

# DIRECTIONAL SURVEY CALCULATION

## MINIMUM CURVATURE METHOD

Well Name		Target Direction	Slot	N / S	E / W	Hole Size	Calculation by	Date			
Stagecoach 2925		1.22	Coordinate					2/26/13			
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 >>			
0	0	0		0.00	0.00	0.00	0.00				
238	0	0	238	238.00	0.00	0.00	0.00	0.00	0.00	0.00	
484	1	0	246	484.00	1.07	1.07	0.00	0.20	0.20	0.00	
730	0	0	246	729.99	2.79	2.79	0.00	0.08	-0.08	0.00	
980	0	0	250	979.99	3.88	3.88	0.00	0.04	-0.04	0.00	
1354	0	9	374	1,353.99	5.18	5.18	0.10	0.01	0.00	2.35	
1823	1	64	469	1,822.97	7.12	7.07	2.43	0.11	0.09	11.75	
2294	0	294	471	2,293.97	8.25	8.15	4.64	0.13	-0.13	48.81	
2760	0	290	466	2,759.96	8.76	8.70	3.11	0.09	0.09	-0.92	
3225	0	304	465	3,224.95	10.14	10.13	0.23	0.02	0.00	3.01	
3695	1	274	470	3,694.93	11.17	11.26	-4.00	0.09	0.06	-6.21	
4162	1	181	467	4,161.90	8.06	8.21	-6.88	0.23	0.02	-20.06	
4351	1	179	189	4,350.89	5.59	5.74	-6.87	0.05	-0.05	-1.01	
4412	1	180	61	4,411.88	4.84	4.99	-6.86	0.02	0.00	1.97	
4443	1	183	31	4,442.88	4.46	4.61	-6.87	0.12	0.00	9.68	
4474	0	123	31	4,473.88	4.25	4.39	-6.83	2.02	-1.61	-194.84	
4506	2	352	32	4,505.88	4.63	4.78	-6.84	5.11	4.06	717.81	
4537	3	349	31	4,536.85	5.93	6.08	-7.07	6.14	6.13	-9.35	
4569	6	349	32	4,568.74	8.44	8.61	-7.55	7.50	7.50	0.00	
4598	8	350	29	4,597.53	11.83	12.01	-8.16	7.25	7.24	3.10	
4631	10	350	33	4,630.11	16.98	17.18	-9.06	7.58	7.58	-0.30	
4661	13	349	30	4,659.50	22.87	23.09	-10.14	7.70	7.67	-3.33	
4693	15	350	32	4,690.57	30.36	30.62	-11.54	7.21	7.19	2.19	
4724	17	353	31	4,720.35	38.83	39.11	-12.84	7.52	7.10	9.03	
4755	19	356	31	4,749.80	48.44	48.74	-13.81	7.21	6.45	10.32	
4786	21	358	31	4,778.94	58.98	59.30	-14.39	5.32	4.84	6.45	
4818	22	359	32	4,808.70	70.72	71.05	-14.75	5.41	5.31	2.81	
4847	24	359	29	4,835.34	82.16	82.49	-14.99	5.87	5.86	0.69	
4878	26	360	31	4,863.38	95.37	95.71	-15.17	7.47	7.42	1.94	
4910	28	1	32	4,891.80	110.07	110.42	-15.16	6.11	5.94	#####	
4941	30	1	31	4,918.92	125.10	125.44	-14.97	4.58	4.52	1.61	
4973	32	1	32	4,946.42	141.46	141.80	-14.62	6.59	6.56	1.25	
5005	34	1	32	4,973.28	158.84	159.18	-14.32	7.01	6.88	-2.50	
5037	36	0	32	4,999.54	177.12	177.46	-14.23	5.42	5.31	-1.88	
5068	37	359	31	5,024.49	195.51	195.86	-14.34	4.71	4.52	1,159.03	
5099	39	359	31	5,048.94	214.56	214.92	-14.66	5.57	5.48	-1.61	
5131	41	359	32	5,073.43	235.13	235.50	-15.09	7.81	7.81	0.00	
5163	45	359	32	5,096.75	257.01	257.40	-15.59	11.88	11.87	-0.62	
5194	49	359	31	5,117.89	279.66	280.06	-15.98	12.40	12.26	2.58	
5226	51	0	32	5,138.57	304.07	304.48	-16.04	5.73	5.31	#####	
5258	51	0	32	5,158.83	328.83	329.25	-15.93	0.67	0.63	-0.31	
5289	51	0	31	5,178.36	352.90	353.32	-15.85	0.97	0.97	0.00	
5320	51	360	31	5,197.79	377.06	377.48	-15.83	0.99	0.65	1,160.32	
5351	51	360	31	5,217.15	401.26	401.69	-15.87	0.32	0.32	0.00	
5382	51	360	31	5,236.49	425.48	425.92	-15.95	0.50	0.00	-0.65	
5414	52	360	32	5,256.35	450.57	451.01	-16.09	1.56	1.56	0.00	
5446	54	359	32	5,275.58	476.13	476.58	-16.31	7.26	7.19	-1.25	
5478	57	359	32	5,293.61	502.54	503.01	-16.68	9.39	9.38	-0.62	
5509	60	359	31	5,309.88	528.91	529.40	-17.12	7.42	7.42	-0.32	
5540	61	359	31	5,325.16	555.86	556.36	-17.59	6.13	6.13	0.00	
5573	65	359	33	5,340.12	585.25	585.77	-18.02	10.03	10.00	0.91	
5605	67	360	32	5,353.18	614.45	614.97	-18.30	7.55	7.50	0.94	
5637	70	360	32	5,364.89	644.22	644.75	-18.54	9.07	9.06	-0.31	
5669	73	358	32	5,374.93	674.56	675.12	-19.23	11.64	10.63	-5.00	
5701	76	355	32	5,383.30	705.34	705.95	-21.07	11.98	9.06	-8.13	
5733	80	355	32	5,389.78	736.49	737.16	-23.74	12.56	12.50	-1.25	
5764	85	355	31	5,393.83	767.02	767.76	-26.58	14.25	14.19	-1.29	

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Stagecoach 2925		1.22		Coordinate										2/26/13	
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 >>							
5881	93	357	117	5,396.07	883.33	884.28	-35.55	7.42	7.18	1.88					
5912	92	356	31	5,394.59	914.18	915.19	-37.46	2.77	-2.26	-1.61					
5944	91	357	32	5,393.55	946.06	947.11	-39.39	4.07	-3.44	2.19					
5975	91	358	31	5,393.07	976.98	978.07	-40.90	3.23	-2.58	1.94					
6006	91	358	31	5,392.77	1,007.92	1,009.04	-42.12	1.64	0.32	1.61					
6038	90	359	32	5,392.54	1,039.88	1,041.03	-43.01	2.79	-1.25	2.50					
6070	91	359	32	5,392.32	1,071.86	1,073.02	-43.57	1.77	1.25	1.25					
6101	90	360	31	5,392.13	1,102.84	1,104.02	-43.81	2.77	-1.61	2.26					
6133	90	1	32	5,392.13	1,134.84	1,136.02	-43.56	3.49	-0.62	#####					
6165	88	2	32	5,392.61	1,166.84	1,168.00	-42.67	6.00	-4.69	3.75					
6196	89	4	31	5,393.39	1,197.81	1,198.95	-41.13	4.30	0.97	4.19					
6228	89	4	32	5,393.95	1,229.78	1,230.88	-39.04	2.44	1.88	1.56					
6259	90	4	31	5,394.27	1,260.74	1,261.81	-37.01	1.74	0.65	-1.61					
6290	90	3	31	5,394.52	1,291.72	1,292.76	-35.25	1.64	0.32	-1.61					
6322	90	3	32	5,394.69	1,323.71	1,324.72	-33.66	1.13	0.63	-0.94					
6353	90	2	31	5,394.71	1,354.70	1,355.69	-32.28	1.37	0.97	-0.97					
6385	91	2	32	5,394.54	1,386.70	1,387.67	-31.02	1.56	1.25	-0.94					
6416	91	3	31	5,394.22	1,417.68	1,418.63	-29.65	2.97	0.65	2.90					
6448	91	3	32	5,393.77	1,449.67	1,450.59	-27.97	0.63	0.63	0.00					
6480	91	3	32	5,393.16	1,481.65	1,482.54	-26.35	1.40	1.25	-0.63					
6511	93	3	31	5,391.92	1,512.61	1,513.47	-24.76	6.52	6.45	0.97					
6543	95	4	32	5,389.74	1,544.51	1,545.34	-22.92	3.95	3.75	1.25					
6575	95	3	32	5,386.98	1,576.37	1,577.17	-21.03	2.88	2.81	-0.63					
6606	95	2	31	5,384.14	1,607.23	1,608.00	-19.58	3.97	-0.97	-3.87					
6638	94	1	32	5,381.71	1,639.13	1,639.90	-18.77	6.20	-4.69	-4.06					
6670	93	360	32	5,379.98	1,671.08	1,671.85	-18.57	4.20	-3.13	1,122.19					
6702	93	360	32	5,378.39	1,703.03	1,703.81	-18.71	1.82	1.56	-0.94					
6734	94	360	32	5,376.52	1,734.96	1,735.76	-18.94	1.56	1.56	0.00					
6765	93	0	31	5,374.82	1,765.91	1,766.71	-18.96	3.68	-2.90	#####					
6796	93	1	31	5,373.36	1,796.87	1,797.67	-18.75	0.64	0.00	0.65					
6828	92	1	32	5,372.02	1,828.84	1,829.64	-18.30	2.65	-1.87	1.88					
6860	92	1	32	5,370.82	1,860.82	1,861.61	-17.66	0.44	0.31	0.31					
6891	93	1	31	5,369.52	1,891.79	1,892.58	-17.04	1.33	1.29	-0.32					
6923	93	1	32	5,367.96	1,923.75	1,924.54	-16.54	1.77	1.25	-1.25					
6954	93	2	31	5,366.25	1,954.71	1,955.48	-15.91	3.06	0.97	2.90					
6986	94	2	32	5,364.16	1,986.63	1,987.40	-14.88	3.22	2.81	1.56					
7017	95	2	31	5,361.73	2,017.53	2,018.28	-13.75	1.94	1.94	0.00					
7049	95	1	32	5,359.11	2,049.43	2,050.16	-12.80	2.57	-0.63	-2.50					
7081	93	1	32	5,356.87	2,081.35	2,082.07	-12.08	3.75	-3.75	0.00					
7112	93	2	31	5,355.22	2,112.30	2,113.02	-11.19	3.19	-2.26	2.26					
7144	93	3	32	5,353.66	2,144.26	2,144.95	-9.91	1.97	0.63	1.87					
7176	93	2	32	5,352.01	2,176.21	2,176.88	-8.57	1.29	0.31	-1.25					
7207	94	3	31	5,350.15	2,207.14	2,207.79	-7.22	3.49	2.90	1.94					
7239	93	2	32	5,348.33	2,239.08	2,239.71	-5.83	4.47	-4.06	-1.87					
7271	92	1	32	5,346.97	2,271.05	2,271.67	-4.85	2.96	-0.94	-2.81					
7302	94	1	31	5,345.34	2,302.01	2,302.62	-4.17	4.53	4.52	-0.32					
7333	94	1	31	5,343.32	2,332.94	2,333.54	-3.50	0.46	0.32	0.32					
7365	94	1	32	5,341.08	2,364.87	2,365.46	-2.75	1.29	1.25	0.31					
7397	93	2	32	5,339.02	2,396.80	2,397.38	-1.88	3.26	-3.13	0.94					
7429	92	2	32	5,337.65	2,428.77	2,429.33	-0.88	4.73	-4.69	0.62					
7460	92	2	31	5,336.70	2,459.75	2,460.30	0.09	0.72	0.32	-0.65					
7491	92	2	31	5,335.76	2,490.73	2,491.27	1.07	0.72	-0.32	0.65					
7538	92	2	47	5,334.40	2,537.71	2,538.22	2.71	0.48	-0.21	0.43					
7586	90	2	48	5,333.69	2,585.70	2,586.18	4.55	3.15	-3.13	0.42					
7634	89	2	48	5,334.15	2,633.69	2,634.14	6.39	2.74	-2.71	-0.42					
7681	87	2	47	5,335.88	2,680.65	2,681.08	7.91	3.97	-3.83	-1.06					
7729	88	2	48	5,338.18	2,728.59	2,729.01	9.41	1.33	1.04	0.83					



