



SURVEY CALCULATION PROGRAM

11/28/17 18:13

Company:	RKI Expl & Prod LLC
Well Name:	RDX Federal COM 17 45H
Location:	Eddy County, NM
Rig:	Orion Phoenix
Job Number:	DDMO-170829
API #:	30-015-44408

Magnetic Declination: 6.92 REFERENCED TO GRID NORTH

Proposed Direction: 179.94

Vertical Section Azimuth:	179.94
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Survey Calculation Method:	Minimum Curvature
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PTB:	MD	15,478	INC	91.4	AZM	180.9	TVD	Feet	N/S	Feet	E/W	Feet	Surface	Vert Sec	Distance	Closure	Azm	DLS/100	BUR/100'
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#	Depth	Feet	Inc	Degrees	Azm	Degrees	TVD	Feet	N/S	Feet	E/W	Feet	Surface	Vert Sec	Distance	Closure	Azm	DLS/100	BUR/100'
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TIE IN	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.65	0.65	0.00	0.34	0.34
1	149	0.50	0.50	269.40	149.00	269.40	149.00	0.01	-0.01	-0.65	-0.65	-0.65	0.65	0.65	0.65	0.65	269.40	0.34	0.34
2	239	1.70	1.70	241.10	238.98	241.10	238.98	-0.66	-0.66	-2.21	-2.21	-2.21	0.65	0.65	2.31	2.31	253.48	1.42	1.33
3	329	0.10	0.10	14.50	328.97	14.50	328.97	-1.23	-1.23	-3.36	-3.36	-3.36	1.22	1.22	3.58	3.58	249.97	1.97	-1.78
4	420	0.10	0.10	334.20	419.97	334.20	419.97	-1.08	-1.08	-3.38	-3.38	-3.38	1.07	1.07	3.54	3.54	252.30	0.08	0.00
5	509	0.30	0.30	247.70	508.97	247.70	508.97	-1.10	-1.10	-3.62	-3.62	-3.62	1.09	1.09	3.79	3.79	253.19	0.35	0.22
6	599	0.40	0.40	239.70	598.97	239.70	598.97	-1.34	-1.34	-4.11	-4.11	-4.11	1.34	1.34	4.33	4.33	251.92	0.12	0.11
7	689	0.70	0.70	245.90	688.96	245.90	688.96	-1.73	-1.73	-4.89	-4.89	-4.89	1.72	1.72	5.18	5.18	250.54	0.34	0.33
8	779	0.80	0.80	50.60	778.96	50.60	778.96	-1.55	-1.55	-4.90	-4.90	-4.90	1.55	1.55	5.14	5.14	252.44	1.65	0.11
9	869	1.30	1.30	45.00	868.94	45.00	868.94	-0.43	-0.43	-3.70	-3.70	-3.70	0.43	0.43	3.72	3.72	263.34	0.57	0.56
10	960	1.70	1.70	25.80	959.91	25.80	959.91	1.51	1.51	-2.38	-2.38	-2.38	-1.52	-1.52	2.82	2.82	302.48	0.70	0.44
11	1,059	2.70	2.70	12.00	1058.84	12.00	1058.84	5.12	5.12	-1.25	-1.25	-1.25	-5.12	-5.12	5.27	5.27	346.22	1.14	1.01
12	1,150	2.80	2.80	11.40	1149.73	11.40	1149.73	9.39	9.39	-0.37	-0.37	-0.37	-9.39	-9.39	9.40	9.40	357.75	0.11	0.11
13	1,239	2.90	2.90	8.40	1238.62	8.40	1238.62	13.75	13.75	0.39	0.39	0.39	-13.75	-13.75	13.76	13.76	1.62	0.20	0.11
14	1,330	3.10	3.10	357.10	1329.50	357.10	1329.50	18.49	18.49	0.60	0.60	0.60	-18.48	-18.48	18.49	18.49	1.86	0.68	0.22
15	1,422	1.50	1.50	327.40	1421.43	327.40	1421.43	21.98	21.98	-0.17	-0.17	-0.17	-21.98	-21.98	21.99	21.99	359.55	2.11	-1.74
16	1,513	1.20	1.20	293.70	1512.40	293.70	1512.40	23.37	23.37	-1.69	-1.69	-1.69	-23.37	-23.37	23.43	23.43	355.87	0.92	-0.33
17	1,603	0.50	0.50	130.00	1602.40	130.00	1602.40	23.50	23.50	-2.25	-2.25	-2.25	-23.50	-23.50	23.60	23.60	354.53	1.87	-0.78
18	1,693	1.00	1.00	122.80	1692.39	122.80	1692.39	22.82	22.82	-1.29	-1.29	-1.29	-22.82	-22.82	22.86	22.86	356.77	0.56	0.56
19	1,787	0.80	0.80	133.50	1786.38	133.50	1786.38	21.92	21.92	-0.12	-0.12	-0.12	-21.92	-21.92	21.92	21.92	359.68	0.28	-0.21
20	1,882	0.70	0.70	162.20	1881.37	162.20	1881.37	20.91	20.91	0.53	0.53	0.53	-20.91	-20.91	20.92	20.92	1.46	0.40	-0.11
21	1,978	0.50	0.50	163.70	1977.36	163.70	1977.36	19.95	19.95	0.83	0.83	0.83	-19.95	-19.95	19.97	19.97	2.39	0.21	-0.21
22	2,073	0.60	0.60	147.80	2072.36	147.80	2072.36	19.14	19.14	1.21	1.21	1.21	-19.13	-19.13	19.17	19.17	3.63	0.19	0.11
23	2,168	0.40	0.40	178.70	2167.36	178.70	2167.36	18.38	18.38	1.49	1.49	1.49	-18.38	-18.38	18.44	18.44	4.62	0.35	-0.21
24	2,262	0.30	0.30	156.00	2261.35	156.00	2261.35	17.83	17.83	1.59	1.59	1.59	-17.83	-17.83	17.90	17.90	5.11	0.18	-0.11
25	2,357	0.10	0.10	299.30	2356.35	299.30	2356.35	17.64	17.64	1.62	1.62	1.62	-17.64	-17.64	17.72	17.72	5.25	0.41	-0.21
26	2,452	0.30	0.30	262.20	2451.35	262.20	2451.35	17.65	17.65	1.30	1.30	1.30	-17.65	-17.65	17.70	17.70	4.22	0.24	0.21
27	2,548	0.60	0.60	260.10	2547.35	260.10	2547.35	17.53	17.53	0.56	0.56	0.56	-17.53	-17.53	17.54	17.54	1.83	0.31	0.31
28	2,642	0.80	0.80	241.70	2641.34	241.70	2641.34	17.13	17.13	-0.50	-0.50	-0.50	-17.13	-17.13	17.14	17.14	358.32	0.32	0.21
29	2,737	0.60	0.60	254.80	2736.34	254.80	2736.34	16.69	16.69	-1.57	-1.57	-1.57	-16.69	-16.69	16.76	16.76	354.63	0.27	-0.21
30	2,832	0.40	0.40	222.20	2831.33	222.20	2831.33	16.31	16.31	-2.27	-2.27	-2.27	-16.32	-16.32	16.47	16.47	352.08	0.36	-0.21
31	2,927	0.50	0.50	186.50	2926.33	186.50	2926.33	15.66	15.66	-2.54	-2.54	-2.54	-15.66	-15.66	15.86	15.86	350.78	0.31	0.11
32	3,021	0.70	0.70	181.50	3020.32	181.50	3020.32	14.67	14.67	-2.60	-2.60	-2.60	-14.68	-14.68	14.90	14.90	349.95	0.22	0.21
33	3,115	0.80	0.80	311.80	3115.32	311.80	3115.32	14.31	14.31	-2.86	-2.86	-2.86	-14.32	-14.32	14.60	14.60	348.69	1.06	-0.32



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Rig:	Orion Phoenix
Job Number:	DDMO-170829
API #:	30-015-44408

Magnetic Declination:	6.92	REFERENCED TO GRID NORTH
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Vertical Section Azimuth:	179.94	Proposed Direction:	179.94
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Survey Calculation Method:	Minimum Curvature
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PTB:	MD	15.478	INC	91.4	TVD	Feet	Azm	Degrees	Inc	Degrees	Depth	Feet

#	Depth	Feet	Inc	Degrees	Azm	Degrees	TVD	Feet	Azm	Degrees	INC	Feet	N/S	Feet	TVD	Feet	E/W	Surface	Vert Sec	N/S	Feet	E/W	Distance	Closure	Azm	DLS/ 100'	BUR/ 100'
34	3,211	0.20			56.20		3210.32	14.63				14.63		-2.97		-14.63											
35	3,306	0.10			136.30		3305.32	14.66				14.66		-2.78		-14.66											
36	3,401	0.20			171.50		3400.32	14.44				14.44		-2.70		-14.44											
37	3,447	0.40			147.30		3446.32	14.22				14.22		-2.60		-14.22											
38	3,589	0.31			110.30		3588.32	13.67				13.67		-1.97		-13.67											
39	3,684	0.22			101.40		3683.32	13.55				13.55		-1.55		-13.55											
40	3,777	0.10			169.00		3776.32	13.43				13.43		-1.36		-13.43											
41	3,872	0.31			93.82		3871.32	13.33				13.33		-1.09		-13.33											
42	3,967	0.40			59.23		3966.31	13.49				13.49		-0.55		-13.49											
43	4,061	0.10			73.02		4060.31	13.68				13.68		-0.19		-13.68											
44	4,156	0.31			48.30		4155.31	13.87				13.87		0.09		-13.87											
45	4,251	0.30			32.50		4250.31	14.25				14.25		0.41		-14.25											
46	4,346	0.31			357.52		4345.31	14.72				14.72		0.53		-14.72											
47	4,441	0.40			299.84		4440.31	15.14				15.14		0.23		-15.14											
48	4,536	0.49			299.53		4535.31	15.51				15.51		-0.41		-15.51											
49	4,631	0.49			336.24		4630.30	16.08				16.08		-0.92		-16.08											
50	4,726	0.71			321.83		4725.30	16.91				16.91		-1.45		-16.91											
51	4,820	0.71			319.80		4819.29	17.82				17.82		-2.19		-17.82											
52	4,916	0.49			311.60		4915.28	18.54				18.54		-2.88		-18.55											
53	5,010	0.88			319.80		5009.28	19.36				19.36		-3.64		-19.36											
54	5,105	0.80			295.21		5104.27	20.20				20.20		-4.71		-20.21											
55	5,199	1.10			282.83		5198.25	20.68				20.68		-6.19		-20.69											
56	5,293	0.88			266.04		5292.24	20.83				20.83		-7.79		-20.84											
57	5,388	0.80			237.83		5387.23	20.43				20.43		-9.08		-20.44											
58	5,483	1.10			232.02		5482.22	19.51				19.51		-10.36		-19.52											
59	5,578	0.80			225.63		5577.20	18.49				18.49		-11.55		-18.50											
60	5,673	1.02			212.01		5672.19	17.31				17.31		-12.47		-17.32											
61	5,768	1.28			207.82		5767.17	15.65				15.65		-13.42		-15.67											
62	5,863	1.19			208.31		5862.15	13.85				13.85		-14.38		-13.86											
63	5,958	1.02			104.80		5957.14	12.76				12.76		-14.03		-12.78											
64	6,052	1.28			102.90		6051.12	12.31				12.31		-12.20		-12.33											
65	6,147	1.28			103.34		6146.10	11.83				11.83		-10.13		-11.84											
66	6,242	1.28			107.83		6241.07	11.26				11.26		-8.09		-11.27											
67	6,336	1.02			103.60		6336.06	10.74				10.74		-6.26		-10.74											



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Rig:	Orion Phoenix
Job Number:	DDMO-170829
API #:	30-015-44408

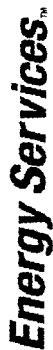
Magnetic Declination: 6.92 REFERENCED TO GRID NORTH

Proposed Direction: 179.94

Vertical Section Azimuth: 179.94

Survey Calculation Method:				Minimum Curvature											
PTB:		MD		INC		AZM		TVD		E/W		VS			
		15,478		91.4		180.9		10732.58		-5008.02					
#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	E/W Feet	Surface Vert Sec	Closure	Distance	Azm	DLS/ 100'	BUR/ 100'			

68	6,432	1.10	122.33	6431.04	10.05	-4.66	-10.06	11.08	335.11	0.37	0.08
69	6,527	1.41	121.01	6526.02	8.96	-2.89	-8.96	9.42	342.12	0.33	0.33
70	6,623	1.59	130.00	6621.98	7.50	-0.86	-7.50	7.55	353.47	0.31	0.19
71	6,717	1.19	56.54	6715.96	7.20	0.95	-7.20	7.26	7.56	1.80	-0.43
72	6,812	1.50	46.32	6810.94	8.60	2.68	-8.60	9.01	17.29	0.41	0.33
73	6,907	1.28	49.62	6905.91	10.15	4.38	-10.14	11.05	23.37	0.25	-0.23
74	7,001	1.02	69.54	6999.89	11.12	5.97	-11.11	12.62	28.23	0.50	-0.28
75	7,096	1.10	76.72	7094.87	11.62	7.65	-11.61	13.91	33.35	0.16	0.08
76	7,191	1.10	285.34	7189.87	12.07	7.66	-12.07	14.30	32.38	2.24	0.00
77	7,286	2.12	287.54	7284.83	12.84	5.10	-12.84	13.82	21.66	1.08	1.07
78	7,381	0.49	274.01	7379.80	13.40	3.02	-13.40	13.74	12.70	1.73	-1.72
79	7,476	0.31	240.92	7474.80	13.31	2.39	-13.30	13.52	10.19	0.30	-0.19
80	7,571	0.80	239.33	7569.79	12.84	1.60	-12.84	12.94	7.08	0.52	0.52
81	7,665	0.49	230.03	7663.79	12.25	0.72	-12.25	12.27	3.38	0.35	-0.33
82	7,761	1.10	265.20	7759.78	11.91	-0.51	-11.91	11.92	357.55	0.79	0.64
83	7,855	0.88	240.33	7853.76	11.48	-2.04	-11.48	11.66	349.94	0.51	-0.23
84	7,950	1.81	252.64	7948.74	10.67	-4.10	-10.67	11.43	338.97	1.02	0.98
85	8,045	1.02	227.61	8043.71	9.65	-6.16	-9.66	11.45	327.45	1.04	-0.83
86	8,140	1.10	333.02	8138.70	9.89	-7.20	-9.90	12.23	323.96	1.78	0.08
87	8,234	2.12	322.62	8232.66	12.08	-8.66	-12.09	14.86	324.35	1.12	1.09
88	8,328	1.99	319.93	8326.60	14.71	-10.77	-14.72	18.23	323.79	0.17	-0.14
89	8,423	1.41	311.43	8421.56	16.74	-12.71	-16.76	21.02	322.81	0.66	-0.61
90	8,518	1.59	315.04	8516.53	18.45	-14.51	-18.47	23.47	321.81	0.21	0.19
91	8,613	1.99	316.23	8611.48	20.57	-16.59	-20.59	26.43	321.13	0.42	0.42
92	8,708	1.59	267.31	8706.44	21.70	-19.04	-21.72	28.87	318.73	1.61	-0.42
93	8,803	1.90	285.12	8801.39	22.05	-21.88	-22.07	31.07	315.22	0.65	0.33
94	8,898	1.68	277.54	8896.35	22.65	-24.78	-22.67	33.57	312.42	0.34	-0.23
95	8,993	1.10	181.51	8991.33	21.92	-26.19	-21.94	34.15	309.93	2.21	-0.61
96	9,088	2.30	161.51	9086.29	19.20	-25.61	-19.22	32.00	306.86	1.39	1.26
97	9,184	1.50	154.50	9182.23	16.24	-24.45	-16.26	29.35	303.58	0.87	-0.83
98	9,279	1.10	161.64	9277.21	14.25	-23.63	-14.27	27.59	301.09	0.45	-0.42
99	9,373	1.68	166.84	9371.18	12.05	-23.03	-12.07	26.00	297.62	0.63	0.62
100	9,469	3.18	173.10	9466.09	8.08	-22.40	-8.10	23.81	289.83	1.60	1.58
101	9,559.99		173.10	9559.99	3.70	-21.78	-3.73	22.09	279.65	1.04	-1.03



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API #:		30-015-44408									
Vertical Section Azimuth:		179.94									
Survey Calculation Method:		Minimum Curvature									
PTB:		MD		INC		AZM		N/S		TVD	
		15,478		91.4		180.9					
#		Depth Feet		Inc Degrees		Azim Degrees		TVD Feet		N/S Feet	
		102		9,657		125.33		9654.94		1.22	
		103		9,751		35.83		9748.92		1.82	
		104		9,846		29.04		9843.87		4.25	
		105		9,940		18.82		9937.84		6.48	
		106		10,035		0.71		10032.83		8.16	
		107		10,130		6.50		10127.64		3.75	
		108		10,224		14.41		10220.01		-12.49	
		109		10,319		22.18		10310.14		-41.37	
		110		10,414		31.29		10394.91		-83.39	
		111		10,508		36.72		10472.89		-135.73	
		112		10,602		45.12		10543.85		-196.99	
		113		10,697		51.22		10607.22		-267.62	
		114		10,792		58.20		10662.07		-345.11	
		115		10,887		66.59		10706.05		-429.20	
		116		11,004		75.90		10743.64		-539.85	
		117		11,035		78.20		10750.59		-570.05	
		118		11,067		81.00		10756.36		-601.51	
		119		11,130		87.20		10762.83		-664.05	
		120		11,224		90.20		10764.97		-757.86	
		121		11,319		91.50		10763.56		-852.79	
		122		11,414		91.80		10760.82		-947.75	
		123		11,508		91.20		10758.36		-1041.68	
		124		11,603		84.70		10761.76		-1136.45	
		125		11,697		84.10		10770.93		-1229.84	
		126		11,792		87.50		10777.89		-1324.51	
		127		11,887		94.00		10776.65		-1419.44	
		128		11,981		93.10		10770.82		-1513.21	
		129		12,076		94.20		10764.78		-1607.96	
		130		12,139		92.70		10760.99		-1670.82	
		131		12,171		90.90		10759.98		-1702.80	
		132		12,265		89.80		10759.41		-1796.79	
		133		12,359		89.30		10760.14		-1890.79	
						89.60		10761.06		-1985.79	
								10761.06		-2079.78	
										Page 4	



Company: RKI Expl & Prod LLC
Well Name: RDX Federal COM 17 45H
Location: Eddy County, NM
Rig: Orion Phoenix
Job Number: DDMO-170829
API #: 30-015-44408

SURVEY CALCULATION PROGRAM

11/28/17 18:13

Magnetic Declination: 6.92
REFERENCED TO GRID NORTH

Vertical Section Azimuth: 179.94
Proposed Direction: 179.94

Survey Calculation Method:					Minimum Curvature						
PTB:	MD		INC	AZM		TVD	N/S	E/W	VS		
	15.478			180.9							
#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	E/W Feet	Surface Vert Sec	Closure Distance	Azm	DLS/ 100	BUR/ 100'
136	12,643	91.10	179.90	10759.81	-2174.78	-35.31	2174.74	2175.06	180.93	0.74	0.74
137	12,738	90.60	179.30	10758.40	-2269.76	-34.65	2269.72	2270.03	180.87	0.82	-0.53
138	12,832	90.50	179.10	10757.50	-2363.75	-33.34	2363.71	2363.98	180.81	0.24	-0.11
139	12,927	89.70	179.10	10757.34	-2458.74	-31.84	2458.70	2458.94	180.74	0.84	-0.84
140	13,022	90.60	179.40	10757.09	-2553.73	-30.60	2553.69	2553.91	180.69	1.00	0.95
141	13,117	93.60	180.70	10753.61	-2648.65	-30.68	2648.62	2648.83	180.66	3.44	3.16
142	13,212	94.00	181.10	10747.31	-2743.43	-32.17	2743.39	2743.62	180.67	0.59	0.42
143	13,307	90.80	180.80	10743.33	-2838.32	-33.74	2838.28	2838.52	180.68	3.38	-3.37
144	13,402	84.60	179.50	10747.14	-2933.19	-33.99	2933.16	2933.39	180.66	6.67	-6.53
145	13,497	86.40	179.30	10754.60	-3027.89	-33.00	3027.86	3028.07	180.62	1.91	1.89
146	13,591	89.50	180.20	10757.96	-3121.82	-32.59	3121.78	3121.99	180.60	3.43	3.30
147	13,686	90.30	180.40	10758.12	-3216.82	-33.09	3216.78	3216.99	180.59	0.87	0.84
148	13,780	90.00	180.60	10757.88	-3310.81	-33.91	3310.78	3310.99	180.59	0.38	-0.32
149	13,875	89.70	180.90	10758.13	-3405.80	-35.15	3405.77	3405.99	180.59	0.45	-0.32
150	13,970	89.80	181.20	10758.54	-3500.79	-36.90	3500.75	3500.98	180.60	0.33	0.11
151	14,064	90.40	181.90	10758.38	-3594.75	-39.44	3594.71	3594.97	180.63	0.98	0.64
152	14,159	90.80	181.20	10757.38	-3689.71	-42.01	3689.66	3689.95	180.65	0.85	0.42
153	14,253	92.50	180.80	10754.68	-3783.65	-43.65	3783.61	3783.91	180.66	1.86	1.81
154	14,347	93.20	180.60	10750.00	-3877.53	-44.79	3877.48	3877.79	180.66	0.77	0.74
155	14,443	93.50	180.20	10744.39	-3973.36	-45.46	3973.31	3973.62	180.66	0.52	0.31
156	14,537	92.40	180.10	10739.56	-4067.24	-45.71	4067.19	4067.49	180.64	1.18	-1.17
157	14,632	90.50	180.40	10737.15	-4162.20	-46.12	4162.15	4162.46	180.63	2.02	-2.00
158	14,726	90.90	178.60	10736.00	-4256.19	-45.30	4256.14	4256.43	180.61	1.96	0.43
159	14,821	91.20	178.40	10734.26	-4351.14	-42.82	4351.09	4351.35	180.56	0.38	0.32
160	14,915	89.40	178.80	10733.77	-4445.10	-40.52	4445.06	4445.29	180.52	1.96	-1.91
161	15,010	89.60	179.20	10734.60	-4540.09	-38.86	4540.04	4540.25	180.49	0.47	0.21
162	15,104	89.30	179.20	10735.50	-4634.07	-37.55	4634.03	4634.22	180.46	0.32	-0.32
163	15,199	89.90	180.00	10736.16	-4729.07	-36.89	4729.03	4729.21	180.45	1.05	0.63
164	15,293	90.60	180.60	10735.75	-4823.06	-37.38	4823.02	4823.21	180.44	0.98	0.74
165	15,387	90.80	180.80	10734.61	-4917.05	-38.53	4917.01	4917.20	180.45	0.30	0.21
166	15,425	91.40	180.90	10733.88	-4955.04	-39.09	4954.99	4955.19	180.45	1.60	1.58