

Encana Oil & Gas  
 Precision 209  
 J & A Associates 1-11H

M.W.D. OPERATOR: Kenney H. / Shawn F..  
 DIRECTIONAL DRILLERS: Richard Snider / Billy Spurgeon

Magnetic Declination:	6.3
Job #:	DR1206099
Vertical Section Azimuth	180.83

Minimum Curvature Calculation

No.	Survey Depth	INC	AZM	TVD	N-S	E-W	Vertical Section	DLS/100
Tie	1355	1.59	81.07	1354.80	0.67	15.02	0.67	0.89
1	1394	1.4	60.3	1393.79	0.99	15.97	-1.22	1.46
2	1485	0.8	77.6	1484.77	1.68	17.55	-1.93	0.75
3	1575	0.7	76.7	1574.76	1.94	18.70	-2.21	0.11
4	1666	0.6	82.8	1665.76	2.13	19.72	-2.41	0.13
5	1756	0.8	102.3	1755.75	2.05	20.80	-2.35	0.34
6	1846	0.7	113.9	1845.74	1.69	21.91	-2.01	0.20
7	1937	0.8	103.3	1936.73	1.32	23.04	-1.66	0.19
8	2027	0.7	157.0	2026.73	0.67	23.87	-1.02	0.76
9	2117	0.7	171.7	2116.72	-0.38	24.16	0.03	0.20
10	2208	0.6	207.3	2207.72	-1.35	24.02	1.00	0.45
11	2298	0.5	233.9	2297.71	-2.00	23.49	1.66	0.30
12	2389	0.6	239.6	2388.71	-2.48	22.76	2.15	0.13
13	2479	0.5	246.6	2478.70	-2.87	21.99	2.55	0.13
14	2570	0.5	206.7	2569.70	-3.38	21.45	3.07	0.37
15	2660	0.2	263.5	2659.70	-3.75	21.12	3.44	0.47
16	2750	0.1	118.7	2749.70	-3.81	21.03	3.50	0.32
17	2841	0.6	163.6	2840.70	-4.30	21.23	3.99	0.59
18	2931	0.4	186.6	2930.69	-5.07	21.33	4.76	0.31
19	3021	0.1	74.0	3020.69	-5.36	21.37	5.05	0.50
20	3112	0.2	44.4	3111.69	-5.22	21.56	4.91	0.14
21	3202	0.2	119.9	3201.69	-5.19	21.80	4.87	0.27
22	3292	0.2	113.1	3291.69	-5.33	22.08	5.01	0.03
23	3338	1.1	197.1	3337.69	-5.78	22.03	5.46	2.39
24	3383	4.1	179.2	3382.64	-7.80	21.92	7.48	6.83
25	3428	6.9	182.2	3427.43	-12.11	21.84	11.80	6.25
26	3474	9.9	183.1	3472.93	-18.82	21.52	18.51	6.53
27	3519	12.4	185.2	3517.07	-27.50	20.87	27.19	5.63
28	3564	16.1	184.6	3560.68	-38.54	19.94	38.24	8.23
29	3609	19.9	183.6	3603.47	-52.40	18.95	52.12	8.47
30	3654	22.8	182.4	3645.38	-68.76	18.11	68.49	6.52
31	3699	25.8	181.9	3686.39	-87.26	17.42	87.00	6.68
32	3745	28.7	181.6	3727.28	-108.31	16.78	108.06	6.31
33	3790	31.7	182.0	3766.17	-130.94	16.06	130.69	6.68
34	3835	34.7	182.0	3803.82	-155.56	15.20	155.32	6.67
35	3880	37.1	182.0	3840.27	-181.93	14.28	181.70	5.33



Encana Oil & Gas  
Precision 209  
J & A Associates 1-11H

M.W.D. OPERATOR: Kenney H. / Shawn F..  
DIRECTIONAL DRILLERS: Richard Snider / Billy Spurgeon

Magnetic Declination:	6.3
Job #:	DR1206099
Vertical Section Azimuth	180.83

Minimum Curvature Calculation

No.	Survey Depth	INC	AZM	TVD	N-S	E-W	Vertical Section	DLS/100
36	3925	39.5	183.0	3875.58	-209.79	13.06	209.58	5.51
37	3971	42.8	183.2	3910.21	-240.01	11.42	239.82	7.18
38	4016	45.8	181.9	3942.41	-271.40	10.03	271.23	6.97
39	4061	48.5	181.3	3973.02	-304.38	9.12	304.21	6.08
40	4106	51.6	181.2	4001.91	-338.86	8.36	338.71	6.89
41	4152	55.1	181.8	4029.36	-375.75	7.39	375.60	7.68
42	4197	59.6	181.3	4053.63	-413.61	6.37	413.48	10.04
43	4242	61.6	180.8	4075.72	-452.81	5.66	452.68	4.55
44	4287	61.4	180.9	4097.19	-492.35	5.07	492.23	0.49
45	4332	61.0	180.3	4118.87	-531.78	4.66	531.66	1.47
46	4377	60.8	180.5	4140.76	-571.10	4.38	570.98	0.59
47	4422	61.4	181.4	4162.51	-610.49	3.73	610.37	2.20
48	4468	65.2	183.2	4183.17	-651.54	2.07	651.45	8.97
49	4513	69.9	184.1	4200.35	-693.04	-0.58	692.97	10.61
50	4558	74.8	184.3	4213.99	-735.79	-3.73	735.77	10.90
51	4603	79.6	184.7	4223.96	-779.52	-7.17	779.55	10.70
52	4648	83.1	184.6	4230.73	-823.86	-10.77	823.93	7.78
53	4658	83.9	184.0	4231.86	-833.77	-11.52	833.85	9.98
54	4722	85.9	181.9	4237.55	-897.42	-14.80	897.54	4.52
55	4754	85.5	181.8	4239.95	-929.31	-15.83	929.45	1.29
56	4786	86.7	181.4	4242.12	-961.23	-16.72	961.37	3.95
57	4817	88.5	181.3	4243.42	-992.19	-17.45	992.34	5.82
58	4849	89.9	181.0	4243.87	-1024.18	-18.09	1024.33	4.47
59	4881	90.3	181.2	4243.81	-1056.17	-18.71	1056.33	1.40
60	4912	91.1	181.4	4243.43	-1087.16	-19.41	1087.33	2.66
61	4944	90.5	180.2	4242.99	-1119.16	-19.86	1119.33	4.19
62	4976	91.2	180.4	4242.51	-1151.15	-20.02	1151.32	2.28
63	5007	90.6	179.7	4242.03	-1182.15	-20.05	1182.31	2.97
64	5039	89.7	179.9	4241.94	-1214.15	-19.94	1214.31	2.88
65	5071	87.9	180.1	4242.61	-1246.14	-19.94	1246.30	5.66
66	5102	87.5	180.2	4243.86	-1277.11	-20.02	1277.27	1.33
67	5134	88.3	179.8	4245.03	-1309.09	-20.02	1309.24	2.79
68	5165	89.8	179.6	4245.54	-1340.09	-19.86	1340.23	4.88
69	5197	89.7	179.1	4245.68	-1372.08	-19.49	1372.22	1.59
70	5228	90.2	178.4	4245.71	-1403.08	-18.82	1403.20	2.77
71	5260	90.6	178.3	4245.49	-1435.06	-17.90	1435.17	1.29



Survey Calculation Program

Encana Oil & Gas  
Precision 209  
J & A Associates 1-11H

M.W.D. OPERATOR: Kenney H. / Shawn F..  
DIRECTIONAL DRILLERS: Richard Snider / Billy Spurgeon

Magnetic Declination:	6.3
Job #:	DR1206099
Vertical Section Azimuth	180.83

Minimum Curvature Calculation

No.	Survey Depth	INC	AZM	TVD	N-S	E-W	Vertical Section	DLS/100
72	5291	90.8	179.2	4245.11	-1466.05	-17.22	1466.15	2.97
73	5323	90.9	178.8	4244.63	-1498.04	-16.66	1498.13	1.29
74	5355	90.5	178.9	4244.24	-1530.03	-16.02	1530.11	1.29
75	5386	90.5	179.3	4243.97	-1561.03	-15.53	1561.09	1.29
76	5418	89.1	179.3	4244.08	-1593.03	-15.14	1593.08	4.38
77	5450	89.4	179.3	4244.50	-1625.02	-14.75	1625.06	0.94
78	5481	90.2	179.0	4244.61	-1656.02	-14.29	1656.05	2.76
79	5513	90.2	178.7	4244.50	-1688.01	-13.65	1688.03	0.94
80	5544	90.5	180.4	4244.31	-1719.01	-13.41	1719.02	5.57
81	5576	90.3	180.4	4244.09	-1751.01	-13.63	1751.02	0.63
82	5610	88.9	180.2	4244.32	-1785.00	-13.81	1785.02	4.16
83	5641	89.2	179.7	4244.84	-1816.00	-13.78	1816.01	1.88
84	5672	88.9	180.3	4245.35	-1847.00	-13.78	1847.00	2.16
85	5702	90.2	180.8	4245.59	-1876.99	-14.07	1877.00	4.64
86	5733	90.4	184.7	4245.42	-1907.95	-15.55	1907.98	12.60
87	5763	91.4	185.0	4244.95	-1937.84	-18.09	1937.90	3.48
88	5794	90.2	185.6	4244.52	-1968.70	-20.95	1968.80	4.33
89	5825	89.8	184.6	4244.52	-1999.58	-23.71	1999.71	3.47
90	5855	89.5	183.0	4244.70	-2029.51	-25.70	2029.67	5.43
91	5886	89.0	182.7	4245.11	-2060.47	-27.24	2060.65	1.88
92	5916	88.1	181.9	4245.87	-2090.44	-28.44	2090.63	4.01
93	5947	86.0	180.0	4247.46	-2121.39	-28.96	2121.58	9.13
94	5978	86.5	180.3	4249.49	-2152.32	-29.04	2152.52	1.88
95	6008	86.8	180.8	4251.24	-2182.27	-29.32	2182.46	1.94
96	6039	85.0	180.1	4253.46	-2213.19	-29.57	2213.38	6.23
97	6069	85.8	180.2	4255.87	-2243.09	-29.65	2243.28	2.69
98	6100	85.1	179.1	4258.33	-2273.99	-29.46	2274.18	4.20
99	6130	86.3	179.6	4260.58	-2303.90	-29.12	2304.08	4.33
100	6161	88.0	179.9	4262.12	-2334.86	-28.98	2335.04	5.57
101	6191	89.5	179.6	4262.77	-2364.86	-28.85	2365.03	5.10
102	6222	89.7	178.3	4262.99	-2395.85	-28.28	2396.01	4.24
103	6252	90.0	178.3	4263.07	-2425.84	-27.39	2425.98	1.00
104	6284	91.0	178.8	4262.79	-2457.82	-26.58	2457.95	3.49
105	6316	93.6	179.1	4261.50	-2489.79	-26.00	2489.91	8.18
106	6347	94.1	179.0	4259.42	-2520.72	-25.49	2520.82	1.64
107	6379	94.6	178.6	4256.99	-2552.62	-24.82	2552.71	2.00



Survey Calculation Program

Encana Oil & Gas  
Precision 209  
J & A Associates 1-11H

M.W.D. OPERATOR: Kenney H. / Shawn F..  
DIRECTIONAL DRILLERS: Richard Snider / Billy Spurgeon

Magnetic Declination:	6.3
Job #:	DR1206099
Vertical Section Azimuth	180.83

Minimum Curvature Calculation

No.	Survey Depth	INC	AZM	TVD	N-S	E-W	Vertical Section	DLS/100
108	6410	94.2	180.1	4254.62	-2583.52	-24.47	2583.61	4.99
109	6442	93.6	181.0	4252.44	-2615.45	-24.77	2615.53	3.37
110	6474	93.9	180.3	4250.35	-2647.38	-25.14	2647.46	2.38
111	6505	92.3	181.3	4248.67	-2678.33	-25.57	2678.41	6.08
112	6537	91.3	182.0	4247.66	-2710.30	-26.49	2710.39	3.81
113	6569	91.0	181.8	4247.02	-2742.27	-27.55	2742.38	1.13
114	6600	90.8	182.0	4246.54	-2773.25	-28.58	2773.37	0.91
115	6631	91.2	181.6	4245.99	-2804.23	-29.55	2804.36	1.82
116	6664	91.1	181.0	4245.33	-2837.22	-30.30	2837.36	1.84
117	6695	89.7	181.3	4245.12	-2868.21	-30.92	2868.35	4.62
118	6727	88.5	180.7	4245.62	-2900.20	-31.48	2900.35	4.19
119	6758	88.4	180.7	4246.46	-2931.18	-31.86	2931.34	0.32
120	6790	89.8	181.3	4246.96	-2963.17	-32.42	2963.33	4.76
121	6821	90.1	181.1	4246.99	-2994.17	-33.07	2994.33	1.16
122	6853	90.2	180.9	4246.90	-3026.16	-33.62	3026.33	0.70
123	6885	90.3	180.9	4246.76	-3058.16	-34.13	3058.33	0.31
124	6916	90.7	180.5	4246.49	-3089.15	-34.51	3089.33	1.82
125	6948	90.9	180.5	4246.05	-3121.15	-34.79	3121.33	0.63
126	6979	89.6	180.8	4245.91	-3152.15	-35.14	3152.33	4.30
127	7011	89.8	181.1	4246.08	-3184.14	-35.67	3184.32	1.13
128	7043	90.0	181.0	4246.13	-3216.14	-36.25	3216.32	0.70
129	7074	90.5	180.7	4246.00	-3247.13	-36.71	3247.32	1.88
130	7106	90.4	180.3	4245.75	-3279.13	-36.99	3279.32	1.29
131	7138	90.4	179.9	4245.52	-3311.13	-37.05	3311.32	1.25
132	7169	90.9	179.8	4245.17	-3342.13	-36.97	3342.31	1.64
133	7201	91.1	179.3	4244.61	-3374.12	-36.72	3374.30	1.68
134	7233	90.9	179.9	4244.06	-3406.12	-36.49	3406.29	1.98
135	7264	90.1	178.9	4243.78	-3437.11	-36.17	3437.28	4.13
136	7296	90.5	179.0	4243.62	-3469.11	-35.58	3469.26	1.29
137	7328	90.0	179.9	4243.48	-3501.10	-35.28	3501.25	3.22
138	7359	88.8	180.0	4243.80	-3532.10	-35.25	3532.24	3.88
139	7391	89.0	179.8	4244.42	-3564.10	-35.19	3564.23	0.88
140	7422	89.0	181.1	4244.96	-3595.09	-35.44	3595.23	4.19
141	7454	88.8	180.3	4245.57	-3627.08	-35.83	3627.22	2.58
142	7486	88.9	180.4	4246.21	-3659.07	-36.02	3659.21	0.44
143	7517	89.8	181.8	4246.57	-3690.07	-36.62	3690.21	5.37



Survey Calculation Program

Encana Oil & Gas  
Precision 209  
J & A Associates 1-11H

M.W.D. OPERATOR: Kenney H. / Shawn F..  
DIRECTIONAL DRILLERS: Richard Snider / Billy Spurgeon

Magnetic Declination:	6.3
Job #:	DR1206099
Vertical Section Azimuth	180.83

Minimum Curvature Calculation

No.	Survey Depth	INC	AZM	TVD	N-S	E-W	Vertical Section	DLS/100
144	7549	90.4	182.1	4246.51	-3722.05	-37.71	3722.20	2.10
145	7580	90.6	182.1	4246.24	-3753.02	-38.84	3753.19	0.65
146	7612	90.5	181.8	4245.93	-3785.00	-39.93	3785.19	0.99
147	7644	90.6	182.4	4245.63	-3816.98	-41.10	3817.18	1.90
148	7675	90.4	182.4	4245.35	-3847.95	-42.40	3848.16	0.65
149	7707	90.0	182.3	4245.24	-3879.93	-43.71	3880.15	1.29
150	7739	89.0	182.2	4245.52	-3911.90	-44.97	3912.14	3.14
151	7770	88.4	182.6	4246.23	-3942.86	-46.27	3943.12	2.33
152	7802	89.6	182.2	4246.78	-3974.83	-47.61	3975.10	3.95
153	7834	90.3	181.8	4246.81	-4006.81	-48.72	4007.10	2.52
154	7865	90.9	181.8	4246.49	-4037.79	-49.70	4038.09	1.94
155	7897	90.9	181.4	4245.98	-4069.78	-50.59	4070.08	1.25
156	7928	90.4	181.9	4245.63	-4100.76	-51.48	4101.08	2.28
157	7960	90.1	181.8	4245.49	-4132.75	-52.52	4133.07	0.99
158	7991	90.3	182.1	4245.38	-4163.73	-53.57	4164.07	1.16
159	8023	90.4	182.2	4245.19	-4195.70	-54.77	4196.06	0.44
160	8055	90.0	182.3	4245.08	-4227.68	-56.03	4228.05	1.29
161	8086	89.4	182.5	4245.24	-4258.65	-57.33	4259.03	2.04
162	8118	89.3	182.4	4245.60	-4290.62	-58.69	4291.02	0.44
163	8149	89.7	182.7	4245.87	-4321.59	-60.07	4322.00	1.61
164	8181	90.0	182.1	4245.96	-4353.56	-61.41	4353.99	2.10
165	8213	90.7	182.0	4245.76	-4385.54	-62.56	4385.98	2.21
166	8244	91.1	182.4	4245.28	-4416.51	-63.75	4416.97	1.82
167	8307	91.4	183.0	4243.90	-4479.43	-66.71	4479.92	1.06
168	8339	90.3	182.9	4243.43	-4511.38	-68.36	4511.90	3.45
169	8371	90.0	183.4	4243.34	-4543.33	-70.12	4543.87	1.82
170	8403	90.1	183.0	4243.31	-4575.28	-71.91	4575.84	1.29
171	8434	90.2	183.2	4243.23	-4606.24	-73.58	4606.82	0.72
172	8466	90.5	183.5	4243.04	-4638.18	-75.45	4638.79	1.33
173	8498	90.7	183.0	4242.70	-4670.13	-77.27	4670.76	1.68
174	8518	91.2	183.6	4242.37	-4690.09	-78.42	4690.73	3.90
PTB	8565	91.2	183.6	4241.39	-4736.99	-81.37	4737.67	0.00