.12	1,799.8	-13.6	1.6	13.4	0.35	0.28	24.28	
1,825.0	0.62	127.99	1,824.8	-13.8	1.8	13.6	0.49	0.36	-32.52	
1,850.0	0.66	128.92	1,849.8	-14.0	2.0	13.7	0.17	0.16	3.72	
1,875.0	0.69	130.69	1,874.8	-14.1	2.3	13.9	0.15	0.12	7.08	
1,900.0	0.71	127.95	1,899.8	-14.3	2.5	14.1	0.16	0.08	-10.96	
1,925.0	0.68	135.02	1,924.8	-14.5	2.7	14.2	0.36	-0.12	28.28	
1,950.0	0.77	126.40	1,949.8	-14.7	3.0	14.4	0.56	0.36	-34.48	
1,975.0	0.74	128.27	1,974.8	-14.9	3.2	14.6	0.16	-0.12	7.48	
2,000.0	0.73	132.75	1,999.8	-15.1	3.5	14.8	0.23	-0.04	17.92	
2,025.0	0.76	129.20	2,024.8	-15.4	3.7	15.0	0.22	0.12	-14.20	
2,050.0	0.71	129.26	2,049.8	-15.6	4.0	15.2	0.20	-0.20	0.24	
2,075.0	0.68	128.18	2,074.8	-15.8	4.2	15.3	0.13	-0.12	-4.32	
2,100.0	0.58	128.80	2,099.8	-15.9	4.4	15.5	0.40	-0.40	2.48	
2,125.0	0.07	89.71	2,124.8	-16.0	4.5	15.6	2.11	-2.04	-156.36	
2,150.0	0.55	318.35	2,149.8	-15.9	4.5	15.5	2.39	1.92	-525.44	
2,175.0	0.71	310.18	2,174.8	-15.7	4.3	15.3	0.73	0.64	-32.68	
2,200.0	0.81	308.89	2,199.8	-15.5	4.0	15.1	0.41	0.40	-5.16	
2,225.0	0.82	307.21	2,224.8	-15.3	3.7	14.9	0.10	0.04	-6.72	
2,250.0	0.82	307.65	2,249.8	-15.1	3.5	14.7	0.03	0.00	1.76	
2,275.0	0.87	308.00	2,274.8	-14.9	3.2	14.5	0.20	0.20	1.40	
2,300.0	0.79	308.22	2,299.8	-14.6	2.9	14.3	0.32	-0.32	0.88	
2,325.0	0.75	308.48	2,324.8	-14.4	2.6	14.1	0.16	-0.16	1.04	
2,350.0	0.81	305.85	2,349.8	-14.2	2.4	14.0	0.28	0.24	-10.52	
2,375.0	0.77	303.64	2,374.8	-14.0	2.1	13.8	0.20	-0.16	-8.84	
2,400.0	0.76	303.85	2,399.8	-13.8	1.8	13.6	0.04	-0.04	0.84	
2,425.0	0.72	300.25	2,424.8	-13.7	1.5	13.5	0.25	-0.16	-14.40	
2,450.0	0.70	301.63	2,449.8	-13.5	1.3	13.3	0.11	-0.08	5.52	

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Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
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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)	
2,475.0	0.68	301.00	2,474.8	-13.3	1.0	13.2	0.09	-0.08	-2.52	
2,500.0	0.64	300.33	2,499.8	-13.2	0.7	13.1	0.16	-0.16	-2.68	
2,525.0	0.57	303.49	2,524.8	-13.1	0.5	13.0	0.31	-0.28	12.64	
2,550.0	0.56	294.94	2,549.8	-12.9	0.3	12.9	0.34	-0.04	-34.20	
2,575.0	0.44	292.17	2,574.8	-12.9	0.1	12.8	0.49	-0.48	-11.08	
2,600.0	0.44	290.48	2,599.8	-12.8	-0.1	12.7	0.05	0.00	-6.76	
2,625.0	0.46	282.32	2,624.8	-12.7	-0.3	12.7	0.27	0.08	-32.64	
2,650.0	0.40	278.36	2,649.8	-12.7	-0.4	12.7	0.27	-0.24	-15.84	
2,675.0	0.40	274.81	2,674.8	-12.7	-0.6	12.7	0.10	0.00	-14.20	
2,700.0	0.42	276.76	2,699.8	-12.7	-0.8	12.7	0.10	0.08	7.80	
2,725.0	0.32	277.90	2,724.8	-12.6	-1.0	12.7	0.40	-0.40	4.56	
2,750.0	0.23	264.62	2,749.8	-12.6	-1.1	12.7	0.44	-0.36	-53.12	
2,775.0	0.18	271.08	2,774.8	-12.6	-1.2	12.7	0.22	-0.20	25.84	
2,800.0	0.11	231.80	2,799.8	-12.6	-1.2	12.7	0.47	-0.28	-157.12	
2,825.0	0.16	225.73	2,824.8	-12.7	-1.3	12.7	0.21	0.20	-24.28	
2,850.0	0.17	225.61	2,849.8	-12.7	-1.3	12.8	0.04	0.04	-0.48	
2,875.0	0.22	193.63	2,874.8	-12.8	-1.4	12.9	0.47	0.20	-127.92	
2,900.0	0.25	187.38	2,899.8	-12.9	-1.4	13.0	0.16	0.12	-25.00	
2,925.0	0.22	197.03	2,924.8	-13.0	-1.4	13.1	0.20	-0.12	38.60	
2,950.0	0.26	188.30	2,949.8	-13.1	-1.4	13.2	0.22	0.16	-34.92	
2,975.0	0.33	180.39	2,974.8	-13.2	-1.4	13.3	0.32	0.28	-31.64	
3,000.0	0.43	173.25	2,999.8	-13.4	-1.4	13.5	0.44	0.40	-28.56	
3,025.0	0.44	167.21	3,024.8	-13.6	-1.4	13.7	0.19	0.04	-24.16	
3,050.0	0.53	169.20	3,049.8	-13.8	-1.3	13.9	0.37	0.36	7.96	
3,075.0	0.62	160.56	3,074.7	-14.0	-1.3	14.1	0.50	0.36	-34.56	
3,100.0	0.78	158.29	3,099.7	-14.3	-1.2	14.4	0.65	0.64	-9.08	
3,125.0	0.95	151.16	3,124.7	-14.7	-1.0	14.7	0.80	0.68	-28.52	
3,150.0	0.99	148.82	3,149.7	-15.0	-0.8	15.0	0.23	0.16	-9.36	
3,175.0	1.02	150.89	3,174.7	-15.4	-0.6	15.4	0.19	0.12	8.28	
3,200.0	1.06	148.41	3,199.7	-15.8	-0.3	15.8	0.24	0.16	-9.92	
3,225.0	1.01	149.66	3,224.7	-16.2	-0.1	16.1	0.22	-0.20	5.00	
3,250.0	0.64	145.40	3,249.7	-16.5	0.1	16.4	1.50	-1.48	-17.04	
3,275.0	0.41	136.64	3,274.7	-16.7	0.2	16.6	0.97	-0.92	-35.04	
3,300.0	0.30	128.92	3,299.7	-16.8	0.3	16.7	0.48	-0.44	-30.88	
3,325.0	0.30	128.82	3,324.7	-16.9	0.4	16.8	0.00	0.00	-0.40	
3,350.0	0.38	120.56	3,349.7	-16.9	0.6	16.8	0.37	0.32	-33.04	
3,375.0	0.54	121.21	3,374.7	-17.1	0.7	16.9	0.64	0.64	2.60	
3,400.0	0.69	122.16	3,399.7	-17.2	1.0	17.0	0.60	0.60	3.80	
3,425.0	0.76	125.59	3,424.7	-17.4	1.2	17.2	0.33	0.28	13.72	
3,450.0	0.77	123.29	3,449.7	-17.6	1.5	17.4	0.13	0.04	-9.20	
3,475.0	0.74	126.18	3,474.7	-17.7	1.8	17.5	0.19	-0.12	11.56	
3,500.0	0.73	128.14	3,499.7	-17.9	2.0	17.7	0.11	-0.04	7.84	
3,525.0	0.51	133.04	3,524.7	-18.1	2.2	17.9	0.90	-0.88	19.60	
3,550.0	0.11	184.75	3,549.7	-18.2	2.3	17.9	1.80	-1.60	206.84	

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well PICKELHAUBE ST #701H
Project:	LEA COUNTY, NM	TVD Reference:	KB=31' @ 3419.0usft (Precision 106)
Site:	BULLDOG	MD Reference:	KB=31' @ 3419.0usft (Precision 106)
Well:	PICKELHAUBE ST #701H	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	0.23	278.29	3,574.7	-18.2	2.3	18.0	1.04	0.48	374.16
3,600.0	0.11	15.97	3,599.7	-18.2	2.2	17.9	1.07	-0.48	390.72
3,625.0	0.41	269.11	3,624.7	-18.2	2.1	17.9	1.82	1.20	-427.44
3,650.0	0.25	275.51	3,649.7	-18.2	2.0	17.9	0.66	-0.64	25.60
3,675.0	0.21	271.52	3,674.7	-18.2	1.9	17.9	0.17	-0.16	-15.96
3,700.0	0.25	252.14	3,699.7	-18.2	1.8	18.0	0.35	0.16	-77.52
3,725.0	0.25	239.89	3,724.7	-18.2	1.7	18.0	0.21	0.00	-49.00
3,750.0	0.31	218.61	3,749.7	-18.3	1.6	18.1	0.48	0.24	-85.12
3,775.0	0.39	213.37	3,774.7	-18.4	1.5	18.2	0.34	0.32	-20.96
3,800.0	0.53	212.90	3,799.7	-18.6	1.4	18.4	0.56	0.56	-1.88
3,825.0	0.59	209.34	3,824.7	-18.8	1.3	18.6	0.28	0.24	-14.24
3,850.0	0.74	202.48	3,849.7	-19.1	1.2	18.9	0.68	0.60	-27.44
3,875.0	0.80	197.89	3,874.7	-19.4	1.0	19.2	0.34	0.24	-18.36
3,900.0	0.78	202.04	3,899.7	-19.7	0.9	19.6	0.24	-0.08	16.60
3,925.0	0.89	215.64	3,924.7	-20.0	0.7	19.9	0.90	0.44	54.40
3,950.0	0.92	220.89	3,949.7	-20.3	0.5	20.2	0.35	0.12	21.00
3,975.0	0.95	222.33	3,974.7	-20.6	0.2	20.5	0.15	0.12	5.76
4,000.0	1.00	216.34	3,999.7	-21.0	0.0	20.9	0.45	0.20	-23.96
4,025.0	1.16	212.12	4,024.7	-21.4	-0.3	21.3	0.71	0.64	-16.88
4,050.0	1.22	206.37	4,049.7	-21.8	-0.6	21.8	0.53	0.24	-23.00
4,075.0	1.28	204.76	4,074.7	-22.3	-0.8	22.3	0.28	0.24	-6.44
4,100.0	1.25	205.65	4,099.7	-22.8	-1.0	22.8	0.14	-0.12	3.56
4,125.0	1.28	205.33	4,124.7	-23.3	-1.3	23.3	0.12	0.12	-1.28
4,150.0	1.29	204.94	4,149.7	-23.8	-1.5	23.8	0.05	0.04	-1.56
4,175.0	1.22	206.17	4,174.6	-24.3	-1.7	24.4	0.30	-0.28	4.92
4,200.0	0.73	231.07	4,199.6	-24.6	-2.0	24.7	2.55	-1.96	99.60
4,225.0	0.54	266.41	4,224.6	-24.7	-2.2	24.8	1.70	-0.76	141.36
4,250.0	0.62	284.83	4,249.6	-24.7	-2.5	24.8	0.81	0.32	73.68
4,275.0	0.76	296.43	4,274.6	-24.6	-2.7	24.8	0.79	0.56	46.40
4,300.0	1.09	306.33	4,299.6	-24.4	-3.1	24.6	1.46	1.32	39.60
4,325.0	1.19	307.59	4,324.6	-24.1	-3.5	24.3	0.41	0.40	5.04
4,350.0	1.17	308.85	4,349.6	-23.8	-3.9	24.0	0.13	-0.08	5.04
4,375.0	1.17	310.36	4,374.6	-23.5	-4.3	23.7	0.12	0.00	6.04
4,400.0	1.26	299.71	4,399.6	-23.2	-4.7	23.5	0.97	0.36	-42.60
4,425.0	1.19	293.08	4,424.6	-22.9	-5.2	23.3	0.63	-0.28	-26.52
4,450.0	1.23	286.72	4,449.6	-22.7	-5.7	23.1	0.56	0.16	-25.44
4,475.0	1.40	275.45	4,474.6	-22.6	-6.3	23.1	1.23	0.68	-45.08
4,500.0	1.48	269.74	4,499.6	-22.6	-6.9	23.1	0.66	0.32	-22.84
4,525.0	1.65	271.39	4,524.6	-22.6	-7.6	23.2	0.70	0.68	6.60
4,550.0	1.69	260.65	4,549.6	-22.6	-8.3	23.3	1.26	0.16	-42.96
4,575.0	1.53	260.46	4,574.6	-22.8	-9.0	23.4	0.64	-0.64	-0.76
4,600.0	1.24	263.79	4,599.6	-22.8	-9.6	23.6	1.20	-1.16	13.32
4,625.0	0.87	260.80	4,624.5	-22.9	-10.0	23.7	1.50	-1.48	-11.96

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well PICKELHAUBE ST #701H
Project:	LEA COUNTY, NM	TVD Reference:	KB=31' @ 3419.0usft (Precision 106)
Site:	BULLDOG	MD Reference:	KB=31' @ 3419.0usft (Precision 106)
Well:	PICKELHAUBE ST #701H	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	0.38	230.77	4,649.5	-23.0	-10.3	23.8	2.29	-1.96	-120.12	
4,675.0	0.41	163.60	4,674.5	-23.1	-10.3	23.9	1.75	0.12	-268.68	
4,700.0	0.65	144.24	4,699.5	-23.3	-10.2	24.1	1.18	0.96	-77.44	
4,725.0	0.85	133.21	4,724.5	-23.6	-10.0	24.3	0.98	0.80	-44.12	
4,750.0	1.21	131.23	4,749.5	-23.9	-9.7	24.6	1.45	1.44	-7.92	
4,775.0	1.74	127.38	4,774.5	-24.3	-9.2	25.0	2.16	2.12	-15.40	
4,800.0	1.99	129.28	4,799.5	-24.8	-8.5	25.4	1.03	1.00	7.60	
4,825.0	1.97	129.84	4,824.5	-25.3	-7.9	25.9	0.11	-0.08	2.24	
4,850.0	1.87	132.25	4,849.5	-25.9	-7.2	26.4	0.51	-0.40	9.64	
4,875.0	1.40	132.40	4,874.5	-26.4	-6.7	26.8	1.88	-1.88	0.60	
4,900.0	0.52	140.92	4,899.5	-26.7	-6.4	27.1	3.56	-3.52	34.08	
4,925.0	0.27	129.61	4,924.5	-26.8	-6.3	27.2	1.04	-1.00	-45.24	
4,950.0	0.13	35.33	4,949.5	-26.8	-6.2	27.2	1.23	-0.56	-377.12	
4,975.0	0.37	2.90	4,974.5	-26.7	-6.2	27.1	1.08	0.96	-129.72	
5,000.0	0.55	0.04	4,999.5	-26.5	-6.2	26.9	0.73	0.72	-11.44	
5,025.0	0.61	3.68	5,024.5	-26.2	-6.2	26.7	0.28	0.24	14.56	
5,050.0	0.76	3.08	5,049.5	-25.9	-6.2	26.4	0.60	0.60	-2.40	
5,075.0	0.95	357.59	5,074.5	-25.6	-6.2	26.0	0.83	0.76	-21.96	
5,100.0	1.01	357.46	5,099.5	-25.1	-6.2	25.6	0.24	0.24	-0.52	
5,125.0	1.10	357.81	5,124.5	-24.7	-6.2	25.1	0.36	0.36	1.40	
5,150.0	1.61	349.37	5,149.5	-24.1	-6.3	24.5	2.19	2.04	-33.76	
5,175.0	1.94	348.83	5,174.4	-23.3	-6.4	23.8	1.32	1.32	-2.16	
5,200.0	1.96	348.30	5,199.4	-22.5	-6.6	23.0	0.11	0.08	-2.12	
5,225.0	1.97	353.45	5,224.4	-21.7	-6.7	22.2	0.71	0.04	20.60	
5,250.0	1.94	1.05	5,249.4	-20.8	-6.8	21.3	1.04	-0.12	30.40	
5,275.0	1.95	1.90	5,274.4	-20.0	-6.8	20.5	0.12	0.04	3.40	
5,300.0	2.14	6.33	5,299.4	-19.1	-6.7	19.6	0.99	0.76	17.72	
5,325.0	2.28	9.19	5,324.3	-18.1	-6.6	18.6	0.71	0.56	11.44	
5,350.0	2.45	10.27	5,349.3	-17.1	-6.4	17.6	0.70	0.68	4.32	
5,375.0	2.45	10.40	5,374.3	-16.0	-6.2	16.5	0.02	0.00	0.52	
5,400.0	2.47	9.52	5,399.3	-15.0	-6.0	15.4	0.17	0.08	-3.52	
5,425.0	2.76	356.33	5,424.3	-13.9	-6.0	14.3	2.66	1.16	-52.76	
5,450.0	3.02	350.06	5,449.2	-12.6	-6.1	13.1	1.64	1.04	-25.08	
5,475.0	3.05	347.89	5,474.2	-11.3	-6.4	11.8	0.47	0.12	-8.68	
5,500.0	3.02	347.03	5,499.2	-10.0	-6.6	10.5	0.22	-0.12	-3.44	
5,525.0	2.82	345.15	5,524.1	-8.8	-7.0	9.3	0.89	-0.80	-7.52	
5,550.0	2.77	343.67	5,549.1	-7.6	-7.3	8.2	0.35	-0.20	-5.92	
5,575.0	2.80	342.99	5,574.1	-6.4	-7.6	7.1	0.18	0.12	-2.72	
5,600.0	2.84	342.35	5,599.0	-5.3	-8.0	5.9	0.20	0.16	-2.56	
5,625.0	2.96	339.33	5,624.0	-4.1	-8.4	4.8	0.78	0.48	-12.08	
5,650.0	3.18	335.14	5,649.0	-2.8	-8.9	3.6	1.26	0.88	-16.76	
5,675.0	3.28	333.38	5,673.9	-1.6	-9.5	2.4	0.56	0.40	-7.04	
5,700.0	3.72	328.95	5,698.9	-0.2	-10.3	1.1	2.06	1.76	-17.72	

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well PICKELHAUBE ST #701H
Project:	LEA COUNTY, NM	TVD Reference:	KB=31' @ 3419.0usft (Precision 106)
Site:	BULLDOG	MD Reference:	KB=31' @ 3419.0usft (Precision 106)
Well:	PICKELHAUBE ST #701H	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	4.33	325.29	5,723.8	1.2	-11.2	-0.3	2.65	2.44	-14.64	
5,750.0	4.88	322.63	5,748.7	2.9	-12.4	-1.8	2.36	2.20	-10.64	
5,775.0	5.00	322.15	5,773.6	4.6	-13.7	-3.4	0.51	0.48	-1.92	
5,800.0	5.03	322.36	5,798.5	6.3	-15.1	-5.0	0.14	0.12	0.84	
5,825.0	5.06	322.19	5,823.4	8.0	-16.4	-6.6	0.13	0.12	-0.68	
5,850.0	5.08	322.01	5,848.4	9.8	-17.8	-8.2	0.10	0.08	-0.72	
5,875.0	5.12	322.03	5,873.3	11.5	-19.1	-9.8	0.16	0.16	0.08	
5,900.0	5.03	321.80	5,898.2	13.3	-20.5	-11.4	0.37	-0.36	-0.92	
5,925.0	5.09	321.39	5,923.1	15.0	-21.9	-13.1	0.28	0.24	-1.64	
5,950.0	5.12	321.14	5,948.0	16.7	-23.3	-14.7	0.15	0.12	-1.00	
5,975.0	5.10	320.77	5,972.9	18.5	-24.7	-16.3	0.15	-0.08	-1.48	
6,000.0	4.92	319.66	5,997.8	20.1	-26.1	-17.8	0.82	-0.72	-4.44	
6,025.0	4.75	318.16	6,022.7	21.7	-27.5	-19.3	0.85	-0.68	-6.00	
6,050.0	4.73	318.33	6,047.6	23.3	-28.8	-20.7	0.10	-0.08	0.68	
6,075.0	4.90	315.77	6,072.5	24.8	-30.3	-22.1	1.10	0.68	-10.24	
6,100.0	5.63	304.64	6,097.4	26.3	-32.0	-23.4	5.01	2.92	-44.52	
6,125.0	5.49	300.46	6,122.3	27.6	-34.1	-24.5	1.71	-0.56	-16.72	
6,150.0	5.87	301.73	6,147.2	28.8	-36.2	-25.6	1.60	1.52	5.08	
6,175.0	5.97	302.78	6,172.0	30.2	-38.4	-26.8	0.59	0.40	4.20	
6,200.0	5.93	301.58	6,196.9	31.6	-40.5	-28.0	0.52	-0.16	-4.80	
6,225.0	5.93	301.74	6,221.8	33.0	-42.7	-29.2	0.07	0.00	0.64	
6,250.0	6.10	302.97	6,246.6	34.4	-45.0	-30.4	0.85	0.68	4.92	
6,275.0	5.98	302.34	6,271.5	35.8	-47.2	-31.6	0.55	-0.48	-2.52	
6,300.0	5.93	302.30	6,296.3	37.2	-49.4	-32.8	0.20	-0.20	-0.16	
6,325.0	5.93	302.13	6,321.2	38.5	-51.5	-34.0	0.07	0.00	-0.68	
6,350.0	5.94	301.21	6,346.1	39.9	-53.7	-35.1	0.38	0.04	-3.68	
6,375.0	6.26	298.84	6,370.9	41.2	-56.0	-36.2	1.63	1.28	-9.48	
6,400.0	5.69	298.70	6,395.8	42.5	-58.3	-37.3	2.28	-2.28	-0.56	
6,425.0	5.72	299.09	6,420.7	43.7	-60.5	-38.3	0.20	0.12	1.56	
6,450.0	5.66	297.87	6,445.5	44.9	-62.7	-39.3	0.54	-0.24	-4.88	
6,475.0	5.71	298.05	6,470.4	46.0	-64.9	-40.3	0.21	0.20	0.72	
6,500.0	5.63	297.93	6,495.3	47.2	-67.1	-41.2	0.32	-0.32	-0.48	
6,525.0	5.53	297.56	6,520.2	48.3	-69.2	-42.2	0.43	-0.40	-1.48	
6,550.0	5.52	297.15	6,545.1	49.4	-71.3	-43.1	0.16	-0.04	-1.64	
6,575.0	5.50	296.60	6,570.0	50.5	-73.5	-44.0	0.23	-0.08	-2.20	
6,600.0	5.50	295.98	6,594.8	51.6	-75.6	-44.9	0.24	0.00	-2.48	
6,625.0	5.34	296.93	6,619.7	52.6	-77.7	-45.7	0.73	-0.64	3.80	
6,650.0	5.28	296.05	6,644.6	53.6	-79.8	-46.6	0.40	-0.24	-3.52	
6,675.0	5.23	296.12	6,669.5	54.7	-81.9	-47.4	0.20	-0.20	0.28	
6,700.0	5.23	296.32	6,694.4	55.7	-83.9	-48.2	0.07	0.00	0.80	
6,725.0	5.11	295.99	6,719.3	56.7	-85.9	-49.0	0.49	-0.48	-1.32	
6,750.0	5.07	295.14	6,744.2	57.6	-87.9	-49.8	0.34	-0.16	-3.40	
6,775.0	5.08	295.38	6,769.1	58.6	-89.9	-50.6	0.09	0.04	0.96	
6,800.0	5.04	293.89	6,794.0	59.5	-91.9	-51.3	0.55	-0.16	-5.96	

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well PICKELHAUBE ST #701H
Project:	LEA COUNTY, NM	TVD Reference:	KB=31' @ 3419.0usft (Precision 106)
Site:	BULLDOG	MD Reference:	KB=31' @ 3419.0usft (Precision 106)
Well:	PICKELHAUBE ST #701H	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	4.98	293.46	6,818.9	60.4	-93.9	-52.0	0.28	-0.24	-1.72
6,850.0	4.99	292.19	6,843.8	61.2	-95.9	-52.7	0.44	0.04	-5.08
6,875.0	4.91	292.26	6,868.7	62.0	-97.9	-53.4	0.32	-0.32	0.28
6,900.0	4.97	292.49	6,893.6	62.8	-99.9	-54.0	0.25	0.24	0.92
6,925.0	4.91	291.72	6,918.5	63.6	-101.9	-54.6	0.36	-0.24	-3.08
6,950.0	4.89	290.61	6,943.5	64.4	-103.9	-55.2	0.39	-0.08	-4.44
6,975.0	4.90	290.45	6,968.4	65.2	-105.9	-55.8	0.07	0.04	-0.64
7,000.0	4.92	290.51	6,993.3	65.9	-107.9	-56.4	0.08	0.08	0.24
7,025.0	5.00	291.68	7,018.2	66.7	-109.9	-57.0	0.52	0.32	4.68
7,050.0	5.13	293.21	7,043.1	67.5	-112.0	-57.6	0.75	0.52	6.12
7,075.0	5.15	293.40	7,068.0	68.4	-114.0	-58.3	0.11	0.08	0.76
7,100.0	5.21	292.24	7,092.9	69.3	-116.1	-59.0	0.48	0.24	-4.64
7,125.0	5.18	292.80	7,117.8	70.2	-118.2	-59.7	0.24	-0.12	2.24
7,150.0	5.26	292.90	7,142.7	71.0	-120.3	-60.4	0.32	0.32	0.40
7,175.0	5.52	290.82	7,167.6	71.9	-122.5	-61.1	1.30	1.04	-8.32
7,200.0	5.18	290.53	7,192.5	72.7	-124.7	-61.7	1.36	-1.36	-1.16
7,225.0	5.23	290.81	7,217.3	73.5	-126.8	-62.4	0.22	0.20	1.12
7,250.0	5.33	290.39	7,242.2	74.3	-128.9	-63.0	0.43	0.40	-1.68
7,275.0	5.28	289.84	7,267.1	75.1	-131.1	-63.6	0.29	-0.20	-2.20
7,300.0	5.30	289.37	7,292.0	75.9	-133.3	-64.2	0.19	0.08	-1.88
7,325.0	5.05	288.06	7,316.9	76.6	-135.4	-64.7	1.11	-1.00	-5.24
7,350.0	4.88	287.07	7,341.8	77.3	-137.5	-65.2	0.76	-0.68	-3.96
7,375.0	4.77	286.42	7,366.7	77.9	-139.5	-65.6	0.49	-0.44	-2.60
7,400.0	4.53	284.60	7,391.7	78.4	-141.4	-66.0	1.13	-0.96	-7.28
7,425.0	4.49	284.13	7,416.6	78.9	-143.3	-66.3	0.22	-0.16	-1.88
7,450.0	4.27	284.34	7,441.5	79.4	-145.2	-66.6	0.88	-0.88	0.84
7,475.0	4.13	284.50	7,466.4	79.9	-147.0	-66.9	0.56	-0.56	0.64
7,500.0	4.04	288.57	7,491.4	80.4	-148.7	-67.3	1.21	-0.36	16.28
7,525.0	4.05	292.39	7,516.3	81.0	-150.3	-67.7	1.08	0.04	15.28
7,550.0	4.17	294.00	7,541.3	81.7	-152.0	-68.3	0.67	0.48	6.44
7,575.0	4.08	294.81	7,566.2	82.4	-153.6	-68.9	0.43	-0.36	3.24
7,600.0	4.00	294.85	7,591.1	83.2	-155.2	-69.5	0.32	-0.32	0.16
7,625.0	3.98	294.37	7,616.1	83.9	-156.8	-70.1	0.16	-0.08	-1.92
7,650.0	4.03	294.46	7,641.0	84.6	-158.4	-70.7	0.20	0.20	0.36
7,675.0	3.97	294.46	7,665.9	85.3	-160.0	-71.3	0.24	-0.24	0.00
7,700.0	3.90	293.32	7,690.9	86.0	-161.5	-71.8	0.42	-0.28	-4.56
7,725.0	3.87	293.59	7,715.8	86.7	-163.1	-72.3	0.14	-0.12	1.08
7,750.0	3.92	292.91	7,740.8	87.4	-164.7	-72.9	0.27	0.20	-2.72
7,775.0	4.00	295.10	7,765.7	88.1	-166.2	-73.4	0.68	0.32	8.76
7,800.0	4.16	300.46	7,790.6	88.9	-167.8	-74.1	1.65	0.64	21.44
7,825.0	4.33	304.23	7,815.6	89.9	-169.4	-75.0	1.31	0.68	15.08
7,850.0	4.37	304.44	7,840.5	91.0	-170.9	-75.9	0.17	0.16	0.84
7,875.0	4.39	303.70	7,865.4	92.0	-172.5	-76.8	0.24	0.08	-2.96

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well PICKELHAUBE ST #701H
Project:	LEA COUNTY, NM	TVD Reference:	KB=31' @ 3419.0usft (Precision 106)
Site:	BULLDOG	MD Reference:	KB=31' @ 3419.0usft (Precision 106)
Well:	PICKELHAUBE ST #701H	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	4.46	303.48	7,890.4	93.1	-174.1	-77.8	0.29	0.28	-0.88
7,925.0	4.35	303.64	7,915.3	94.2	-175.7	-78.7	0.44	-0.44	0.64
7,950.0	4.28	303.62	7,940.2	95.2	-177.3	-79.6	0.28	-0.28	-0.08
7,975.0	4.19	302.42	7,965.1	96.2	-178.8	-80.5	0.51	-0.36	-4.80
8,000.0	4.14	301.62	7,990.1	97.2	-180.4	-81.3	0.31	-0.20	-3.20
8,025.0	4.33	298.74	8,015.0	98.1	-182.0	-82.1	1.14	0.76	-11.52
8,050.0	4.02	299.46	8,039.9	99.0	-183.6	-82.8	1.26	-1.24	2.88
8,075.0	4.09	299.97	8,064.9	99.9	-185.1	-83.6	0.31	0.28	2.04
8,100.0	4.05	299.12	8,089.8	100.7	-186.6	-84.3	0.29	-0.16	-3.40
8,125.0	3.95	298.97	8,114.8	101.6	-188.2	-85.0	0.40	-0.40	-0.60
8,150.0	3.80	296.50	8,139.7	102.4	-189.7	-85.7	0.90	-0.60	-9.88
8,175.0	3.51	296.90	8,164.7	103.1	-191.1	-86.3	1.16	-1.16	1.60
8,200.0	3.27	295.36	8,189.6	103.7	-192.4	-86.8	1.03	-0.96	-6.16
8,225.0	3.22	296.98	8,214.6	104.4	-193.7	-87.3	0.42	-0.20	6.48
8,250.0	3.24	303.15	8,239.5	105.1	-194.9	-87.9	1.39	0.08	24.68
8,275.0	3.30	312.18	8,264.5	105.9	-196.0	-88.7	2.07	0.24	36.12
8,300.0	3.33	315.00	8,289.4	106.9	-197.1	-89.6	0.66	0.12	11.28
8,325.0	3.22	316.20	8,314.4	108.0	-198.1	-90.5	0.52	-0.44	4.80
8,350.0	3.00	314.80	8,339.4	108.9	-199.0	-91.4	0.93	-0.88	-5.60
8,375.0	2.92	314.45	8,364.3	109.8	-199.9	-92.2	0.33	-0.32	-1.40
8,400.0	2.81	314.24	8,389.3	110.7	-200.8	-93.0	0.44	-0.44	-0.84
8,425.0	2.65	312.91	8,414.3	111.5	-201.7	-93.8	0.69	-0.64	-5.32
8,450.0	2.37	311.78	8,439.3	112.3	-202.5	-94.4	1.14	-1.12	-4.52
8,475.0	2.51	314.13	8,464.2	113.0	-203.3	-95.1	0.69	0.56	9.40
8,500.0	2.39	312.60	8,489.2	113.7	-204.1	-95.7	0.55	-0.48	-6.12
8,525.0	2.36	312.93	8,514.2	114.4	-204.8	-96.4	0.13	-0.12	1.32
8,550.0	2.35	314.53	8,539.2	115.1	-205.6	-97.0	0.27	-0.04	6.40
8,575.0	2.19	313.61	8,564.1	115.8	-206.3	-97.6	0.66	-0.64	-3.68
8,600.0	2.12	313.35	8,589.1	116.5	-206.9	-98.2	0.28	-0.28	-1.04
8,625.0	2.13	310.70	8,614.1	117.1	-207.6	-98.8	0.40	0.04	-10.60
8,650.0	2.30	308.15	8,639.1	117.7	-208.4	-99.3	0.79	0.68	-10.20
8,675.0	3.18	308.29	8,664.1	118.4	-209.3	-100.0	3.52	3.52	0.56
8,700.0	3.45	307.36	8,689.0	119.3	-210.5	-100.8	1.10	1.08	-3.72
8,725.0	3.63	307.57	8,714.0	120.3	-211.7	-101.6	0.72	0.72	0.84
8,750.0	3.95	308.96	8,738.9	121.3	-213.0	-102.5	1.33	1.28	5.56
8,775.0	4.66	312.61	8,763.8	122.5	-214.4	-103.6	3.04	2.84	14.60
8,800.0	4.73	312.15	8,788.8	123.9	-215.9	-104.9	0.32	0.28	-1.84
8,825.0	4.76	313.25	8,813.7	125.3	-217.4	-106.1	0.38	0.12	4.40
8,850.0	4.64	312.52	8,838.6	126.7	-218.9	-107.4	0.54	-0.48	-2.92
8,875.0	4.35	311.79	8,863.5	128.0	-220.4	-108.6	1.18	-1.16	-2.92
8,900.0	4.33	312.82	8,888.4	129.3	-221.8	-109.7	0.32	-0.08	4.12
8,925.0	3.86	311.12	8,913.4	130.5	-223.1	-110.8	1.94	-1.88	-6.80
8,950.0	3.68	311.85	8,938.3	131.6	-224.3	-111.8	0.75	-0.72	2.92

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well PICKELHAUBE ST #701H
Project:	LEA COUNTY, NM	TVD Reference:	KB=31' @ 3419.0usft (Precision 106)
Site:	BULLDOG	MD Reference:	KB=31' @ 3419.0usft (Precision 106)
Well:	PICKELHAUBE ST #701H	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	3.50	311.60	8,963.3	132.6	-225.5	-112.7	0.72	-0.72	-1.00	
9,000.0	3.34	311.52	8,988.2	133.6	-226.6	-113.6	0.64	-0.64	-0.32	
9,025.0	3.11	312.49	9,013.2	134.5	-227.7	-114.4	0.95	-0.92	3.88	
9,050.0	3.00	311.51	9,038.2	135.4	-228.7	-115.3	0.49	-0.44	-3.92	
9,075.0	2.93	311.61	9,063.1	136.3	-229.6	-116.0	0.28	-0.28	0.40	
9,100.0	2.89	311.60	9,088.1	137.1	-230.6	-116.8	0.16	-0.16	-0.04	
9,125.0	3.02	310.53	9,113.1	138.0	-231.6	-117.5	0.56	0.52	-4.28	
9,150.0	3.72	308.22	9,138.0	138.9	-232.7	-118.4	2.85	2.80	-9.24	
9,175.0	3.70	306.99	9,163.0	139.9	-234.0	-119.2	0.33	-0.08	-4.92	
9,200.0	3.69	307.19	9,187.9	140.9	-235.3	-120.1	0.07	-0.04	0.80	
9,225.0	3.72	306.37	9,212.9	141.8	-236.5	-121.0	0.24	0.12	-3.28	
9,250.0	3.51	305.26	9,237.8	142.8	-237.8	-121.8	0.89	-0.84	-4.44	
9,275.0	3.31	305.50	9,262.8	143.6	-239.0	-122.5	0.80	-0.80	0.96	
9,300.0	3.11	305.35	9,287.7	144.4	-240.2	-123.2	0.80	-0.80	-0.60	
9,325.0	2.93	305.94	9,312.7	145.2	-241.3	-123.9	0.73	-0.72	2.36	
9,350.0	2.84	305.16	9,337.7	145.9	-242.3	-124.5	0.39	-0.36	-3.12	
9,375.0	2.80	305.74	9,362.6	146.6	-243.3	-125.2	0.20	-0.16	2.32	
9,400.0	3.01	306.58	9,387.6	147.4	-244.3	-125.8	0.86	0.84	3.36	
9,425.0	3.41	310.70	9,412.6	148.3	-245.4	-126.6	1.85	1.60	16.48	
9,450.0	3.52	311.35	9,437.5	149.3	-246.5	-127.5	0.47	0.44	2.60	
9,475.0	3.42	312.16	9,462.5	150.3	-247.7	-128.4	0.45	-0.40	3.24	
9,500.0	2.90	313.34	9,487.4	151.2	-248.7	-129.2	2.10	-2.08	4.72	
9,525.0	2.53	315.81	9,512.4	152.0	-249.5	-130.0	1.55	-1.48	9.88	
9,550.0	2.34	316.51	9,537.4	152.8	-250.3	-130.7	0.77	-0.76	2.80	
9,575.0	2.31	317.14	9,562.4	153.5	-250.9	-131.4	0.16	-0.12	2.52	
9,600.0	2.25	317.98	9,587.3	154.3	-251.6	-132.0	0.27	-0.24	3.36	
9,625.0	2.28	319.15	9,612.3	155.0	-252.3	-132.7	0.22	0.12	4.68	
9,650.0	2.28	319.27	9,637.3	155.8	-252.9	-133.4	0.02	0.00	0.48	
9,675.0	2.17	316.04	9,662.3	156.5	-253.6	-134.1	0.67	-0.44	-12.92	
9,700.0	2.13	302.90	9,687.3	157.1	-254.3	-134.6	1.97	-0.16	-52.56	
9,725.0	2.23	291.72	9,712.2	157.5	-255.1	-135.0	1.74	0.40	-44.72	
9,750.0	2.29	291.75	9,737.2	157.9	-256.0	-135.3	0.24	0.24	0.12	
9,775.0	2.45	295.25	9,762.2	158.3	-257.0	-135.6	0.86	0.64	14.00	
9,800.0	2.86	301.97	9,787.2	158.8	-258.0	-136.0	2.06	1.64	26.88	
9,825.0	3.42	307.57	9,812.1	159.6	-259.1	-136.7	2.55	2.24	22.40	
9,850.0	3.39	307.16	9,837.1	160.5	-260.3	-137.5	0.15	-0.12	-1.64	
9,875.0	3.47	306.23	9,862.0	161.4	-261.5	-138.3	0.39	0.32	-3.72	
9,900.0	3.75	305.20	9,887.0	162.3	-262.8	-139.1	1.15	1.12	-4.12	
9,925.0	3.79	305.26	9,911.9	163.3	-264.1	-140.0	0.16	0.16	0.24	
9,950.0	3.80	305.62	9,936.9	164.2	-265.5	-140.8	0.10	0.04	1.44	
9,975.0	3.73	304.69	9,961.8	165.2	-266.8	-141.6	0.37	-0.28	-3.72	
10,000.0	3.84	303.54	9,986.8	166.1	-268.2	-142.4	0.53	0.44	-4.60	
10,025.0	3.74	302.79	10,011.7	167.0	-269.6	-143.2	0.45	-0.40	-3.00	
10,050.0	3.66	302.78	10,036.7	167.9	-270.9	-144.0	0.32	-0.32	-0.04	

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well PICKELHAUBE ST #701H
Project:	LEA COUNTY, NM	TVD Reference:	KB=31' @ 3419.0usft (Precision 106)
Site:	BULLDOG	MD Reference:	KB=31' @ 3419.0usft (Precision 106)
Well:	PICKELHAUBE ST #701H	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	3.57	302.47	10,061.6	168.7	-272.3	-144.7	0.37	-0.36	-1.24
10,100.0	3.44	302.20	10,086.6	169.6	-273.5	-145.4	0.52	-0.52	-1.08
10,125.0	3.22	301.31	10,111.5	170.3	-274.8	-146.0	0.90	-0.88	-3.56
10,150.0	3.03	300.96	10,136.5	171.0	-275.9	-146.7	0.76	-0.76	-1.40
10,175.0	2.94	300.26	10,161.5	171.7	-277.1	-147.2	0.39	-0.36	-2.80
10,200.0	2.87	298.45	10,186.4	172.3	-278.2	-147.7	0.46	-0.28	-7.24
10,225.0	2.75	298.20	10,211.4	172.9	-279.2	-148.2	0.48	-0.48	-1.00
10,250.0	2.82	297.49	10,236.4	173.5	-280.3	-148.7	0.31	0.28	-2.84
10,275.0	2.93	297.65	10,261.3	174.0	-281.4	-149.2	0.44	0.44	0.64
10,300.0	3.04	298.59	10,286.3	174.7	-282.6	-149.7	0.48	0.44	3.76
10,325.0	3.09	297.23	10,311.3	175.3	-283.8	-150.2	0.35	0.20	-5.44
10,350.0	2.91	294.03	10,336.2	175.9	-284.9	-150.7	0.98	-0.72	-12.80
10,375.0	2.71	287.83	10,361.2	176.3	-286.1	-151.0	1.45	-0.80	-24.80
10,400.0	2.59	285.03	10,386.2	176.6	-287.2	-151.2	0.71	-0.48	-11.20
10,425.0	2.51	280.71	10,411.2	176.9	-288.3	-151.4	0.83	-0.32	-17.28
10,450.0	2.43	279.77	10,436.1	177.1	-289.3	-151.5	0.36	-0.32	-3.76
10,475.0	2.44	278.51	10,461.1	177.2	-290.4	-151.6	0.22	0.04	-5.04
10,500.0	2.53	278.64	10,486.1	177.4	-291.5	-151.6	0.36	0.36	0.52
10,525.0	2.51	279.83	10,511.1	177.6	-292.5	-151.7	0.22	-0.08	4.76
10,550.0	2.60	281.63	10,536.0	177.8	-293.6	-151.8	0.48	0.36	7.20
10,575.0	2.69	284.65	10,561.0	178.0	-294.8	-152.0	0.66	0.36	12.08
10,600.0	2.72	285.24	10,586.0	178.3	-295.9	-152.2	0.16	0.12	2.36
10,625.0	2.71	286.96	10,611.0	178.7	-297.0	-152.4	0.33	-0.04	6.88
10,650.0	2.76	287.40	10,635.9	179.0	-298.2	-152.7	0.22	0.20	1.76
10,675.0	2.76	286.83	10,660.9	179.4	-299.3	-153.0	0.11	0.00	-2.28
10,700.0	2.76	287.36	10,685.9	179.7	-300.5	-153.2	0.10	0.00	2.12
10,725.0	2.78	287.29	10,710.8	180.1	-301.6	-153.5	0.08	0.08	-0.28
10,750.0	2.70	288.28	10,735.8	180.5	-302.8	-153.7	0.37	-0.32	3.96
10,775.0	2.85	286.40	10,760.8	180.8	-303.9	-154.0	0.70	0.60	-7.52
10,800.0	2.68	285.81	10,785.8	181.1	-305.1	-154.2	0.69	-0.68	-2.36
10,825.0	2.64	286.47	10,810.7	181.5	-306.2	-154.4	0.20	-0.16	2.64
10,850.0	2.34	280.97	10,835.7	181.7	-307.3	-154.6	1.53	-1.20	-22.00
10,875.0	2.28	277.04	10,860.7	181.9	-308.2	-154.7	0.68	-0.24	-15.72
10,900.0	2.36	275.26	10,885.7	182.0	-309.3	-154.7	0.43	0.32	-7.12
10,925.0	2.58	280.87	10,910.6	182.2	-310.3	-154.8	1.31	0.88	22.44
10,950.0	3.13	287.63	10,935.6	182.5	-311.5	-155.0	2.58	2.20	27.04
10,975.0	3.25	289.58	10,960.6	182.9	-312.8	-155.3	0.65	0.48	7.80
11,000.0	3.47	289.38	10,985.5	183.4	-314.2	-155.7	0.88	0.88	-0.80
11,025.0	4.41	289.19	11,010.5	184.0	-315.8	-156.1	3.76	3.76	-0.76
11,050.0	5.39	289.40	11,035.4	184.7	-317.9	-156.6	3.92	3.92	0.84
11,075.0	5.53	289.60	11,060.3	185.5	-320.1	-157.2	0.57	0.56	0.80
11,100.0	5.43	288.19	11,085.1	186.2	-322.4	-157.8	0.67	-0.40	-5.64
11,125.0	5.09	285.96	11,110.0	186.9	-324.5	-158.3	1.59	-1.36	-8.92

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well PICKELHAUBE ST #701H
Project:	LEA COUNTY, NM	TVD Reference:	KB=31' @ 3419.0usft (Precision 106)
Site:	BULLDOG	MD Reference:	KB=31' @ 3419.0usft (Precision 106)
Well:	PICKELHAUBE ST #701H	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	4.69	281.40	11,135.0	187.4	-326.6	-158.6	2.23	-1.60	-18.24
11,175.0	4.23	278.68	11,159.9	187.8	-328.5	-158.8	2.02	-1.84	-10.88
11,200.0	4.48	281.92	11,184.8	188.1	-330.4	-159.0	1.40	1.00	12.96
11,225.0	5.02	288.92	11,209.7	188.7	-332.4	-159.4	3.17	2.16	28.00
11,250.0	5.35	291.38	11,234.6	189.4	-334.5	-159.9	1.59	1.32	9.84
11,275.0	5.51	293.00	11,259.5	190.3	-336.7	-160.6	0.89	0.64	6.48
11,300.0	5.99	298.36	11,284.4	191.4	-338.9	-161.5	2.88	1.92	21.44
11,325.0	6.21	301.47	11,309.2	192.7	-341.2	-162.7	1.59	0.88	12.44
11,350.0	6.40	301.98	11,334.1	194.2	-343.6	-163.9	0.79	0.76	2.04
11,375.0	6.10	300.85	11,358.9	195.6	-345.9	-165.1	1.30	-1.20	-4.52
11,400.0	5.65	298.99	11,383.8	196.9	-348.1	-166.2	1.95	-1.80	-7.44
11,425.0	4.92	294.52	11,408.7	197.9	-350.2	-167.1	3.35	-2.92	-17.88
11,450.0	4.33	289.52	11,433.6	198.7	-352.0	-167.7	2.86	-2.36	-20.00
11,475.0	3.91	283.49	11,458.6	199.2	-353.8	-168.0	2.41	-1.68	-24.12
11,500.0	3.49	274.68	11,483.5	199.5	-355.3	-168.1	2.82	-1.68	-35.24
11,525.0	3.29	266.39	11,508.5	199.5	-356.8	-168.0	2.12	-0.80	-33.16
11,550.0	3.31	264.11	11,533.4	199.4	-358.3	-167.8	0.53	0.08	-9.12
11,575.0	3.70	271.25	11,558.4	199.3	-359.8	-167.6	2.34	1.56	28.56
11,600.0	4.54	283.94	11,583.3	199.6	-361.5	-167.7	4.94	3.36	50.76
11,625.0	5.05	288.90	11,608.2	200.2	-363.5	-168.1	2.63	2.04	19.84
11,650.0	5.01	291.79	11,633.1	200.9	-365.6	-168.7	1.03	-0.16	11.56
11,675.0	4.83	293.63	11,658.0	201.7	-367.6	-169.4	0.96	-0.72	7.36
11,700.0	4.90	294.48	11,682.9	202.6	-369.5	-170.1	0.40	0.28	3.40
11,725.0	5.09	295.49	11,707.8	203.5	-371.5	-170.8	0.84	0.76	4.04
11,750.0	5.05	295.40	11,732.7	204.5	-373.5	-171.6	0.16	-0.16	-0.36
11,775.0	4.96	291.18	11,757.6	205.3	-375.5	-172.3	1.52	-0.36	-16.88
11,800.0	4.97	285.66	11,782.6	206.0	-377.5	-172.8	1.91	0.04	-22.08
11,825.0	4.65	283.35	11,807.5	206.5	-379.6	-173.1	1.50	-1.28	-9.24
11,850.0	4.73	282.29	11,832.4	207.0	-381.6	-173.4	0.47	0.32	-4.24
11,875.0	4.72	284.67	11,857.3	207.5	-383.6	-173.7	0.79	-0.04	9.52
11,900.0	4.60	288.32	11,882.2	208.1	-385.5	-174.1	1.28	-0.48	14.60
11,925.0	4.47	290.85	11,907.1	208.7	-387.4	-174.6	0.95	-0.52	10.12
11,950.0	4.38	290.55	11,932.1	209.4	-389.2	-175.1	0.37	-0.36	-1.20
11,975.0	4.25	291.74	11,957.0	210.1	-390.9	-175.7	0.63	-0.52	4.76
12,000.0	4.07	292.73	11,981.9	210.8	-392.6	-176.2	0.78	-0.72	3.96
12,025.0	3.96	293.78	12,006.9	211.5	-394.2	-176.7	0.53	-0.44	4.20
12,050.0	3.89	292.68	12,031.8	212.1	-395.8	-177.3	0.41	-0.28	-4.40
12,075.0	3.78	291.58	12,056.8	212.8	-397.3	-177.8	0.53	-0.44	-4.40
12,100.0	3.85	289.48	12,081.7	213.3	-398.9	-178.2	0.63	0.28	-8.40
12,125.0	3.78	287.17	12,106.6	213.9	-400.5	-178.6	0.68	-0.28	-9.24
12,150.0	3.66	285.56	12,131.6	214.3	-402.0	-178.9	0.64	-0.48	-6.44
12,175.0	3.68	282.64	12,156.5	214.7	-403.6	-179.2	0.75	0.08	-11.68
12,200.0	3.63	280.48	12,181.5	215.0	-405.1	-179.4	0.59	-0.20	-8.64

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well PICKELHAUBE ST #701H
Project:	LEA COUNTY, NM	TVD Reference:	KB=31' @ 3419.0usft (Precision 106)
Site:	BULLDOG	MD Reference:	KB=31' @ 3419.0usft (Precision 106)
Well:	PICKELHAUBE ST #701H	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)
12,225.0	3.70	279.84	12,206.4	215.3	-406.7	-179.5	0.32	0.28	-2.56
12,250.0	3.60	277.43	12,231.4	215.6	-408.3	-179.6	0.73	-0.40	-9.64
12,270.0	3.51	275.51	12,251.3	215.7	-409.5	-179.7	0.75	-0.45	-9.60
12,362.0	3.20	273.34	12,343.2	216.1	-414.9	-179.6	0.36	-0.34	-2.36
12,393.0	3.47	233.87	12,374.1	215.6	-416.5	-179.0	7.31	0.87	-127.32
12,426.0	6.54	201.88	12,407.0	213.3	-418.0	-176.5	12.24	9.30	-96.94
12,458.0	9.75	199.23	12,438.7	209.0	-419.6	-172.1	10.10	10.03	-8.28
12,489.0	13.28	197.34	12,469.1	203.1	-421.5	-166.1	11.45	11.39	-6.10
12,520.0	18.50	196.33	12,498.9	195.0	-424.0	-157.8	16.86	16.84	-3.26
12,552.0	23.76	195.42	12,528.7	183.9	-427.1	-146.5	16.47	16.44	-2.84
12,583.0	28.81	188.02	12,556.5	170.5	-429.8	-132.9	19.39	16.29	-23.87
12,614.0	30.63	184.94	12,583.4	155.2	-431.5	-117.5	7.66	5.87	-9.94
12,646.0	30.72	186.07	12,610.9	139.0	-433.1	-101.2	1.82	0.28	3.53
12,677.0	31.80	185.51	12,637.4	123.0	-434.7	-85.1	3.61	3.48	-1.81
12,708.0	32.93	184.72	12,663.6	106.5	-436.2	-68.5	3.89	3.65	-2.55
12,739.0	34.52	184.62	12,689.4	89.3	-437.6	-51.3	5.13	5.13	-0.32
12,771.0	39.41	181.11	12,715.0	70.1	-438.5	-32.1	16.64	15.28	-10.97
12,803.0	42.75	180.01	12,739.1	49.1	-438.7	-11.1	10.68	10.44	-3.44
12,834.0	44.99	178.84	12,761.4	27.6	-438.5	10.3	7.68	7.23	-3.77
12,865.0	48.26	180.00	12,782.7	5.1	-438.3	32.7	10.89	10.55	3.74
12,897.0	51.30	180.01	12,803.4	-19.4	-438.3	57.0	9.50	9.50	0.03
12,928.0	55.08	179.68	12,822.0	-44.2	-438.2	81.7	12.22	12.19	-1.06
12,959.0	60.90	178.57	12,838.4	-70.5	-437.8	107.9	19.02	18.77	-3.58
12,990.0	65.75	178.00	12,852.3	-98.1	-437.0	135.4	15.73	15.65	-1.84
13,021.0	70.13	177.48	12,863.9	-126.8	-435.8	163.9	14.21	14.13	-1.68
13,052.0	71.40	177.82	12,874.1	-156.1	-434.6	192.9	4.23	4.10	1.10
13,084.0	73.72	178.10	12,883.7	-186.6	-433.6	223.2	7.30	7.25	0.88
13,115.0	74.82	178.53	12,892.1	-216.4	-432.7	252.8	3.79	3.55	1.39
13,146.0	77.85	178.33	12,899.5	-246.5	-431.8	282.8	9.79	9.77	-0.65
13,177.0	81.69	179.39	12,905.0	-277.0	-431.2	313.1	12.84	12.39	3.42
13,209.0	86.49	180.90	12,908.3	-308.8	-431.3	344.8	15.72	15.00	4.72
13,240.0	92.70	181.69	12,908.5	-339.8	-432.0	375.7	20.19	20.03	2.55
13,303.0	93.43	180.43	12,905.1	-402.7	-433.2	438.5	2.31	1.16	-2.00
13,398.0	90.33	176.98	12,902.0	-497.6	-431.0	532.9	4.88	-3.26	-3.63
13,492.0	89.67	170.86	12,902.0	-591.0	-421.1	625.1	6.55	-0.70	-6.51
13,586.0	88.18	170.79	12,903.8	-683.8	-406.1	716.2	1.59	-1.59	-0.07
13,680.0	86.53	176.83	12,908.1	-777.1	-396.0	808.3	6.65	-1.76	6.43
13,775.0	88.86	186.27	12,911.9	-871.9	-398.6	903.0	10.23	2.45	9.94
13,869.0	88.98	181.86	12,913.7	-965.6	-405.2	996.9	4.69	0.13	-4.69
13,964.0	89.88	180.28	12,914.6	-1,060.6	-407.0	1,091.7	1.91	0.95	-1.66
14,058.0	91.27	178.73	12,913.7	-1,154.6	-406.2	1,185.3	2.21	1.48	-1.65
14,151.0	92.51	179.33	12,910.6	-1,247.5	-404.6	1,277.7	1.48	1.33	0.65
14,245.0	90.70	176.94	12,908.0	-1,341.4	-401.5	1,371.0	3.19	-1.93	-2.54
14,276.0	89.85	176.54	12,907.9	-1,372.4	-399.8	1,401.7	3.03	-2.74	-1.29

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well PICKELHAUBE ST #701H
Project:	LEA COUNTY, NM	TVD Reference:	KB=31' @ 3419.0usft (Precision 106)
Site:	BULLDOG	MD Reference:	KB=31' @ 3419.0usft (Precision 106)
Well:	PICKELHAUBE ST #701H	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)
14,371.0	88.10	182.26	12,909.6	-1,467.3	-398.8	1,496.2	6.30	-1.84	6.02
14,466.0	85.80	182.34	12,914.6	-1,562.1	-402.6	1,590.9	2.42	-2.42	0.08
14,561.0	88.66	181.90	12,919.2	-1,656.9	-406.1	1,685.7	3.05	3.01	-0.46
14,655.0	89.89	183.39	12,920.4	-1,750.8	-410.4	1,779.6	2.06	1.31	1.59
14,750.0	90.69	183.96	12,919.9	-1,845.6	-416.5	1,874.6	1.03	0.84	0.60
14,845.0	91.88	183.87	12,917.8	-1,940.3	-423.0	1,969.5	1.26	1.25	-0.09
14,939.0	89.93	183.16	12,916.3	-2,034.1	-428.8	2,063.5	2.21	-2.07	-0.76
15,033.0	87.88	181.65	12,918.1	-2,128.0	-432.7	2,157.4	2.71	-2.18	-1.61
15,128.0	87.65	181.19	12,921.8	-2,222.9	-435.1	2,252.1	0.54	-0.24	-0.48
15,222.0	87.49	180.88	12,925.8	-2,316.8	-436.8	2,345.8	0.37	-0.17	-0.33
15,317.0	87.86	182.06	12,929.6	-2,411.7	-439.2	2,440.6	1.30	0.39	1.24
15,411.0	88.23	183.16	12,932.8	-2,505.6	-443.5	2,534.4	1.23	0.39	1.17
15,506.0	87.97	181.56	12,936.0	-2,600.4	-447.4	2,629.3	1.71	-0.27	-1.68
15,601.0	87.85	180.58	12,939.5	-2,695.4	-449.2	2,724.0	1.04	-0.13	-1.03
15,695.0	87.58	180.41	12,943.2	-2,789.3	-450.0	2,817.7	0.34	-0.29	-0.18
15,789.0	86.44	178.04	12,948.1	-2,883.1	-448.7	2,911.1	2.79	-1.21	-2.52
15,884.0	87.39	177.61	12,953.2	-2,977.9	-445.1	3,005.2	1.10	1.00	-0.45
15,978.0	89.67	177.94	12,955.6	-3,071.8	-441.5	3,098.4	2.45	2.43	0.35
16,072.0	90.18	178.43	12,955.8	-3,165.8	-438.5	3,191.8	0.75	0.54	0.52
16,165.0	88.12	178.18	12,957.1	-3,258.7	-435.7	3,284.1	2.23	-2.22	-0.27
16,259.0	90.59	178.37	12,958.2	-3,352.7	-432.9	3,377.5	2.64	2.63	0.20
16,353.0	91.38	178.94	12,956.6	-3,446.6	-430.7	3,470.9	1.04	0.84	0.61
16,448.0	91.92	178.95	12,953.8	-3,541.6	-428.9	3,565.3	0.57	0.57	0.01
16,542.0	89.73	179.58	12,952.5	-3,635.5	-427.7	3,658.9	2.42	-2.33	0.67
16,635.0	90.47	180.85	12,952.3	-3,728.5	-428.1	3,751.5	1.58	0.80	1.37
16,730.0	89.92	181.05	12,952.0	-3,823.5	-429.7	3,846.3	0.62	-0.58	0.21
16,825.0	89.42	180.57	12,952.5	-3,918.5	-431.0	3,941.1	0.73	-0.53	-0.51
16,919.0	88.54	179.40	12,954.2	-4,012.5	-431.0	4,034.7	1.56	-0.94	-1.24
17,013.0	90.13	183.10	12,955.3	-4,106.4	-433.0	4,128.5	4.28	1.69	3.94
17,108.0	90.81	182.50	12,954.5	-4,201.3	-437.7	4,223.4	0.95	0.72	-0.63
17,201.0	84.98	178.38	12,957.9	-4,294.2	-438.4	4,316.0	7.67	-6.27	-4.43
17,295.0	85.59	177.43	12,965.7	-4,387.8	-435.0	4,409.0	1.20	0.65	-1.01
17,389.0	90.03	177.27	12,969.3	-4,481.6	-430.6	4,502.1	4.73	4.72	-0.17
17,484.0	88.25	176.75	12,970.7	-4,576.5	-425.7	4,596.1	1.95	-1.87	-0.55
17,578.0	92.83	177.56	12,969.8	-4,670.3	-421.0	4,689.2	4.95	4.87	0.86
17,672.0	94.51	177.59	12,963.8	-4,764.1	-417.0	4,782.3	1.79	1.79	0.03
17,747.0	90.99	176.66	12,960.2	-4,838.9	-413.3	4,856.5	4.85	-4.69	-1.24
Final MWD Svy @ 17747'MD									
17,766.7	90.99	176.66	12,959.9	-4,858.5	-412.1	4,876.0	0.00	0.00	0.00
LTP @ 17766.7'MD / 12959.9'TVD									
17,817.0	90.99	176.66	12,959.0	-4,908.7	-409.2	4,925.7	0.00	0.00	0.00
PTD @ 17817'MD									

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well PICKELHAUBE ST #701H
Project:	LEA COUNTY, NM	TVD Reference:	KB=31' @ 3419.0usft (Precision 106)
Site:	BULLDOG	MD Reference:	KB=31' @ 3419.0usft (Precision 106)
Well:	PICKELHAUBE ST #701H	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)	
17,747.0	12,960.2	-4,838.9	-413.3	Final MWD Svy @ 17747'MD
17,766.7	12,959.9	-4,858.5	-412.1	LTP @ 17766.7'MD / 12959.9'TVD
17,817.0	12,959.0	-4,908.7	-409.2	PTD @ 17817'MD

Checked By: _____ Approved By: _____ Date: _____