

HOBBS OCD
JAN 06 2020
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NORTHERN DELAWARE BASIN

LEA COUNTY, NM

BULLDOG

BONAIID FED COM #14H

OWB

Design: AWP

Standard Survey Report

26 August, 2019

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well BONAID FED COM #14H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3376.7+25 @ 3401.7usft (Pioneer 84)
Site:	BULLDOG	MD Reference:	RKB=3376.7+25 @ 3401.7usft (Pioneer 84)
Well:	BONAID FED COM #14H	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	BONAID FED COM #14H		
Well Position	+N/-S	0.0 usft	Northing: 446,509.70 usft
	+E/-W	0.0 usft	Easting: 790,481.60 usft
Position Uncertainty	3.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 13' 26.694 N
		Longitude:	103° 23' 38.423 W
		Ground Level:	3,376.7 usft

Wellbore	OWB				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	WMM2015	2/22/2018	6.82	60.07	47,873.41255020

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	176.45	

Survey Program	Date 8/26/2019			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	8,448.0	GYROS (OWB)	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4
8,448.0	19,346.0	MWD-CURVE/LATERAL (OWB)	MWD+IFR1+MS	OWSG MWD + IFR1 + Multi-Station 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	0.37	24.46	100.0	0.3	0.1	-0.3	0.37	0.37	0.00
125.0	0.51	49.64	125.0	0.4	0.3	-0.4	0.94	0.56	100.72
150.0	0.51	40.76	150.0	0.6	0.4	-0.6	0.32	0.00	-35.52
175.0	0.55	59.88	175.0	0.7	0.6	-0.7	0.72	0.16	76.48
200.0	0.51	38.61	200.0	0.9	0.8	-0.8	0.80	-0.16	-85.08
225.0	0.46	45.35	225.0	1.0	0.9	-1.0	0.30	-0.20	26.96
250.0	0.46	44.40	250.0	1.2	1.0	-1.1	0.03	0.00	-3.80
275.0	0.45	43.21	275.0	1.3	1.2	-1.3	0.06	-0.04	-4.76
300.0	0.47	43.42	300.0	1.5	1.3	-1.4	0.08	0.08	0.84

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Well:	BONAID FED COM #14H	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)
325.0	0.46	31.83	325.0	1.6	1.4	-1.5	0.38	-0.04	-46.36
350.0	0.45	43.42	350.0	1.8	1.6	-1.7	0.37	-0.04	46.36
375.0	0.42	45.22	375.0	1.9	1.7	-1.8	0.13	-0.12	7.20
400.0	0.51	53.92	400.0	2.1	1.8	-1.9	0.46	0.36	34.80
425.0	0.38	44.55	425.0	2.2	2.0	-2.1	0.59	-0.52	-37.48
450.0	0.35	47.64	450.0	2.3	2.1	-2.2	0.14	-0.12	12.36
475.0	0.39	56.58	475.0	2.4	2.2	-2.2	0.28	0.16	35.76
500.0	0.40	55.07	500.0	2.5	2.4	-2.3	0.06	0.04	-6.04
525.0	0.39	49.85	525.0	2.6	2.5	-2.4	0.15	-0.04	-20.88
550.0	0.38	63.30	550.0	2.7	2.7	-2.5	0.36	-0.04	53.80
575.0	0.38	44.57	575.0	2.8	2.8	-2.6	0.49	0.00	-74.92
600.0	0.38	52.37	600.0	2.9	2.9	-2.7	0.21	0.00	31.20
625.0	0.41	58.94	625.0	3.0	3.1	-2.8	0.22	0.12	26.28
650.0	0.39	55.67	650.0	3.1	3.2	-2.9	0.12	-0.08	-13.08
675.0	0.45	58.07	675.0	3.2	3.4	-3.0	0.25	0.24	9.60
700.0	0.48	57.99	700.0	3.3	3.5	-3.1	0.12	0.12	-0.32
725.0	0.48	59.03	725.0	3.4	3.7	-3.2	0.03	0.00	4.16
750.0	0.53	54.35	750.0	3.5	3.9	-3.3	0.26	0.20	-18.72
775.0	0.61	53.24	775.0	3.7	4.1	-3.4	0.32	0.32	-4.44
800.0	0.63	52.51	800.0	3.8	4.3	-3.6	0.09	0.08	-2.92
825.0	0.66	56.21	825.0	4.0	4.5	-3.7	0.21	0.12	14.80
850.0	0.67	53.95	850.0	4.2	4.8	-3.9	0.11	0.04	-9.04
875.0	0.63	60.91	875.0	4.3	5.0	-4.0	0.35	-0.16	27.84
900.0	0.66	56.32	900.0	4.5	5.3	-4.1	0.24	0.12	-18.36
925.0	0.63	53.06	925.0	4.6	5.5	-4.3	0.19	-0.12	-13.04
950.0	0.64	53.50	950.0	4.8	5.7	-4.4	0.04	0.04	1.76
975.0	0.61	56.80	975.0	4.9	5.9	-4.6	0.19	-0.12	13.20
1,000.0	0.62	65.31	1,000.0	5.1	6.2	-4.7	0.37	0.04	34.04
1,025.0	0.52	39.00	1,025.0	5.2	6.4	-4.8	1.11	-0.40	-105.24
1,050.0	0.49	45.06	1,050.0	5.4	6.5	-5.0	0.24	-0.12	24.24
1,075.0	0.49	43.30	1,075.0	5.5	6.7	-5.1	0.06	0.00	-7.04
1,100.0	0.53	39.96	1,100.0	5.7	6.8	-5.3	0.20	0.16	-13.36
1,125.0	0.52	40.08	1,125.0	5.9	6.9	-5.4	0.04	-0.04	0.48
1,150.0	0.49	53.20	1,150.0	6.0	7.1	-5.6	0.48	-0.12	52.48
1,175.0	0.50	48.99	1,175.0	6.2	7.3	-5.7	0.15	0.04	-16.84
1,200.0	0.51	39.24	1,200.0	6.3	7.4	-5.8	0.35	0.04	-39.00
1,225.0	0.51	52.06	1,225.0	6.5	7.6	-6.0	0.46	0.00	51.28
1,250.0	0.52	57.08	1,250.0	6.6	7.8	-6.1	0.18	0.04	20.08
1,275.0	0.49	50.94	1,275.0	6.7	7.9	-6.2	0.25	-0.12	-24.56
1,300.0	0.49	44.76	1,300.0	6.9	8.1	-6.4	0.21	0.00	-24.72
1,325.0	0.48	49.46	1,325.0	7.0	8.3	-6.5	0.16	-0.04	18.80
1,350.0	0.49	44.61	1,350.0	7.2	8.4	-6.6	0.17	0.04	-19.40
1,375.0	0.49	45.80	1,375.0	7.3	8.6	-6.8	0.04	0.00	4.76

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Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	AWP	Database:	EDM_Users

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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	0.52	46.64	1,399.9	7.5	8.7	-6.9	0.12	0.12	3.36
1,425.0	0.51	46.84	1,424.9	7.6	8.9	-7.1	0.04	-0.04	0.80
1,450.0	0.54	56.88	1,449.9	7.8	9.1	-7.2	0.39	0.12	40.16
1,475.0	0.67	50.00	1,474.9	7.9	9.3	-7.3	0.59	0.52	-27.52
1,500.0	0.75	46.72	1,499.9	8.1	9.5	-7.5	0.36	0.32	-13.12
1,525.0	0.73	51.43	1,524.9	8.3	9.8	-7.7	0.26	-0.08	18.84
1,550.0	0.80	46.33	1,549.9	8.6	10.0	-7.9	0.39	0.28	-20.40
1,575.0	0.78	46.99	1,574.9	8.8	10.3	-8.1	0.09	-0.08	2.64
1,600.0	0.83	43.93	1,599.9	9.0	10.5	-8.4	0.26	0.20	-12.24
1,625.0	0.84	46.04	1,624.9	9.3	10.8	-8.6	0.13	0.04	8.44
1,650.0	0.85	48.55	1,649.9	9.6	11.0	-8.8	0.15	0.04	10.04
1,675.0	0.90	41.76	1,674.9	9.8	11.3	-9.1	0.46	0.20	-27.16
1,700.0	0.96	46.58	1,699.9	10.1	11.6	-9.4	0.39	0.24	19.28
1,725.0	0.98	47.80	1,724.9	10.4	11.9	-9.6	0.11	0.08	4.88
1,750.0	1.03	45.50	1,749.9	10.7	12.2	-9.9	0.26	0.20	-9.20
1,775.0	1.11	45.43	1,774.9	11.0	12.5	-10.2	0.32	0.32	-0.28
1,800.0	1.02	41.86	1,799.9	11.4	12.9	-10.5	0.45	-0.36	-14.28
1,825.0	1.11	42.09	1,824.9	11.7	13.2	-10.9	0.36	0.36	0.92
1,850.0	1.13	32.96	1,849.9	12.1	13.5	-11.2	0.72	0.08	-36.52
1,875.0	1.13	36.01	1,874.9	12.5	13.8	-11.6	0.24	0.00	12.20
1,900.0	1.20	38.36	1,899.9	12.9	14.1	-12.0	0.34	0.28	9.40
1,925.0	1.18	33.80	1,924.9	13.3	14.4	-12.4	0.39	-0.08	-18.24
1,950.0	1.22	35.28	1,949.9	13.8	14.7	-12.8	0.20	0.16	5.92
1,975.0	1.21	32.18	1,974.9	14.2	15.0	-13.2	0.27	-0.04	-12.40
2,000.0	1.28	35.21	1,999.9	14.6	15.3	-13.7	0.38	0.28	12.12
2,025.0	1.48	34.86	2,024.9	15.1	15.6	-14.1	0.80	0.80	-1.40
2,050.0	1.54	34.09	2,049.8	15.7	16.0	-14.7	0.25	0.24	-3.08
2,075.0	1.53	35.91	2,074.8	16.2	16.4	-15.2	0.20	-0.04	7.28
2,100.0	1.51	33.83	2,099.8	16.8	16.7	-15.7	0.23	-0.08	-8.32
2,125.0	1.53	37.53	2,124.8	17.3	17.1	-16.2	0.40	0.08	14.80
2,150.0	1.65	33.78	2,149.8	17.9	17.5	-16.8	0.64	0.48	-15.00
2,175.0	1.61	35.61	2,174.8	18.5	17.9	-17.3	0.26	-0.16	7.32
2,200.0	1.67	34.85	2,199.8	19.0	18.3	-17.9	0.26	0.24	-3.04
2,225.0	1.58	34.71	2,224.8	19.6	18.8	-18.4	0.36	-0.36	-0.56
2,250.0	1.72	32.76	2,249.8	20.2	19.2	-19.0	0.60	0.56	-7.80
2,275.0	1.65	37.46	2,274.8	20.8	19.6	-19.6	0.62	-0.28	18.80
2,300.0	1.64	40.48	2,299.8	21.4	20.0	-20.1	0.35	-0.04	12.08
2,325.0	1.59	37.55	2,324.7	21.9	20.5	-20.6	0.39	-0.20	-11.72
2,350.0	1.68	36.60	2,349.7	22.5	20.9	-21.2	0.38	0.36	-3.80
2,375.0	1.77	33.46	2,374.7	23.1	21.3	-21.8	0.52	0.36	-12.56
2,400.0	1.83	37.85	2,399.7	23.8	21.8	-22.4	0.60	0.24	17.56
2,425.0	1.95	39.83	2,424.7	24.4	22.3	-23.0	0.55	0.48	7.92
2,450.0	1.99	41.30	2,449.7	25.1	22.9	-23.6	0.26	0.16	5.88

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Well:	BONAID FED COM #14H	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)
2,475.0	2.07	40.25	2,474.7	25.7	23.4	-24.2	0.35	0.32	-4.20
2,500.0	2.18	39.67	2,499.6	26.4	24.0	-24.9	0.45	0.44	-2.32
2,525.0	2.25	44.98	2,524.6	27.1	24.7	-25.6	0.87	0.28	21.24
2,550.0	2.21	44.53	2,549.6	27.8	25.4	-26.2	0.17	-0.16	-1.80
2,575.0	2.25	47.27	2,574.6	28.5	26.1	-26.8	0.46	0.16	10.96
2,600.0	2.21	47.50	2,599.6	29.2	26.8	-27.5	0.16	-0.16	0.92
2,625.0	1.95	49.46	2,624.6	29.8	27.5	-28.0	1.08	-1.04	7.84
2,650.0	1.68	59.90	2,649.5	30.2	28.1	-28.4	1.70	-1.08	41.76
2,675.0	1.55	70.44	2,674.5	30.5	28.7	-28.7	1.29	-0.52	42.16
2,700.0	1.34	81.18	2,699.5	30.7	29.3	-28.8	1.37	-0.84	42.96
2,725.0	1.24	94.02	2,724.5	30.7	29.9	-28.8	1.22	-0.40	51.36
2,750.0	1.10	101.14	2,749.5	30.7	30.4	-28.7	0.81	-0.56	28.48
2,775.0	0.95	116.73	2,774.5	30.5	30.8	-28.5	1.26	-0.60	62.36
2,800.0	1.16	154.10	2,799.5	30.2	31.1	-28.2	2.82	0.84	149.48
2,825.0	1.59	174.95	2,824.5	29.6	31.3	-27.6	2.61	1.72	83.40
2,850.0	1.97	180.40	2,849.5	28.8	31.3	-26.8	1.66	1.52	21.80
2,875.0	2.20	178.56	2,874.5	27.9	31.3	-25.9	0.96	0.92	-7.36
2,900.0	2.21	177.77	2,899.5	27.0	31.3	-25.0	0.13	0.04	-3.16
2,925.0	2.05	183.05	2,924.4	26.0	31.3	-24.1	1.01	-0.64	21.12
2,950.0	2.06	181.73	2,949.4	25.1	31.3	-23.2	0.19	0.04	-5.28
2,975.0	1.87	179.13	2,974.4	24.3	31.3	-22.3	0.84	-0.76	-10.40
3,000.0	1.81	176.47	2,999.4	23.5	31.3	-21.5	0.42	-0.24	-10.64
3,025.0	1.84	174.85	3,024.4	22.7	31.4	-20.7	0.24	0.12	-6.48
3,050.0	1.81	176.89	3,049.4	21.9	31.4	-19.9	0.29	-0.12	8.16
3,075.0	1.86	176.97	3,074.4	21.1	31.5	-19.1	0.20	0.20	0.32
3,100.0	1.99	171.36	3,099.3	20.3	31.6	-18.3	0.92	0.52	-22.44
3,125.0	1.79	170.76	3,124.3	19.5	31.7	-17.4	0.80	-0.80	-2.40
3,150.0	1.83	165.87	3,149.3	18.7	31.9	-16.7	0.64	0.16	-19.56
3,175.0	1.90	160.40	3,174.3	17.9	32.1	-15.9	0.76	0.28	-21.88
3,200.0	1.89	153.32	3,199.3	17.1	32.4	-15.1	0.94	-0.04	-28.32
3,225.0	1.91	151.05	3,224.3	16.4	32.8	-14.3	0.31	0.08	-9.08
3,250.0	1.88	148.99	3,249.3	15.7	33.2	-13.6	0.30	-0.12	-8.24
3,275.0	1.82	149.55	3,274.2	15.0	33.6	-12.9	0.25	-0.24	2.24
3,300.0	1.90	149.31	3,299.2	14.3	34.0	-12.2	0.32	0.32	-0.96
3,325.0	1.93	147.57	3,324.2	13.6	34.5	-11.4	0.26	0.12	-6.96
3,350.0	1.88	143.22	3,349.2	12.9	34.9	-10.7	0.61	-0.20	-17.40
3,375.0	1.97	141.74	3,374.2	12.2	35.5	-10.0	0.41	0.36	-5.92
3,400.0	2.08	141.45	3,399.2	11.5	36.0	-9.3	0.44	0.44	-1.16
3,425.0	2.12	138.28	3,424.2	10.8	36.6	-8.6	0.49	0.16	-12.68
3,450.0	1.95	141.04	3,449.1	10.2	37.2	-7.8	0.78	-0.68	11.04
3,475.0	1.87	130.34	3,474.1	9.6	37.8	-7.2	1.46	-0.32	-42.80
3,500.0	1.43	119.50	3,499.1	9.2	38.3	-6.8	2.15	-1.76	-43.36
3,525.0	1.20	98.93	3,524.1	9.0	38.9	-6.5	2.08	-0.92	-82.28
3,550.0	1.12	78.22	3,549.1	9.0	39.4	-6.5	1.70	-0.32	-82.84

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well BONAID FED COM #14H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3376.7+25 @ 3401.7usft (Pioneer 84)
Site:	BULLDOG	MD Reference:	RKB=3376.7+25 @ 3401.7usft (Pioneer 84)
Well:	BONAID FED COM #14H	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	1.16	66.46	3,574.1	9.1	39.8	-6.6	0.95	0.16	-47.04
3,600.0	1.34	64.82	3,599.1	9.4	40.3	-6.8	0.73	0.72	-6.56
3,625.0	1.15	69.11	3,624.1	9.6	40.8	-7.0	0.85	-0.76	17.16
3,650.0	1.13	70.22	3,649.1	9.7	41.3	-7.2	0.12	-0.08	4.44
3,675.0	1.18	67.43	3,674.1	9.9	41.8	-7.3	0.30	0.20	-11.16
3,700.0	1.22	62.91	3,699.1	10.1	42.2	-7.5	0.41	0.16	-18.08
3,725.0	1.09	65.44	3,724.1	10.4	42.7	-7.7	0.56	-0.52	10.12
3,750.0	1.13	64.33	3,749.1	10.6	43.1	-7.9	0.18	0.16	-4.44
3,775.0	1.10	62.40	3,774.1	10.8	43.6	-8.1	0.19	-0.12	-7.72
3,800.0	1.06	66.34	3,799.1	11.0	44.0	-8.2	0.34	-0.16	15.76
3,825.0	1.03	62.69	3,824.0	11.2	44.4	-8.4	0.29	-0.12	-14.60
3,850.0	1.00	65.20	3,849.0	11.4	44.8	-8.6	0.21	-0.12	10.04
3,875.0	0.97	64.75	3,874.0	11.6	45.2	-8.7	0.12	-0.12	-1.80
3,900.0	0.94	67.40	3,899.0	11.7	45.6	-8.9	0.21	-0.12	10.60
3,925.0	0.88	68.58	3,924.0	11.9	45.9	-9.0	0.25	-0.24	4.72
3,950.0	0.86	73.84	3,949.0	12.0	46.3	-9.1	0.33	-0.08	21.04
3,975.0	0.83	77.34	3,974.0	12.1	46.7	-9.2	0.24	-0.12	14.00
4,000.0	0.88	84.32	3,999.0	12.2	47.0	-9.2	0.46	0.20	27.92
4,025.0	0.84	91.43	4,024.0	12.2	47.4	-9.2	0.46	-0.16	28.44
4,050.0	1.25	104.51	4,049.0	12.1	47.8	-9.1	1.89	1.64	52.32
4,075.0	1.47	99.27	4,074.0	12.0	48.4	-8.9	1.01	0.88	-20.96
4,100.0	1.39	95.61	4,099.0	11.9	49.0	-8.8	0.49	-0.32	-14.64
4,125.0	1.33	97.29	4,124.0	11.8	49.6	-8.7	0.29	-0.24	6.72
4,150.0	1.32	95.35	4,149.0	11.8	50.2	-8.6	0.18	-0.04	-7.76
4,175.0	1.19	85.35	4,174.0	11.8	50.8	-8.6	1.02	-0.52	-40.00
4,200.0	1.07	74.07	4,199.0	11.8	51.2	-8.6	1.01	-0.48	-45.12
4,225.0	1.15	74.27	4,224.0	12.0	51.7	-8.7	0.32	0.32	0.80
4,250.0	1.23	73.75	4,249.0	12.1	52.2	-8.9	0.32	0.32	-2.08
4,275.0	1.35	69.93	4,274.0	12.3	52.7	-9.0	0.59	0.48	-15.28
4,300.0	1.55	68.94	4,299.0	12.5	53.3	-9.2	0.81	0.80	-3.96
4,325.0	1.66	74.58	4,323.9	12.7	54.0	-9.4	0.77	0.44	22.56
4,350.0	1.98	73.53	4,348.9	13.0	54.8	-9.5	1.29	1.28	-4.20
4,375.0	2.16	73.78	4,373.9	13.2	55.6	-9.7	0.72	0.72	1.00
4,400.0	2.54	72.44	4,398.9	13.5	56.6	-10.0	1.54	1.52	-5.36
4,425.0	2.81	76.84	4,423.9	13.8	57.7	-10.2	1.36	1.08	17.60
4,450.0	2.97	77.31	4,448.8	14.1	59.0	-10.4	0.65	0.64	1.88
4,475.0	3.12	78.16	4,473.8	14.4	60.3	-10.6	0.63	0.60	3.40
4,500.0	3.15	80.10	4,498.8	14.6	61.6	-10.8	0.44	0.12	7.76
4,525.0	2.87	83.10	4,523.7	14.8	62.9	-10.9	1.28	-1.12	12.00
4,550.0	2.51	87.69	4,548.7	14.9	64.1	-10.9	1.68	-1.44	18.36
4,575.0	1.96	99.77	4,573.7	14.9	65.0	-10.8	2.89	-2.20	48.32
4,600.0	1.49	113.55	4,598.7	14.7	65.7	-10.6	2.49	-1.88	55.12
4,625.0	1.45	124.72	4,623.7	14.4	66.3	-10.2	1.16	-0.16	44.68

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well BONAID FED COM #14H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3376.7+25 @ 3401.7usft (Pioneer 84)
Site:	BULLDOG	MD Reference:	RKB=3376.7+25 @ 3401.7usft (Pioneer 84)
Well:	BONAID FED COM #14H	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)	Bulld Rate (°/100usft)	Turn Rate (°/100usft)
4,650.0	1.44	126.50	4,648.7	14.0	66.8	-9.8	0.18	-0.04	7.12
4,675.0	1.36	128.67	4,673.6	13.6	67.3	-9.4	0.38	-0.32	8.68
4,700.0	1.19	136.07	4,698.6	13.2	67.7	-9.0	0.95	-0.68	29.60
4,725.0	1.24	145.76	4,723.6	12.8	68.0	-8.6	0.84	0.20	38.76
4,750.0	1.15	167.46	4,748.6	12.4	68.3	-8.1	1.83	-0.36	86.80
4,775.0	1.18	177.72	4,773.6	11.9	68.3	-7.6	0.84	0.12	41.04
4,800.0	1.25	185.03	4,798.6	11.3	68.3	-7.1	0.68	0.28	29.24
4,825.0	1.36	191.92	4,823.6	10.8	68.2	-6.5	0.77	0.44	27.56
4,850.0	1.37	198.47	4,848.6	10.2	68.1	-6.0	0.63	0.04	26.20
4,875.0	1.54	204.71	4,873.6	9.6	67.8	-5.4	0.93	0.68	24.96
4,900.0	1.72	201.42	4,898.6	9.0	67.6	-4.8	0.81	0.72	-13.16
4,925.0	1.65	205.03	4,923.6	8.3	67.3	-4.1	0.51	-0.28	14.44
4,950.0	1.69	207.30	4,948.6	7.6	66.9	-3.5	0.31	0.16	9.08
4,975.0	1.83	205.73	4,973.6	6.9	66.6	-2.8	0.59	0.56	-6.28
5,000.0	1.51	208.58	4,998.5	6.3	66.3	-2.2	1.32	-1.28	11.40
5,025.0	1.57	210.97	5,023.5	5.7	65.9	-1.6	0.35	0.24	9.56
5,050.0	1.52	210.77	5,048.5	5.1	65.6	-1.1	0.20	-0.20	-0.80
5,075.0	1.66	212.09	5,073.5	4.5	65.2	-0.5	0.58	0.56	5.28
5,100.0	1.59	210.26	5,098.5	3.9	64.9	0.1	0.35	-0.28	-7.32
5,125.0	1.59	216.75	5,123.5	3.4	64.5	0.6	0.72	0.00	25.96
5,150.0	1.47	213.97	5,148.5	2.8	64.1	1.2	0.56	-0.48	-11.12
5,175.0	1.65	218.18	5,173.5	2.3	63.7	1.7	0.85	0.72	16.84
5,200.0	1.63	217.08	5,198.5	1.7	63.3	2.2	0.15	-0.08	-4.40
5,225.0	1.60	217.07	5,223.5	1.1	62.8	2.8	0.12	-0.12	-0.04
5,250.0	1.65	216.74	5,248.4	0.6	62.4	3.3	0.20	0.20	-1.32
5,275.0	1.63	220.52	5,273.4	0.0	62.0	3.8	0.44	-0.08	15.12
5,300.0	1.59	220.70	5,298.4	-0.5	61.5	4.3	0.16	-0.16	0.72
5,325.0	1.78	224.66	5,323.4	-1.1	61.0	4.8	0.89	0.76	15.84
5,350.0	1.73	219.76	5,348.4	-1.6	60.5	5.4	0.63	-0.20	-19.60
5,375.0	1.68	221.24	5,373.4	-2.2	60.0	5.9	0.27	-0.20	5.92
5,400.0	1.13	203.34	5,398.4	-2.7	59.7	6.4	2.79	-2.20	-71.60
5,425.0	1.04	187.89	5,423.4	-3.1	59.5	6.8	1.22	-0.36	-61.80
5,450.0	0.95	181.47	5,448.4	-3.6	59.5	7.3	0.57	-0.36	-25.68
5,475.0	0.60	156.68	5,473.4	-3.9	59.5	7.6	1.91	-1.40	-99.16
5,500.0	0.52	101.41	5,498.4	-4.0	59.7	7.7	2.10	-0.32	-221.08
5,525.0	0.75	81.22	5,523.4	-4.0	60.0	7.8	1.27	0.92	-80.76
5,550.0	0.85	71.60	5,548.4	-4.0	60.3	7.7	0.67	0.40	-38.48
5,575.0	0.96	60.72	5,573.4	-3.8	60.7	7.6	0.81	0.44	-43.52
5,600.0	1.74	45.52	5,598.4	-3.4	61.1	7.2	3.41	3.12	-60.80
5,625.0	2.02	43.14	5,623.3	-2.8	61.7	6.7	1.16	1.12	-9.52
5,650.0	1.89	42.15	5,648.3	-2.2	62.3	6.1	0.54	-0.52	-3.96
5,675.0	2.33	42.84	5,673.3	-1.5	62.9	5.4	1.76	1.76	2.76
5,700.0	3.03	46.62	5,698.3	-0.7	63.7	4.7	2.89	2.80	15.12

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well BONAID FED COM #14H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3376.7+25 @ 3401.7usft (Pioneer 84)
Site:	BULLDOG	MD Reference:	RKB=3376.7+25 @ 3401.7usft (Pioneer 84)
Well:	BONAID FED COM #14H	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	3.26	47.05	5,723.3	0.2	64.7	3.8	0.92	0.92	1.72
5,750.0	3.41	48.31	5,748.2	1.2	65.8	2.9	0.67	0.60	5.04
5,775.0	3.82	47.94	5,773.2	2.3	67.0	1.9	1.64	1.64	-1.48
5,800.0	4.34	46.44	5,798.1	3.5	68.3	0.8	2.12	2.08	-6.00
5,825.0	4.78	47.55	5,823.0	4.8	69.7	-0.5	1.79	1.76	4.44
5,850.0	4.72	47.11	5,847.9	6.2	71.3	-1.8	0.28	-0.24	-1.76
5,875.0	5.27	45.47	5,872.8	7.7	72.8	-3.2	2.27	2.20	-6.56
5,900.0	5.78	45.05	5,897.7	9.4	74.5	-4.8	2.05	2.04	-1.68
5,925.0	6.24	45.11	5,922.6	11.3	76.4	-6.5	1.84	1.84	0.24
5,950.0	6.22	45.13	5,947.4	13.2	78.3	-8.3	0.08	-0.08	0.08
5,975.0	6.20	44.84	5,972.3	15.1	80.2	-10.1	0.15	-0.08	-1.16
6,000.0	6.30	44.45	5,997.1	17.0	82.1	-11.9	0.43	0.40	-1.56
6,025.0	6.36	45.31	6,022.0	19.0	84.1	-13.7	0.45	0.24	3.44
6,050.0	6.22	45.46	6,046.8	20.9	86.0	-15.5	0.56	-0.56	0.60
6,075.0	5.99	43.94	6,071.7	22.8	87.9	-17.3	1.12	-0.92	-6.08
6,100.0	5.75	42.64	6,096.6	24.7	89.7	-19.1	1.10	-0.96	-5.20
6,125.0	5.76	42.70	6,121.4	26.5	91.4	-20.8	0.05	0.04	0.24
6,150.0	5.61	40.76	6,146.3	28.4	93.0	-22.5	0.98	-0.60	-7.76
6,175.0	5.62	39.29	6,171.2	30.2	94.6	-24.3	0.58	0.04	-5.88
6,200.0	5.47	38.72	6,196.1	32.1	96.1	-26.1	0.64	-0.60	-2.28
6,225.0	5.37	36.16	6,221.0	34.0	97.5	-27.9	1.05	-0.40	-10.24
6,250.0	5.46	36.89	6,245.9	35.9	98.9	-29.7	0.45	0.36	2.92
6,275.0	5.69	36.11	6,270.7	37.8	100.4	-31.5	0.97	0.92	-3.12
6,300.0	5.66	36.33	6,295.6	39.8	101.8	-33.4	0.15	-0.12	0.88
6,325.0	5.67	36.23	6,320.5	41.8	103.3	-35.3	0.06	0.04	-0.40
6,350.0	6.19	37.84	6,345.4	43.9	104.9	-37.3	2.18	2.08	6.44
6,375.0	6.58	39.28	6,370.2	46.0	106.6	-39.3	1.69	1.56	5.76
6,400.0	6.96	41.61	6,395.0	48.3	108.5	-41.5	1.88	1.52	9.32
6,425.0	7.02	42.17	6,419.8	50.5	110.5	-43.6	0.36	0.24	2.24
6,450.0	7.44	45.89	6,444.6	52.8	112.7	-45.7	2.51	1.68	14.88
6,475.0	7.64	48.15	6,469.4	55.0	115.1	-47.8	1.43	0.80	9.04
6,500.0	8.07	49.59	6,494.2	57.3	117.7	-49.9	1.89	1.72	5.76
6,525.0	7.95	49.98	6,518.9	59.5	120.4	-52.0	0.53	-0.48	1.56
6,550.0	7.73	50.61	6,543.7	61.7	123.0	-54.0	0.94	-0.88	2.52
6,575.0	7.81	51.01	6,568.5	63.9	125.6	-55.9	0.39	0.32	1.60
6,600.0	8.05	50.40	6,593.2	66.0	128.3	-58.0	1.02	0.96	-2.44
6,625.0	8.06	50.93	6,618.0	68.3	131.0	-60.0	0.30	0.04	2.12
6,650.0	7.86	51.13	6,642.8	70.4	133.7	-62.0	0.81	-0.80	0.80
6,675.0	7.16	53.57	6,667.5	72.4	136.3	-63.8	3.08	-2.80	9.76
6,700.0	7.03	54.36	6,692.4	74.2	138.8	-65.5	0.65	-0.52	3.16
6,725.0	6.90	54.58	6,717.2	76.0	141.2	-67.1	0.53	-0.52	0.88
6,750.0	7.19	53.75	6,742.0	77.8	143.7	-68.7	1.23	1.16	-3.32
6,775.0	7.24	53.68	6,766.8	79.7	146.2	-70.4	0.20	0.20	-0.28
6,800.0	7.09	53.93	6,791.6	81.5	148.8	-72.1	0.61	-0.60	1.00

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well BONAID FED COM #14H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3376.7+25 @ 3401.7usft (Pioneer 84)
Site:	BULLDOG	MD Reference:	RKB=3376.7+25 @ 3401.7usft (Pioneer 84)
Well:	BONAID FED COM #14H	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	7.11	51.15	6,816.4	83.4	151.2	-73.9	1.38	0.08	-11.12
6,850.0	7.13	49.64	6,841.2	85.4	153.6	-75.7	0.75	0.08	-6.04
6,875.0	7.11	48.55	6,866.0	87.4	155.9	-77.6	0.55	-0.08	-4.36
6,900.0	7.28	47.80	6,890.8	89.5	158.3	-79.5	0.78	0.68	-3.00
6,925.0	7.14	47.89	6,915.6	91.6	160.6	-81.5	0.56	-0.56	0.36
6,950.0	7.00	47.93	6,940.4	93.6	162.9	-83.4	0.56	-0.56	0.16
6,975.0	7.24	47.14	6,965.2	95.7	165.2	-85.3	1.04	0.96	-3.16
7,000.0	6.94	48.37	6,990.0	97.8	167.4	-87.2	1.34	-1.20	4.92
7,025.0	6.19	51.22	7,014.9	99.7	169.6	-89.0	3.27	-3.00	11.40
7,050.0	5.92	53.61	7,039.7	101.3	171.7	-90.4	1.48	-1.08	9.56
7,075.0	5.81	53.77	7,064.6	102.8	173.8	-91.8	0.44	-0.44	0.64
7,100.0	5.61	52.85	7,089.5	104.3	175.8	-93.2	0.88	-0.80	-3.68
7,125.0	5.52	52.32	7,114.4	105.7	177.7	-94.5	0.41	-0.36	-2.12
7,150.0	5.56	52.28	7,139.2	107.2	179.6	-95.9	0.16	0.16	-0.16
7,175.0	5.53	52.13	7,164.1	108.7	181.5	-97.2	0.13	-0.12	-0.60
7,200.0	5.49	51.90	7,189.0	110.2	183.4	-98.6	0.18	-0.16	-0.92
7,225.0	5.47	51.30	7,213.9	111.7	185.3	-100.0	0.24	-0.08	-2.40
7,250.0	5.24	52.30	7,238.8	113.1	187.1	-101.3	0.99	-0.92	4.00
7,275.0	5.17	51.67	7,263.7	114.5	188.9	-102.6	0.36	-0.28	-2.52
7,300.0	5.11	51.41	7,288.6	115.9	190.6	-103.8	0.26	-0.24	-1.04
7,325.0	5.05	50.90	7,313.5	117.3	192.4	-105.1	0.30	-0.24	-2.04
7,350.0	5.00	51.45	7,338.4	118.7	194.1	-106.4	0.28	-0.20	2.20
7,375.0	4.89	52.59	7,363.3	120.0	195.8	-107.6	0.59	-0.44	4.56
7,400.0	4.92	54.90	7,388.2	121.2	197.5	-108.8	0.80	0.12	9.24
7,425.0	5.12	57.97	7,413.1	122.4	199.3	-109.9	1.34	0.80	12.28
7,450.0	5.17	58.30	7,438.0	123.6	201.2	-110.9	0.23	0.20	1.32
7,475.0	5.16	58.26	7,462.9	124.8	203.1	-112.0	0.04	-0.04	-0.16
7,500.0	5.18	57.36	7,487.8	126.0	205.0	-113.1	0.33	0.08	-3.60
7,525.0	5.07	57.85	7,512.7	127.2	206.9	-114.1	0.47	-0.44	1.96
7,550.0	4.96	58.16	7,537.6	128.4	208.8	-115.2	0.45	-0.44	1.24
7,575.0	4.81	57.34	7,562.5	129.5	210.6	-116.2	0.66	-0.60	-3.28
7,600.0	4.75	62.32	7,587.4	130.6	212.4	-117.1	1.68	-0.24	19.92
7,625.0	4.67	66.50	7,612.4	131.4	214.2	-117.9	1.41	-0.32	16.72
7,650.0	4.65	69.47	7,637.3	132.2	216.1	-118.5	0.97	-0.08	11.88
7,675.0	4.63	68.80	7,662.2	132.9	218.0	-119.2	0.23	-0.08	-2.68
7,700.0	4.41	66.82	7,687.1	133.7	219.8	-119.8	1.08	-0.88	-7.92
7,725.0	4.42	63.68	7,712.0	134.5	221.6	-120.5	0.97	0.04	-12.56
7,750.0	4.15	62.89	7,737.0	135.3	223.2	-121.2	1.11	-1.08	-3.16
7,775.0	4.11	62.07	7,761.9	136.1	224.8	-121.9	0.29	-0.16	-3.28
7,800.0	4.06	65.44	7,786.8	136.9	226.4	-122.6	0.98	-0.20	13.48
7,825.0	5.10	73.23	7,811.8	137.6	228.3	-123.2	4.84	4.16	31.16
7,850.0	4.24	74.10	7,836.7	138.2	230.3	-123.7	3.45	-3.44	3.48
7,875.0	4.22	78.56	7,861.6	138.6	232.1	-124.0	1.32	-0.08	17.84

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well BONAID FED COM #14H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3376.7+25 @ 3401.7usft (Pioneer 84)
Site:	BULLDOG	MD Reference:	RKB=3376.7+25 @ 3401.7usft (Pioneer 84)
Well:	BONAID FED COM #14H	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	4.30	78.78	7,886.5	139.0	233.9	-124.2	0.33	0.32	0.88
7,925.0	4.25	76.56	7,911.5	139.4	235.7	-124.5	0.69	-0.20	-8.88
7,950.0	4.08	75.17	7,936.4	139.8	237.5	-124.8	0.79	-0.68	-5.56
7,975.0	3.92	75.02	7,961.3	140.3	239.1	-125.2	0.64	-0.64	-0.60
8,000.0	3.87	73.72	7,986.3	140.7	240.8	-125.5	0.41	-0.20	-5.20
8,025.0	3.73	72.34	8,011.2	141.2	242.4	-125.9	0.67	-0.56	-5.52
8,050.0	3.65	72.57	8,036.2	141.7	243.9	-126.3	0.33	-0.32	0.92
8,075.0	3.43	71.23	8,061.1	142.2	245.4	-126.7	0.94	-0.88	-5.36
8,100.0	3.31	70.31	8,086.1	142.7	246.8	-127.1	0.53	-0.48	-3.68
8,125.0	3.28	70.52	8,111.0	143.2	248.1	-127.5	0.13	-0.12	0.84
8,150.0	3.46	74.94	8,136.0	143.6	249.5	-127.8	1.26	0.72	17.68
8,175.0	3.47	79.46	8,161.0	143.9	251.0	-128.1	1.09	0.04	18.08
8,200.0	3.51	80.84	8,185.9	144.2	252.5	-128.3	0.37	0.16	5.52
8,225.0	3.59	82.02	8,210.9	144.4	254.0	-128.4	0.43	0.32	4.72
8,250.0	3.47	80.63	8,235.8	144.6	255.5	-128.5	0.59	-0.48	-5.56
8,275.0	3.40	78.47	8,260.8	144.9	257.0	-128.7	0.59	-0.28	-8.64
8,300.0	3.40	75.75	8,285.7	145.2	258.4	-128.9	0.65	0.00	-10.88
8,325.0	3.35	72.49	8,310.7	145.6	259.9	-129.3	0.79	-0.20	-13.04
8,350.0	3.39	69.52	8,335.6	146.1	261.3	-129.6	0.72	0.16	-11.88
8,375.0	3.35	67.18	8,360.6	146.7	262.6	-130.1	0.57	-0.16	-9.36
8,400.0	3.53	71.15	8,385.6	147.2	264.0	-130.5	1.19	0.72	15.88
8,425.0	4.03	75.27	8,410.5	147.7	265.6	-130.9	2.27	2.00	16.48
8,448.0	3.85	75.12	8,433.4	148.1	267.1	-131.2	0.78	-0.78	-0.65
8,512.0	3.64	68.40	8,497.3	149.4	271.1	-132.3	0.76	-0.33	-10.50
8,575.0	5.57	88.56	8,560.1	150.2	276.0	-132.8	3.95	3.06	32.00
8,606.0	9.46	100.16	8,590.8	149.8	280.0	-132.1	13.41	12.55	37.42
8,638.0	14.04	105.28	8,622.2	148.3	286.4	-130.3	14.66	14.31	16.00
8,670.0	17.37	103.92	8,653.0	146.1	294.7	-127.6	10.47	10.41	-4.25
8,701.0	19.79	102.75	8,682.3	143.8	304.4	-124.7	7.90	7.81	-3.77
8,733.0	22.49	102.52	8,712.2	141.3	315.6	-121.5	8.44	8.44	-0.72
8,765.0	24.02	108.07	8,741.6	138.0	327.8	-117.4	8.35	4.78	17.34
8,796.0	25.07	116.21	8,769.8	133.1	339.7	-111.8	11.41	3.39	26.26
8,828.0	28.98	121.98	8,798.3	126.0	352.3	-103.9	14.70	12.22	18.03
8,859.0	29.36	122.25	8,825.4	118.0	365.1	-95.1	1.30	1.23	0.87
8,891.0	30.76	126.44	8,853.1	108.9	378.4	-85.3	7.88	4.38	13.09
8,923.0	33.02	128.34	8,880.2	98.7	391.8	-74.2	7.73	7.06	5.94
8,954.0	35.16	133.55	8,905.9	87.3	404.9	-62.0	11.67	6.90	16.81
8,986.0	36.39	139.35	8,931.9	73.7	417.7	-47.7	11.27	3.84	18.13
9,017.0	36.69	143.95	8,956.8	59.2	429.2	-32.5	8.89	0.97	14.84
9,049.0	33.95	148.18	8,982.9	43.9	439.5	-16.6	11.47	-8.56	13.22
9,081.0	34.60	153.39	9,009.3	28.2	448.3	-0.4	9.39	2.03	16.28
9,112.0	36.26	156.53	9,034.6	11.9	455.9	16.4	7.95	5.35	10.13
9,144.0	41.00	159.94	9,059.6	-6.6	463.3	35.3	16.23	14.81	10.66

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well BONAID FED COM #14H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3376.7+25 @ 3401.7usft (Pioneer 84)
Site:	BULLDOG	MD Reference:	RKB=3376.7+25 @ 3401.7usft (Pioneer 84)
Well:	BONAID FED COM #14H	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)
9,176.0	45.71	161.99	9,082.9	-27.4	470.4	56.5	15.36	14.72	6.41
9,207.0	51.45	162.24	9,103.4	-49.5	477.6	79.0	18.53	18.52	0.81
9,239.0	56.78	161.90	9,122.1	-74.2	485.5	104.1	16.68	16.66	-1.06
9,270.0	61.77	160.75	9,138.0	-99.4	494.1	129.8	16.41	16.10	-3.71
9,289.0	65.41	161.19	9,146.4	-115.5	499.6	146.2	19.27	19.15	2.33
FTP @ 9289'MD / 9146.4'TVD									
9,302.0	67.90	161.48	9,151.6	-126.8	503.4	157.8	19.27	19.16	2.21
9,334.0	73.81	162.87	9,162.0	-155.6	512.7	187.0	18.92	18.47	4.34
9,371.0	81.69	165.08	9,169.9	-190.3	522.7	222.3	22.08	21.30	5.97
9,403.0	85.65	166.89	9,173.4	-221.1	530.3	253.6	13.59	12.38	5.66
9,434.0	86.60	168.14	9,175.5	-251.3	537.0	284.1	5.06	3.06	4.03
9,498.0	87.64	169.07	9,178.7	-314.0	549.7	347.5	2.18	1.63	1.45
9,592.0	88.22	170.83	9,182.1	-406.5	566.1	440.8	1.97	0.62	1.87
9,687.0	87.59	173.24	9,185.6	-500.5	579.2	535.4	2.62	-0.66	2.54
9,782.0	85.88	175.64	9,191.0	-594.9	588.4	630.2	3.10	-1.80	2.53
9,877.0	86.39	178.70	9,197.4	-689.6	593.1	725.0	3.26	0.54	3.22
9,971.0	85.65	181.22	9,203.9	-783.3	593.1	818.6	2.79	-0.79	2.68
10,066.0	83.14	182.06	9,213.2	-877.8	590.4	912.7	2.78	-2.64	0.88
10,161.0	84.16	182.17	9,223.7	-972.2	587.0	1,006.7	1.08	1.07	0.12
10,256.0	83.26	182.46	9,234.1	-1,066.5	583.1	1,100.6	0.99	-0.95	0.31
10,351.0	82.91	181.56	9,245.6	-1,160.8	579.8	1,194.5	1.01	-0.37	-0.95
10,446.0	83.04	180.84	9,257.2	-1,255.0	577.9	1,288.4	0.76	0.14	-0.76
10,541.0	82.91	180.91	9,268.8	-1,349.3	576.4	1,382.4	0.16	-0.14	0.07
10,636.0	82.97	180.67	9,280.5	-1,443.6	575.1	1,476.5	0.26	0.06	-0.25
10,731.0	83.37	180.61	9,291.8	-1,537.9	574.1	1,570.5	0.43	0.42	-0.06
10,826.0	84.21	181.30	9,302.1	-1,632.3	572.5	1,664.7	1.14	0.88	0.73
10,921.0	84.98	181.44	9,311.0	-1,726.9	570.2	1,758.9	0.82	0.81	0.15
11,015.0	86.68	181.98	9,317.8	-1,820.6	567.4	1,852.3	1.90	1.81	0.57
11,110.0	85.72	181.37	9,324.1	-1,915.3	564.7	1,946.6	1.20	-1.01	-0.64
11,205.0	85.75	180.73	9,331.2	-2,010.1	562.9	2,041.1	0.67	0.03	-0.67
11,300.0	88.33	182.02	9,336.1	-2,104.9	560.6	2,135.6	3.04	2.72	1.36
11,394.0	89.98	180.89	9,337.5	-2,198.8	558.3	2,229.2	2.13	1.76	-1.20
11,489.0	87.57	180.62	9,339.5	-2,293.8	557.0	2,323.9	2.55	-2.54	-0.28
11,584.0	85.83	180.63	9,345.0	-2,388.6	556.0	2,418.5	1.83	-1.83	0.01
11,679.0	86.42	179.97	9,351.4	-2,483.4	555.5	2,513.1	0.93	0.62	-0.69
11,773.0	85.92	177.57	9,357.7	-2,577.2	557.5	2,606.8	2.60	-0.53	-2.55
11,868.0	87.73	177.12	9,363.0	-2,671.9	561.9	2,701.6	1.96	1.91	-0.47
11,963.0	88.81	177.53	9,365.8	-2,766.8	566.3	2,796.6	1.22	1.14	0.43
12,057.0	86.91	177.57	9,369.3	-2,860.6	570.3	2,890.5	2.02	-2.02	0.04
12,152.0	86.08	177.57	9,375.1	-2,955.4	574.4	2,985.3	0.87	-0.87	0.00
12,247.0	88.42	178.66	9,379.7	-3,050.2	577.5	3,080.1	2.72	2.46	1.15
12,342.0	87.34	178.00	9,383.2	-3,145.1	580.2	3,175.0	1.33	-1.14	-0.69
12,437.0	85.10	178.08	9,389.5	-3,239.8	583.5	3,269.8	2.36	-2.36	0.08
12,532.0	84.84	178.14	9,397.8	-3,334.4	586.6	3,364.3	0.28	-0.27	0.06

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well BONAID FED COM #14H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3376.7+25 @ 3401.7usft (Pioneer 84)
Site:	BULLDOG	MD Reference:	RKB=3376.7+25 @ 3401.7usft (Pioneer 84)
Well:	BONAID FED COM #14H	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)
12,626.0	85.60	177.94	9,405.6	-3,428.0	589.8	3,458.0	0.84	0.81	-0.21
12,721.0	87.45	178.37	9,411.4	-3,522.8	592.9	3,552.8	2.00	1.95	0.45
12,816.0	91.01	180.43	9,412.7	-3,617.8	593.9	3,647.6	4.33	3.75	2.17
12,911.0	91.36	179.39	9,410.7	-3,712.7	594.0	3,742.4	1.15	0.37	-1.09
13,006.0	92.27	178.84	9,407.7	-3,807.7	595.5	3,837.3	1.12	0.96	-0.58
13,100.0	91.57	179.61	9,404.5	-3,901.6	596.7	3,931.1	1.11	-0.74	0.82
13,195.0	92.04	179.39	9,401.6	-3,996.6	597.6	4,025.9	0.55	0.49	-0.23
13,289.0	91.46	179.67	9,398.7	-4,090.5	598.3	4,119.7	0.69	-0.62	0.30
13,384.0	89.13	180.78	9,398.2	-4,185.5	598.0	4,214.5	2.72	-2.45	1.17
13,479.0	88.68	180.80	9,400.0	-4,280.5	596.7	4,309.2	0.47	-0.47	0.02
13,573.0	88.36	180.49	9,402.4	-4,374.4	595.6	4,402.9	0.47	-0.34	-0.33
13,668.0	90.54	180.63	9,403.4	-4,469.4	594.7	4,497.7	2.30	2.29	0.15
13,763.0	91.47	180.56	9,401.7	-4,564.4	593.7	4,592.4	0.98	0.98	-0.07
13,858.0	92.36	180.39	9,398.5	-4,659.3	592.9	4,687.1	0.95	0.94	-0.18
13,953.0	91.05	179.17	9,395.7	-4,754.3	593.3	4,781.9	1.88	-1.38	-1.28
14,048.0	91.91	179.51	9,393.2	-4,849.3	594.4	4,876.8	0.97	0.91	0.36
14,143.0	92.14	179.40	9,389.9	-4,944.2	595.3	4,971.6	0.27	0.24	-0.12
14,238.0	93.55	179.49	9,385.2	-5,039.1	596.2	5,066.3	1.49	1.48	0.09
14,332.0	92.86	180.09	9,379.9	-5,132.9	596.5	5,160.0	0.97	-0.73	0.64
14,427.0	90.95	180.18	9,376.7	-5,227.9	596.3	5,254.8	2.01	-2.01	0.09
14,522.0	89.22	179.39	9,376.6	-5,322.9	596.7	5,349.6	2.00	-1.82	-0.83
14,617.0	88.57	179.36	9,378.4	-5,417.8	597.7	5,444.5	0.68	-0.68	-0.03
14,711.0	88.17	179.36	9,381.1	-5,511.8	598.7	5,538.3	0.43	-0.43	0.00
14,806.0	90.86	179.74	9,381.9	-5,606.8	599.5	5,633.2	2.86	2.83	0.40
14,901.0	92.08	179.93	9,379.5	-5,701.7	599.8	5,728.0	1.30	1.28	0.20
14,996.0	93.17	180.00	9,375.1	-5,796.6	599.8	5,822.7	1.15	1.15	0.07
15,091.0	92.37	180.06	9,370.5	-5,891.5	599.8	5,917.4	0.84	-0.84	0.06
15,186.0	92.00	179.66	9,366.9	-5,986.5	600.0	6,012.1	0.57	-0.39	-0.42
15,281.0	91.47	179.49	9,364.0	-6,081.4	600.7	6,107.0	0.59	-0.56	-0.18
15,375.0	89.65	179.05	9,363.1	-6,175.4	601.9	6,200.8	1.99	-1.94	-0.47
15,470.0	89.38	178.58	9,363.9	-6,270.4	603.9	6,295.7	0.57	-0.28	-0.49
15,565.0	88.45	178.24	9,365.7	-6,365.3	606.5	6,390.7	1.04	-0.98	-0.36
15,660.0	87.93	177.94	9,368.7	-6,460.2	609.7	6,485.6	0.63	-0.55	-0.32
15,755.0	88.36	177.83	9,371.8	-6,555.1	613.2	6,580.5	0.47	0.45	-0.12
15,850.0	89.00	177.79	9,374.0	-6,650.0	616.8	6,675.5	0.67	0.67	-0.04
15,945.0	90.45	177.77	9,374.4	-6,744.9	620.5	6,770.4	1.53	1.53	-0.02
16,040.0	90.45	178.65	9,373.7	-6,839.9	623.4	6,865.4	0.93	0.00	0.93
16,134.0	91.01	179.33	9,372.5	-6,933.9	625.1	6,959.3	0.94	0.60	0.72
16,229.0	91.35	179.09	9,370.5	-7,028.8	626.4	7,054.1	0.44	0.36	-0.25
16,324.0	90.05	179.43	9,369.4	-7,123.8	627.6	7,149.0	1.41	-1.37	0.36
16,419.0	90.01	179.19	9,369.3	-7,218.8	628.8	7,243.9	0.26	-0.04	-0.25
16,514.0	90.65	179.21	9,368.8	-7,313.8	630.1	7,338.8	0.67	0.67	0.02
16,609.0	91.21	178.93	9,367.2	-7,408.8	631.7	7,433.7	0.66	0.59	-0.29

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well BONAID FED COM #14H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3376.7+25 @ 3401.7usft (Pioneer 84)
Site:	BULLDOG	MD Reference:	RKB=3376.7+25 @ 3401.7usft (Pioneer 84)
Well:	BONAID FED COM #14H	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)
16,704.0	92.86	179.62	9,363.9	-7,503.7	632.9	7,528.5	1.88	1.74	0.73
16,799.0	92.80	180.11	9,359.2	-7,598.6	633.1	7,623.2	0.52	-0.06	0.52
16,894.0	91.75	181.82	9,355.4	-7,693.5	631.5	7,717.8	2.11	-1.11	1.80
16,987.0	91.76	182.38	9,352.6	-7,786.4	628.1	7,810.3	0.60	0.01	0.60
17,082.0	92.69	182.89	9,348.9	-7,881.2	623.7	7,904.7	1.12	0.98	0.54
17,176.0	92.77	182.42	9,344.4	-7,975.0	619.4	7,998.1	0.51	0.09	-0.50
17,271.0	90.71	180.43	9,341.5	-8,069.9	617.0	8,092.6	3.01	-2.17	-2.09
17,366.0	89.68	180.32	9,341.2	-8,164.9	616.4	8,187.4	1.09	-1.08	-0.12
17,461.0	88.16	179.32	9,343.0	-8,259.9	616.7	8,282.2	1.92	-1.60	-1.05
17,556.0	88.18	179.59	9,346.0	-8,354.8	617.6	8,377.1	0.28	0.02	0.28
17,651.0	88.78	179.84	9,348.5	-8,449.8	618.0	8,471.9	0.68	0.63	0.26
17,746.0	88.98	180.15	9,350.4	-8,544.8	618.1	8,566.7	0.39	0.21	0.33
17,841.0	89.68	179.54	9,351.5	-8,639.8	618.3	8,661.5	0.98	0.74	-0.64
17,935.0	89.91	179.21	9,351.8	-8,733.8	619.3	8,755.4	0.43	0.24	-0.35
18,030.0	90.70	179.71	9,351.3	-8,828.8	620.2	8,850.2	0.98	0.83	0.53
18,125.0	90.82	180.16	9,350.1	-8,923.8	620.3	8,945.0	0.49	0.13	0.47
18,219.0	90.33	178.43	9,349.1	-9,017.7	621.5	9,038.9	1.91	-0.52	-1.84
18,314.0	90.74	178.98	9,348.2	-9,112.7	623.6	9,133.8	0.72	0.43	0.58
18,409.0	91.34	179.18	9,346.5	-9,207.7	625.2	9,228.7	0.67	0.63	0.21
18,504.0	92.33	179.51	9,343.5	-9,302.6	626.3	9,323.6	1.10	1.04	0.35
18,599.0	93.13	179.93	9,338.9	-9,397.5	626.7	9,418.3	0.95	0.84	0.44
18,694.0	91.99	179.57	9,334.7	-9,492.4	627.1	9,513.0	1.26	-1.20	-0.38
18,789.0	91.80	179.42	9,331.6	-9,587.4	628.0	9,607.9	0.25	-0.20	-0.16
18,884.0	91.11	178.96	9,329.1	-9,682.3	629.3	9,702.7	0.87	-0.73	-0.48
18,979.0	92.11	178.93	9,326.5	-9,777.3	631.1	9,797.6	1.05	1.05	-0.03
19,074.0	92.67	179.36	9,322.5	-9,872.2	632.5	9,892.4	0.74	0.59	0.45
19,169.0	91.14	179.09	9,319.4	-9,967.1	633.8	9,987.2	1.64	-1.61	-0.28
19,217.3	90.18	179.00	9,318.8	-10,015.4	634.6	10,035.5	2.00	-1.99	-0.18
LTP @ 19217.3'MD / 9318.8'TVD									
19,264.0	89.25	178.92	9,319.0	-10,062.1	635.4	10,082.1	2.00	-1.99	-0.18
19,276.0	89.34	178.93	9,319.2	-10,074.1	635.6	10,094.1	0.75	0.75	0.08
Final MWD Survey @ 19276'MD									
19,346.0	89.34	178.93	9,320.0	-10,144.1	636.9	10,164.0	0.00	0.00	0.00
PTD @ 19346'MD									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
9,289.0	9,146.4	-115.5	499.6	FTP @ 9289'MD / 9146.4'TVD
19,217.3	9,318.8	-10,015.4	634.6	LTP @ 19217.3'MD / 9318.8'TVD
19,276.0	9,319.2	-10,074.1	635.6	Final MWD Survey @ 19276'MD
19,346.0	9,320.0	-10,144.1	636.9	PTD @ 19346'MD

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well BONAID FED COM #14H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3376.7+25 @ 3401.7usft (Pioneer 84)
Site:	BULLDOG	MD Reference:	RKB=3376.7+25 @ 3401.7usft (Pioneer 84)
Well:	BONAID FED COM #14H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	AWP	Database:	EDM_Users

Checked By: _____	Approved By: _____	Date: _____
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