



7821 Will Rogers Blvd.
Fort Worth, Texas 76140

817.568.1038 (office)
817.568.1499 (fax)
www.msenergyservices.com

NM OIL CONSERVATION
ARTESIA DISTRICT

Survey Company: MS Energy Services
MWD Surveyor Name: Oscar Villareal
Survey Type: MWD
Operating Company: RKI Exploration & Production LLC
Well Name & Number: North Brushy Draw Federal 35 5H
API Number: 30-015-42291
Surveyed Depths: 139' – 15,324' MD
Dates Performed: 02/22/2017 – 03/11/2017
Location: Eddy County, NM

I certify that the data is true, correct and complete and within the limitations of the tool set forth by MS Energy Services; that I am authorized and qualified to make this report and that I have reviewed this report and find it conforms to the principles and procedures as set forth by MS Energy Services.

Digitally signed by:

Title: MWD Field Specialist

Date: 2017-03-28

Email: ovillarreal@msenergyservices.com



SURVEY CALCULATION PROGRAM

3/23/17 19:52

VO8.04.02

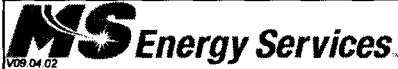
Company:	RKI Exploration & Production LLC
Well Name:	North Brushy Draw Federal 35 5H
Location:	Eddy County, NM
Rig:	Orion Phoenix
Job Number:	DDMO-170163
API #:	30-015-42291

Magnetic Declination: 7.02 REFERENCED TO GRID NORTH

Vertical Section Azimuth: 1.07 Proposed Direction: 1.07

Survey Calculation Method: Minimum Curvature

PTB:	MD	INC		AZM	TVD	N/S	E/W	VS			
	15,411	88.8		359.2	10593.24	4903.08	126.89	4904.6			
#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	E/W Feet	Surface Vert Sec	Closure Distance	Azm	DLS/ 100	BUR/ 100'
TIE IN	0	0.00	0.00	0.00	0.00	0.00			0.00		
1	139	0.30	133.60	139.00	-0.25	0.26	-0.25	0.36	133.60	0.22	0.22
2	228	0.30	139.20	228.00	-0.59	0.58	-0.58	0.83	135.17	0.03	0.00
3	319	0.20	122.00	319.00	-0.85	0.87	-0.84	1.22	134.26	0.14	-0.11
4	408	0.30	208.20	408.00	-1.14	0.90	-1.12	1.45	141.82	0.39	0.11
5	498	0.10	271.10	498.00	-1.35	0.71	-1.33	1.52	152.31	0.30	-0.22
6	584	0.30	220.70	584.00	-1.52	0.48	-1.51	1.59	162.26	0.29	0.23
7	700	0.50	231.60	699.99	-2.06	-0.11	-2.06	2.06	183.05	0.18	0.17
8	790	0.80	267.40	789.99	-2.33	-1.05	-2.35	2.56	204.14	0.55	0.33
9	881	0.40	144.40	880.98	-2.62	-1.50	-2.65	3.02	209.71	1.18	-0.44
10	971	0.60	163.20	970.98	-3.33	-1.18	-3.35	3.53	199.47	0.28	0.22
11	1,061	0.50	138.70	1060.98	-4.07	-0.78	-4.09	4.15	190.85	0.28	-0.11
12	1,152	0.30	114.00	1151.97	-4.47	-0.30	-4.47	4.48	183.85	0.29	-0.22
13	1,241	0.00	43.70	1240.97	-4.56	-0.09	-4.56	4.56	181.11	0.34	-0.34
14	1,331	0.10	31.70	1330.97	-4.50	-0.05	-4.50	4.50	180.60	0.11	0.11
15	1,516	0.20	71.00	1515.97	-4.25	0.34	-4.25	4.27	175.38	0.07	0.05
16	1,706	0.50	200.30	1705.97	-4.92	0.37	-4.91	4.94	175.71	0.34	0.16
17	1,896	0.60	254.30	1895.96	-5.97	-0.88	-5.98	6.03	188.35	0.27	0.05
18	2,084	1.10	240.50	2083.94	-7.12	-3.39	-7.19	7.89	205.47	0.29	0.27
19	2,274	1.30	259.80	2273.90	-8.40	-7.10	-8.54	11.00	220.20	0.24	0.11
20	2,463	1.40	165.80	2462.87	-11.02	-8.65	-11.18	14.01	218.11	1.05	0.05
21	2,653	1.50	139.50	2652.81	-15.16	-6.46	-15.28	16.48	203.08	0.35	0.05
22	2,843	3.00	127.10	2842.66	-20.05	-0.88	-20.07	20.07	182.52	0.83	0.79
23	3,032	2.50	119.00	3031.44	-25.04	6.67	-24.91	25.91	165.08	0.33	-0.26
24	3,127	2.30	119.80	3126.36	-26.99	10.13	-26.79	28.83	159.42	0.21	-0.21
25	3,202	1.90	117.70	3201.31	-28.31	12.54	-28.07	30.97	156.11	0.54	-0.53
26	3,297	2.00	116.70	3296.25	-29.79	15.42	-29.50	33.54	152.64	0.11	0.11
27	3,393	2.00	112.60	3392.19	-31.19	18.46	-30.84	36.24	149.38	0.15	0.00
28	3,487	4.20	117.30	3486.05	-33.40	23.03	-32.96	40.57	145.41	2.35	2.34
29	3,582	6.70	120.00	3580.61	-37.76	30.93	-37.18	48.81	140.68	2.64	2.63
30	3,677	9.00	118.60	3674.72	-44.09	42.25	-43.30	61.07	136.22	2.43	2.42
31	3,772	8.70	119.20	3768.59	-51.15	55.05	-50.12	75.15	132.90	0.33	-0.32
32	3,867	8.80	120.10	3862.48	-58.30	67.61	-57.03	89.27	130.78	0.18	0.11
33	3,962	8.70	119.20	3956.37	-65.45	80.16	-63.95	103.49	129.23	0.18	-0.11



SURVEY CALCULATION PROGRAM

3/23/17 19:52

Company:		RKI Exploration & Production LLC												
Well Name:		North Brushy Draw Federal 35 5H												
Location:		Eddy County, NM												
Rig:		Orion Phoenix					Magnetic Declination:		7.02		REFERENCED TO GRID NORTH			
Job Number:		DDMO-170163												
API #:		30-015-42291												
Vertical Section Azimuth:					1.07		Proposed Direction:		1.07					
Survey Calculation Method:					Minimum Curvature									
PTB:	MD		INC		AZM		TVD		N/S		E/W		VS	
	15,411		88.8		359.2		10593.24		4903.08		126.89		4904.6	
#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	E/W Feet	Surface Vert Sec	Closure Distance		Azm	DLS/ 100	BUR/ 100'		
34	4,057	8.00	118.10	4050.37	-72.07	92.27	-70.34	117.08	127.99	0.76	-0.74			
35	4,151	7.70	117.40	4143.49	-78.05	103.63	-76.10	129.73	126.99	0.33	-0.32			
36	4,245	7.50	116.70	4236.66	-83.71	114.70	-81.55	142.00	126.12	0.23	-0.21			
37	4,340	7.60	123.90	4330.84	-90.00	125.45	-87.64	154.40	125.65	1.00	0.11			
38	4,435	7.70	125.10	4424.99	-97.16	135.87	-94.60	167.04	125.57	0.20	0.11			
39	4,529	7.80	121.50	4518.14	-104.11	146.47	-101.36	179.70	125.41	0.53	0.11			
40	4,623	5.30	124.50	4611.51	-109.91	155.48	-106.98	190.41	125.26	2.68	-2.66			
41	4,718	2.40	143.80	4706.29	-114.00	160.28	-110.98	196.68	125.42	3.30	-3.05			
42	4,812	0.60	242.00	4800.27	-115.82	161.00	-112.79	198.33	125.73	2.72	-1.91			
43	4,907	0.80	259.40	4895.26	-116.17	159.91	-113.17	197.66	126.00	0.30	0.21			
44	5,002	1.00	248.90	4990.25	-116.59	158.49	-113.61	196.75	126.34	0.27	0.21			
45	5,098	1.10	237.30	5086.23	-117.39	156.93	-114.44	195.98	126.80	0.24	0.10			
46	5,193	1.00	249.60	5181.21	-118.17	155.39	-115.25	195.22	127.25	0.26	-0.11			
47	5,288	0.30	108.30	5276.21	-118.54	154.85	-115.63	195.01	127.44	1.31	-0.74			
48	5,383	0.90	110.00	5371.20	-118.87	155.78	-115.94	195.96	127.35	0.63	0.63			
49	5,477	1.20	129.30	5465.19	-119.75	157.24	-116.79	197.65	127.29	0.49	0.32			
50	5,572	1.40	125.00	5560.16	-121.05	158.96	-118.06	199.80	127.29	0.23	0.21			
51	5,667	1.30	128.00	5655.14	-122.37	160.76	-119.35	202.04	127.28	0.13	-0.11			
52	5,762	1.10	127.90	5750.12	-123.60	162.33	-120.55	204.03	127.29	0.21	-0.21			
53	5,857	1.10	141.50	5845.10	-124.87	163.61	-121.80	205.82	127.35	0.27	0.00			
54	5,952	0.80	149.70	5940.09	-126.16	164.52	-123.06	207.32	127.48	0.35	-0.32			
55	6,047	0.80	161.10	6035.08	-127.36	165.07	-124.25	208.49	127.65	0.17	0.00			
56	6,142	0.90	157.00	6130.07	-128.67	165.57	-125.56	209.69	127.85	0.12	0.11			
57	6,236	0.80	159.60	6224.06	-129.97	166.09	-126.84	210.90	128.04	0.11	-0.11			
58	6,331	1.10	145.30	6319.04	-131.34	166.84	-128.20	212.33	128.21	0.40	0.32			
59	6,426	0.40	225.40	6414.04	-132.32	167.12	-129.18	213.16	128.37	1.16	-0.74			
60	6,521	0.30	239.10	6509.04	-132.68	166.67	-129.55	213.04	128.52	0.14	-0.11			
61	6,616	0.70	215.00	6604.03	-133.28	166.13	-130.16	212.99	128.74	0.47	0.42			
62	6,711	1.00	207.90	6699.02	-134.49	165.41	-131.38	213.18	129.11	0.33	0.32			
63	6,806	0.80	316.90	6794.01	-134.74	164.56	-131.64	212.69	129.31	1.55	-0.21			
64	6,901	1.00	318.90	6889.00	-133.63	163.57	-130.55	211.21	129.25	0.21	0.21			
65	6,996	0.90	274.70	6983.99	-132.95	162.28	-129.89	209.78	129.33	0.76	-0.11			
66	7,091	1.00	266.90	7078.98	-132.93	160.71	-129.91	208.56	129.60	0.17	0.11			
67	7,186	1.00	248.60	7173.96	-133.28	159.11	-130.28	207.55	129.95	0.33	0.00			



SURVEY CALCULATION PROGRAM

3/23/17 19:52

V08 04.02

Company:	RKI Exploration & Production LLC		
Well Name:	North Brushy Draw Federal 35 5H		
Location:	Eddy County, NM		
Rig:	Orion Phoenix	Magnetic Declination:	7.02
Job Number:	DDMO-170163		
API #:	30-015-42291		

REFERENCED TO GRID NORTH

Vertical Section Azimuth:	1.07	Proposed Direction:	1.07
---------------------------	------	---------------------	------

Survey Calculation Method: Minimum Curvature

PTB:	MD	INC	AZM	TVD	N/S	E/W	VS				
	15,411	88.8	359.2	10593.24	4903.08	126.89	4904.6				
#	Depth	Inc	Azm	TVD	N/S	Surface	Closure	DLS/	BUR/		
	Feet	Degrees	Degrees	Feet	Feet	Feet	Vert Sec	Distance	Azm	100	100'
68	7,281	2.00	265.70	7268.93	-133.70	156.68	-130.76	205.98	130.48	1.14	1.05
69	7,376	1.30	284.00	7363.89	-133.57	153.98	-130.67	203.84	130.94	0.91	-0.74
70	7,470	1.70	290.70	7457.86	-132.82	151.64	-129.96	201.58	131.21	0.46	0.43
71	7,566	2.40	284.70	7553.80	-131.80	148.37	-129.01	198.46	131.62	0.76	0.73
72	7,661	1.20	276.70	7648.75	-131.18	145.46	-128.44	195.87	132.05	1.29	-1.26
73	7,756	1.40	258.60	7743.72	-131.30	143.33	-128.60	194.38	132.49	0.48	0.21
74	7,851	0.90	83.30	7838.72	-131.44	142.93	-128.75	194.18	132.60	2.42	-0.53
75	7,945	1.00	106.30	7932.70	-131.58	144.45	-128.86	195.40	132.33	0.42	0.11
76	8,040	0.90	106.60	8027.69	-132.03	145.96	-129.28	196.82	132.13	0.11	-0.11
77	8,135	0.40	123.20	8122.68	-132.42	146.96	-129.66	197.82	132.02	0.56	-0.53
78	8,230	0.60	133.40	8217.68	-132.95	147.60	-130.17	198.64	132.01	0.23	0.21
79	8,325	1.20	108.90	8312.67	-133.61	148.90	-130.81	200.06	131.90	0.74	0.63
80	8,421	1.50	135.40	8408.64	-134.83	150.73	-131.99	202.24	131.81	0.71	0.31
81	8,515	1.60	150.00	8502.61	-136.84	152.25	-133.98	204.71	131.95	0.43	0.11
82	8,610	2.00	134.50	8597.56	-139.15	154.10	-136.25	207.63	132.08	0.66	0.42
83	8,705	2.00	116.00	8692.51	-141.04	156.77	-138.09	210.88	131.98	0.68	0.00
84	8,799	0.80	165.30	8786.48	-142.40	158.41	-139.41	213.00	131.95	1.70	-1.28
85	8,894	1.00	203.40	8881.47	-143.80	158.25	-140.82	213.83	132.26	0.65	0.21
86	8,989	0.90	52.60	8976.46	-144.11	158.51	-141.12	214.23	132.27	1.94	-0.11
87	9,084	0.60	42.20	9071.45	-143.28	159.44	-140.28	214.36	131.95	0.35	-0.32
88	9,179	0.50	101.30	9166.45	-143.00	160.18	-139.98	214.72	131.76	0.58	-0.11
89	9,274	0.10	130.80	9261.45	-143.13	160.65	-140.11	215.16	131.70	0.44	-0.42
90	9,369	0.20	143.40	9356.45	-143.32	160.81	-140.29	215.41	131.71	0.11	0.11
91	9,464	0.50	200.10	9451.45	-143.84	160.77	-140.82	215.72	131.82	0.45	0.32
92	9,559	0.70	208.70	9546.44	-144.74	160.35	-141.72	216.01	132.07	0.23	0.21
93	9,653	0.90	226.00	9640.43	-145.76	159.54	-142.75	216.10	132.42	0.33	0.21
94	9,747	0.10	276.10	9734.43	-146.26	158.93	-143.27	215.99	132.62	0.89	-0.85
95	9,842	0.20	228.20	9829.43	-146.36	158.72	-143.37	215.90	132.68	0.16	0.11
96	9,937	0.60	210.70	9924.43	-146.90	158.34	-143.92	215.99	132.85	0.44	0.42
97	10,021	0.70	211.10	10008.42	-147.72	157.85	-144.75	216.19	133.10	0.12	0.12
98	10,035	0.80	205.70	10022.42	-147.88	157.77	-144.91	216.24	133.15	0.87	0.71
99	10,135	5.80	4.90	10122.27	-143.47	157.90	-140.50	213.34	132.26	6.55	5.00
100	10,230	19.80	6.80	10214.68	-122.61	160.22	-119.59	201.75	127.42	14.74	14.74



SURVEY CALCULATION PROGRAM

3/23/17 19:52

Company:		RKI Exploration & Production LLC												
Well Name:		North Brushy Draw Federal 35 5H												
Location:		Eddy County, NM												
Rig:		Orion Phoenix					Magnetic Declination:		7.02					
Job Number:		DDMO-170163							REFERENCED TO GRID NORTH					
API #:		30-015-42291												
Vertical Section Azimuth:		1.07					Proposed Direction:		1.07					
Survey Calculation Method:		Minimum Curvature												
PTB:	MD		INC		AZM		TVD		N/S		E/W		VS	
	15,411		88.8		359.2		10593.24		4903.08		126.89		4904.6	
#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	E/W Feet	Surface Vert Sec	Closure Distance		Azm	DLS/ 100	BUR/ 100'		
101	10,324	32.40	9.10	10298.92	-81.77	166.12	-78.65	185.15	116.21	13.45	13.40			
102	10,419	42.00	8.50	10374.51	-25.07	174.86	-21.80	176.65	98.16	10.11	10.11			
103	10,514	50.70	0.90	10440.07	43.30	180.15	46.66	185.28	76.48	10.82	9.16			
104	10,609	58.90	357.20	10494.79	120.83	178.74	124.15	215.75	55.94	9.20	8.63			
105	10,704	65.50	357.00	10539.08	204.71	174.48	207.94	268.98	40.44	6.95	6.95			
106	10,798	76.60	356.60	10569.55	293.34	169.52	296.45	338.80	30.02	11.82	11.81			
107	10,894	86.50	356.60	10583.64	388.01	163.89	391.01	421.21	22.90	10.31	10.31			
108	10,934	88.70	357.50	10585.32	427.92	161.84	430.87	457.50	20.72	5.94	5.50			
109	11,048	90.70	358.00	10585.92	541.83	157.36	544.67	564.21	16.19	1.81	1.75			
110	11,139	90.60	357.80	10584.88	632.76	154.03	635.53	651.24	13.68	0.25	-0.11			
111	11,230	91.40	358.20	10583.29	723.69	150.85	726.38	739.24	11.77	0.98	0.88			
112	11,321	91.80	358.10	10580.75	814.61	147.92	817.23	827.93	10.29	0.45	0.44			
113	11,412	90.90	358.50	10578.61	905.54	145.22	908.09	917.11	9.11	1.08	-0.99			
114	11,503	88.90	358.80	10578.77	996.51	143.07	999.01	1006.73	8.17	2.22	-2.20			
115	11,593	89.70	359.00	10579.87	1086.49	141.34	1088.94	1095.64	7.41	0.92	0.89			
116	11,684	90.50	358.90	10579.71	1177.47	139.68	1179.87	1185.73	6.77	0.89	0.88			
117	11,775	87.80	359.50	10581.06	1268.44	138.41	1270.81	1275.97	6.23	3.04	-2.97			
118	11,866	88.90	0.30	10583.68	1359.40	138.25	1361.75	1366.41	5.81	1.49	1.21			
119	11,957	89.80	1.00	10584.71	1450.39	139.28	1452.74	1457.06	5.49	1.25	0.99			
120	12,048	90.00	0.90	10584.87	1541.38	140.79	1543.74	1547.79	5.22	0.25	0.22			
121	12,138	91.10	1.70	10584.01	1631.35	142.83	1633.73	1637.59	5.00	1.51	1.22			
122	12,230	91.00	1.40	10582.32	1723.30	145.32	1725.71	1729.41	4.82	0.34	-0.11			
123	12,321	90.20	1.20	10581.37	1814.27	147.38	1816.70	1820.24	4.64	0.91	-0.88			
124	12,412	90.80	1.80	10580.57	1905.23	149.77	1907.70	1911.11	4.49	0.93	0.66			
125	12,502	91.40	1.80	10578.85	1995.17	152.59	1997.67	2001.00	4.37	0.67	0.67			
126	12,593	90.30	359.50	10577.50	2086.15	153.62	2088.65	2091.80	4.21	2.80	-1.21			
127	12,684	90.10	359.10	10577.18	2177.14	152.51	2179.61	2182.48	4.01	0.49	-0.22			
128	12,775	90.20	358.80	10576.94	2268.12	150.84	2270.55	2273.13	3.80	0.35	0.11			
129	12,866	90.70	358.30	10576.23	2359.09	148.54	2361.45	2363.76	3.60	0.78	0.55			
130	12,957	90.90	357.70	10574.95	2450.03	145.37	2452.31	2454.34	3.40	0.69	0.22			
131	13,048	90.80	357.80	10573.60	2540.95	141.79	2543.15	2544.90	3.19	0.16	-0.11			
132	13,140	89.70	358.30	10573.20	2632.89	138.66	2635.02	2636.54	3.01	1.31	-1.20			
133	13,231	90.90	358.30	10572.73	2723.85	135.96	2725.91	2727.24	2.86	1.32	1.32			



SURVEY CALCULATION PROGRAM

3/23/17 19:52

Company:

RKI Exploration & Production LLC

Well Name:

North Brushy Draw Federal 35 5H

Location:

Eddy County, NM

Rig:

Orion Phoenix

Job Number:

DDMO-170163

API #:

30-015-42291

Vertical Section Azimuth:

1.07

Proposed Direction:

1.07

Survey Calculation Method:

Minimum Curvature

Magnetic Declination:

7.02

REFERENCED TO GRID NORTH

PTB:	MD	INC	AZM	TVD	N/S	E/W	VS				
	15,411	88.8	359.2	10593.24	4903.08	126.89	4904.6				
#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	E/W Feet	Surface Vert Sec	Closure Distance	Azm	DLS/ 100	BUR/ 100'
134	13,321	90.60	358.80	10571.55	2813.81	133.69	2815.82	2816.99	2.72	0.65	-0.33
135	13,413	89.00	359.50	10571.87	2905.80	132.32	2907.76	2908.81	2.61	1.90	-1.74
136	13,503	89.40	359.50	10573.13	2995.78	131.54	2997.72	2998.67	2.51	0.44	0.44
137	13,594	88.40	358.40	10574.87	3086.75	129.87	3088.64	3089.48	2.41	1.63	-1.10
138	13,685	88.40	358.50	10577.41	3177.68	127.41	3179.51	3180.23	2.30	0.11	0.00
139	13,777	88.90	359.10	10579.58	3269.63	125.48	3271.41	3272.04	2.20	0.85	0.54
140	13,868	89.10	0.20	10581.17	3360.62	124.93	3362.36	3362.94	2.13	1.23	0.22
141	13,959	89.00	0.20	10582.68	3451.60	125.25	3453.34	3453.88	2.08	0.11	-0.11
142	14,050	89.30	0.30	10584.03	3542.59	125.64	3544.32	3544.82	2.03	0.35	0.33
143	14,141	91.00	0.60	10583.79	3633.59	126.36	3635.31	3635.78	1.99	1.90	1.87
144	14,232	91.00	359.90	10582.20	3724.57	126.75	3726.29	3726.73	1.95	0.77	0.00
145	14,323	93.20	0.70	10578.87	3815.50	127.23	3817.21	3817.62	1.91	2.57	2.42
146	14,414	91.60	0.30	10575.06	3906.42	128.02	3908.13	3908.51	1.88	1.81	-1.76
147	14,505	89.10	0.30	10574.50	3997.41	128.50	3999.11	3999.47	1.84	2.75	-2.75
148	14,596	88.90	0.10	10576.09	4088.39	128.82	4090.08	4090.42	1.80	0.31	-0.22
149	14,687	88.10	359.80	10578.47	4179.36	128.74	4181.04	4181.34	1.76	0.94	-0.88
150	14,778	89.60	359.80	10580.30	4270.34	128.42	4271.99	4272.27	1.72	1.65	1.65
151	14,869	86.50	359.10	10583.39	4361.27	127.55	4362.89	4363.13	1.68	3.49	-3.41
152	14,960	89.20	0.40	10586.81	4452.19	127.15	4453.79	4454.01	1.64	3.29	2.97
153	15,051	89.70	0.70	10587.68	4543.19	128.03	4544.78	4544.99	1.61	0.64	0.55
154	15,142	90.40	1.00	10587.60	4634.18	129.38	4635.78	4635.98	1.60	0.84	0.77
155	15,233	88.00	359.10	10588.87	4725.16	129.45	4726.75	4726.93	1.57	3.36	-2.64
156	15,324	88.80	359.20	10591.41	4816.11	128.11	4817.66	4817.81	1.52	0.89	0.88