

# DIRECTIONAL SURVEY CALCULATION

## MINIMUM CURVATURE METHOD

Well Name		Target Direction		Slot	N / S	E / W	Hole Size	Calculation by		Date
Eley 3025 1-1H		180.35		Coordinate						2/12/13
Job Number		Type of Survey		Tie-in Point				Directional Co.		
0										
Measured Depth	Hole Angle	Hole Direction	Course Length	True Vertical Depth	Vertical Section	Total Coordinate		Dogleg Severity	Build Up °/100 ft	Walk/ °/100 ft
						N + / S -	E + / W -			
0	0	0	0	0.00	0.00			<< TIE-IN POINT >>		
1441	1	238	1441	1,440.94	6.02	-5.96	-9.62	0.06	0.06	16.53
1898	1	266	457	1,897.91	8.09	-8.00	-14.66	0.11	-0.09	6.02
2355	0	164	457	2,354.90	9.02	-8.92	-16.43	0.13	-0.07	-22.23
2812	1	212	457	2,811.89	11.49	-11.38	-17.26	0.09	0.07	10.42
3268	0	164	456	3,267.88	14.33	-14.22	-17.97	0.08	-0.04	-10.50
3725	0	180	457	3,724.88	15.88	-15.77	-17.64	0.05	-0.04	3.59
4181	0	63	456	4,180.88	15.72	-15.62	-16.58	0.08	0.04	-25.75
4334	0	59	153	4,333.87	15.26	-15.17	-15.76	0.07	0.07	-2.29
4365	2	157	31	4,364.87	15.66	-15.56	-15.48	6.12	4.52	315.48
4395	5	168	30	4,394.81	17.34	-17.25	-15.03	10.50	10.33	36.00
4426	8	172	31	4,425.63	20.66	-20.58	-14.48	8.85	8.71	14.52
4456	10	173	30	4,455.28	25.16	-25.08	-13.92	7.35	7.33	3.33
4486	12	174	30	4,484.74	30.78	-30.69	-13.33	7.03	7.00	3.33
4517	14	176	31	4,514.96	37.67	-37.59	-12.74	6.53	6.45	4.52
4547	16	177	30	4,543.94	45.39	-45.31	-12.28	7.10	7.00	4.67
4578	18	178	31	4,573.57	54.49	-54.42	-11.93	7.19	7.10	3.87
4608	20	179	30	4,601.94	64.23	-64.16	-11.69	5.01	5.00	1.00
4639	21	179	31	4,630.98	75.08	-75.01	-11.43	5.16	5.16	-0.32
4669	23	177	30	4,658.77	86.36	-86.29	-11.02	5.58	5.33	-4.33
4700	24	177	31	4,687.18	98.75	-98.69	-10.39	4.55	4.52	-1.29
4730	26	179	30	4,714.31	111.53	-111.47	-9.89	6.73	6.33	5.33
4761	27	179	31	4,742.01	125.45	-125.40	-9.63	3.48	3.23	2.90
4791	29	182	30	4,768.53	139.47	-139.41	-9.79	5.72	4.33	8.00
4821	30	183	30	4,794.69	154.14	-154.08	-10.34	5.45	5.33	2.33
4852	31	181	31	4,821.34	169.98	-169.92	-10.79	5.04	4.19	-5.48
4882	33	180	30	4,846.75	185.92	-185.86	-10.84	5.13	4.67	-4.00
4913	35	178	31	4,872.51	203.16	-203.10	-10.54	6.80	6.45	-3.87
4943	37	179	30	4,896.81	220.74	-220.69	-10.06	7.34	7.33	0.33
4973	39	178	30	4,920.53	239.10	-239.04	-9.48	5.15	5.00	-2.00
5004	40	179	31	4,944.46	258.78	-258.73	-8.88	6.29	6.13	2.26
5034	42	179	30	4,967.04	278.53	-278.49	-8.52	5.55	5.33	2.33
5065	43	179	31	4,989.87	299.49	-299.45	-8.21	3.61	3.55	-0.97
5095	45	179	30	5,011.43	320.34	-320.30	-7.83	6.34	6.33	-0.33
5126	47	179	31	5,032.99	342.62	-342.58	-7.40	6.13	6.13	0.00
5156	48	179	30	5,053.27	364.71	-364.67	-6.98	3.67	3.67	0.00
5186	49	180	30	5,073.19	387.14	-387.10	-6.72	3.48	2.67	3.00
5217	49	179	31	5,093.55	410.51	-410.48	-6.50	1.96	0.97	-2.26
5247	49	179	30	5,113.25	433.13	-433.10	-6.18	1.12	-1.00	0.67
5278	49	179	31	5,133.73	456.40	-456.37	-5.90	0.97	-0.97	0.00
5308	48	179	30	5,153.71	478.78	-478.75	-5.57	1.83	-1.67	-1.00
5339	49	179	31	5,174.31	501.94	-501.91	-5.20	2.31	2.26	0.65
5369	51	179	30	5,193.65	524.86	-524.84	-4.90	7.67	7.67	0.33
5399	54	180	30	5,211.93	548.64	-548.62	-4.66	9.68	9.67	0.67
5430	58	180	31	5,229.38	574.26	-574.24	-4.55	12.01	11.94	1.61
5460	62	181	30	5,244.56	600.13	-600.11	-4.87	13.93	13.33	4.67
5491	65	181	31	5,258.39	627.86	-627.84	-5.50	12.27	12.26	-0.65
5521	69	180	30	5,269.94	655.54	-655.52	-5.86	13.29	13.00	-3.00
5552	73	180	31	5,279.85	684.91	-684.88	-5.85	13.35	13.23	-1.94
5582	78	180	30	5,287.38	713.94	-713.91	-5.75	13.68	13.67	0.67
5612	81	181	30	5,292.93	743.41	-743.39	-5.86	12.49	12.33	2.00
5643	86	181	31	5,296.52	774.20	-774.17	-6.18	13.89	13.87	0.65
5657	88	181	14	5,297.37	788.17	-788.15	-6.33	14.36	14.29	-1.43
5743	92	181	86	5,297.82	874.15	-874.12	-7.38	5.14	5.12	0.47
5774	92	181	31	5,296.79	905.13	-905.10	-7.78	0.97	0.00	-0.97
5806	92	180	32	5,295.82	937.11	-937.08	-8.01	1.56	-0.94	-1.25
5837	90	180	31	5,295.30	968.11	-968.08	-8.01	4.39	-4.19	-1.29
5869	90	180	32	5,295.30	1,000.11	-1,000.08	-7.81	2.10	-1.87	-0.94

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Well Name		Target Direction		Slot	N / S	E / W	Hole Size	Calculation by		Date
Eley 3025 1-1H		180.35		Coordinate						2/12/13
Job Number		Type of Survey		Tie-in Point				Directional Co.		
0										
Measured Depth	Hole Angle	Hole Direction	Course Length	True Vertical Depth	Vertical Section	Total Coordinate		Dogleg Severity	Build Up %/100 ft	Walk/ %/100 ft
						N + / S -	E + / W -			
0	0	0	0	0.00	0.00					<< TIE-IN POINT >>
5900	89	180	31	5,295.68	1,031.10	-1,031.07	-7.62	2.76	-2.58	0.97
5932	88	180	32	5,296.57	1,063.09	-1,063.06	-7.57	3.19	-3.13	0.62
5963	87	181	31	5,297.87	1,094.06	-1,094.03	-7.75	2.97	-1.94	2.26
5995	87	181	32	5,299.44	1,126.02	-1,125.99	-8.31	1.97	-0.63	1.88
6026	88	181	31	5,300.87	1,156.98	-1,156.95	-8.83	2.77	1.61	-2.26
6058	88	181	32	5,302.01	1,188.96	-1,188.93	-9.16	2.19	2.19	0.00
6089	87	181	31	5,303.31	1,219.93	-1,219.90	-9.65	4.91	-4.52	1.94
6121	87	181	32	5,305.07	1,251.88	-1,251.84	-10.18	1.59	-0.31	-1.56
6152	87	181	31	5,306.72	1,282.84	-1,282.80	-10.55	0.97	0.97	0.00
6184	88	181	32	5,308.20	1,314.80	-1,314.76	-11.03	1.82	1.56	0.94
6215	88	181	31	5,309.50	1,345.77	-1,345.73	-11.43	1.61	0.00	-1.61
6247	88	180	32	5,310.75	1,377.75	-1,377.70	-11.63	1.33	0.94	-0.94
6278	89	181	31	5,311.73	1,408.73	-1,408.69	-11.85	2.33	1.94	1.29
6310	90	181	32	5,312.29	1,440.73	-1,440.68	-12.15	3.14	3.13	-0.31
6341	90	180	31	5,312.45	1,471.73	-1,471.68	-12.23	2.60	1.29	-2.26
6373	91	180	32	5,312.34	1,503.73	-1,503.68	-12.12	1.87	1.87	0.00
6404	91	180	31	5,311.85	1,534.72	-1,534.68	-12.07	2.66	2.58	0.65
6436	90	180	32	5,311.43	1,566.72	-1,566.67	-12.01	3.49	-3.44	-0.62
6467	89	180	31	5,311.59	1,597.72	-1,597.67	-12.01	3.47	-3.23	1.29
6498	90	180	31	5,311.86	1,628.71	-1,628.67	-12.07	2.04	1.94	-0.65
6530	91	180	32	5,311.75	1,660.71	-1,660.67	-12.09	2.52	2.50	0.31
6561	91	180	31	5,311.27	1,691.71	-1,691.67	-12.23	2.16	1.94	0.97
6593	90	180	32	5,310.82	1,723.71	-1,723.66	-12.37	2.67	-2.50	-0.94
6624	90	181	31	5,310.79	1,754.71	-1,754.66	-12.56	2.77	-2.26	1.61
6656	90	180	32	5,310.96	1,786.70	-1,786.66	-12.78	1.25	0.00	-1.25
6687	90	180	31	5,311.07	1,817.70	-1,817.66	-12.84	0.91	0.65	-0.65
6719	90	180	32	5,311.07	1,849.70	-1,849.66	-12.75	1.13	0.62	-0.94
6750	91	179	31	5,310.88	1,880.70	-1,880.66	-12.35	3.32	1.61	-2.90
6782	91	178	32	5,310.35	1,912.67	-1,912.64	-11.43	3.56	2.19	-2.81
6813	92	178	31	5,309.48	1,943.64	-1,943.61	-10.43	2.52	1.94	1.61
6845	91	178	32	5,308.62	1,975.61	-1,975.58	-9.53	2.19	-2.19	0.00
6876	91	179	31	5,308.16	2,006.59	-2,006.57	-8.77	2.60	-2.26	1.29
6908	90	180	32	5,308.10	2,038.58	-2,038.57	-8.38	4.00	-2.50	3.13
6939	90	180	31	5,308.21	2,069.58	-2,069.57	-8.22	0.91	0.65	-0.65
6971	90	180	32	5,308.18	2,101.58	-2,101.57	-8.05	1.13	0.94	0.63
7002	91	179	31	5,307.91	2,132.57	-2,132.56	-7.76	2.97	1.94	-2.26
7034	92	179	32	5,307.24	2,164.56	-2,164.55	-7.28	2.52	2.50	0.31
7065	91	180	31	5,306.56	2,195.55	-2,195.54	-6.98	2.77	-2.26	1.61
7097	90	180	32	5,306.37	2,227.54	-2,227.54	-6.84	3.45	-3.44	0.31
7128	90	180	31	5,306.42	2,258.54	-2,258.54	-6.76	0.72	0.65	0.32
7160	91	180	32	5,306.25	2,290.54	-2,290.54	-6.62	2.10	1.87	-0.94
7191	90	180	31	5,306.01	2,321.54	-2,321.54	-6.46	1.16	-0.97	0.65
7222	89	180	31	5,306.09	2,352.53	-2,352.54	-6.27	3.06	-2.90	-0.97
7254	89	180	32	5,306.51	2,384.53	-2,384.54	-6.22	2.67	-0.94	2.50
7285	89	180	31	5,306.92	2,415.53	-2,415.53	-6.22	2.16	0.97	-1.94
7317	90	180	32	5,307.03	2,447.53	-2,447.53	-6.13	2.67	2.50	0.94
7348	90	181	31	5,306.95	2,478.52	-2,478.53	-6.30	1.96	-0.32	1.94
7380	90	181	32	5,307.00	2,510.52	-2,510.53	-6.74	1.77	-1.25	1.25
7411	89	182	31	5,307.36	2,541.52	-2,541.52	-7.45	2.97	-2.26	1.94
7443	89	182	32	5,307.91	2,573.51	-2,573.50	-8.31	0.31	0.00	-0.31
7474	90	182	31	5,308.21	2,604.50	-2,604.49	-9.12	2.90	2.90	0.00
7506	91	182	32	5,308.07	2,636.49	-2,636.48	-10.02	2.28	2.19	0.62
7537	90	182	31	5,307.91	2,667.47	-2,667.46	-11.12	2.97	-1.94	2.26
7569	90	183	32	5,308.02	2,699.44	-2,699.41	-12.74	3.37	-1.25	3.13
7600	89	184	31	5,308.54	2,730.39	-2,730.35	-14.61	3.56	-3.55	0.32
7632	89	183	32	5,309.26	2,762.34	-2,762.29	-16.51	1.40	1.25	-0.62
7695	90	183	63	5,310.14	2,825.26	-2,825.19	-19.97	1.06	0.95	-0.48

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Job Number		Type of Survey		Tie-in Point				Directional Co.		
0										
Measured Depth	Hole Angle	Hole Direction	Course Length	True Vertical Depth	Vertical Section	Total Coordinate		Dogleg Severity	Build Up °/100 ft	Walk/ °/100 ft
						N + / S -	E + / W -			
0	0	0	0	0.00	0.00			<< TIE-IN POINT >>		
7726	90	183	31	5,310.30	2,856.23	-2,856.15	-21.48	1.82	1.29	-1.29
7757	90	183	31	5,310.28	2,887.20	-2,887.12	-22.91	1.02	0.97	0.32
7789	91	182	32	5,309.97	2,919.18	-2,919.09	-24.14	3.81	2.19	-3.13
7820	90	182	31	5,309.70	2,950.17	-2,950.08	-25.09	2.60	-2.58	0.32
7852	89	182	32	5,309.92	2,982.16	-2,982.06	-26.15	3.19	-3.13	0.62
7883	89	182	31	5,310.46	3,013.14	-3,013.03	-27.23	0.65	-0.65	0.00
7915	89	182	32	5,310.99	3,045.13	-3,045.01	-28.35	0.94	0.94	0.00
7946	89	181	31	5,311.37	3,076.11	-3,075.99	-29.24	2.35	0.65	-2.26
7978	90	181	32	5,311.60	3,108.11	-3,107.98	-29.97	1.25	1.25	0.00
8009	91	181	31	5,311.51	3,139.10	-3,138.98	-30.67	2.26	2.26	0.00
8041	91	181	32	5,311.21	3,171.10	-3,170.97	-31.42	0.44	0.31	0.31
8072	90	182	31	5,311.10	3,202.09	-3,201.95	-32.32	3.04	-2.58	1.61
8104	89	182	32	5,311.41	3,234.08	-3,233.93	-33.41	2.21	-2.19	0.31
8135	89	182	31	5,311.81	3,265.06	-3,264.91	-34.57	1.37	0.97	0.97
8167	89	182	32	5,312.15	3,297.04	-3,296.88	-35.74	1.25	0.00	-1.25
8198	90	182	31	5,312.44	3,328.03	-3,327.87	-36.77	0.32	0.32	0.00
8230	90	182	32	5,312.64	3,360.01	-3,359.84	-37.91	1.33	0.94	0.94
8261	90	182	31	5,312.83	3,391.00	-3,390.83	-38.94	2.16	-0.97	-1.94
8292	90	182	31	5,313.07	3,421.99	-3,421.81	-39.78	0.46	0.32	-0.32
8324	89	181	32	5,313.41	3,453.99	-3,453.80	-40.59	1.29	-1.25	-0.31
8355	89	181	31	5,313.87	3,484.98	-3,484.79	-41.16	2.28	-0.32	-2.26
8387	90	181	32	5,314.15	3,516.98	-3,516.79	-41.52	2.52	2.50	-0.31
8418	90	180	31	5,314.09	3,547.98	-3,547.79	-41.63	2.89	1.29	-2.58
8450	91	180	32	5,313.76	3,579.97	-3,579.79	-41.57	1.98	1.88	0.62
8481	92	179	31	5,313.00	3,610.96	-3,610.78	-41.41	3.76	3.23	-1.94
8513	90	179	32	5,312.61	3,642.95	-3,642.77	-40.94	7.66	-7.50	-1.56
8544	89	180	31	5,313.12	3,673.94	-3,673.76	-40.53	3.68	-2.90	2.26
8576	89	180	32	5,313.68	3,705.93	-3,705.76	-40.36	2.58	2.50	0.63
8607	93	181	31	5,313.17	3,736.92	-3,736.75	-40.44	10.25	10.00	2.26
8639	92	180	32	5,311.80	3,768.90	-3,768.72	-40.61	1.29	-0.31	-1.25
8670	93	180	31	5,310.31	3,799.86	-3,799.68	-40.67	2.26	2.26	0.00
8702	94	180	32	5,308.47	3,831.80	-3,831.63	-40.55	2.25	1.25	-1.87
8733	93	180	31	5,306.77	3,862.76	-3,862.58	-40.37	2.46	-2.26	0.97
8765	93	180	32	5,305.15	3,894.71	-3,894.54	-40.20	0.88	0.63	-0.63
8796	93	181	31	5,303.47	3,925.67	-3,925.49	-40.22	2.97	0.65	2.90
8828	93	181	32	5,301.88	3,957.63	-3,957.45	-40.59	2.38	-2.19	0.94
8859	93	181	31	5,300.53	3,988.60	-3,988.42	-40.94	0.97	0.00	-0.97
8890	93	180	31	5,299.12	4,019.56	-4,019.39	-41.05	2.04	0.65	-1.94
8922	91	179	32	5,298.17	4,051.54	-4,051.37	-40.68	7.13	-6.25	-3.44
8953	90	179	31	5,297.88	4,082.53	-4,082.36	-40.20	2.16	-0.97	1.94
8985	91	179	32	5,297.51	4,114.53	-4,114.36	-39.83	1.59	1.56	-0.31
9016	91	179	31	5,297.05	4,145.52	-4,145.35	-39.40	0.72	-0.32	-0.65
9048	91	180	32	5,296.47	4,177.51	-4,177.35	-39.21	3.78	1.56	3.44
9079	91	180	31	5,295.98	4,208.50	-4,208.34	-39.37	2.66	-2.58	0.65
9111	89	181	32	5,296.03	4,240.50	-4,240.34	-39.73	4.06	-3.75	1.56
9142	89	181	31	5,296.60	4,271.50	-4,271.33	-40.22	2.26	-2.26	0.00
9174	89	181	32	5,297.36	4,303.49	-4,303.32	-40.80	0.99	0.31	0.94
9205	90	182	31	5,297.84	4,334.47	-4,334.30	-41.67	3.65	2.58	2.58
9237	91	184	32	5,297.70	4,366.44	-4,366.25	-43.34	7.81	4.69	6.25
9268	93	185	31	5,296.62	4,397.33	-4,397.14	-45.77	7.21	6.45	3.23
9300	95	186	32	5,294.53	4,429.14	-4,428.93	-48.78	5.31	4.69	2.50
9350	95	186	50	5,290.61	4,478.76	-4,478.52	-53.82	0.00	0.00	0.00
0	0	0		5,290.61	4,478.76	-4,478.52	-53.82			
0	0	0		5,290.61	4,478.76	-4,478.52	-53.82			
0	0	0		5,290.61	4,478.76	-4,478.52	-53.82			
0	0	0		5,290.61	4,478.76	-4,478.52	-53.82			
0	0	0		5,290.61	4,478.76	-4,478.52	-53.82			

