Detail by Distribution Account
Forecasted Test Year Ending December 31, 2018

Line No	[A] Acct	[B] Plant	[C] AccDep-SL	[D] AccDep-TS	[E] DepExp-SL	[F] CWIP	[G] Dist O&M
1	374	769,100	279,890	124,238	24,348	-	11,651
2	375	145,076	116,564	23,435	9,084	-	2,198
3	376	229,210,314	79,482,197	37,054,166	3,910,156	8,878,373	6,720,963
4	377	-	-	-	-	-	-
5	378	12,872,816	2,308,845	2,079,970	518,577	-	1,257,263
6	379	15,117,304	1,985,614	2,444,796	673,510	-	483,721
7	380	158,599,651	76,547,746	25,631,338	3,677,069	-	4,700,619
8	381	46,235,618	12,252,158	7,471,553	1,171,699	-	3,542,801
9	382	-	-	-	-	-	-
10	383	19,482,827	10,824,159	3,147,190	274,704	-	1,492,870
11	385	2,664,381	841,304	430,716	70,352	-	204,158
12	301	-	-	-	-	-	-
13	302	3,969,435	3,945,496	641,209	4,511	-	60,132
14	303	15,600,454	3,301,044	2,520,165	1,475,869	-	236,329
15		504,666,977	191,885,017	81,568,774	11,809,879	8,878,373	18,712,706
16							
17							

18 NOTE: These figures do not include G&C allocations or A&G allocations

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1953	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	2,704	$871.54	$0.32	$16,668.20	$6.16	0	1	1	$0.789581
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1953	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	218,449	$70,717.01	$0.32	$1,352,462.83	$6.19	0	2	4	$0.791691
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1953	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	33,455	$10,726.74	$0.32	$205,148.91	$6.13	0	2	4	$0.787460
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1953	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	10,676	$3,443.63	$0.32	$65,859.43	$6.17	0	3	9	$0.790285
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1953	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	86,520	$55,810.07	$0.65	$1,067,367.60	$12.34	0	4	16	$1.091315
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1953	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	730	$519.22	$0.71	$9,930.07	$13.60	0	6	36	$1.133539
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1953	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	63	$1,245.22	$19.77	$23,814.84	$378.01	0	6	36	$2.577503
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1953	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	265	$269.63	$1.02	$5,156.67	$19.46	1	1.25	1.5625	$1.289143
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	186	Steel 10 in	1953	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	19,829	$51,161.27	$2.58	$978,459.29	$49.34	1	10	100	$1.693199
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	186	Steel 10 in	1953	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	19	$49.02	$2.58	$937.51	$49.34	1	10	100	$1.693199
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	187	Steel 12 in	1953	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	9,575	$46.30	$0.00	$885.49	$0.09	1	12	144	($1.045757)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	187	Steel 12 in	1953	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	1,032	$1,772.55	$1.72	$33,900.02	$32.85	1	12	144	$1.516535
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1953	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	40,228	$39,904.87	$0.99	$763,180.62	$18.97	1	2	4	$1.278067
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1953	299	Rosemount-Rosemount-C-Inver Grove Hts-0199 - 000G93 - 299	36	$35.71	$0.99	$682.95	$18.97	1	2	4	$1.278067
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1953	351	Rosemount-Eureka-T-Lakeville-0194 - 000G93 - 351	1,464	$1,452.24	$0.99	$27,774.09	$18.97	1	2	4	$1.278067
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1953	354	Rosemount-Burnsville-C-Rosemount - 000G93 - 354	330	$327.35	$0.99	$6,260.57	$18.97	1	2	4	$1.278067
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1953	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	9,353	$8,910.09	$0.95	$170,405.47	$18.22	1	3	9	$1.260548
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1953	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	1,268	$3,276.99	$2.58	$62,672.44	$49.43	1	4	16	$1.693991
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1953	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	11,255	$29,087.13	$2.58	$556,291.36	$49.43	1	4	16	$1.693991
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1953	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	19,153	$101,525.14	$5.30	$1,941,668.30	$101.38	1	6	36	$2.005952
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1953	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	17	$23.60	$1.39	$451.35	$26.55	1	8	64	$1.424065
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1954	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	430	$488.43	$1.14	$8,896.40	$20.69	0	1	1	$1.315760
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1954	9	Rosemount-Randolph-T-Randolph-0195 - 000G93 - 009	17,043	$7,697.71	$0.45	$140,208.29	$8.23	0	2	4	$0.915400
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1954	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	178,022	$80,402.22	$0.45	$1,464,469.02	$8.23	0	2	4	$0.915400
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1954	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	1,560	$704.50	$0.45	$12,831.96	$8.23	0	3	9	$0.915400
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1954	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	76,643	$69,233.16	$0.90	$1,261,032.55	$16.45	0	4	16	$1.216166
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1954	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	1,960	$1,784.87	$0.91	$32,510.12	$16.59	0	4	16	$1.219846
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1954	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	2,626	$2,396.38	$0.91	$43,648.36	$16.62	0	4	16	$1.220631
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1954	316	Rosemount-Lakeville-C-Farmington-0192 - 000G93 - 316	6,793	$6,136.16	$0.90	$111,765.78	$16.45	0	4	16	$1.216166
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1954	330	Rosemount-Lakeville-C-Rosemnt-Apple Vly-0196 - 000G93 - 330	264	$238.46	$0.90	$4,343.38	$16.45	0	4	16	$1.216166
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1954	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	1,904	$1,719.51	$0.90	$31,319.65	$16.45	0	6	36	$1.216166
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1954	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	2,638	$3,765.79	$1.43	$68,591.18	$26.00	1	1.25	1.5625	$1.414973
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1954	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	36,626	$52,620.41	$1.44	$958,443.18	$26.17	1	2	4	$1.417804
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1954	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	12,972	$18,513.91	$1.43	$337,217.65	$26.00	1	3	9	$1.414973
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1954	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	14,234	$57,798.12	$4.06	$1,052,751.47	$73.96	1	4	16	$1.868997
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1954	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	2,672	$19,915.64	$7.45	$362,749.16	$135.76	1	6	36	$2.132772
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1954	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	2,666	$660.92	$0.25	$12,038.19	$4.52	1	8	64	$0.655138
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1955	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	139	$37.22	$0.27	$662.17	$4.76	0	1	1	$0.677607
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1955	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	33,633	$9,070.23	$0.27	$161,365.72	$4.80	0	2	4	$0.681241
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1955	12	Rosemount-Cannon Falls-T-Cannon Falls-0252 - 000G93 - 012	5,296	$1,428.22	$0.27	$25,409.04	$4.80	0	2	4	$0.681241
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1955	330	Rosemount-Lakeville-C-Rosemnt-Apple Vly-0196 - 000G93 - 330	70	$19.06	$0.27	$339.09	$4.84	0	2	4	$0.684845
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1955	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	397	$106.95	$0.27	$1,902.72	$4.79	0	3	9	$0.680336
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1955	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	8,071	$4,353.17	$0.54	$77,445.93	$9.60	0	4	16	$0.982271
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1955	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	18,958	$9,914.86	$0.52	$176,392.27	$9.30	0	4	16	$0.968483
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1955	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	12,241	$6,602.33	$0.54	$117,460.06	$9.60	0	6	36	$0.982271
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1955	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	1,897	$1,617.37	$0.85	$28,774.14	$15.17	1	1.25	1.5625	$1.180986
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1955	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	51,524	$43,625.27	$0.85	$776,123.99	$15.06	1	2	4	$1.177825
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1955	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	9,183	$7,829.73	$0.85	$139,296.36	$15.17	1	3	9	$1.180986
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1955	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	459	$1,433.31	$3.12	$25,499.58	$55.55	1	4	16	$1.744684
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1955	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	14,175	$32,425.47	$2.29	$576,871.74	$40.70	1	4	16	$1.609594
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1955	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	6,235	$26,682.71	$4.28	$474,704.03	$76.14	1	6	36	$1.881613
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1956	29	Rosemount-Webster-T-Northfield-0659 - 000G93 - 029	245	$132.55	$0.54	$2,204.36	$9.00	0	1	1	$0.954243
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1956	340	Rosemount-New Market-T-Lakeville-0194 - 000G93 - 340	139	$75.35	$0.54	$1,253.10	$9.02	0	1	1	$0.955207
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1956	29	Rosemount-Webster-T-Northfield-0659 - 000G93 - 029	17,872	$9,711.81	$0.54	$161,511.63	$9.04	0	2	4	$0.956168
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1956	30	Rosemount-Elko-C-Lakeville-0194 - 000G93 - 030	40,066	$21,774.00	$0.54	$362,111.09	$9.04	0	2	4	$0.956168
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1956	31	Rosemount-New Market-C-New Prague-0721 - 000G93 - 031	29,617	$16,093.96	$0.54	$267,649.55	$9.04	0	2	4	$0.956168
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1956	12	Rosemount-Cannon Falls-T-Cannon Falls-0252 - 000G93 - 012	4,236	$4,603.93	$1.09	$76,565.36	$18.07	0	4	16	$1.256958
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1956	31	Rosemount-New Market-C-New Prague-0721 - 000G93 - 031	4,590	$5,424.21	$1.18	$90,206.97	$19.65	0	4	16	$1.293363
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1956	12	Rosemount-Cannon Falls-T-Cannon Falls-0252 - 000G93 - 012	130	$222.42	$1.71	$3,698.94	$28.45	1	1.25	1.5625	$1.454082
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1956	12	Rosemount-Cannon Falls-T-Cannon Falls-0252 - 000G93 - 012	7,269	$12,481.90	$1.72	$207,579.43	$28.56	1	2	4	$1.455758
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1956	29	Rosemount-Webster-T-Northfield-0659 - 000G93 - 029	1,105	$1,897.26	$1.72	$31,552.25	$28.55	1	2	4	$1.455606
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1956	31	Rosemount-New Market-C-New Prague-0721 - 000G93 - 031	5,266	$9,213.71	$1.75	$153,228.00	$29.10	1	2	4	$1.463893
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1956	29	Rosemount-Webster-T-Northfield-0659 - 000G93 - 029	4,901	$23,514.74	$4.80	$391,060.35	$79.79	1	4	16	$1.901948
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1957	32	Rosemount-New Market-T-New Prague-0721 - 000G93 - 032	2,373	$1,692.68	$0.71	$26,426.54	$11.14	0	2	4	$1.046885
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1957	340	Rosemount-New Market-T-Lakeville-0194 - 000G93 - 340	107,749	$76,394.58	$0.71	$1,192,690.89	$11.07	0	2	4	$1.044148
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1957	340	Rosemount-New Market-T-Lakeville-0194 - 000G93 - 340	40,606	$57,928.75	$1.43	$904,397.83	$22.27	0	4	16	$1.347720
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1958	33	Rosemount-Spring Lk-T-Prior Lk-Savage-0719 - 000G93 - 033	1,064	$643.67	$0.60	$9,655.05	$9.07	0	1	1	$0.957607

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1958	33	Rosemount-Spring Lk-T-Prior Lk-Savage-0719 - 000G93 - 033	111,933	$67,338.14	$0.60	$1,010,072.10	$9.02	0	2	4	$0.955207
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1958	341	Rosemount-Spring Lk-T-Lakeville-0194 - 000G93 - 341	20,491	$11,733.93	$0.57	$176,008.95	$8.59	0	2	4	$0.933993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1958	414	Rosemount-Credit River-T-Lakeville SD - 000G93 - 414	15,944	$9,130.15	$0.57	$136,952.25	$8.59	0	2	4	$0.933993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1958	32	Rosemount-New Market-T-New Prague-0721 - 000G93 - 032	2,288	$3,081.23	$1.35	$46,218.45	$20.20	0	4	16	$1.305351
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1958	33	Rosemount-Spring Lk-T-Prior Lk-Savage-0719 - 000G93 - 033	21,248	$25,712.22	$1.21	$385,683.30	$18.15	0	4	16	$1.258877
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1958	340	Rosemount-New Market-T-Lakeville-0194 - 000G93 - 340	2,068	$2,784.96	$1.35	$41,774.40	$20.20	0	4	16	$1.305351
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1958	32	Rosemount-New Market-T-New Prague-0721 - 000G93 - 032	8,020	$42,844.33	$5.34	$642,664.95	$80.13	1	4	16	$1.903795
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1958	340	Rosemount-New Market-T-Lakeville-0194 - 000G93 - 340	55	$293.82	$5.34	$4,407.30	$80.13	1	4	16	$1.903795
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1959	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	643	$176.12	$0.27	$2,542.11	$3.95	0	1	1	$0.596597
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1959	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	2,043	$560.15	$0.27	$8,085.18	$3.96	0	1	1	$0.597695
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1959	293	Rosemount-Castle Rock-T-Farmington-0192 - 000G93 - 293	27,726	$7,605.35	$0.27	$109,775.34	$3.96	0	2	4	$0.597695
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1959	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	74,006	$20,555.89	$0.28	$296,702.94	$4.01	0	2	4	$0.603144
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1959	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	32,077	$8,811.03	$0.27	$127,178.07	$3.96	0	2	4	$0.597695
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1959	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	158,868	$46,618.32	$0.29	$672,887.07	$4.24	0	2	4	$0.627366
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1959	293	Rosemount-Castle Rock-T-Farmington-0192 - 000G93 - 293	10,539	$2,890.97	$0.27	$41,728.15	$3.96	0	3	9	$0.597695
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1959	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	1,259	$345.27	$0.27	$4,983.62	$3.96	0	3	9	$0.597695
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1959	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	2,375	$651.84	$0.27	$9,408.63	$3.96	0	3	9	$0.597695
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1959	33	Rosemount-Spring Lk-T-Prior Lk-Savage-0719 - 000G93 - 033	3,050	$1,673.18	$0.55	$24,150.62	$7.92	0	4	16	$0.898725
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1959	293	Rosemount-Castle Rock-T-Farmington-0192 - 000G93 - 293	15,036	$8,248.77	$0.55	$119,062.43	$7.92	0	4	16	$0.898725
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1959	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	55,960	$30,715.10	$0.55	$443,340.59	$7.92	0	4	16	$0.898725
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1959	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	5,205	$2,855.06	$0.55	$41,209.83	$7.92	0	4	16	$0.898725
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1959	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	3,892	$2,134.90	$0.55	$30,815.07	$7.92	0	6	36	$0.898725
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1959	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	6,322	$5,479.81	$0.87	$79,095.37	$12.51	1	1.25	1.5625	$1.097257
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1959	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	1,553	$2,537.45	$1.63	$36,625.46	$23.58	1	1.25	1.5625	$1.372544
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	186	Steel 10 in	1959	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	5,465	$11,991.85	$2.19	$173,089.91	$31.67	1	10	100	$1.500648
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	187	Steel 12 in	1959	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	119	$260.55	$2.19	$3,760.77	$31.60	1	12	144	$1.499687
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1959	293	Rosemount-Castle Rock-T-Farmington-0192 - 000G93 - 293	9,825	$7,891.78	$0.80	$113,909.65	$11.59	1	2	4	$1.064083
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1959	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	80,425	$69,816.00	$0.87	$1,007,721.51	$12.53	1	2	4	$1.097951
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1959	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	76,088	$66,932.85	$0.88	$966,106.23	$12.70	1	2	4	$1.103804
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1959	293	Rosemount-Castle Rock-T-Farmington-0192 - 000G93 - 293	4,227	$1,729.02	$0.41	$24,956.61	$5.90	1	3	9	$0.770852
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1959	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	7,979	$6,915.72	$0.87	$99,821.24	$12.51	1	3	9	$1.097257
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1959	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	43,226	$37,466.00	$0.87	$540,782.83	$12.51	1	3	9	$1.097257
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1959	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	1,418	$3,433.90	$2.42	$49,564.78	$34.95	1	4	16	$1.543447
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1959	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	40,915	$107,881.94	$2.64	$1,557,163.85	$38.06	1	4	16	$1.580469
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1959	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	21,940	$53,131.90	$2.42	$766,903.84	$34.95	1	4	16	$1.543447
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1959	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	22,898	$102,688.62	$4.48	$1,482,203.66	$64.73	1	6	36	$1.811106
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1959	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	11,389	$51,073.76	$4.48	$737,196.73	$64.73	1	6	36	$1.811106
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1959	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	7,736	$14,771.71	$1.91	$213,214.30	$27.56	1	8	64	$1.440279
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1960	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	430,225	$267,358.70	$0.62	$3,718,716.46	$8.64	0	2	4	$0.936514
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1960	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	83,570	$55,355.67	$0.66	$769,947.05	$9.21	0	3	9	$0.964260
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1960	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	153,268	$200,480.80	$1.31	$2,788,505.66	$18.19	0	4	16	$1.259833
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1960	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	4,216	$5,240.18	$1.24	$72,886.14	$17.29	0	6	36	$1.237795
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1960	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	2,981	$5,854.76	$1.96	$81,434.39	$27.32	1	1.25	1.5625	$1.436481
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	186	Steel 10 in	1960	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	3,361	$16,709.01	$4.97	$232,407.14	$69.15	1	10	100	$1.839792
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1960	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	66,868	$131,358.17	$1.96	$1,827,072.72	$27.32	1	2	4	$1.436481
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1960	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	8,339	$69,391.76	$8.32	$965,176.30	$115.74	1	4	16	$2.063483
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1961	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	236	$59.01	$0.25	$791.98	$3.36	0	1.25	1.5625	$0.526339
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1961	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	748	$231.50	$0.31	$3,106.97	$4.15	0	1	1	$0.618048
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1961	42	Fairmont-Dunbar-T-United S Central-2134 - 000G94 - 042	393	$98.05	$0.25	$1,315.93	$3.35	0	1	1	$0.525045
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1961	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	859	$214.25	$0.25	$2,875.46	$3.35	0	1	1	$0.525045
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1961	75	Fairmont-Trimont-C-Martin Cty W-2448 - 000G94 - 075	287	$71.72	$0.25	$962.56	$3.35	0	1	1	$0.525045
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1961	76	Fairmont-Truman-C-Truman-0458 - 000G94 - 076	102	$25.42	$0.25	$341.16	$3.34	0	1	1	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1961	77	Fairmont-Welcome-C-Martin Cty W-2448 - 000G94 - 077	611	$151.61	$0.25	$2,034.77	$3.33	0	1	1	$0.522444
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1961	93	Fairmont-New Richland-C-NRHEG-2168 - 000G94 - 093	4	$1.00	$0.25	$13.42	$3.36	0	1	1	$0.526339
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1961	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	162	$39.95	$0.25	$536.17	$3.31	0	1	1	$0.519828
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1961	311	Fairmont-Freeborn-T-United S Central-2134 - 000G94 - 311	282	$69.90	$0.25	$938.13	$3.33	0	1	1	$0.522444
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	110	$27.37	$0.25	$367.33	$3.34	0	2	4	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	140,600	$34,980.45	$0.25	$469,474.46	$3.34	0	2	4	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	41	Fairmont-Clark-T-United S Central-2134 - 000G94 - 041	212	$52.78	$0.25	$708.36	$3.34	0	2	4	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	42	Fairmont-Dunbar-T-United S Central-2134 - 000G94 - 042	466	$116.21	$0.25	$1,559.66	$3.35	0	2	4	$0.525045
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	11,023	$2,859.88	$0.26	$38,382.58	$3.48	0	2	4	$0.541579
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	44	Fairmont-Alden-C-Alden-Conger-0242 - 000G94 - 044	9,267	$2,273.77	$0.25	$30,516.38	$3.29	0	2	4	$0.517196
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	45	Fairmont-Emmons-C-Glenville-Emmons-2886 - 000G94 - 045	425	$105.31	$0.25	$1,413.37	$3.33	0	2	4	$0.522444
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	46	Fairmont-Freeborn-C-United S Central-2134 - 000G94 - 046	9,969	$2,478.78	$0.25	$33,267.84	$3.34	0	2	4	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	66	Fairmont-Dunnell-C-Martin Cty W-2448 - 000G94 - 066	1,612	$401.07	$0.25	$5,382.78	$3.34	0	2	4	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	65,164	$16,326.46	$0.25	$219,118.29	$3.36	0	2	4	$0.526339
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	68	Fairmont-Fraser-T-Fairmont Area-2752 - 000G94 - 068	7,000	$1,741.27	$0.25	$23,369.68	$3.34	0	2	4	$0.523746

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	71	Fairmont-Northrop-C-Fairmont Area-2752 - 000G94 - 071	5,689	$1,665.08	$0.29	$22,347.13	$3.93	0	2	4	$0.594393
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	73	Fairmont-Rutland-T-Fairmont Area-2752 - 000G94 - 073	19,450	$4,838.72	$0.25	$64,940.72	$3.34	0	2	4	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	74	Fairmont-Sherburn-C-Martin Cty W-2448 - 000G94 - 074	5,998	$1,492.10	$0.25	$20,025.55	$3.34	0	2	4	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	75	Fairmont-Trimont-C-Martin Cty W-2448 - 000G94 - 075	5,049	$1,256.28	$0.25	$16,860.60	$3.34	0	2	4	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	76	Fairmont-Truman-C-Truman-0458 - 000G94 - 076	6,622	$1,647.19	$0.25	$22,107.02	$3.34	0	2	4	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	77	Fairmont-Welcome-C-Martin Cty W-2448 - 000G94 - 077	636	$157.97	$0.25	$2,120.12	$3.33	0	2	4	$0.522444
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	88	Fairmont-Berlin-T-NRHEG-2168 - 000G94 - 088	1,325	$340.00	$0.26	$4,563.16	$3.44	0	2	4	$0.536558
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	89	Fairmont-Ellendale-C-NRHEG-2168 - 000G94 - 089	3,800	$1,111.41	$0.29	$14,916.30	$3.93	0	2	4	$0.594393
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	92	Fairmont-New Richland-T-NRHEG-2168 - 000G94 - 092	125	$31.07	$0.25	$416.99	$3.34	0	2	4	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	93	Fairmont-New Richland-C-NRHEG-2168 - 000G94 - 093	3,191	$793.76	$0.25	$10,653.09	$3.34	0	2	4	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	97	Rochester-Claremont-C-Triton-2125 - 000G95 - 097	6,689	$1,664.73	$0.25	$22,342.43	$3.34	0	2	4	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	8,679	$2,159.66	$0.25	$28,984.91	$3.34	0	2	4	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	2,581	$641.85	$0.25	$8,614.30	$3.34	0	2	4	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	101	Rochester-Hayfield-T-Hayfield-0203 - 000G95 - 101	1,373	$341.41	$0.25	$4,582.09	$3.34	0	2	4	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	17,425	$4,411.02	$0.25	$59,200.53	$3.40	0	2	4	$0.531479
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	104	Rochester-Vernon-T-Hayfield-0203 - 000G95 - 104	10,835	$2,695.42	$0.25	$36,175.37	$3.34	0	2	4	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	105	Rochester-Wasioja-T-Triton-2125 - 000G95 - 105	1,667	$414.35	$0.25	$5,561.02	$3.34	0	2	4	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	106	Rochester-West Concord-C-Triton-2125 - 000G95 - 106	38	$83.52	$2.20	$1,120.93	$29.50	0	2	4	$1.469822
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	107	Rochester-Westfield-T-Blooming Prairie-0756 - 000G95 - 107	672	$167.05	$0.25	$2,241.99	$3.34	0	2	4	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	109	Rochester-Harmony-T-Fillmore Central-2198 - 000G95 - 109	502	$125.28	$0.25	$1,681.39	$3.35	0	2	4	$0.525045
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	112	Rochester-Fountain-C-Fillmore Central-2198 - 000G95 - 112	509	$761.83	$1.50	$10,224.56	$20.09	0	2	4	$1.302980
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	114	Rochester-Lanesboro-C-Lanesboro-0229 - 000G95 - 114	2,805	$698.14	$0.25	$9,369.77	$3.34	0	2	4	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	66,972	$16,867.92	$0.25	$226,385.25	$3.38	0	2	4	$0.528917
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	298	Rosemount-Eureka-T-Farmington-0192 - 000G93 - 298	28,728	$7,166.89	$0.25	$96,187.21	$3.35	0	2	4	$0.525045
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	299	Rosemount-Rosemount-C-Inver Grove Hts-0199 - 000G93 - 299	863	$214.25	$0.25	$2,875.46	$3.33	0	2	4	$0.522444
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	300	Fairmont-Carlston-T-Alden-Conger-0242 - 000G94 - 300	541	$134.36	$0.25	$1,803.25	$3.33	0	2	4	$0.522444
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	310	Fairmont-Carlston-T-United S Central-2134 - 000G94 - 310	3,807	$947.14	$0.25	$12,711.62	$3.34	0	2	4	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	311	Fairmont-Freeborn-T-United S Central-2134 - 000G94 - 311	15,900	$3,956.37	$0.25	$53,098.65	$3.34	0	2	4	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	316	Rosemount-Lakeville-C-Farmington-0192 - 000G93 - 316	13,366	$3,325.38	$0.25	$44,630.09	$3.34	0	2	4	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	359	Fairmont-Westford-T-Truman - 000G94 - 359	1,808	$513.05	$0.28	$6,885.66	$3.81	0	2	4	$0.580925
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	213	$53.01	$0.25	$711.45	$3.34	0	2	4	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	391	Rochester-Canisteo-Kasson-Mantorville - 000G95 - 391	43	$10.69	$0.25	$143.47	$3.34	0	2	4	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1961	424	Fairmont-Alden-C-Alden-Conger-0242 - 000G94 - 044	9,267	$2,273.77	$0.25	$30,516.38	$3.29	0	2	4	$0.517196
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1961	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	6,371	$1,585.54	$0.25	$21,279.61	$3.34	0	3	9	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1961	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	329	$233.11	$0.71	$3,128.58	$9.51	0	3	9	$0.978181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1961	68	Fairmont-Fraser-T-Fairmont Area-2752 - 000G94 - 068	4,250	$1,057.52	$0.25	$14,193.03	$3.34	0	3	9	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1961	71	Fairmont-Northrop-C-Fairmont Area-2752 - 000G94 - 071	1,018	$253.49	$0.25	$3,402.11	$3.34	0	3	9	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1961	73	Fairmont-Rutland-T-Fairmont Area-2752 - 000G94 - 073	17,618	$4,383.05	$0.25	$58,825.14	$3.34	0	3	9	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1961	97	Rochester-Claremont-C-Triton-2125 - 000G95 - 097	964	$239.67	$0.25	$3,216.62	$3.34	0	3	9	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1961	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	329	$81.82	$0.25	$1,098.10	$3.34	0	3	9	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1961	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	1,273	$439.59	$0.35	$5,899.76	$4.63	0	3	9	$0.665581
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1961	101	Rochester-Hayfield-T-Hayfield-0203 - 000G95 - 101	736	$183.20	$0.25	$2,458.74	$3.34	0	3	9	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1961	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	1,411	$351.34	$0.25	$4,715.35	$3.34	0	3	9	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1961	105	Rochester-Wasioja-T-Triton-2125 - 000G95 - 105	690	$171.61	$0.25	$2,303.19	$3.34	0	3	9	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1961	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	85	$21.16	$0.25	$284.00	$3.34	0	3	9	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1961	300	Fairmont-Carlston-T-Alden-Conger-0242 - 000G94 - 300	1,892	$470.27	$0.25	$6,311.52	$3.34	0	0.75	0.5625	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1961	310	Fairmont-Carlston-T-United S Central-2134 - 000G94 - 310	3,053	$758.97	$0.25	$10,186.18	$3.34	0	0.75	0.5625	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1961	311	Fairmont-Freeborn-T-United S Central-2134 - 000G94 - 311	915	$227.87	$0.25	$3,058.26	$3.34	0	0.75	0.5625	$0.523746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1961	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	47,634	$23,702.56	$0.50	$318,113.31	$6.68	0	4	16	$0.824776
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1961	41	Fairmont-Clark-T-United S Central-2134 - 000G94 - 041	1,665	$828.50	$0.50	$11,119.34	$6.68	0	4	16	$0.824776
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1961	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	7,346	$3,800.51	$0.52	$51,006.85	$6.94	0	4	16	$0.841359
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1961	46	Fairmont-Freeborn-C-United S Central-2134 - 000G94 - 046	2,090	$1,040.05	$0.50	$13,958.57	$6.68	0	4	16	$0.824776
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1961	66	Fairmont-Dunnell-C-Martin Cty W-2448 - 000G94 - 066	1,404	$699.05	$0.50	$9,381.99	$6.68	0	4	16	$0.824776
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1961	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	19,323	$9,615.97	$0.50	$129,056.44	$6.68	0	4	16	$0.824776
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1961	68	Fairmont-Fraser-T-Fairmont Area-2752 - 000G94 - 068	4,997	$2,486.61	$0.50	$33,372.92	$6.68	0	4	16	$0.824776
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1961	69	Fairmont-Lake Fremont-T-Martin Cty W-2448 - 000G94 - 069	89	$44.48	$0.50	$596.97	$6.71	0	4	16	$0.826723
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1961	73	Fairmont-Rutland-T-Fairmont Area-2752 - 000G94 - 073	7,306	$3,635.05	$0.50	$48,786.20	$6.68	0	4	16	$0.824776
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1961	74	Fairmont-Sherburn-C-Martin Cty W-2448 - 000G94 - 074	1,332	$664.55	$0.50	$8,918.96	$6.70	0	4	16	$0.826075
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1961	88	Fairmont-Berlin-T-NRHEG-2168 - 000G94 - 088	397	$197.91	$0.50	$2,656.16	$6.69	0	4	16	$0.825426
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1961	92	Fairmont-New Richland-T-NRHEG-2168 - 000G94 - 092	9,629	$4,791.65	$0.50	$64,308.98	$6.68	0	4	16	$0.824776
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1961	93	Fairmont-New Richland-C-NRHEG-2168 - 000G94 - 093	343	$170.93	$0.50	$2,294.06	$6.69	0	4	16	$0.825426
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1961	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	4,533	$2,256.03	$0.50	$30,278.30	$6.68	0	4	16	$0.824776
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1961	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	8,824	$6,080.78	$0.69	$81,610.46	$9.25	0	4	16	$0.966142
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1961	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	183	$121.88	$0.67	$1,635.75	$8.94	0	4	16	$0.951338
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1961	105	Rochester-Wasioja-T-Triton-2125 - 000G95 - 105	26	$12.71	$0.49	$170.58	$6.56	0	4	16	$0.816904
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1961	112	Rochester-Fountain-C-Fillmore Central-2198 - 000G95 - 112	22	$645.94	$29.36	$8,669.20	$394.05	0	4	16	$2.595551
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1961	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	37,224	$18,522.34	$0.50	$248,589.30	$6.68	0	4	16	$0.824776

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1961	298	Rosemount-Eureka-T-Farmington-0192 - 000G93 - 298	22,945	$11,777.76	$0.51	$158,069.94	$6.89	0	4	16	$0.838219
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1961	300	Fairmont-Carlston-T-Alden-Conger-0242 - 000G94 - 300	7,836	$3,899.24	$0.50	$52,331.91	$6.68	0	4	16	$0.824776
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1961	310	Fairmont-Carlston-T-United S Central-2134 - 000G94 - 310	15,204	$7,565.15	$0.50	$101,532.28	$6.68	0	4	16	$0.824776
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1961	311	Fairmont-Freeborn-T-United S Central-2134 - 000G94 - 311	1,316	$654.91	$0.50	$8,789.58	$6.68	0	4	16	$0.824776
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1961	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	8	$3.63	$0.45	$48.72	$6.09	0	6	36	$0.784617
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1961	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	1,895	$947.80	$0.50	$12,720.47	$6.71	0	6	36	$0.826723
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1961	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	2,298	$1,143.13	$0.50	$15,342.01	$6.68	0	6	36	$0.824776
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1961	298	Rosemount-Eureka-T-Farmington-0192 - 000G93 - 298	6,984	$2,977.76	$0.43	$39,964.67	$5.72	0	6	36	$0.757396
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	183	Steel 1 1/2 in	1961	74	Fairmont-Sherburn-C-Martin Cty W-2448 - 000G94 - 074	207	$163.41	$0.79	$2,193.13	$10.59	1	1.5	2.25	$1.024896
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1961	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	126	$99.86	$0.79	$1,340.23	$10.64	1	1.25	1.5625	$1.026942
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1961	44	Fairmont-Alden-C-Alden-Conger-0242 - 000G94 - 044	7	$5.51	$0.79	$73.95	$10.56	1	1.25	1.5625	$1.023664
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1961	66	Fairmont-Dunnell-C-Martin Cty W-2448 - 000G94 - 066	2,096	$1,648.66	$0.79	$22,126.75	$10.56	1	1.25	1.5625	$1.023664
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1961	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	1,768	$1,390.13	$0.79	$18,657.01	$10.55	1	1.25	1.5625	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1961	74	Fairmont-Sherburn-C-Martin Cty W-2448 - 000G94 - 074	2	$1.57	$0.79	$21.08	$10.54	1	1.25	1.5625	$1.022841
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1961	75	Fairmont-Trimont-C-Martin Cty W-2448 - 000G94 - 075	20,064	$15,780.94	$0.79	$211,796.83	$10.56	1	1.25	1.5625	$1.023664
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1961	76	Fairmont-Truman-C-Truman-0458 - 000G94 - 076	205	$160.69	$0.78	$2,156.63	$10.52	1	1.25	1.5625	$1.022016
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1961	97	Rochester-Claremont-C-Triton-2125 - 000G95 - 097	485	$382.21	$0.79	$5,129.66	$10.58	1	1.25	1.5625	$1.024486
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1961	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	333	$262.01	$0.79	$3,516.45	$10.56	1	1.25	1.5625	$1.023664
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1961	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	6	$4.72	$0.79	$63.35	$10.56	1	1.25	1.5625	$1.023664
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1961	105	Rochester-Wasioja-T-Triton-2125 - 000G95 - 105	829	$651.84	$0.79	$8,748.38	$10.55	1	1.25	1.5625	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1961	107	Rochester-Westfield-T-Blooming Prairie-0756 - 000G95 - 107	153	$119.84	$0.78	$1,608.38	$10.51	1	1.25	1.5625	$1.021603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1961	113	Rochester-Harmony-C-Fillmore Central-2198 - 000G95 - 113	17,658	$13,909.95	$0.79	$186,686.18	$10.57	1	1.25	1.5625	$1.024075
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1961	114	Rochester-Lanesboro-C-Lanesboro-0229 - 000G95 - 114	727	$571.04	$0.79	$7,663.96	$10.54	1	1.25	1.5625	$1.022841
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1961	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	706	$554.70	$0.79	$7,444.66	$10.54	1	1.25	1.5625	$1.022841
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1961	424	Fairmont-Alden-C-Alden-Conger-0242 - 000G94 - 044	7	$5.51	$0.79	$73.95	$10.56	1	1.25	1.5625	$1.023664
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1961	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	602	$473.08	$0.79	$6,349.24	$10.55	1	1	1	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1961	92	Fairmont-New Richland-T-NRHEG-2168 - 000G94 - 092	42	$32.98	$0.79	$442.63	$10.54	1	1	1	$1.022841
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	186	Steel 10 in	1961	305	Rochester-Havana-T-Owatonna-0761 - 000G95 - 305	5,190	$10,330.48	$1.99	$138,645.92	$26.71	1	10	100	$1.426674
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	186	Steel 10 in	1961	306	Fairmont-Owatonna-T-Owatonna-0761 - 000G94 - 306	24,449	$20,554.74	$0.84	$275,866.25	$11.28	1	10	100	$1.052309
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	190	Steel 2 1/2 in	1961	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	128	$100.77	$0.79	$1,352.44	$10.57	1	2.5	6.25	$1.024075
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	3,523	$2,907.62	$0.83	$39,023.32	$11.08	1	2	4	$1.044540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	44	Fairmont-Alden-C-Alden-Conger-0242 - 000G94 - 044	13,710	$11,110.89	$0.81	$149,119.84	$10.88	1	2	4	$1.036629
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	45	Fairmont-Emmons-C-Glenville-Emmons-2886 - 000G94 - 045	13,549	$11,041.92	$0.81	$148,194.19	$10.94	1	2	4	$1.039017
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	49	Fairmont-Twin Lakes-C-Albert Lea-0241 - 000G94 - 049	3,808	$3,296.29	$0.87	$44,239.69	$11.62	1	2	4	$1.065206
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	66	Fairmont-Dunnell-C-Martin Cty W-2448 - 000G94 - 066	2,911	$2,686.82	$0.92	$36,059.96	$12.39	1	2	4	$1.093071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	112,723	$89,595.31	$0.79	$1,202,463.36	$10.67	1	2	4	$1.028164
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	70	Fairmont-Manyaska-T-Martin Cty W-2448 - 000G94 - 070	1,247	$1,383.58	$1.11	$18,569.10	$14.89	1	2	4	$1.172895
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	72	Fairmont-Rolling Green-T-Fairmont Area-2752 - 000G94 - 072	29	$26.77	$0.92	$359.28	$12.39	1	2	4	$1.093071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	74	Fairmont-Sherburn-C-Martin Cty W-2448 - 000G94 - 074	34,289	$27,332.34	$0.80	$366,828.78	$10.70	1	2	4	$1.029384
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	75	Fairmont-Trimont-C-Martin Cty W-2448 - 000G94 - 075	2,426	$2,310.50	$0.95	$31,009.35	$12.78	1	2	4	$1.106531
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	76	Fairmont-Truman-C-Truman-0458 - 000G94 - 076	31,305	$23,932.94	$0.76	$321,205.25	$10.26	1	2	4	$1.011147
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	77	Fairmont-Welcome-C-Martin Cty W-2448 - 000G94 - 077	26,440	$20,690.43	$0.78	$277,687.35	$10.50	1	2	4	$1.021189
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	89	Fairmont-Ellendale-C-NRHEG-2168 - 000G94 - 089	10,654	$8,698.18	$0.82	$116,738.73	$10.96	1	2	4	$1.039811
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	92	Fairmont-New Richland-T-NRHEG-2168 - 000G94 - 092	18	$15.72	$0.87	$210.98	$11.72	1	2	4	$1.068928
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	93	Fairmont-New Richland-C-NRHEG-2168 - 000G94 - 093	1,511	$1,244.49	$0.82	$16,702.37	$11.05	1	2	4	$1.043362
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	97	Rochester-Claremont-C-Triton-2125 - 000G95 - 097	8,470	$6,659.17	$0.79	$89,373.07	$10.55	1	2	4	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	98	Rochester-Concord-T-Triton-2125 - 000G95 - 098	1,713	$1,347.26	$0.79	$18,081.65	$10.56	1	2	4	$1.023664
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	28,091	$23,096.97	$0.82	$309,985.65	$11.04	1	2	4	$1.042969
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	15,101	$11,872.79	$0.79	$159,345.35	$10.55	1	2	4	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	39,790	$31,663.20	$0.80	$424,953.47	$10.68	1	2	4	$1.028571
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	1,098	$863.25	$0.79	$11,585.72	$10.55	1	2	4	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	105	Rochester-Wasioja-T-Triton-2125 - 000G95 - 105	3,469	$2,785.85	$0.80	$37,389.04	$10.78	1	2	4	$1.032619
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	106	Rochester-West Concord-C-Triton-2125 - 000G95 - 106	15,928	$12,522.33	$0.79	$168,062.86	$10.55	1	2	4	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	107	Rochester-Westfield-T-Blooming Prairie-0756 - 000G95 - 107	127	$99.86	$0.79	$1,340.23	$10.55	1	2	4	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	113	Rochester-Harmony-C-Fillmore Central-2198 - 000G95 - 113	10,807	$8,497.09	$0.79	$114,039.89	$10.55	1	2	4	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	114	Rochester-Lanesboro-C-Lanesboro-0229 - 000G95 - 114	1,899	$1,537.95	$0.81	$20,640.91	$10.87	1	2	4	$1.036230
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	121	$0.00	$0.00	($0.01)	$0.00	1	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	9,936	$7,812.08	$0.79	$104,846.33	$10.55	1	2	4	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	44,329	$30,343.05	$0.68	$407,235.67	$9.19	1	2	4	$0.963316
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	298	Rosemount-Eureka-T-Farmington-0192 - 000G93 - 298	242	$189.74	$0.78	$2,546.51	$10.52	1	2	4	$1.022016
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	299	Rosemount-Rosemount-C-Inver Grove Hts-0199 - 000G93 - 299	3,482	$2,733.69	$0.79	$36,689.00	$10.54	1	2	4	$1.022841
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	316	Rosemount-Lakeville-C-Farmington-0192 - 000G93 - 316	1,976	$1,553.55	$0.79	$20,850.28	$10.55	1	2	4	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	359	Fairmont-Westford-T-Truman - 000G94 - 359	574	$456.02	$0.79	$6,120.27	$10.66	1	2	4	$1.027757
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	14	$11.01	$0.79	$147.77	$10.56	1	2	4	$1.023664
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	392	Rochester-Claremont-T-Trion-2125 - 000G95 - 392	69	$54.25	$0.79	$728.09	$10.55	1	2	4	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1961	424	Fairmont-Alden-C-Alden-Conger-0242 - 000G94 - 044	13,710	$11,110.89	$0.81	$149,119.84	$10.88	1	2	4	$1.036629
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1961	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	4,213	$3,312.44	$0.79	$44,456.43	$10.55	1	3	9	$1.023252

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1961	41	Fairmont-Clark-T-United S Central-2134 - 000G94 - 041	579	$455.24	$0.79	$6,109.80	$10.55	1	3	9	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1961	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	1,533	$1,276.93	$0.83	$17,137.76	$11.18	1	3	9	$1.048442
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1961	45	Fairmont-Emmons-C-Glenville-Emmons-2886 - 000G94 - 045	2,904	$2,282.97	$0.79	$30,639.86	$10.55	1	3	9	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1961	49	Fairmont-Twin Lakes-C-Albert Lea-0241 - 000G94 - 049	3,014	$2,369.50	$0.79	$31,801.18	$10.55	1	3	9	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1961	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	4,268	$3,276.60	$0.77	$43,975.42	$10.30	1	3	9	$1.012837
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1961	74	Fairmont-Sherburn-C-Martin Cty W-2448 - 000G94 - 074	1,206	$947.80	$0.79	$12,720.47	$10.55	1	3	9	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1961	75	Fairmont-Trimont-C-Martin Cty W-2448 - 000G94 - 075	2,419	$1,901.67	$0.79	$25,522.41	$10.55	1	3	9	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1961	76	Fairmont-Truman-C-Truman-0458 - 000G94 - 076	7,084	$5,569.07	$0.79	$74,742.78	$10.55	1	3	9	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1961	77	Fairmont-Welcome-C-Martin Cty W-2448 - 000G94 - 077	8,470	$6,660.31	$0.79	$89,388.37	$10.55	1	3	9	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1961	88	Fairmont-Berlin-T-NRHEG-2168 - 000G94 - 088	40	$31.45	$0.79	$422.09	$10.55	1	3	9	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1961	89	Fairmont-Ellendale-C-NRHEG-2168 - 000G94 - 089	2,727	$2,143.77	$0.79	$28,771.65	$10.55	1	3	9	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1961	97	Rochester-Claremont-C-Triton-2125 - 000G95 - 097	322	$253.29	$0.79	$3,399.42	$10.56	1	3	9	$1.023664
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1961	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	5,385	$4,233.54	$0.79	$56,818.56	$10.55	1	3	9	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1961	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	8,431	$6,239.57	$0.74	$83,741.59	$9.93	1	3	9	$0.996949
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1961	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	5,380	$3,063.93	$0.57	$41,121.17	$7.64	1	3	9	$0.883093
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1961	104	Rochester-Vernon-T-Hayfield-0203 - 000G95 - 104	20,241	$15,913.35	$0.79	$213,573.91	$10.55	1	3	9	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1961	106	Rochester-West Concord-C-Triton-2125 - 000G95 - 106	5,096	$4,007.23	$0.79	$53,781.24	$10.55	1	3	9	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1961	113	Rochester-Harmony-C-Fillmore Central-2198 - 000G95 - 113	1,265	$994.10	$0.79	$13,341.87	$10.55	1	3	9	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1961	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	14,001	$11,006.82	$0.79	$147,723.11	$10.55	1	3	9	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1961	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	1,190	$935.63	$0.79	$12,557.14	$10.55	1	3	9	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1961	298	Rosemount-Eureka-T-Farmington-0192 - 000G93 - 298	1,152	$905.13	$0.79	$12,147.80	$10.54	1	3	9	$1.022841
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1961	299	Rosemount-Rosemount-C-Inver Grove Hts-0199 - 000G93 - 299	368	$289.61	$0.79	$3,886.87	$10.56	1	3	9	$1.023664
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1961	389	Rochester-Sargeant-T-Hayfield-0203 - 000G95 - 389	4,205	$3,305.94	$0.79	$44,369.19	$10.55	1	3	9	$1.023252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	978	$2,157.17	$2.21	$28,951.48	$29.60	1	4	16	$1.471292
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	44	Fairmont-Alden-C-Alden-Conger-0242 - 000G94 - 044	112	$246.12	$2.20	$3,303.19	$29.49	1	4	16	$1.469675
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	90,140	$197,758.40	$2.19	$2,654,125.90	$29.44	1	4	16	$1.468938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	69	Fairmont-Lake Fremont-T-Martin Cty W-2448 - 000G94 - 069	102	$223.33	$2.19	$2,997.32	$29.39	1	4	16	$1.468200
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	70	Fairmont-Manyaska-T-Martin Cty W-2448 - 000G94 - 070	5,142	$11,295.68	$2.20	$151,599.91	$29.48	1	4	16	$1.469527
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	72	Fairmont-Rolling Green-T-Fairmont Area-2752 - 000G94 - 072	4,205	$7,121.21	$1.69	$95,574.13	$22.73	1	4	16	$1.356599
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	74	Fairmont-Sherburn-C-Martin Cty W-2448 - 000G94 - 074	6,107	$13,415.16	$2.20	$180,045.57	$29.48	1	4	16	$1.469527
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	75	Fairmont-Trimont-C-Martin Cty W-2448 - 000G94 - 075	3,790	$8,289.62	$2.19	$111,255.43	$29.35	1	4	16	$1.467608
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	76	Fairmont-Truman-C-Truman-0458 - 000G94 - 076	3,904	$3,052.67	$0.78	$40,970.04	$10.49	1	4	16	$1.020775
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	89	Fairmont-Ellendale-C-NRHEG-2168 - 000G94 - 089	1,181	$2,596.46	$2.20	$34,847.23	$29.51	1	4	16	$1.469969
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	92	Fairmont-New Richland-T-NRHEG-2168 - 000G94 - 092	116	$254.77	$2.20	$3,419.29	$29.48	1	4	16	$1.469527
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	98	Rochester-Concord-T-Triton-2125 - 000G95 - 098	1,304	$2,864.41	$2.20	$38,443.40	$29.48	1	4	16	$1.469527
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	1,552	$3,408.97	$2.20	$45,751.95	$29.48	1	4	16	$1.469527
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	2,146	$4,358.87	$2.03	$58,500.63	$27.26	1	4	16	$1.435526
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	4,457	$8,975.77	$2.01	$120,464.29	$27.03	1	4	16	$1.431846
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	105	Rochester-Wasioja-T-Triton-2125 - 000G95 - 105	61	$134.36	$2.20	$1,803.25	$29.56	1	4	16	$1.470704
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	106	Rochester-West Concord-C-Triton-2125 - 000G95 - 106	642	$737.41	$1.15	$9,896.82	$15.42	1	4	16	$1.188084
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	108	Rochester-Carrolton-T-Fillmore Central-2198 - 000G95 - 108	49	$107.62	$2.20	$1,444.37	$29.48	1	4	16	$1.469527
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	109	Rochester-Harmony-T-Fillmore Central-2198 - 000G95 - 109	361	$793.67	$2.20	$10,651.89	$29.51	1	4	16	$1.469969
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	112	Rochester-Fountain-C-Fillmore Central-2198 - 000G95 - 112	877	$2,561.49	$2.92	$34,377.90	$39.20	1	4	16	$1.593286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	113	Rochester-Harmony-C-Fillmore Central-2198 - 000G95 - 113	3,402	$7,473.73	$2.20	$100,305.32	$29.48	1	4	16	$1.469527
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	4,136	$9,084.78	$2.20	$121,927.31	$29.48	1	4	16	$1.469527
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	153	Rochester-Haverhill-T-Rochester-0535 - 000G95 - 153	414	$909.35	$2.20	$12,204.44	$29.48	1	4	16	$1.469527
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	155	Rochester-Kalmar-T-Bryron-0531 - 000G95 - 155	274	$601.84	$2.20	$8,077.33	$29.48	1	4	16	$1.469527
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	29,035	$66,358.61	$2.29	$890,602.40	$30.67	1	4	16	$1.486714
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	8,738	$12,475.34	$1.43	$167,432.20	$19.16	1	4	16	$1.282396
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	299	Rosemount-Rosemount-C-Inver Grove Hts-0199 - 000G93 - 299	15,867	$34,670.37	$2.19	$465,312.86	$29.33	1	4	16	$1.467312
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	309	Rochester-Oronoco-T-Rochester-0535 - 000G95 - 309	41	$90.07	$2.20	$1,208.83	$29.48	1	4	16	$1.469527
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	312	Rochester-Chatfield-T-Chatfield-0227 - 000G95 - 312	286	$628.20	$2.20	$8,431.11	$29.48	1	4	16	$1.469527
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	267	$586.47	$2.20	$7,871.04	$29.48	1	4	16	$1.469527
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1961	424	Fairmont-Alden-C-Alden-Conger-0242 - 000G94 - 044	112	$246.12	$2.20	$3,303.19	$29.49	1	4	16	$1.469675
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1961	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	14,222	$57,852.75	$4.07	$776,444.81	$54.59	1	6	36	$1.737113
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1961	74	Fairmont-Sherburn-C-Martin Cty W-2448 - 000G94 - 074	159	$647.30	$4.07	$8,687.45	$54.64	1	6	36	$1.737511
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1961	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	62	$252.38	$4.07	$3,387.21	$54.63	1	6	36	$1.737431
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1961	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	51,684	$210,241.34	$4.07	$2,821,660.09	$54.59	1	6	36	$1.737113
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1961	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	492	$1,797.17	$3.65	$24,119.91	$49.02	1	6	36	$1.690373
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1961	299	Rosemount-Rosemount-C-Inver Grove Hts-0199 - 000G93 - 299	5,786	$22,327.11	$3.86	$299,653.32	$51.79	1	6	36	$1.714246
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1961	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	3,419	$6,805.28	$1.99	$91,334.02	$26.71	1	8	64	$1.426674
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1961	298	Rosemount-Eureka-T-Farmington-0192 - 000G93 - 298	1,118	$2,225.15	$1.99	$29,863.86	$26.71	1	8	64	$1.426674
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1962	115	Rochester-Mabel-C-Mabel-Canton-0238 - 000G95 - 115	2,408	$600.22	$0.25	$7,916.69	$3.29	0	2	4	$0.517196
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1962	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	4,239	$1,056.74	$0.25	$13,938.04	$3.29	0	2	4	$0.517196
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1962	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	6,565	$1,707.15	$0.26	$22,516.72	$3.43	0	2	4	$0.535294
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1962	120	Rochester-Rushford-V-Rushford-Peterson-0239 - 000G95 - 120	10,005	$2,606.35	$0.26	$34,376.85	$3.44	0	2	4	$0.536558
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1962	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	5,240	$1,306.30	$0.25	$17,229.65	$3.29	0	2	4	$0.517196

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1962	124	Fairmont-Hayward-C-Albert Lea-0241 - 000G94 - 124	265	$66.27	$0.25	$874.08	$3.30	0	2	4	$0.518514
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1962	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	8,188	$2,041.78	$0.25	$26,930.38	$3.29	0	2	4	$0.517196
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1962	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	741	$185.20	$0.25	$2,442.72	$3.30	0	3	9	$0.518514
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1962	122	Rochester-Spring Valley-T-Kingsland-2137 - 000G95 - 122	1,440	$358.60	$0.25	$4,729.81	$3.28	0	3	9	$0.515874
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1962	115	Rochester-Mabel-C-Mabel-Canton-0238 - 000G95 - 115	708	$353.01	$0.50	$4,656.08	$6.58	0	4	16	$0.818226
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1962	116	Rochester-Newburg-T-Mabel-Canton-0238 - 000G95 - 116	4,650	$2,318.81	$0.50	$30,584.31	$6.58	0	4	16	$0.818226
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1962	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	1,628	$811.84	$0.50	$10,707.89	$6.58	0	4	16	$0.818226
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1962	120	Rochester-Rushford-V-Rushford-Peterson-0239 - 000G95 - 120	2,442	$1,217.77	$0.50	$16,061.97	$6.58	0	4	16	$0.818226
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1962	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	1,120	$558.42	$0.50	$7,365.36	$6.58	0	4	16	$0.818226
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1962	122	Rochester-Spring Valley-T-Kingsland-2137 - 000G95 - 122	486	$242.31	$0.50	$3,195.99	$6.58	0	4	16	$0.818226
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1962	128	Rochester-Minneola-T-Zumbrota-Mazeppa-2805 - 000G95 - 128	2,084	$1,039.49	$0.50	$13,710.51	$6.58	0	4	16	$0.818226
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1962	115	Rochester-Mabel-C-Mabel-Canton-0238 - 000G95 - 115	9,238	$7,279.34	$0.79	$96,011.98	$10.39	1	1.25	1.5625	$1.016616
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1962	116	Rochester-Newburg-T-Mabel-Canton-0238 - 000G95 - 116	1,684	$1,327.28	$0.79	$17,506.37	$10.40	1	1.25	1.5625	$1.017033
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1962	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	77	$61.73	$0.80	$814.20	$10.57	1	1.25	1.5625	$1.024075
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1962	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	437	$344.99	$0.79	$4,550.30	$10.41	1	1.25	1.5625	$1.017451
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1962	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	66	$51.75	$0.78	$682.56	$10.34	1	1.25	1.5625	$1.014521
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1962	114	Rochester-Lanesboro-C-Lanesboro-0229 - 000G95 - 114	18,965	$14,943.30	$0.79	$197,096.97	$10.39	1	2	4	$1.016616
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1962	115	Rochester-Mabel-C-Mabel-Canton-0238 - 000G95 - 115	7,736	$6,095.51	$0.79	$80,397.69	$10.39	1	2	4	$1.016616
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1962	116	Rochester-Newburg-T-Mabel-Canton-0238 - 000G95 - 116	1,060	$834.79	$0.79	$11,010.59	$10.39	1	2	4	$1.016616
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1962	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	27,908	$21,989.33	$0.79	$290,031.68	$10.39	1	2	4	$1.016616
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1962	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	19,171	$15,531.76	$0.81	$204,858.56	$10.69	1	2	4	$1.028978
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1962	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	49,603	$39,106.78	$0.79	$515,804.94	$10.40	1	2	4	$1.017033
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1962	122	Rochester-Spring Valley-T-Kingsland-2137 - 000G95 - 122	1,036	$816.33	$0.79	$10,767.12	$10.39	1	2	4	$1.016616
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1962	124	Fairmont-Hayward-C-Albert Lea-0241 - 000G94 - 124	8,217	$6,475.55	$0.79	$85,410.27	$10.39	1	2	4	$1.016616
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1962	125	Fairmont-Oakland-T-Austin-0492 - 000G94 - 125	1,792	$1,412.28	$0.79	$18,627.49	$10.39	1	2	4	$1.016616
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1962	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	26,227	$20,666.54	$0.79	$272,584.54	$10.39	1	2	4	$1.016616
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1962	385	Rochester-Moscow-T-Austin - 000G95 - 385	1,084	$854.30	$0.79	$11,267.92	$10.39	1	2	4	$1.016616
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1962	114	Rochester-Lanesboro-C-Lanesboro-0229 - 000G95 - 114	2,784	$2,193.46	$0.79	$28,930.98	$10.39	1	3	9	$1.016616
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1962	115	Rochester-Mabel-C-Mabel-Canton-0238 - 000G95 - 115	2,390	$1,883.48	$0.79	$24,842.46	$10.39	1	3	9	$1.016616
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1962	116	Rochester-Newburg-T-Mabel-Canton-0238 - 000G95 - 116	478	$377.08	$0.79	$4,973.55	$10.40	1	3	9	$1.017033
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1962	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	6,397	$4,932.80	$0.77	$65,061.94	$10.17	1	3	9	$1.007321
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1962	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	7,756	$6,167.30	$0.80	$81,344.56	$10.49	1	3	9	$1.020775
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1962	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	7,093	$5,589.19	$0.79	$73,719.50	$10.39	1	3	9	$1.016616
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1962	124	Fairmont-Hayward-C-Albert Lea-0241 - 000G94 - 124	285	$224.49	$0.79	$2,960.94	$10.39	1	3	9	$1.016616
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1962	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	9,043	$7,126.23	$0.79	$93,992.51	$10.39	1	3	9	$1.016616
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1962	386	Rochester-Hayward-T-Albert Lea-0241 - 000G95 - 386	50	$39.38	$0.79	$519.41	$10.39	1	3	9	$1.016616
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1962	114	Rochester-Lanesboro-C-Lanesboro-0229 - 000G95 - 114	383	$301.41	$0.79	$3,975.49	$10.38	1	0.75	0.5625	$1.016197
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1962	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	16	$12.71	$0.79	$167.64	$10.48	1	0.75	0.5625	$1.020361
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1962	114	Rochester-Lanesboro-C-Lanesboro-0229 - 000G95 - 114	1,654	$3,641.61	$2.20	$48,031.58	$29.04	1	4	16	$1.462997
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1962	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	1,216	$2,677.39	$2.20	$35,313.85	$29.04	1	4	16	$1.462997
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1962	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	6,677	$14,700.36	$2.20	$193,892.68	$29.04	1	4	16	$1.462997
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1962	120	Rochester-Rushford-V-Rushford-Peterson-0239 - 000G95 - 120	241	$962.12	$3.99	$12,690.04	$52.66	1	4	16	$1.721481
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1962	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	2,042	$4,495.78	$2.20	$59,297.80	$29.04	1	4	16	$1.462997
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1962	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	6,455	$14,211.01	$2.20	$187,438.32	$29.04	1	4	16	$1.462997
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1962	108	Rochester-Carrolton-T-Fillmore Central-2198 - 000G95 - 108	509	$555.06	$1.09	$7,321.05	$14.38	1	6	36	$1.157759
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1962	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	6,571	$7,165.68	$1.09	$94,512.86	$14.38	1	6	36	$1.157759
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1962	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	5,546	$22,611.05	$4.08	$298,231.95	$53.77	1	6	36	$1.730540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1962	122	Rochester-Spring Valley-T-Kingsland-2137 - 000G95 - 122	108	$440.31	$4.08	$5,807.54	$53.77	1	6	36	$1.730540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1962	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	2,630	$10,721.78	$4.08	$141,416.58	$53.77	1	6	36	$1.730540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1962	309	Rochester-Oronoco-T-Rochester-0535 - 000G95 - 309	477	$520.17	$1.09	$6,860.86	$14.38	1	6	36	$1.157759
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1962	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	316	$630.05	$1.99	$8,310.14	$26.30	1	8	64	$1.419956
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1963	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	6,529	$1,406.27	$0.22	$17,929.94	$2.75	0	2	4	$0.439333
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1963	131	Rochester-Wanamingo-C-Kenyon-Wanamingo-2172 - 000G95 - 131	5,952	$1,440.77	$0.24	$18,369.82	$3.09	0	2	4	$0.489958
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1963	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	2,410	$583.29	$0.24	$7,436.95	$3.09	0	2	4	$0.489958
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1963	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	7,229	$1,840.22	$0.25	$23,462.81	$3.25	0	2	4	$0.511883
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1963	134	Rochester-Houston-C-Houston-0294 - 000G95 - 134	300	$72.63	$0.24	$926.03	$3.09	0	2	4	$0.489958
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1963	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	3,402	$857.48	$0.25	$10,932.87	$3.21	0	2	4	$0.506505
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1963	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	338	$81.71	$0.24	$1,041.80	$3.08	0	3	9	$0.488551
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1963	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	274	$132.55	$0.48	$1,690.01	$6.17	0	4	16	$0.790285
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1963	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	1,912	$926.01	$0.48	$11,806.63	$6.18	0	4	16	$0.790988
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1963	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	1,792	$867.91	$0.48	$11,065.85	$6.18	0	4	16	$0.790988
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1963	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	1,413	$683.62	$0.48	$8,716.16	$6.17	0	4	16	$0.790285
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1963	384	Rochester-Pine Island-T-Zumbrota - 000G95 - 384	63	$29.96	$0.48	$381.99	$6.06	0	4	16	$0.782473
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1963	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	1,977	$1,513.40	$0.77	$19,295.85	$9.76	1	1.25	1.5625	$0.989450
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1963	130	Rochester-Roscoe-T-Zumbrota-Mazeppa-2805 - 000G95 - 130	1,385	$1,059.45	$0.76	$13,507.99	$9.75	1	1.25	1.5625	$0.989005
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1963	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	662	$506.60	$0.77	$6,459.15	$9.76	1	1.25	1.5625	$0.989450
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1963	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	16,818	$12,865.94	$0.77	$164,040.73	$9.75	1	1.25	1.5625	$0.989005

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1963	134	Rochester-Houston-C-Houston-0294 - 000G95 - 134	13,656	$9,451.88	$0.69	$120,511.48	$8.82	1	1.25	1.5625	$0.945469
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1963	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	1,494	$1,142.78	$0.76	$14,570.45	$9.75	1	1.25	1.5625	$0.989005
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1963	375	Rochester-Houston-T-Houston-0294 - 000G95 - 375	899	$622.23	$0.69	$7,933.43	$8.82	1	1.25	1.5625	$0.945469
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	190	Steel 2 1/2 in	1963	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	166	$127.10	$0.77	$1,620.53	$9.76	1	2.5	6.25	$0.989450
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1963	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	1,402	$1,072.59	$0.77	$13,675.52	$9.75	1	2	4	$0.989005
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1963	128	Rochester-Minneola-T-Zumbrota-Mazeppa-2805 - 000G95 - 128	2,198	$1,681.35	$0.76	$21,437.21	$9.75	1	2	4	$0.989005
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1963	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	15,098	$12,114.13	$0.80	$154,455.15	$10.23	1	2	4	$1.009876
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1963	131	Rochester-Wanamingo-C-Kenyon-Wanamingo-2172 - 000G95 - 131	15,052	$11,586.06	$0.77	$147,722.27	$9.81	1	2	4	$0.991669
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1963	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	46,417	$35,497.06	$0.76	$452,587.51	$9.75	1	2	4	$0.989005
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1963	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	37,793	$28,716.95	$0.76	$366,141.11	$9.69	1	2	4	$0.986324
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1963	134	Rochester-Houston-C-Houston-0294 - 000G95 - 134	9,470	$6,480.84	$0.68	$82,630.71	$8.73	1	2	4	$0.941014
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1963	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	3,417	$2,614.69	$0.77	$33,337.29	$9.76	1	2	4	$0.989450
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1963	154	Rochester-High Forest-T-Stewartville-0534 - 000G95 - 154	4,710	$3,289.69	$0.70	$41,943.55	$8.91	1	2	4	$0.949878
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1963	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	5,476	$4,189.38	$0.77	$53,414.59	$9.75	1	3	9	$0.989005
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1963	131	Rochester-Wanamingo-C-Kenyon-Wanamingo-2172 - 000G95 - 131	7,658	$5,858.39	$0.77	$74,694.47	$9.75	1	3	9	$0.989005
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1963	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	6,504	$4,952.18	$0.76	$63,140.29	$9.71	1	3	9	$0.987219
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1963	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	6,847	$5,237.42	$0.76	$66,777.11	$9.75	1	3	9	$0.989005
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1963	134	Rochester-Houston-C-Houston-0294 - 000G95 - 134	4,748	$2,289.37	$0.48	$29,189.47	$6.15	1	3	9	$0.788875
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1963	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	1,438	$1,099.41	$0.76	$14,017.48	$9.75	1	0.75	0.5625	$0.989005
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1963	131	Rochester-Wanamingo-C-Kenyon-Wanamingo-2172 - 000G95 - 131	290	$222.42	$0.77	$2,835.86	$9.78	1	0.75	0.5625	$0.990339
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1963	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	1,796	$3,839.17	$2.14	$48,949.41	$27.25	1	4	16	$1.435367
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1963	131	Rochester-Wanamingo-C-Kenyon-Wanamingo-2172 - 000G95 - 131	116	$248.34	$2.14	$3,166.33	$27.30	1	4	16	$1.436163
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1963	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	2,371	$5,291.97	$2.23	$67,472.63	$28.46	1	4	16	$1.454235
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1963	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	1,285	$2,746.26	$2.14	$35,014.82	$27.25	1	4	16	$1.435367
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1963	134	Rochester-Houston-C-Houston-0294 - 000G95 - 134	76	$163.14	$2.15	$2,080.04	$27.37	1	4	16	$1.437275
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1963	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	47	$185.74	$3.95	$2,368.19	$50.39	1	6	36	$1.702344
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1963	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	8,726	$33,853.02	$3.88	$431,626.00	$49.46	1	6	36	$1.694254
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1963	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	4,895	$19,375.46	$3.96	$247,037.12	$50.47	1	6	36	$1.703033
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1964	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	410	$177.03	$0.43	$2,184.32	$5.33	0	1	1	$0.726727
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1964	136	Rochester-La Crescent-T-LaCrescent-Hokah-0300 - 000G95 - 136	1,578	$679.98	$0.43	$8,390.08	$5.32	0	2	4	$0.725912
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1964	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	2,206	$950.80	$0.43	$11,731.65	$5.32	0	2	4	$0.725912
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1964	138	Rochester-Spring Grove-T-Spring Grove-0297 - 000G95 - 138	224	$96.55	$0.43	$1,191.30	$5.32	0	2	4	$0.725912
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1964	140	Rochester-Brownsdale-C-Hayfield-0203 - 000G95 - 140	19,262	$8,305.86	$0.43	$102,483.60	$5.32	0	2	4	$0.725912
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1964	141	Rochester-Lansing-T-Austin-0492 - 000G95 - 141	8,437	$6,162.96	$0.73	$76,042.97	$9.01	0	2	4	$0.954725
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1964	142	Rochester-Red Rock-C-Hayfield-0203 - 000G95 - 142	1,453	$626.54	$0.43	$7,730.69	$5.32	0	2	4	$0.725912
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1964	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	15,522	$6,694.59	$0.43	$82,602.61	$5.32	0	2	4	$0.725912
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1964	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	129,236	$55,729.98	$0.43	$687,636.04	$5.32	0	2	4	$0.725912
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1964	155	Rochester-Kalmar-T-Bryron-0531 - 000G95 - 155	502	$216.51	$0.43	$2,671.45	$5.32	0	2	4	$0.725912
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1964	416	Rochester-Cascade-T-Byron SD-0531 - 000G95 - 416	13,161	$5,675.37	$0.43	$70,026.74	$5.32	0	2	4	$0.725912
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1964	140	Rochester-Brownsdale-C-Hayfield-0203 - 000G95 - 140	2,309	$1,991.69	$0.86	$24,574.88	$10.64	0	4	16	$1.026942
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1964	142	Rochester-Red Rock-C-Hayfield-0203 - 000G95 - 142	77	$66.42	$0.86	$819.54	$10.64	0	4	16	$1.026942
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1964	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	2,793	$2,948.98	$1.06	$36,386.60	$13.03	0	4	16	$1.114944
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1964	136	Rochester-La Crescent-T-LaCrescent-Hokah-0300 - 000G95 - 136	1,340	$1,825.36	$1.36	$22,522.59	$16.81	1	1.25	1.5625	$1.225568
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1964	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	772	$1,052.21	$1.36	$12,982.91	$16.82	1	1.25	1.5625	$1.225826
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1964	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	520	$708.13	$1.36	$8,737.41	$16.80	1	1.25	1.5625	$1.225309
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1964	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	46,268	$63,046.07	$1.36	$777,907.15	$16.81	1	2	4	$1.225568
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1964	136	Rochester-La Crescent-T-LaCrescent-Hokah-0300 - 000G95 - 136	10,794	$14,653.24	$1.36	$180,802.07	$16.75	1	2	4	$1.224015
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1964	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	16,668	$22,711.79	$1.36	$280,234.19	$16.81	1	2	4	$1.225568
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1964	155	Rochester-Kalmar-T-Bryron-0531 - 000G95 - 155	180	$245.27	$1.36	$3,026.32	$16.81	1	2	4	$1.225568
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1964	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	8,346	$11,372.44	$1.36	$140,321.23	$16.81	1	3	9	$1.225568
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1964	142	Rochester-Red Rock-C-Hayfield-0203 - 000G95 - 142	21	$28.60	$1.36	$352.89	$16.80	1	3	9	$1.225309
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1964	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	12,749	$17,371.69	$1.36	$214,344.24	$16.81	1	3	9	$1.225568
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1964	155	Rochester-Kalmar-T-Bryron-0531 - 000G95 - 155	18	$24.53	$1.36	$302.67	$16.82	1	3	9	$1.225826
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1964	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	3,654	$13,912.04	$3.81	$171,656.62	$46.98	1	4	16	$1.671913
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1964	136	Rochester-La Crescent-T-LaCrescent-Hokah-0300 - 000G95 - 136	299	$1,138.40	$3.81	$14,046.39	$46.98	1	4	16	$1.671913
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1964	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	3,225	$9,917.83	$3.08	$122,373.22	$37.95	1	4	16	$1.579212
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1964	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	3,943	$27,798.21	$7.05	$342,994.04	$86.99	1	6	36	$1.939469
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1964	136	Rochester-La Crescent-T-LaCrescent-Hokah-0300 - 000G95 - 136	24	$169.20	$7.05	$2,087.71	$86.99	1	6	36	$1.939469
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1965	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	37,163	$14,864.30	$0.40	$177,674.84	$4.78	0	2	4	$0.679428
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1965	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	12,727	$5,088.40	$0.40	$60,822.29	$4.78	0	2	4	$0.679428
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1965	148	Rochester-Dover-C-Dover-Eyota-0533 - 000G95 - 148	3,228	$1,430.60	$0.44	$17,100.13	$5.30	0	2	4	$0.724276
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1965	150	Rochester-Elmira-T-Chatfield-0227 - 000G95 - 150	1,847	$737.93	$0.40	$8,820.57	$4.78	0	2	4	$0.679428
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1965	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	6,791	$2,799.71	$0.41	$33,465.29	$4.93	0	2	4	$0.692847
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1965	153	Rochester-Haverhill-T-Rochester-0535 - 000G95 - 153	33,161	$13,341.32	$0.40	$159,470.47	$4.81	0	2	4	$0.682145
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1965	154	Rochester-High Forest-T-Stewartville-0534 - 000G95 - 154	8,207	$3,280.29	$0.40	$39,209.71	$4.78	0	2	4	$0.679428
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1965	155	Rochester-Kalmar-T-Bryron-0531 - 000G95 - 155	4,573	$1,828.42	$0.40	$21,855.33	$4.78	0	2	4	$0.679428
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1965	156	Rochester-Marion-T-Rochester-0535 - 000G95 - 156	81,885	$32,741.90	$0.40	$391,368.02	$4.78	0	2	4	$0.679428

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1965	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	187	$74.44	$0.40	$889.79	$4.76	0	3	9	$0.677607
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1965	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	581	$232.23	$0.40	$2,775.87	$4.78	0	3	9	$0.679428
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1965	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	95	$76.18	$0.80	$910.59	$9.59	0	4	16	$0.981819
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1965	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	66,486	$53,160.11	$0.80	$635,429.44	$9.56	0	4	16	$0.980458
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1965	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	478	$382.48	$0.80	$4,571.83	$9.56	0	4	16	$0.980458
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1965	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	1,951	$1,559.69	$0.80	$18,643.17	$9.56	0	4	16	$0.980458
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1965	153	Rochester-Haverhill-T-Rochester-0535 - 000G95 - 153	11,498	$9,195.29	$0.80	$109,912.45	$9.56	0	4	16	$0.980458
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1965	154	Rochester-High Forest-T-Stewartville-0534 - 000G95 - 154	1,956	$1,563.96	$0.80	$18,694.21	$9.56	0	4	16	$0.980458
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1965	155	Rochester-Kalmar-T-Bryron-0531 - 000G95 - 155	4,705	$3,773.12	$0.80	$45,100.57	$9.59	0	4	16	$0.981819
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1965	416	Rochester-Cascade-T-Byron SD-0531 - 000G95 - 416	283	$226.28	$0.80	$2,704.75	$9.56	0	4	16	$0.980458
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1965	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	8,242	$6,589.21	$0.80	$78,761.65	$9.56	0	6	36	$0.980458
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1965	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	908	$1,147.53	$1.26	$13,716.57	$15.11	1	1.25	1.5625	$1.179264
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1965	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	1,456	$985.93	$0.68	$11,784.94	$8.09	1	1.25	1.5625	$0.907949
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1965	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	23	$29.96	$1.30	$358.12	$15.57	1	1	1	$1.192289
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	186	Steel 10 in	1965	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	1,653	$12,355.62	$7.48	$147,688.27	$89.35	1	10	100	$1.951095
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	187	Steel 12 in	1965	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	2,926	$25,211.25	$8.62	$301,353.22	$102.99	1	12	144	$2.012795
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1965	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	900	$1,136.96	$1.26	$13,590.23	$15.10	1	2	4	$1.178977
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1965	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	8,791	$10,138.71	$1.15	$121,189.27	$13.79	1	2	4	$1.139564
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1965	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	34,204	$43,209.70	$1.26	$516,490.93	$15.10	1	2	4	$1.178977
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1965	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	16,560	$21,069.95	$1.27	$251,851.74	$15.21	1	2	4	$1.182129
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1965	153	Rochester-Haverhill-T-Rochester-0535 - 000G95 - 153	944	$1,192.01	$1.26	$14,248.24	$15.09	1	2	4	$1.178689
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1965	154	Rochester-High Forest-T-Stewartville-0534 - 000G95 - 154	8,212	$9,169.33	$1.12	$109,602.15	$13.35	1	2	4	$1.125481
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1965	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	6,875	$8,684.57	$1.26	$103,807.75	$15.10	1	3	9	$1.178977
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1965	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	3,656	$4,717.91	$1.29	$56,393.76	$15.42	1	3	9	$1.188084
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1965	152	Rochester-Eyota-T-Dover-Eyota-0533 - 000G95 - 152	389	$491.36	$1.26	$5,873.29	$15.10	1	3	9	$1.178977
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1965	154	Rochester-High Forest-T-Stewartville-0534 - 000G95 - 154	1,467	$1,846.00	$1.26	$22,065.47	$15.04	1	3	9	$1.177248
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1965	155	Rochester-Kalmar-T-Bryron-0531 - 000G95 - 155	2,161	$2,730.83	$1.26	$32,641.95	$15.11	1	3	9	$1.179264
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1965	47	Fairmont-Freeman-T-Glenville-Emmons-2886 - 000G94 - 047	2,533	$1,699.49	$0.67	$20,314.22	$8.02	1	4	16	$0.904174
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1965	123	Fairmont-Glenville-C-Glenville-Emmons-2886 - 000G94 - 123	5,285	$3,545.91	$0.67	$42,384.71	$8.02	1	4	16	$0.904174
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1965	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	7,591	$26,383.51	$3.48	$315,365.39	$41.54	1	4	16	$1.618466
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1965	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	8,336	$29,422.66	$3.53	$351,692.73	$42.19	1	4	16	$1.625210
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1965	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	72	$253.29	$3.52	$3,027.61	$42.05	1	4	16	$1.623766
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1965	154	Rochester-High Forest-T-Stewartville-0534 - 000G95 - 154	891	$2,488.09	$2.79	$29,740.45	$33.38	1	4	16	$1.523486
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1965	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	100,254	$67,264.35	$0.67	$804,019.19	$8.02	1	4	16	$0.904174
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1965	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	16,342	$10,964.49	$0.67	$131,059.92	$8.02	1	4	16	$0.904174
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1965	423	Fairmont-Albert Lea-T-Glenville-Emmons - 000G94 - 423	4,315	$2,895.10	$0.67	$34,605.49	$8.02	1	4	16	$0.904174
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1965	425	Fairmont-Bankcroft-T-Albert Lea - 000G94 - 425	5,669	$3,803.56	$0.67	$45,464.43	$8.02	1	4	16	$0.904174
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1965	457	Fairmont-Pickerel Lake-T-Albert Lea - 000G94 - 457	2,083	$1,397.57	$0.67	$16,705.33	$8.02	1	4	16	$0.904174
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1965	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	12,932	$29,008.67	$2.24	$346,744.26	$26.81	1	6	36	$1.428297
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1965	154	Rochester-High Forest-T-Stewartville-0534 - 000G95 - 154	41	$158.19	$3.86	$1,890.86	$46.12	1	6	36	$1.663889
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1965	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	7	$1,607.79	$229.68	$19,218.11	$2,745.44	1	6	36	$3.438612
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1965	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	27	$34.50	$1.28	$412.38	$15.27	1	8	64	$1.183839
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1965	153	Rochester-Haverhill-T-Rochester-0535 - 000G95 - 153	3,779	$12,085.36	$3.20	$144,457.82	$38.23	1	8	64	$1.582404
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1965	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	13	$18,463.23	$1,420.25	$220,693.30	$16,976.41	1	8	64	$4.229846
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1966	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	207	$1,316.04	$6.36	$15,488.78	$74.83	0	1.25	1.5625	$1.874076
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1966	159	Rochester-Oronoco-C-Rochester-0535 - 000G95 - 159	213	$114.39	$0.54	$1,346.28	$6.32	0	1	1	$0.800717
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1966	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	8,102	$5,788.55	$0.71	$68,126.78	$8.41	0	1	1	$0.924796
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1966	158	Rochester-Orion-T-Chatfield-0227 - 000G95 - 158	3,089	$1,659.87	$0.54	$19,535.40	$6.32	0	2	4	$0.800717
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1966	159	Rochester-Oronoco-C-Rochester-0535 - 000G95 - 159	4,508	$2,422.77	$0.54	$28,514.14	$6.33	0	2	4	$0.801404
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1966	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	713,402	$385,865.82	$0.54	$4,541,343.84	$6.37	0	2	4	$0.804139
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1966	156	Rochester-Marion-T-Rochester-0535 - 000G95 - 156	4,333	$2,880.63	$0.66	$33,902.80	$7.82	0	3	9	$0.893207
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1966	156	Rochester-Marion-T-Rochester-0535 - 000G95 - 156	38,431	$43,043.24	$1.12	$506,585.82	$13.18	0	4	16	$1.119915
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1966	157	Rochester-New Haven-T-Pine Island-0255 - 000G95 - 157	2,446	$2,628.87	$1.07	$30,939.78	$12.65	0	4	16	$1.102091
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1966	159	Rochester-Oronoco-C-Rochester-0535 - 000G95 - 159	1,180	$1,416.11	$1.20	$16,666.52	$14.12	0	4	16	$1.149835
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1966	159	Rochester-Oronoco-C-Rochester-0535 - 000G95 - 159	4,082	$4,386.76	$1.07	$51,628.79	$12.65	0	6	36	$1.102091
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1966	156	Rochester-Marion-T-Rochester-0535 - 000G95 - 156	861	$1,461.65	$1.70	$17,202.50	$19.98	1	1.25	1.5625	$1.300595
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1966	106	Rochester-West Concord-C-Triton-2125 - 000G95 - 106	99	$167.95	$1.70	$1,976.64	$19.97	1	2	4	$1.300378
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1966	156	Rochester-Marion-T-Rochester-0535 - 000G95 - 156	63,876	$105,535.01	$1.65	$1,242,065.89	$19.44	1	2	4	$1.288696
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1966	156	Rochester-Marion-T-Rochester-0535 - 000G95 - 156	32,316	$53,129.51	$1.64	$625,293.46	$19.35	1	3	9	$1.286681
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1966	156	Rochester-Marion-T-Rochester-0535 - 000G95 - 156	39,892	$173,976.84	$4.36	$2,047,573.58	$51.33	1	4	16	$1.710371
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1966	159	Rochester-Oronoco-C-Rochester-0535 - 000G95 - 159	559	$1,228.33	$2.20	$14,456.50	$25.86	1	4	16	$1.412629
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1966	156	Rochester-Marion-T-Rochester-0535 - 000G95 - 156	3,065	$26,929.71	$8.79	$316,941.97	$103.41	1	6	36	$2.014563
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1966	157	Rochester-New Haven-T-Pine Island-0255 - 000G95 - 157	3,129	$27,491.68	$8.79	$323,555.93	$103.41	1	6	36	$2.014563
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1967	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	96,868	$32,653.38	$0.34	$362,026.61	$3.74	0	2	4	$0.572872
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1967	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	40,067	$14,422.72	$0.36	$159,904.07	$3.99	0	3	9	$0.600973
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1967	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	240,760	$162,859.76	$0.68	$1,805,619.07	$7.50	0	4	16	$0.875061
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1967	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	7,099	$5,894.35	$0.83	$65,350.40	$9.21	0	6	36	$0.964260

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	183	Steel 1 1/2 in	1967	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	4,102	$5,485.82	$1.34	$60,821.05	$14.83	1	1.5	2.25	$1.171141
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1967	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	2,992	$4,327.23	$1.45	$47,975.81	$16.03	1	1.25	1.5625	$1.204934
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1967	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	782	$2,020.53	$2.58	$22,401.53	$28.65	1	1	1	$1.457125
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	186	Steel 10 in	1967	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	36,227	$95,012.47	$2.62	$1,053,399.12	$29.08	1	10	100	$1.463594
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	187	Steel 12 in	1967	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	13,214	$18,560.75	$1.40	$205,782.23	$15.57	1	12	144	$1.192289
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1967	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	377,246	$402,038.32	$1.07	$4,457,381.38	$11.82	1	2	4	$1.072617
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1967	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	433	$526.48	$1.22	$5,837.06	$13.48	1	2	4	$1.129690
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1967	154	Rochester-High Forest-T-Stewartville-0534 - 000G95 - 154	4,032	$4,585.52	$1.14	$50,839.46	$12.61	1	3	9	$1.100715
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1968	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	220	$37.22	$0.17	$395.46	$1.80	0	1	1	$0.255273
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1968	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	32,390	$5,536.69	$0.17	$58,827.33	$1.82	0	2	4	$0.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1968	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	23,752	$4,116.62	$0.17	$43,739.09	$1.84	0	2	4	$0.264818
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1968	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	2,140	$365.87	$0.17	$3,887.37	$1.82	0	3	9	$0.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1968	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	35,381	$12,204.60	$0.34	$129,673.88	$3.67	0	4	16	$0.564666
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1968	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	3,431	$1,172.78	$0.34	$12,460.79	$3.63	0	4	16	$0.559907
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1968	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	144	$284.64	$1.98	$3,024.30	$21.00	1	1.25	1.5625	$1.322219
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	187	Steel 12 in	1968	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	3,651	$4,992.97	$1.37	$53,050.30	$14.53	1	12	144	$1.162266
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1968	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	20,096	$10,976.13	$0.55	$116,621.37	$5.80	1	2	4	$0.763428
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1968	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	52,913	$29,516.69	$0.56	$313,614.82	$5.93	1	2	4	$0.773055
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1968	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	179,628	$98,237.52	$0.55	$1,043,773.64	$5.81	1	3	9	$0.764176
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1968	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	558	$853.46	$1.53	$9,068.01	$16.25	1	4	16	$1.210853
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1968	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	128,426	$196,522.68	$1.53	$2,088,053.44	$16.26	1	4	16	$1.211121
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1968	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	30	$85.42	$2.85	$907.59	$30.25	1	6	36	$1.480725
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1968	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	22,979	$65,774.11	$2.86	$698,849.91	$30.41	1	6	36	$1.483016
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1968	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	28,017	$35,814.39	$1.28	$380,527.88	$13.58	1	8	64	$1.132900
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1969	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	86	$27.24	$0.32	$267.16	$3.11	0	1	1	$0.492760
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1969	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	1,121	$353.11	$0.31	$3,463.19	$3.09	0	1	1	$0.489958
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1969	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	8,370	$2,640.24	$0.32	$25,894.66	$3.09	0	2	4	$0.489958
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1969	167	Rochester-Elgin-C-Elgin-Millville-2899 - 000G95 - 167	4,575	$1,443.15	$0.32	$14,153.97	$3.09	0	2	4	$0.489958
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1969	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	4,049	$1,277.35	$0.32	$12,527.86	$3.09	0	2	4	$0.489958
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1969	169	Rochester-Plainview-T-Plainview-2899 - 000G95 - 169	1,384	$436.60	$0.32	$4,282.04	$3.09	0	2	4	$0.489958
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1969	170	Rochester-Altura-C-Lewiston-Altura-0857 - 000G95 - 170	12,231	$3,858.48	$0.32	$37,842.78	$3.09	0	2	4	$0.489958
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1969	171	Rochester-Lewiston-C-Lewiston-Altura-0857 - 000G95 - 171	7,094	$2,240.28	$0.32	$21,971.98	$3.10	0	2	4	$0.491362
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1969	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	10,002	$3,422.66	$0.34	$33,568.39	$3.36	0	2	4	$0.526339
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1969	175	Rochester-Utica-T-Lewiston-Altura-0857 - 000G95 - 175	412	$130.13	$0.32	$1,276.27	$3.10	0	2	4	$0.491362
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1969	233	Cloquet--Hoyt Lakes-C-Mesabi E-2711 - 000G96 - 233	16,301	$5,142.09	$0.32	$50,432.04	$3.09	0	2	4	$0.489958
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1969	240	Bemidji-Audubon-C-Lk Park Audubon-2889 - 000G97 - 240	17,061	$5,381.93	$0.32	$52,784.31	$3.09	0	2	4	$0.489958
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1969	242	Bemidji-Burlington-T-Frazee-Vergas-0023 - 000G97 - 242	1,991	$628.44	$0.32	$6,163.54	$3.10	0	2	4	$0.491362
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1969	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	57,909	$18,598.46	$0.32	$182,407.96	$3.15	0	2	4	$0.498311
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1969	309	Rochester-Oronoco-T-Rochester-0535 - 000G95 - 309	2,890	$911.49	$0.32	$8,939.61	$3.09	0	2	4	$0.489958
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1969	170	Rochester-Altura-C-Lewiston-Altura-0857 - 000G95 - 170	1,812	$571.95	$0.32	$5,609.51	$3.10	0	3	9	$0.491362
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1969	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	288	$90.51	$0.31	$887.69	$3.08	0	3	9	$0.488551
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1969	174	Rochester-Utica-C-St Charles-0858 - 000G95 - 174	29	$9.08	$0.31	$89.05	$3.07	0	3	9	$0.487138
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1969	240	Bemidji-Audubon-C-Lk Park Audubon-2889 - 000G97 - 240	1,861	$587.38	$0.32	$5,760.84	$3.10	0	3	9	$0.491362
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1969	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	58,057	$18,315.07	$0.32	$179,628.58	$3.09	0	3	9	$0.489958
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1969	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	407	$128.41	$0.32	$1,259.40	$3.09	0	0.75	0.5625	$0.489958
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1969	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	1,267	$833.41	$0.66	$8,173.83	$6.45	0	4	16	$0.809560
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1969	170	Rochester-Altura-C-Lewiston-Altura-0857 - 000G95 - 170	4,499	$2,838.85	$0.63	$27,842.57	$6.19	0	4	16	$0.791691
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1969	172	Rochester-Norton-T-Lewiston-Altura-0857 - 000G95 - 172	13,277	$8,377.02	$0.63	$82,159.24	$6.19	0	4	16	$0.791691
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1969	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	551	$347.87	$0.63	$3,411.80	$6.19	0	4	16	$0.791691
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1969	175	Rochester-Utica-T-Lewiston-Altura-0857 - 000G95 - 175	9,615	$6,066.63	$0.63	$59,499.65	$6.19	0	4	16	$0.791691
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1969	233	Cloquet--Hoyt Lakes-C-Mesabi E-2711 - 000G96 - 233	338	$213.30	$0.63	$2,091.98	$6.19	0	4	16	$0.791691
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1969	240	Bemidji-Audubon-C-Lk Park Audubon-2889 - 000G97 - 240	204	$128.66	$0.63	$1,261.86	$6.19	0	4	16	$0.791691
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1969	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	5,520	$4,921.07	$0.89	$48,264.34	$8.74	0	4	16	$0.941511
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1969	309	Rochester-Oronoco-T-Rochester-0535 - 000G95 - 309	9,564	$6,034.37	$0.63	$59,183.25	$6.19	0	4	16	$0.791691
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1969	318	Rochester-Oronoco-T-Pine Island-0255 - 000G95 - 318	1,436	$906.17	$0.63	$8,887.43	$6.19	0	4	16	$0.791691
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1969	380	Rochester-St Charles-T-St Charles - 000G95 - 380	31	$19.56	$0.63	$191.84	$6.19	0	4	16	$0.791691
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1969	381	Rochester-Utica-St Charles - 000G95 - 381	849	$535.68	$0.63	$5,253.78	$6.19	0	4	16	$0.791691
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1969	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	835	$526.56	$0.63	$5,164.34	$6.18	0	6	36	$0.790988
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1969	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	344	$216.98	$0.63	$2,128.07	$6.19	0	6	36	$0.791691
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1969	309	Rochester-Oronoco-T-Rochester-0535 - 000G95 - 309	360	$227.63	$0.63	$2,232.53	$6.20	0	6	36	$0.792392
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1969	318	Rochester-Oronoco-T-Pine Island-0255 - 000G95 - 318	19	$12.04	$0.63	$118.08	$6.21	0	6	36	$0.793092
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	183	Steel 1 1/2 in	1969	174	Rochester-Utica-C-St Charles-0858 - 000G95 - 174	82	$81.71	$1.00	$801.39	$9.77	1	1.5	2.25	$0.989895
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1969	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	195	$194.28	$1.00	$1,905.44	$9.77	1	1.25	1.5625	$0.989895
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1969	171	Rochester-Lewiston-C-Lewiston-Altura-0857 - 000G95 - 171	1,052	$1,048.57	$1.00	$10,284.05	$9.78	1	1.25	1.5625	$0.990339
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1969	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	295	$294.14	$1.00	$2,884.83	$9.78	1	1.25	1.5625	$0.990339
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1969	233	Cloquet--Hoyt Lakes-C-Mesabi E-2711 - 000G96 - 233	14,865	$14,620.09	$0.98	$143,389.34	$9.65	1	1.25	1.5625	$0.984527
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1969	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	1,085	$1,081.25	$1.00	$10,604.57	$9.77	1	1.25	1.5625	$0.989895

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1969	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	27,810	$27,722.24	$1.00	$271,891.20	$9.78	1	2	4	$0.990339
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1969	164	Rochester-Viola-T-Dover-Eyota-0533 - 000G95 - 164	555	$577.40	$1.04	$5,662.96	$10.20	1	2	4	$1.008600
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1969	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	32,114	$32,173.91	$1.00	$315,551.79	$9.83	1	2	4	$0.992554
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1969	167	Rochester-Elgin-C-Elgin-Millville-2899 - 000G95 - 167	17,547	$17,491.82	$1.00	$171,554.39	$9.78	1	2	4	$0.990339
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1969	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	34,266	$34,157.36	$1.00	$335,004.88	$9.78	1	2	4	$0.990339
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1969	169	Rochester-Plainview-T-Plainview-2899 - 000G95 - 169	929	$926.01	$1.00	$9,082.02	$9.78	1	2	4	$0.990339
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1969	171	Rochester-Lewiston-C-Lewiston-Altura-0857 - 000G95 - 171	20,599	$20,534.30	$1.00	$201,394.10	$9.78	1	2	4	$0.990339
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1969	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	36,413	$36,297.88	$1.00	$355,998.43	$9.78	1	2	4	$0.990339
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1969	174	Rochester-Utica-C-St Charles-0858 - 000G95 - 174	544	$542.90	$1.00	$5,324.60	$9.79	1	2	4	$0.990783
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1969	175	Rochester-Utica-T-Lewiston-Altura-0857 - 000G95 - 175	1,029	$1,025.96	$1.00	$10,062.30	$9.78	1	2	4	$0.990339
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1969	233	Cloquet--Hoyt Lakes-C-Mesabi E-2711 - 000G96 - 233	25,748	$24,512.98	$0.95	$240,415.77	$9.34	1	2	4	$0.970347
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1969	240	Bemidji-Audubon-C-Lk Park Audubon-2889 - 000G97 - 240	271	$270.54	$1.00	$2,653.37	$9.79	1	2	4	$0.990783
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1969	242	Bemidji-Burlington-T-Frazee-Vergas-0023 - 000G97 - 242	5,737	$5,718.59	$1.00	$56,086.17	$9.78	1	2	4	$0.990339
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1969	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	72,290	$72,918.49	$1.01	$715,162.11	$9.89	1	2	4	$0.995196
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1969	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	6,389	$6,368.76	$1.00	$62,462.84	$9.78	1	3	9	$0.990339
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1969	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	9,007	$8,978.87	$1.00	$88,061.99	$9.78	1	3	9	$0.990339
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1969	167	Rochester-Elgin-C-Elgin-Millville-2899 - 000G95 - 167	2,590	$2,646.04	$1.02	$25,951.54	$10.02	1	3	9	$1.000868
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1969	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	7,215	$7,192.15	$1.00	$70,538.40	$9.78	1	3	9	$0.990339
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1969	171	Rochester-Lewiston-C-Lewiston-Altura-0857 - 000G95 - 171	7,025	$7,003.55	$1.00	$68,688.66	$9.78	1	3	9	$0.990339
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1969	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	8,673	$8,645.50	$1.00	$84,792.40	$9.78	1	3	9	$0.990339
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1969	175	Rochester-Utica-T-Lewiston-Altura-0857 - 000G95 - 175	83	$82.67	$1.00	$810.80	$9.77	1	3	9	$0.989895
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1969	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	37,988	$37,275.47	$0.98	$365,586.34	$9.62	1	3	9	$0.983175
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1969	171	Rochester-Lewiston-C-Lewiston-Altura-0857 - 000G95 - 171	22	$21.79	$0.99	$213.71	$9.71	1	0.75	0.5625	$0.987219
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1969	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	245	$244.21	$1.00	$2,395.14	$9.78	1	0.75	0.5625	$0.990339
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1969	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	9,063	$25,256.20	$2.79	$247,705.03	$27.33	1	4	16	$1.436640
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1969	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	3,281	$9,141.19	$2.79	$89,653.98	$27.33	1	4	16	$1.436640
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1969	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	1,791	$4,988.66	$2.79	$48,927.24	$27.32	1	4	16	$1.436481
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1969	171	Rochester-Lewiston-C-Lewiston-Altura-0857 - 000G95 - 171	233	$649.12	$2.79	$6,366.37	$27.32	1	4	16	$1.436481
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1969	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	6,640	$18,493.96	$2.79	$181,383.06	$27.32	1	4	16	$1.436481
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1969	174	Rochester-Utica-C-St Charles-0858 - 000G95 - 174	1,085	$3,022.25	$2.79	$29,641.30	$27.32	1	4	16	$1.436481
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1969	233	Cloquet--Hoyt Lakes-C-Mesabi E-2711 - 000G96 - 233	6,546	$18,231.53	$2.79	$178,809.24	$27.32	1	4	16	$1.436481
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1969	380	Rochester-St Charles-T-St Charles - 000G95 - 380	159	$442.85	$2.79	$4,343.34	$27.32	1	4	16	$1.436481
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1969	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	4,434	$22,870.67	$5.16	$224,308.49	$50.59	1	6	36	$1.704065
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1969	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	3,135	$16,168.98	$5.16	$158,580.38	$50.58	1	6	36	$1.703979
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1969	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	227	$1,170.22	$5.16	$11,477.16	$50.56	1	6	36	$1.703807
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1969	318	Rochester-Oronoco-T-Pine Island-0255 - 000G95 - 318	2,228	$11,491.62	$5.16	$112,706.27	$50.59	1	6	36	$1.704065
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1970	418	Rochester-Adams-C-Southland - 000G95 - 418	18,601	$12,477.86	$0.67	$115,006.78	$6.18	0	1.25	1.5625	$0.790988
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1970	420	Rochester-Adams-T-Southland - 000G95 - 420	715	$479.63	$0.67	$4,420.69	$6.18	0	1.25	1.5625	$0.790988
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1970	442	Rochester-Leroy-C-Leroy-Ostrander - 000G95 - 442	25,988	$17,433.19	$0.67	$160,679.40	$6.18	0	1.25	1.5625	$0.790988
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1970	443	Rochester-Leroy-T-Leroy-Ostrander - 000G95 - 443	2,063	$1,383.89	$0.67	$12,755.13	$6.18	0	1.25	1.5625	$0.790988
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1970	461	Rochester-Rose Creek-C-Southland - 000G95 - 461	6,302	$4,227.49	$0.67	$38,964.21	$6.18	0	1.25	1.5625	$0.790988
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1970	466	Rochester-Windom-T-Southland - 000G95 - 466	966	$648.01	$0.67	$5,972.62	$6.18	0	1.25	1.5625	$0.790988
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1970	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	475	$151.61	$0.32	$1,397.37	$2.94	0	1	1	$0.468347
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1970	245	Bemidji-Frazee-C-Frazee-Vergas-0023 - 000G97 - 245	810	$257.83	$0.32	$2,376.38	$2.93	0	1	1	$0.466868
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1970	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	316	$100.77	$0.32	$928.78	$2.94	0	1	1	$0.468347
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1970	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	917	$291.85	$0.32	$2,689.94	$2.93	0	1	1	$0.466868
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1970	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	1,198	$381.32	$0.32	$3,514.57	$2.93	0	1	1	$0.466868
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1970	1	Pine City-Mayhew Lake-T-Sauk Rapids-0047 - 000G98 - 001	5,489	$1,747.13	$0.32	$16,103.07	$2.93	0	2	4	$0.466868
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1970	2	Pine City-Harris-C-North Branch-0138 - 000G98 - 002	22,679	$8,301.43	$0.37	$76,513.18	$3.37	0	2	4	$0.527630
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1970	3	Pine City-Nessel-T-Rush City-0139 - 000G98 - 003	16,841	$5,359.62	$0.32	$49,398.90	$2.93	0	2	4	$0.466868
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1970	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	87,171	$28,290.12	$0.32	$260,746.30	$2.99	0	2	4	$0.475671
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1970	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	9,060	$2,883.13	$0.32	$26,573.43	$2.93	0	2	4	$0.466868
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1970	244	Bemidji-Detroit-T-Detroit Lakes-0022 - 000G97 - 244	6,983	$2,247.50	$0.32	$20,714.90	$2.97	0	2	4	$0.472756
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1970	245	Bemidji-Frazee-C-Frazee-Vergas-0023 - 000G97 - 245	6,840	$2,176.61	$0.32	$20,061.53	$2.93	0	2	4	$0.466868
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1970	246	Bemidji-Lake View-T-Detroit Lakes-0022 - 000G97 - 246	237	$75.42	$0.32	$695.14	$2.93	0	2	4	$0.466868
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1970	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	79,949	$27,529.10	$0.34	$253,732.08	$3.17	0	2	4	$0.501059
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1970	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	90,470	$28,330.81	$0.31	$261,121.36	$2.89	0	2	4	$0.460898
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1970	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	74,783	$23,797.53	$0.32	$219,338.68	$2.93	0	2	4	$0.466868
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1970	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	10,117	$3,218.95	$0.32	$29,668.64	$2.93	0	2	4	$0.466868
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1970	328	Bemidji-Grant Valley-Bemidji-0031 - 000G97 - 328	3,427	$1,090.33	$0.32	$10,049.43	$2.93	0	2	4	$0.466868
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1970	342	Bemidji-Eckels-T-Bemidji-0031 - 000G97 - 342	7,550	$2,402.57	$0.32	$22,144.17	$2.93	0	2	4	$0.466868
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1970	418	Rochester-Adams-C-Southland - 000G95 - 418	4,798	$2,959.64	$0.62	$27,278.61	$5.69	0	2	4	$0.755112
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1970	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	6,180	$3,812.14	$0.62	$35,135.99	$5.69	0	2	4	$0.755112
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1970	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	90	$55.52	$0.62	$511.72	$5.69	0	2	4	$0.755112
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1970	442	Rochester-Leroy-C-Leroy-Ostrander - 000G95 - 442	8,550	$5,274.06	$0.62	$48,610.31	$5.69	0	2	4	$0.755112
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1970	443	Rochester-Leroy-T-Leroy-Ostrander - 000G95 - 443	8,118	$5,007.58	$0.62	$46,154.20	$5.69	0	2	4	$0.755112
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1970	457	Fairmont-Pickerel Lake-T-Albert Lea - 000G94 - 457	891	$549.61	$0.62	$5,065.68	$5.69	0	2	4	$0.755112

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1970	461	Rochester-Rose Creek-C-Southland - 000G95 - 461	4,812	$2,968.28	$0.62	$27,358.25	$5.69	0	2	4	$0.755112
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1970	466	Rochester-Windom-T-Southland - 000G95 - 466	1,025	$632.27	$0.62	$5,827.55	$5.69	0	2	4	$0.755112
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1970	2	Pine City-Harris-C-North Branch-0138 - 000G98 - 002	2,237	$711.76	$0.32	$6,560.20	$2.93	0	3	9	$0.466868
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1970	3	Pine City-Nessel-T-Rush City-0139 - 000G98 - 003	10,150	$3,230.15	$0.32	$29,771.86	$2.93	0	3	9	$0.466868
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1970	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	194	$61.73	$0.32	$568.96	$2.93	0	3	9	$0.466868
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1970	244	Bemidji-Detroit-T-Detroit Lakes-0022 - 000G97 - 244	21	$6.35	$0.30	$58.53	$2.79	0	3	9	$0.445604
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1970	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	12,379	$3,939.39	$0.32	$36,308.83	$2.93	0	3	9	$0.466868
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1970	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	14,637	$4,680.46	$0.32	$43,139.18	$2.95	0	3	9	$0.469822
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1970	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	16,111	$5,127.16	$0.32	$47,256.36	$2.93	0	3	9	$0.466868
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1970	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	11	$3.63	$0.33	$33.46	$3.04	0	3	9	$0.482874
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1970	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	331	$105.31	$0.32	$970.63	$2.93	0	0.75	0.5625	$0.466868
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1970	2	Pine City-Harris-C-North Branch-0138 - 000G98 - 002	11,733	$6,376.78	$0.54	$58,773.94	$5.01	0	4	16	$0.699838
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1970	3	Pine City-Nessel-T-Rush City-0139 - 000G98 - 003	498	$316.84	$0.64	$2,920.27	$5.86	0	4	16	$0.767898
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1970	47	Fairmont-Freeman-T-Glenville-Emmons-2886 - 000G94 - 047	11	$24.22	$2.20	$223.23	$20.29	0	4	16	$1.307282
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1970	123	Fairmont-Glenville-C-Glenville-Emmons-2886 - 000G94 - 123	228	$502.05	$2.20	$4,627.33	$20.30	0	4	16	$1.307496
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1970	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	1,735	$1,104.30	$0.64	$10,178.19	$5.87	0	4	16	$0.768638
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1970	244	Bemidji-Detroit-T-Detroit Lakes-0022 - 000G97 - 244	4,357	$2,773.15	$0.64	$25,559.75	$5.87	0	4	16	$0.768638
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1970	246	Bemidji-Lake View-T-Detroit Lakes-0022 - 000G97 - 246	4,879	$3,105.21	$0.64	$28,620.31	$5.87	0	4	16	$0.768638
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1970	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	5,860	$3,729.57	$0.64	$34,374.95	$5.87	0	4	16	$0.768638
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1970	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	16,019	$10,631.69	$0.66	$97,990.88	$6.12	0	4	16	$0.786751
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1970	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	21,877	$14,200.61	$0.65	$130,885.14	$5.98	0	4	16	$0.776701
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1970	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	79	$49.93	$0.63	$460.20	$5.83	0	4	16	$0.765669
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1970	323	Bemidji-Lammers-T-Bemidji-0031 - 000G97 - 323	2,717	$1,729.46	$0.64	$15,940.20	$5.87	0	4	16	$0.768638
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1970	328	Bemidji-Grant Valley-Bemidji-0031 - 000G97 - 328	3,425	$2,179.76	$0.64	$20,090.56	$5.87	0	4	16	$0.768638
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1970	342	Bemidji-Eckels-T-Bemidji-0031 - 000G97 - 342	8,472	$5,391.82	$0.64	$49,695.69	$5.87	0	4	16	$0.768638
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1970	418	Rochester-Adams-C-Southland - 000G95 - 418	3,591	$7,907.33	$2.20	$72,880.81	$20.30	0	4	16	$1.307496
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1970	442	Rochester-Leroy-C-Leroy-Ostrander - 000G95 - 442	7,782	$17,135.87	$2.20	$157,939.04	$20.30	0	4	16	$1.307496
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1970	461	Rochester-Rose Creek-C-Southland - 000G95 - 461	2,667	$5,872.70	$2.20	$54,127.90	$20.30	0	4	16	$1.307496
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1970	466	Rochester-Windom-T-Southland - 000G95 - 466	869	$1,913.53	$2.20	$17,636.75	$20.30	0	4	16	$1.307496
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1970	2	Pine City-Harris-C-North Branch-0138 - 000G98 - 002	1,864	$2,276.90	$1.22	$20,985.89	$11.26	0	6	36	$1.051538
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1970	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	51	$32.68	$0.64	$301.21	$5.91	0	6	36	$0.771587
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	183	Steel 1 1/2 in	1970	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	4,468	$4,605.28	$1.03	$42,446.25	$9.50	1	1.5	2.25	$0.977724
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	183	Steel 1 1/2 in	1970	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	1,481	$1,489.79	$1.01	$13,731.19	$9.27	1	1.5	2.25	$0.967080
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	183	Steel 1 1/2 in	1970	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	306	$127.26	$0.42	$1,172.94	$3.84	1	1.5	2.25	$0.584331
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1970	245	Bemidji-Frazee-C-Frazee-Vergas-0023 - 000G97 - 245	651	$462.69	$0.71	$4,264.55	$6.55	1	1.25	1.5625	$0.816241
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1970	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	3,616	$3,636.46	$1.01	$33,516.77	$9.27	1	1.25	1.5625	$0.967080
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1970	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	41,187	$41,416.54	$1.01	$381,730.76	$9.27	1	1.25	1.5625	$0.967080
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1970	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	1,863	$1,872.91	$1.01	$17,262.36	$9.27	1	1.25	1.5625	$0.967080
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1970	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	206	$207.90	$1.01	$1,916.19	$9.30	1	1.25	1.5625	$0.968483
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1970	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	1,840	$3,237.43	$1.76	$29,838.96	$16.22	1	1.25	1.5625	$1.210051
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1970	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	172	$303.55	$1.76	$2,797.78	$16.22	1	1.25	1.5625	$1.210051
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1970	123	Fairmont-Glenville-C-Glenville-Emmons-2886 - 000G94 - 123	95	$635.06	$6.68	$5,853.26	$61.61	1	1	1	$1.789651
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1970	245	Bemidji-Frazee-C-Frazee-Vergas-0023 - 000G97 - 245	389	$390.94	$1.00	$3,603.24	$9.26	1	1	1	$0.966611
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1970	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	712	$4,759.60	$6.68	$43,868.60	$61.61	1	1	1	$1.789651
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1970	457	Fairmont-Pickerel Lake-T-Albert Lea - 000G94 - 457	1,379	$9,218.38	$6.68	$84,964.59	$61.61	1	1	1	$1.789651
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1970	469	Rochester-Lodi-T-Southland - 000G95 - 469	26	$173.81	$6.69	$1,601.98	$61.61	1	1	1	$1.789651
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	186	Steel 10 in	1970	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	102	$259.65	$2.55	$2,393.16	$23.46	1	10	100	$1.370328
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	186	Steel 10 in	1970	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	5,387	$13,805.35	$2.56	$127,242.08	$23.62	1	10	100	$1.373280
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1970	2	Pine City-Harris-C-North Branch-0138 - 000G98 - 002	6,157	$6,190.67	$1.01	$57,058.58	$9.27	1	2	4	$0.967080
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1970	123	Fairmont-Glenville-C-Glenville-Emmons-2886 - 000G94 - 123	197	$235.54	$1.20	$2,170.94	$11.02	1	2	4	$1.042182
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1970	245	Bemidji-Frazee-C-Frazee-Vergas-0023 - 000G97 - 245	16,441	$16,532.37	$1.01	$152,376.68	$9.27	1	2	4	$0.967080
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1970	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	3,230	$3,248.31	$1.01	$29,939.24	$9.27	1	2	4	$0.967080
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1970	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	106,197	$107,285.04	$1.01	$988,832.00	$9.31	1	2	4	$0.968950
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1970	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	11,158	$11,219.67	$1.01	$103,410.21	$9.27	1	2	4	$0.967080
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1970	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	35,276	$34,571.07	$0.98	$318,636.97	$9.03	1	2	4	$0.955688
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1970	260	Bemidji-McDonaldsville-T-Ada-Borup-2854 - 000G97 - 260	678	$681.57	$1.01	$6,281.94	$9.27	1	2	4	$0.967080
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1970	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	13,899	$16,618.37	$1.20	$153,169.32	$11.02	1	2	4	$1.042182
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1970	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	1,660	$1,984.78	$1.20	$18,293.45	$11.02	1	2	4	$1.042182
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1970	425	Fairmont-Bankcroft-T-Albert Lea - 000G94 - 425	508	$607.39	$1.20	$5,598.23	$11.02	1	2	4	$1.042182
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1970	443	Rochester-Leroy-T-Leroy-Ostrander - 000G95 - 443	242	$289.35	$1.20	$2,666.90	$11.02	1	2	4	$1.042182
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1970	469	Rochester-Lodi-T-Southland - 000G95 - 469	54	$64.57	$1.20	$595.13	$11.02	1	2	4	$1.042182
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1970	2	Pine City-Harris-C-North Branch-0138 - 000G98 - 002	2,219	$2,230.60	$1.01	$20,559.14	$9.27	1	3	9	$0.967080
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1970	123	Fairmont-Glenville-C-Glenville-Emmons-2886 - 000G94 - 123	594	$3,686.61	$6.20	$33,979.00	$57.17	1	3	9	$1.757168
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1970	245	Bemidji-Frazee-C-Frazee-Vergas-0023 - 000G97 - 245	7,898	$7,942.53	$1.01	$73,205.25	$9.27	1	3	9	$0.967080
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1970	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	37,430	$37,652.25	$1.01	$347,035.79	$9.27	1	3	9	$0.967080
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1970	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	2,503	$2,516.58	$1.01	$23,194.98	$9.27	1	3	9	$0.967080
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1970	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	11,887	$11,930.03	$1.00	$109,957.50	$9.25	1	3	9	$0.966142

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1970	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	1,572	$9,748.37	$6.20	$89,849.43	$57.17	1	3	9	$1.757168
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1970	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	855	$692.48	$0.81	$6,382.49	$7.46	1	0.75	0.5625	$0.872739
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1970	425	Fairmont-Bankcroft-T-Albert Lea - 000G94 - 425	73	$59.12	$0.81	$544.90	$7.46	1	0.75	0.5625	$0.872739
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1970	2	Pine City-Harris-C-North Branch-0138 - 000G98 - 002	8,779	$24,665.53	$2.81	$227,338.92	$25.90	1	4	16	$1.413300
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1970	123	Fairmont-Glenville-C-Glenville-Emmons-2886 - 000G94 - 123	24	$134.12	$5.59	$1,236.17	$51.51	1	4	16	$1.711892
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1970	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	15,738	$41,556.39	$2.64	$383,019.74	$24.34	1	4	16	$1.386321
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1970	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	11	$31.77	$2.89	$292.82	$26.62	1	4	16	$1.425208
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1970	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	26,766	$75,199.68	$2.81	$693,105.48	$25.89	1	4	16	$1.413132
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1970	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	5,969	$16,837.40	$2.82	$155,188.08	$26.00	1	4	16	$1.414973
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1970	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	3,924	$8,538.31	$2.18	$78,696.47	$20.06	1	4	16	$1.302331
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1970	323	Bemidji-Lammers-T-Bemidji-0031 - 000G97 - 323	154	$432.14	$2.81	$3,982.98	$25.86	1	4	16	$1.412629
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1970	418	Rochester-Adams-C-Southland - 000G95 - 418	2,606	$14,563.33	$5.59	$134,228.28	$51.51	1	4	16	$1.711892
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1970	420	Rochester-Adams-T-Southland - 000G95 - 420	7,894	$44,114.70	$5.59	$406,599.34	$51.51	1	4	16	$1.711892
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1970	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	1,964	$10,975.59	$5.59	$101,160.56	$51.51	1	4	16	$1.711892
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1970	442	Rochester-Leroy-C-Leroy-Ostrander - 000G95 - 442	1,450	$8,103.16	$5.59	$74,685.75	$51.51	1	4	16	$1.711892
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1970	443	Rochester-Leroy-T-Leroy-Ostrander - 000G95 - 443	11,961	$66,842.66	$5.59	$616,079.94	$51.51	1	4	16	$1.711892
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1970	444	Rochester-Lodi-T-Leroy-Ostrander - 000G95 - 444	17,685	$98,830.56	$5.59	$910,908.17	$51.51	1	4	16	$1.711892
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1970	457	Fairmont-Pickerel Lake-T-Albert Lea - 000G94 - 457	25	$139.71	$5.59	$1,287.69	$51.51	1	4	16	$1.711892
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1970	466	Rochester-Windom-T-Southland - 000G95 - 466	92	$514.13	$5.59	$4,738.67	$51.51	1	4	16	$1.711892
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1970	469	Rochester-Lodi-T-Southland - 000G95 - 469	11,877	$66,373.23	$5.59	$611,753.26	$51.51	1	4	16	$1.711892
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1970	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	7,635	$40,393.56	$5.29	$372,302.08	$48.76	1	6	36	$1.688064
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1970	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	26,006	$135,429.72	$5.21	$1,248,237.77	$48.00	1	6	36	$1.681241
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1970	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	4,241	$6,467.83	$1.53	$59,613.13	$14.06	1	6	36	$1.147985
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1970	457	Fairmont-Pickerel Lake-T-Albert Lea - 000G94 - 457	1,861	$2,838.16	$1.53	$26,158.94	$14.06	1	6	36	$1.147985
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1970	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	7,747	$19,749.49	$2.55	$182,028.43	$23.50	1	8	64	$1.371068
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1970	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	26,690	$75,575.88	$2.83	$696,572.87	$26.10	1	8	64	$1.416641
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1970	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	3,818	$10,810.54	$2.83	$99,639.31	$26.10	1	8	64	$1.416641
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1970	457	Fairmont-Pickerel Lake-T-Albert Lea - 000G94 - 457	13	$36.36	$2.83	$335.13	$26.10	1	8	64	$1.416641
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1971	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	238	$98.96	$0.42	$831.92	$3.50	0	1	1	$0.544068
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1971	6	Pine City-Rusheba-T-Rush City-0139 - 000G98 - 006	855	$355.88	$0.42	$2,991.74	$3.50	0	1	1	$0.544068
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1971	16	Pine City-Barry-T-Hinckley-Finlayson-2165 - 000G98 - 016	618	$257.83	$0.42	$2,167.47	$3.51	0	1	1	$0.545307
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1971	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	170,113	$70,843.60	$0.42	$595,553.34	$3.50	0	2	4	$0.544068
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1971	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	24,084	$10,030.01	$0.42	$84,318.21	$3.50	0	2	4	$0.544068
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1971	6	Pine City-Rusheba-T-Rush City-0139 - 000G98 - 006	8,100	$3,373.22	$0.42	$28,357.29	$3.50	0	2	4	$0.544068
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1971	13	Pine City-Arthur-T-Mora-0332 - 000G98 - 013	17,950	$7,475.04	$0.42	$62,839.62	$3.50	0	2	4	$0.544068
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1971	14	Pine City-Arthur-T-Mora-0332 - 000G98 - 014	3,246	$1,351.80	$0.42	$11,364.03	$3.50	0	2	4	$0.544068
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1971	15	Pine City-Mora-C-Mora-0332 - 000G98 - 015	45,449	$18,230.94	$0.40	$153,260.10	$3.37	0	2	4	$0.527630
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1971	16	Pine City-Barry-T-Hinckley-Finlayson-2165 - 000G98 - 016	4,068	$1,694.06	$0.42	$14,241.27	$3.50	0	2	4	$0.544068
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1971	17	Pine City-Chengwatana-C-Pine City-0578 - 000G98 - 017	60,801	$25,320.36	$0.42	$212,857.96	$3.50	0	2	4	$0.544068
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1971	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	1,281	$533.82	$0.42	$4,487.61	$3.50	0	3	9	$0.544068
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1971	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	1,603	$667.67	$0.42	$5,612.83	$3.50	0	3	9	$0.544068
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1971	14	Pine City-Arthur-T-Mora-0332 - 000G98 - 014	82	$34.50	$0.42	$290.03	$3.54	0	3	9	$0.549003
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1971	15	Pine City-Mora-C-Mora-0332 - 000G98 - 015	3,281	$1,366.32	$0.42	$11,486.10	$3.50	0	3	9	$0.544068
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1971	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	80,538	$67,077.56	$0.83	$563,893.76	$7.00	0	4	16	$0.845098
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1971	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	5,575	$4,643.68	$0.83	$39,037.53	$7.00	0	4	16	$0.845098
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1971	13	Pine City-Arthur-T-Mora-0332 - 000G98 - 013	300	$249.66	$0.83	$2,098.79	$7.00	0	4	16	$0.845098
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1971	14	Pine City-Arthur-T-Mora-0332 - 000G98 - 014	1,007	$838.86	$0.83	$7,051.95	$7.00	0	4	16	$0.845098
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1971	15	Pine City-Mora-C-Mora-0332 - 000G98 - 015	6,582	$5,482.54	$0.83	$46,089.48	$7.00	0	4	16	$0.845098
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1971	16	Pine City-Barry-T-Hinckley-Finlayson-2165 - 000G98 - 016	9,551	$7,955.12	$0.83	$66,875.46	$7.00	0	4	16	$0.845098
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1971	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	8,322	$6,931.48	$0.83	$58,270.13	$7.00	0	4	16	$0.845098
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1971	307	Pine City-Pokegama-T-Pine City-0578 - 000G98 - 307	2,686	$2,236.96	$0.83	$18,805.21	$7.00	0	4	16	$0.845098
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1971	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	11,055	$9,207.47	$0.83	$77,403.46	$7.00	0	6	36	$0.845098
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1971	15	Pine City-Mora-C-Mora-0332 - 000G98 - 015	365	$481.16	$1.32	$4,044.92	$11.08	1	1.25	1.5625	$1.044540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1971	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	183	$241.49	$1.32	$2,030.11	$11.09	1	1	1	$1.044932
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1971	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	35,300	$46,712.80	$1.32	$392,695.52	$11.12	1	2	4	$1.046105
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1971	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	26,578	$34,975.52	$1.32	$294,024.97	$11.06	1	2	4	$1.043755
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1971	6	Pine City-Rusheba-T-Rush City-0139 - 000G98 - 006	635	$835.83	$1.32	$7,026.49	$11.07	1	2	4	$1.044148
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1971	13	Pine City-Arthur-T-Mora-0332 - 000G98 - 013	615	$809.66	$1.32	$6,806.48	$11.07	1	2	4	$1.044148
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1971	15	Pine City-Mora-C-Mora-0332 - 000G98 - 015	44,736	$54,874.22	$1.23	$461,305.26	$10.31	1	2	4	$1.013259
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1971	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	561	$738.30	$1.32	$6,206.59	$11.06	1	2	4	$1.043755
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1971	315	Pine City-Pine City-T-Pine City-0578 - 000G98 - 315	8,263	$10,874.55	$1.32	$91,417.92	$11.06	1	2	4	$1.043755
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1971	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	3,763	$4,958.48	$1.32	$41,683.92	$11.08	1	3	9	$1.044540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1971	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	2,196	$3,005.68	$1.37	$25,267.53	$11.51	1	3	9	$1.061075
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1971	13	Pine City-Arthur-T-Mora-0332 - 000G98 - 013	744	$978.87	$1.32	$8,228.96	$11.06	1	3	9	$1.043755
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1971	15	Pine City-Mora-C-Mora-0332 - 000G98 - 015	18,799	$24,850.08	$1.32	$208,904.52	$11.11	1	3	9	$1.045714
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1971	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	9,801	$36,037.32	$3.68	$302,951.10	$30.91	1	4	16	$1.490099
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1971	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	5,744	$21,118.99	$3.68	$177,538.76	$30.91	1	4	16	$1.490099

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1971	6	Pine City-Rusheba-T-Rush City-0139 - 000G98 - 006	20	$73.54	$3.68	$618.22	$30.91	1	4	16	$1.490099
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1971	15	Pine City-Mora-C-Mora-0332 - 000G98 - 015	13,796	$52,095.00	$3.78	$437,941.48	$31.74	1	4	16	$1.501607
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1971	16	Pine City-Barry-T-Hinckley-Finlayson-2165 - 000G98 - 016	478	$1,757.61	$3.68	$14,775.51	$30.91	1	4	16	$1.490099
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1971	13	Pine City-Arthur-T-Mora-0332 - 000G98 - 013	702	$4,780.80	$6.81	$40,190.24	$57.25	1	6	36	$1.757775
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1971	15	Pine City-Mora-C-Mora-0332 - 000G98 - 015	5,102	$34,739.48	$6.81	$292,040.68	$57.24	1	6	36	$1.757700
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1972	19	Pine City-Hinckley-T-Hinckley-Finlayson - 2165 - 000G98 - 019	59	$20.88	$0.35	$166.39	$2.82	0	1.25	1.5625	$0.450249
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1972	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	210	$72.63	$0.35	$578.77	$2.76	0	1	1	$0.440909
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1972	19	Pine City-Hinckley-T-Hinckley-Finlayson - 2165 - 000G98 - 019	1,747	$605.54	$0.35	$4,825.40	$2.76	0	1	1	$0.440909
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1972	26	Pine City-Sturgeon Lake-C-Willow River-0577 - 000G98 - 026	284	$98.96	$0.35	$788.59	$2.78	0	1	1	$0.444045
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1972	27	Pine City-Willow River-C-Willow River-0577 - 000G98 - 027	361	$125.28	$0.35	$998.33	$2.77	0	1	1	$0.442480
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1972	307	Pine City-Pokegama-T-Pine City-0578 - 000G98 - 307	8,304	$2,877.38	$0.35	$22,929.13	$2.76	0	1	1	$0.440909
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1972	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	18,196	$6,437.49	$0.35	$51,298.75	$2.82	0	2	4	$0.450249
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1972	19	Pine City-Hinckley-T-Hinckley-Finlayson - 2165 - 000G98 - 019	6,064	$2,105.25	$0.35	$16,776.21	$2.77	0	2	4	$0.442480
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1972	20	Pine City-Finlayson-C-Hinckley-Finlayson-2165 - 000G98 - 020	11,160	$3,867.46	$0.35	$30,818.82	$2.76	0	2	4	$0.440909
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1972	21	Pine City-Finlayson-T-Hinckley-Finlayson-2165 - 000G98 - 021	118	$40.85	$0.35	$325.52	$2.76	0	2	4	$0.440909
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1972	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	32,853	$11,851.35	$0.36	$94,440.44	$2.87	0	2	4	$0.457882
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1972	24	Pine City-Sandstone-C-E Central-2580 - 000G98 - 024	13,055	$4,523.98	$0.35	$36,050.47	$2.76	0	2	4	$0.440909
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1972	25	Pine City-Sandstone-T-E Central-2580 - 000G98 - 025	1,596	$553.05	$0.35	$4,407.12	$2.76	0	2	4	$0.440909
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1972	26	Pine City-Sturgeon Lake-C-Willow River-0577 - 000G98 - 026	38,533	$13,352.74	$0.35	$106,404.65	$2.76	0	2	4	$0.440909
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1972	27	Pine City-Willow River-C-Willow River-0577 - 000G98 - 027	5,842	$2,023.84	$0.35	$16,127.47	$2.76	0	2	4	$0.440909
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1972	28	Cloquet-Windmere-T-Moose Lake-0097 - 000G96 - 028	3,743	$1,297.33	$0.35	$10,338.10	$2.76	0	2	4	$0.440909
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1972	35	Pine City-Scandia-C-Forest Lake-0831 - 000G98 - 035	13,700	$4,748.08	$0.35	$37,836.26	$2.76	0	2	4	$0.440909
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1972	256	Pine City-Green Prairie-T-Little Falls-0482 - 000G98 - 256	4,220	$1,462.44	$0.35	$11,653.81	$2.76	0	2	4	$0.440909
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1972	303	Pine City-Knife Lake-T-Mora-0332 - 000G98 - 303	9,041	$3,133.01	$0.35	$24,966.17	$2.76	0	2	4	$0.440909
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1972	307	Pine City-Pokegama-T-Pine City-0578 - 000G98 - 307	52,336	$18,136.20	$0.35	$144,522.84	$2.76	0	2	4	$0.440909
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1972	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	1,547	$536.54	$0.35	$4,275.55	$2.76	0	3	9	$0.440909
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1972	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	1,745	$604.83	$0.35	$4,819.74	$2.76	0	3	9	$0.440909
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1972	28	Cloquet-Windmere-T-Moose Lake-0097 - 000G96 - 028	6,570	$2,279.62	$0.35	$18,165.72	$2.76	0	3	9	$0.440909
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1972	187	Cloquet-Moose Lake-T-Moose Lake-0097 - 000G96 - 187	8	$2.72	$0.34	$21.68	$2.71	0	3	9	$0.432969
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1972	19	Pine City-Hinckley-T-Hinckley-Finlayson - 2165 - 000G98 - 019	505	$175.22	$0.35	$1,396.28	$2.76	0	0.75	0.5625	$0.440909
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1972	28	Cloquet-Windmere-T-Moose Lake-0097 - 000G96 - 028	1,731	$600.09	$0.35	$4,781.97	$2.76	0	0.75	0.5625	$0.440909
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1972	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	7,078	$4,905.47	$0.69	$39,090.46	$5.52	0	4	16	$0.741939
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1972	21	Pine City-Finlayson-T-Hinckley-Finlayson-2165 - 000G98 - 021	11,064	$7,667.75	$0.69	$61,102.38	$5.52	0	4	16	$0.741939
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1972	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	13,553	$9,392.60	$0.69	$74,847.28	$5.52	0	4	16	$0.741939
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1972	24	Pine City-Sandstone-C-E Central-2580 - 000G98 - 024	300	$207.90	$0.69	$1,656.70	$5.52	0	4	16	$0.741939
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1972	26	Pine City-Sturgeon Lake-C-Willow River-0577 - 000G98 - 026	14,527	$10,067.31	$0.69	$80,223.87	$5.52	0	4	16	$0.741939
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1972	27	Pine City-Willow River-C-Willow River-0577 - 000G98 - 027	3,173	$2,199.04	$0.69	$17,523.60	$5.52	0	4	16	$0.741939
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1972	315	Pine City-Pine City-T-Pine City-0578 - 000G98 - 315	773	$535.71	$0.69	$4,268.94	$5.52	0	4	16	$0.741939
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1972	344	Cloquet-Windemere-T-Willow River-0577 - 000G96 - 344	1,686	$1,168.41	$0.69	$9,310.77	$5.52	0	4	16	$0.741939
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1972	360	Pine City-Sturgeon Lake-T-Willow River-0577 - 000G98 - 360	9,547	$6,616.14	$0.69	$52,722.37	$5.52	0	4	16	$0.741939
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1972	21	Pine City-Finlayson-T-Hinckley-Finlayson-2165 - 000G98 - 021	5,394	$3,738.55	$0.69	$29,791.57	$5.52	0	6	36	$0.741939
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1972	24	Pine City-Sandstone-C-E Central-2580 - 000G98 - 024	360	$249.66	$0.69	$1,989.48	$5.53	0	6	36	$0.742725
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1972	25	Pine City-Sandstone-T-E Central-2580 - 000G98 - 025	5,345	$3,704.05	$0.69	$29,516.65	$5.52	0	6	36	$0.741939
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1972	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	215	$236.04	$1.10	$1,880.94	$8.75	1	1.25	1.5625	$0.942008
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1972	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	161	$177.03	$1.10	$1,410.71	$8.76	1	1	1	$0.942504
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1972	17	Pine City-Chengwatana-C-Pine City-0578 - 000G98 - 017	1,233	$1,349.98	$1.09	$10,757.65	$8.72	1	2	4	$0.940516
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1972	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	23,007	$25,085.96	$1.09	$199,903.75	$8.69	1	2	4	$0.939020
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1972	19	Pine City-Hinckley-T-Hinckley-Finlayson - 2165 - 000G98 - 019	978	$1,066.37	$1.09	$8,497.64	$8.69	1	2	4	$0.939020
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1972	20	Pine City-Finlayson-C-Hinckley-Finlayson-2165 - 000G98 - 020	2,795	$3,060.67	$1.10	$24,389.71	$8.73	1	2	4	$0.941014
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1972	21	Pine City-Finlayson-T-Hinckley-Finlayson-2165 - 000G98 - 021	110	$120.46	$1.10	$959.92	$8.73	1	2	4	$0.941014
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1972	22	Pine City-Kettle River-T-Willow River-0577 - 000G98 - 022	876	$958.70	$1.09	$7,639.64	$8.72	1	2	4	$0.940516
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1972	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	38,368	$41,881.12	$1.09	$333,740.19	$8.70	1	2	4	$0.939519
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1972	24	Pine City-Sandstone-C-E Central-2580 - 000G98 - 024	33,889	$37,358.97	$1.10	$297,704.29	$8.78	1	2	4	$0.943495
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1972	25	Pine City-Sandstone-T-E Central-2580 - 000G98 - 025	1,415	$1,549.18	$1.09	$12,345.03	$8.72	1	2	4	$0.940516
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1972	27	Pine City-Willow River-C-Willow River-0577 - 000G98 - 027	14,535	$15,916.52	$1.10	$126,834.77	$8.73	1	2	4	$0.941014
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1972	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	988	$1,081.26	$1.09	$8,616.29	$8.72	1	3	9	$0.940516
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1972	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	6,652	$7,281.57	$1.09	$58,025.01	$8.72	1	3	9	$0.940516
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1972	24	Pine City-Sandstone-C-E Central-2580 - 000G98 - 024	6,860	$7,512.28	$1.10	$59,863.47	$8.73	1	3	9	$0.941014
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1972	25	Pine City-Sandstone-T-E Central-2580 - 000G98 - 025	984	$1,077.57	$1.10	$8,586.89	$8.73	1	3	9	$0.941014
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1972	27	Pine City-Willow River-C-Willow River-0577 - 000G98 - 027	706	$773.49	$1.10	$6,163.75	$8.73	1	3	9	$0.941014
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1972	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	478	$522.92	$1.09	$4,167.02	$8.72	1	0.75	0.5625	$0.940516
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1972	24	Pine City-Sandstone-C-E Central-2580 - 000G98 - 024	680	$744.44	$1.09	$5,932.26	$8.72	1	0.75	0.5625	$0.940516
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1972	315	Pine City-Pine City-T-Pine City-0578 - 000G98 - 315	408	$446.66	$1.09	$3,559.32	$8.72	1	0.75	0.5625	$0.940516
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1972	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	5,949	$18,201.88	$3.06	$145,046.23	$24.38	1	4	16	$1.387034
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1972	20	Pine City-Finlayson-C-Hinckley-Finlayson-2165 - 000G98 - 020	64	$196.10	$3.06	$1,562.67	$24.42	1	4	16	$1.387746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1972	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	5,441	$16,453.77	$3.02	$131,115.98	$24.10	1	4	16	$1.382017
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1972	24	Pine City-Sandstone-C-E Central-2580 - 000G98 - 024	11,098	$33,955.21	$3.06	$270,580.57	$24.38	1	4	16	$1.387034

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1972	25	Pine City-Sandstone-T-E Central-2580 - 000G98 - 025	3,218	$9,846.60	$3.06	$78,465.09	$24.38	1	4	16	$1.387034
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1972	256	Pine City-Green Prairie-T-Little Falls-0482 - 000G98 - 256	13,499	$41,673.10	$3.09	$332,082.51	$24.60	1	4	16	$1.390935
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1972	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	5,712	$32,720.31	$5.73	$260,739.97	$45.65	1	6	36	$1.659441
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1972	315	Pine City-Pine City-T-Pine City-0578 - 000G98 - 315	178	$1,008.48	$5.67	$8,036.32	$45.15	1	6	36	$1.654658
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1973	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	405	$96.23	$0.24	$736.16	$1.82	0	1	1	$0.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1973	51	Fairmont-DesMoines-T-Jackson Cty Centrl-2895 - 000G94 - 051	117	$28.14	$0.24	$215.27	$1.84	0	1	1	$0.264818
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1973	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	338	$80.27	$0.24	$614.06	$1.82	0	1	1	$0.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1973	36	Worthington-Ortonville-T-Ortonville-2903 - 000G99 - 036	2,416	$575.37	$0.24	$4,401.58	$1.82	0	2	4	$0.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1973	37	Worthington-Great Bend-T-Windom-0177 - 000G99 - 037	3,482	$829.28	$0.24	$6,344.00	$1.82	0	2	4	$0.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1973	38	Worthington-Midway-T-Mountain Lake-0173 - 000G99 - 038	10,343	$2,462.34	$0.24	$18,836.90	$1.82	0	2	4	$0.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1973	39	Worthington-Mountain Lake-T-Mountain Lake-0173 - 000G99 - 039	4,408	$1,049.48	$0.24	$8,028.52	$1.82	0	2	4	$0.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1973	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	28,269	$6,713.62	$0.24	$51,359.20	$1.82	0	2	4	$0.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1973	51	Fairmont-DesMoines-T-Jackson Cty Centrl-2895 - 000G94 - 051	297	$70.84	$0.24	$541.92	$1.82	0	2	4	$0.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1973	52	Worthington-Ewington-T-Brewster-0513 - 000G99 - 052	7,346	$1,748.84	$0.24	$13,378.63	$1.82	0	2	4	$0.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1973	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	11,499	$2,821.26	$0.25	$21,582.64	$1.88	0	2	4	$0.274158
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1973	54	Fairmont-Lakefield-C-Jackson Cty Central-2895 - 000G94 - 054	14,955	$3,560.98	$0.24	$27,241.50	$1.82	0	2	4	$0.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1973	55	Worthington-Madison-C-Lac Qui Parle Valley-2853 - 000G99 - 055	5,573	$1,326.91	$0.24	$10,150.87	$1.82	0	2	4	$0.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1973	56	Worthington-Madison-T-Lac Qui Parle Valley-2853 - 000G99 - 056	2,337	$556.34	$0.24	$4,255.99	$1.82	0	2	4	$0.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1973	57	Worthington-Hendricks-C-Hendricks-0402 - 000G99 - 057	25,878	$6,161.67	$0.24	$47,136.78	$1.82	0	2	4	$0.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1973	58	Worthington-Hendricks-T-Hendricks-0402 - 000G99 - 058	221	$52.60	$0.24	$402.39	$1.82	0	2	4	$0.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1973	307	Pine City-Pokegama-T-Pine City-0578 - 000G98 - 307	24,909	$5,931.02	$0.24	$45,372.30	$1.82	0	2	4	$0.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1973	315	Pine City-Pine City-T-Pine City-0578 - 000G98 - 315	11,014	$2,621.89	$0.24	$20,057.46	$1.82	0	2	4	$0.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1973	363	Worthington-Big Stone-T-Ortonville - 000G99 - 363	912	$217.19	$0.24	$1,661.50	$1.82	0	2	4	$0.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1973	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	3,437	$817.98	$0.24	$6,257.55	$1.82	0	3	9	$0.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1973	315	Pine City-Pine City-T-Pine City-0578 - 000G98 - 315	678	$161.64	$0.24	$1,236.54	$1.82	0	3	9	$0.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1973	38	Worthington-Midway-T-Mountain Lake-0173 - 000G99 - 038	301	$143.44	$0.48	$1,097.32	$3.65	0	4	16	$0.562293
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1973	39	Worthington-Mountain Lake-T-Mountain Lake-0173 - 000G99 - 039	16,275	$7,749.45	$0.48	$59,283.29	$3.64	0	4	16	$0.561101
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1973	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	3,746	$1,783.94	$0.48	$13,647.14	$3.64	0	4	16	$0.561101
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1973	51	Fairmont-DesMoines-T-Jackson Cty Centrl-2895 - 000G94 - 051	58	$28.14	$0.49	$215.27	$3.71	0	4	16	$0.569374
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1973	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	23,897	$11,379.16	$0.48	$87,050.57	$3.64	0	4	16	$0.561101
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1973	54	Fairmont-Lakefield-C-Jackson Cty Central-2895 - 000G94 - 054	212	$100.77	$0.48	$770.89	$3.64	0	4	16	$0.561101
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1973	57	Worthington-Hendricks-C-Hendricks-0402 - 000G99 - 057	4,756	$2,285.52	$0.48	$17,484.23	$3.68	0	4	16	$0.565848
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1973	58	Worthington-Hendricks-T-Hendricks-0402 - 000G99 - 058	3,871	$1,842.95	$0.48	$14,098.57	$3.64	0	4	16	$0.561101
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1973	307	Pine City-Pokegama-T-Pine City-0578 - 000G98 - 307	32	$15.43	$0.48	$118.04	$3.69	0	4	16	$0.567026
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	183	Steel 1 1/2 in	1973	54	Fairmont-Lakefield-C-Jackson Cty Central-2895 - 000G94 - 054	141	$105.31	$0.75	$805.62	$5.71	1	1.5	2.25	$0.756636
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1973	37	Worthington-Great Bend-T-Windom-0177 - 000G99 - 037	179	$135.05	$0.75	$1,033.13	$5.77	1	1.25	1.5625	$0.761176
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1973	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	869	$654.21	$0.75	$5,004.71	$5.76	1	1.25	1.5625	$0.760422
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1973	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	527	$395.82	$0.75	$3,028.02	$5.75	1	1.25	1.5625	$0.759668
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1973	54	Fairmont-Lakefield-C-Jackson Cty Central-2895 - 000G94 - 054	227	$170.96	$0.75	$1,307.85	$5.76	1	1.25	1.5625	$0.760422
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1973	313	Worthington-Mountain Lake-C-Mountain Lake-0173 - 000G99 - 313	216	$162.55	$0.75	$1,243.51	$5.76	1	1.25	1.5625	$0.760422
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1973	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	91	$94.42	$1.04	$722.31	$7.94	1	1	1	$0.899821
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1973	37	Worthington-Great Bend-T-Windom-0177 - 000G99 - 037	3,233	$2,432.14	$0.75	$18,605.87	$5.75	1	2	4	$0.759668
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1973	38	Worthington-Midway-T-Mountain Lake-0173 - 000G99 - 038	2,987	$2,214.77	$0.74	$16,942.98	$5.67	1	2	4	$0.753583
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1973	39	Worthington-Mountain Lake-T-Mountain Lake-0173 - 000G99 - 039	768	$570.18	$0.74	$4,361.88	$5.68	1	2	4	$0.754348
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1973	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	79,924	$59,991.37	$0.75	$458,933.97	$5.74	1	2	4	$0.758912
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1973	51	Fairmont-DesMoines-T-Jackson Cty Centrl-2895 - 000G94 - 051	601	$450.69	$0.75	$3,447.78	$5.74	1	2	4	$0.758912
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1973	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	67,817	$50,605.46	$0.75	$387,131.76	$5.71	1	2	4	$0.756636
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1973	54	Fairmont-Lakefield-C-Jackson Cty Central-2895 - 000G94 - 054	8,806	$6,635.18	$0.75	$50,759.12	$5.76	1	2	4	$0.760422
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1973	307	Pine City-Pokegama-T-Pine City-0578 - 000G98 - 307	30	$22.70	$0.76	$173.66	$5.79	1	2	4	$0.762679
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1973	313	Worthington-Mountain Lake-C-Mountain Lake-0173 - 000G99 - 313	40,881	$30,496.09	$0.75	$233,295.07	$5.71	1	2	4	$0.756636
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1973	335	Fairmont-Hunter-T-Jackson Cty Centrl-2895 - 000G94 - 335	33	$24.75	$0.75	$189.34	$5.74	1	2	4	$0.758912
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1973	374	Fairmont-Heron Lake-T-Jackson Cty Central - 000G94 - 374	890	$666.51	$0.75	$5,098.80	$5.73	1	2	4	$0.758155
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1973	38	Worthington-Midway-T-Mountain Lake-0173 - 000G99 - 038	174	$130.86	$0.75	$1,001.08	$5.75	1	3	9	$0.759668
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1973	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	2,424	$1,823.88	$0.75	$13,952.68	$5.76	1	3	9	$0.760422
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1973	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	16,397	$12,336.38	$0.75	$94,373.31	$5.76	1	3	9	$0.760422
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1973	54	Fairmont-Lakefield-C-Jackson Cty Central-2895 - 000G94 - 054	778	$585.00	$0.75	$4,475.25	$5.75	1	3	9	$0.759668
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1973	313	Worthington-Mountain Lake-C-Mountain Lake-0173 - 000G99 - 313	1,510	$1,135.60	$0.75	$8,687.34	$5.75	1	3	9	$0.759668
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1973	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	388	$291.31	$0.75	$2,228.52	$5.74	1	0.75	0.5625	$0.758912
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1973	307	Pine City-Pokegama-T-Pine City-0578 - 000G98 - 307	398	$299.59	$0.75	$2,291.86	$5.76	1	0.75	0.5625	$0.760422
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1973	37	Worthington-Great Bend-T-Windom-0177 - 000G99 - 037	16	$33.59	$2.10	$256.96	$16.06	1	4	16	$1.205746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1973	38	Worthington-Midway-T-Mountain Lake-0173 - 000G99 - 038	26,630	$55,979.86	$2.10	$428,245.93	$16.08	1	4	16	$1.206286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1973	39	Worthington-Mountain Lake-T-Mountain Lake-0173 - 000G99 - 039	10,799	$22,700.33	$2.10	$173,657.53	$16.08	1	4	16	$1.206286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1973	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	38,622	$76,452.48	$1.98	$584,861.47	$15.14	1	4	16	$1.180126
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1973	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	23,245	$48,338.11	$2.08	$369,786.55	$15.91	1	4	16	$1.201670
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1973	54	Fairmont-Lakefield-C-Jackson Cty Central-2895 - 000G94 - 054	4,509	$9,478.36	$2.10	$72,509.45	$16.08	1	4	16	$1.206286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1973	55	Worthington-Madison-C-Lac Qui Parle Valley-2853 - 000G99 - 055	3,265	$7,008.69	$2.15	$53,616.48	$16.42	1	4	16	$1.215373
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1973	335	Fairmont-Hunter-T-Jackson Cty Centrl-2895 - 000G94 - 335	174	$365.85	$2.10	$2,798.75	$16.08	1	4	16	$1.206286

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1973	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	13,506	$52,576.61	$3.89	$402,211.07	$29.78	1	6	36	$1.473925
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1973	51	Fairmont-DesMoines-T-Jackson Cty Centrl-2895 - 000G94 - 051	11	$42.67	$3.88	$326.43	$29.68	1	6	36	$1.472464
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1973	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	4,053	$12,351.37	$3.05	$94,487.98	$23.31	1	6	36	$1.367542
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1973	55	Worthington-Madison-C-Lac Qui Parle Valley-2853 - 000G99 - 055	3,483	$13,558.82	$3.89	$103,724.97	$29.78	1	6	36	$1.473925
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1973	56	Worthington-Madison-T-Lac Qui Parle Valley-2853 - 000G99 - 056	57	$222.42	$3.90	$1,701.51	$29.85	1	6	36	$1.474944
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1973	326	Worthington-Bingham Lake-C-Windom-0177 - 000G99 - 326	12	$46.30	$3.86	$354.20	$29.52	1	6	36	$1.470116
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1974	59	Worthington-Ivanhoe-C-Ivanhoe-0403 - 000G99 - 059	137	$45.39	$0.33	$301.94	$2.20	0	1	1	$0.342423
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1974	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	1,230	$404.99	$0.33	$2,694.06	$2.19	0	1	1	$0.340444
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1974	59	Worthington-Ivanhoe-C-Ivanhoe-0403 - 000G99 - 059	24,538	$8,081.61	$0.33	$53,760.27	$2.19	0	2	4	$0.340444
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1974	61	Worthington-Royal-T-Ivanhoe-0403 - 000G99 - 061	68	$22.40	$0.33	$149.01	$2.19	0	2	4	$0.340444
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1974	62	Worthington-Cottonwood-C-Lakeview-2167 - 000G99 - 062	20,611	$6,788.40	$0.33	$45,157.62	$2.19	0	2	4	$0.340444
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1974	63	Worthington-Fairview-T-Marshall-0413 - 000G99 - 063	1,855	$610.99	$0.33	$4,064.41	$2.19	0	2	4	$0.340444
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1974	64	Worthington-Lucas-T-Lakeview-2167 - 000G99 - 064	271	$89.26	$0.33	$593.77	$2.19	0	2	4	$0.340444
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1974	65	Worthington-Tracy-C-Tracy-0417 - 000G99 - 065	4,377	$1,441.67	$0.33	$9,590.24	$2.19	0	2	4	$0.340444
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1974	78	Worthington-Brewster-C-Brewster-0513 - 000G99 - 078	21,059	$6,935.98	$0.33	$46,139.34	$2.19	0	2	4	$0.340444
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1974	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	84,359	$27,909.02	$0.33	$185,655.65	$2.20	0	2	4	$0.342423
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1974	402	Worthington-Hersy-T-Brewster - 000G99 - 402	85	$28.00	$0.33	$186.26	$2.19	0	2	4	$0.340444
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1974	403	Worthington-Round Lake-Round Lake - 000G99 - 403	540	$177.89	$0.33	$1,183.35	$2.19	0	2	4	$0.340444
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1974	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	753	$247.84	$0.33	$1,648.67	$2.19	0	3	9	$0.340444
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1974	63	Worthington-Fairview-T-Marshall-0413 - 000G99 - 063	56	$18.16	$0.32	$120.80	$2.16	0	0.75	0.5625	$0.334454
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1974	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	146	$48.12	$0.33	$320.10	$2.19	0	0.75	0.5625	$0.340444
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1974	59	Worthington-Ivanhoe-C-Ivanhoe-0403 - 000G99 - 059	4,085	$2,690.88	$0.66	$17,900.20	$4.38	0	4	16	$0.641474
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1974	61	Worthington-Royal-T-Ivanhoe-0403 - 000G99 - 061	36,829	$24,259.70	$0.66	$161,379.74	$4.38	0	4	16	$0.641474
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1974	62	Worthington-Cottonwood-C-Lakeview-2167 - 000G99 - 062	2,195	$1,445.50	$0.66	$9,615.72	$4.38	0	4	16	$0.641474
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1974	78	Worthington-Brewster-C-Brewster-0513 - 000G99 - 078	3,190	$2,100.87	$0.66	$13,975.35	$4.38	0	4	16	$0.641474
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1974	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	21,775	$14,343.72	$0.66	$95,416.92	$4.38	0	4	16	$0.641474
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1974	80	Worthington-Lorain-T-Worthington Dist-0518 - 000G99 - 080	411	$270.74	$0.66	$1,801.01	$4.38	0	4	16	$0.641474
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	183	Steel 1 1/2 in	1974	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	747	$777.12	$1.04	$5,169.54	$6.92	1	1.5	2.25	$0.840106
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1974	65	Worthington-Tracy-C-Tracy-0417 - 000G99 - 065	41,046	$42,820.12	$1.04	$284,846.88	$6.94	1	1.25	1.5625	$0.841359
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1974	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	1,699	$1,767.69	$1.04	$11,758.98	$6.92	1	1.25	1.5625	$0.840106
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1974	86	Worthington-Springdale-T-Westbrk-WalnutGrv-2898 - 000G99 - 086	316	$328.64	$1.04	$2,186.17	$6.92	1	1.25	1.5625	$0.840106
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	190	Steel 2 1/2 in	1974	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	2,861	$2,976.86	$1.04	$19,802.59	$6.92	1	2.5	6.25	$0.840106
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1974	59	Worthington-Ivanhoe-C-Ivanhoe-0403 - 000G99 - 059	1,983	$2,063.55	$1.04	$13,727.09	$6.92	1	2	4	$0.840106
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1974	62	Worthington-Cottonwood-C-Lakeview-2167 - 000G99 - 062	715	$966.87	$1.35	$6,431.79	$9.00	1	2	4	$0.954243
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1974	63	Worthington-Fairview-T-Marshall-0413 - 000G99 - 063	16	$17.25	$1.08	$114.75	$7.17	1	2	4	$0.855519
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1974	65	Worthington-Tracy-C-Tracy-0417 - 000G99 - 065	22,829	$23,791.88	$1.04	$158,267.72	$6.93	1	2	4	$0.840733
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1974	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	50,826	$58,391.36	$1.15	$388,429.52	$7.64	1	2	4	$0.883093
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1974	400	Worthington-Monroe-T-Tracy - 000G99 - 400	559	$581.79	$1.04	$3,870.17	$6.92	1	2	4	$0.840106
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1974	62	Worthington-Cottonwood-C-Lakeview-2167 - 000G99 - 062	1,154	$1,201.09	$1.04	$7,989.86	$6.92	1	3	9	$0.840106
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1974	65	Worthington-Tracy-C-Tracy-0417 - 000G99 - 065	12,864	$13,387.30	$1.04	$89,054.65	$6.92	1	3	9	$0.840106
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1974	63	Worthington-Fairview-T-Marshall-0413 - 000G99 - 063	69	$70.81	$1.03	$471.04	$6.83	1	0.75	0.5625	$0.834421
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1974	61	Worthington-Royal-T-Ivanhoe-0403 - 000G99 - 061	188	$256.02	$1.36	$1,703.09	$9.06	1	4	16	$0.957128
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1974	62	Worthington-Cottonwood-C-Lakeview-2167 - 000G99 - 062	1,699	$4,940.55	$2.91	$32,865.40	$19.34	1	4	16	$1.286456
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1974	65	Worthington-Tracy-C-Tracy-0417 - 000G99 - 065	4,847	$14,095.36	$2.91	$93,764.79	$19.34	1	4	16	$1.286456
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1974	63	Worthington-Fairview-T-Marshall-0413 - 000G99 - 063	11,996	$64,597.66	$5.38	$429,714.87	$35.82	1	6	36	$1.554126
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1974	65	Worthington-Tracy-C-Tracy-0417 - 000G99 - 065	1,518	$8,174.33	$5.38	$54,377.06	$35.82	1	6	36	$1.554126
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1974	401	Worthington-Marshall-C-Marshall - 000G99 - 401	851	$4,582.58	$5.38	$30,484.12	$35.82	1	6	36	$1.554126
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1975	82	Worthington-Lamberton-C-Red Rock Central-2884 - 000G99 - 082	16	$2.72	$0.17	$16.38	$1.02	0	1.25	1.5625	$0.008600
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1975	85	Worthington-Sanborn-C-Red Rock Central-2884 - 000G99 - 085	14	$2.72	$0.19	$16.38	$1.17	0	1.25	1.5625	$0.068186
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1975	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	5,537	$13,022.89	$2.35	$78,444.97	$14.17	0	1.25	1.5625	$1.151370
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1975	457	Fairmont-Pickerel Lake-T-Albert Lea - 000G94 - 457	286	$672.67	$2.35	$4,051.91	$14.17	0	1.25	1.5625	$1.151370
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1975	95	Worthington-Canby-C-Canby-0891 - 000G99 - 095	335	$61.73	$0.18	$371.84	$1.11	0	1	1	$0.045323
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1975	123	Fairmont-Glenville-C-Glenville-Emmons-2886 - 000G94 - 123	610	$165.70	$0.27	$998.11	$1.64	0	1	1	$0.214844
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1975	418	Rochester-Adams-C-Southland - 000G95 - 418	128	$34.77	$0.27	$209.44	$1.64	0	1	1	$0.214844
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1975	443	Rochester-Leroy-T-Leroy-Ostrander - 000G95 - 443	573	$155.65	$0.27	$937.58	$1.64	0	1	1	$0.214844
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1975	466	Rochester-Windom-T-Southland - 000G95 - 466	244	$66.28	$0.27	$399.25	$1.64	0	1	1	$0.214844
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1975	469	Rochester-Lodi-T-Southland - 000G95 - 469	356	$96.70	$0.27	$582.48	$1.64	0	1	1	$0.214844
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1975	80	Worthington-Lorain-T-Worthington Dist-0518 - 000G99 - 080	1,212	$223.33	$0.18	$1,345.26	$1.11	0	2	4	$0.045323
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1975	81	Worthington-Worthington-T-Worthington Admn-0518 - 000G99 - 081	337	$62.13	$0.18	$374.24	$1.11	0	2	4	$0.045323
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1975	82	Worthington-Lamberton-C-Red Rock Central-2884 - 000G99 - 082	9,477	$1,749.18	$0.18	$10,536.40	$1.11	0	2	4	$0.045323
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1975	83	Worthington-Lamberton-T-Red Rock Central-2884 - 000G99 - 083	505	$93.07	$0.18	$560.62	$1.11	0	2	4	$0.045323
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1975	85	Worthington-Sanborn-C-Red Rock Central-2884 - 000G99 - 085	3,456	$638.22	$0.18	$3,844.40	$1.11	0	2	4	$0.045323
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1975	87	Worthington-WalnutGrve-C-Westbrk-WalnutGrv-2898 - 000G99 - 087	3,788	$699.05	$0.18	$4,210.81	$1.11	0	2	4	$0.045323
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1975	90	Worthington-Appleton-T-Lac Qui Parle Valley - 000G99 - 090	3,283	$605.70	$0.18	$3,648.51	$1.11	0	2	4	$0.045323
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1975	91	Worthington-Appleton-C-Lac Qui Parle Valley - 000G99 - 091	10,827	$1,998.02	$0.18	$12,035.33	$1.11	0	2	4	$0.045323
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1975	94	Worthington-Butterfield-C-Butterfield-0836 - 000G99 - 094	19,852	$3,663.20	$0.18	$22,065.73	$1.11	0	2	4	$0.045323
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1975	95	Worthington-Canby-C-Canby-0891 - 000G99 - 095	45,831	$8,315.56	$0.18	$50,089.80	$1.09	0	2	4	$0.037426

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1975	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	864	$41,038.67	$47.50	$247,201.44	$286.11	0	2	4	$2.456533
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1975	81	Worthington-Worthington-T-Worthington Admn-0518 - 000G99 - 081	233	$86.25	$0.37	$519.54	$2.23	0	4	16	$0.348305
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1975	82	Worthington-Lamberton-C-Red Rock Central-2884 - 000G99 - 082	563	$207.90	$0.37	$1,252.31	$2.22	0	4	16	$0.346353
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1975	87	Worthington-WalnutGrve-C-Westbrk-WalnutGrv-2898 - 000G99 - 087	4,912	$1,813.00	$0.37	$10,920.83	$2.22	0	4	16	$0.346353
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1975	91	Worthington-Appleton-C-Lac Qui Parle Valley - 000G99 - 091	1,261	$465.73	$0.37	$2,805.38	$2.22	0	4	16	$0.346353
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1975	94	Worthington-Butterfield-C-Butterfield-0836 - 000G99 - 094	4,756	$1,755.79	$0.37	$10,576.22	$2.22	0	4	16	$0.346353
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1975	95	Worthington-Canby-C-Canby-0891 - 000G99 - 095	13,503	$4,984.26	$0.37	$30,023.30	$2.22	0	4	16	$0.346353
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1975	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	114	$9,050.67	$79.20	$54,517.82	$477.10	0	4	16	$2.678609
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1975	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	175	$13,872.42	$79.20	$83,562.21	$477.09	0	4	16	$2.678600
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	183	Steel 1 1/2 in	1975	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	279	$189.13	$0.68	$1,139.25	$4.08	1	1.5	2.25	$0.610660
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1975	62	Worthington-Cottonwood-C-Lakeview-2167 - 000G99 - 062	409	$296.40	$0.72	$1,785.40	$4.37	1	1.25	1.5625	$0.640481
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1975	84	Worthington-Revere-C-Westbrook-WalnutGrve-2898 - 000G99 - 084	528	$307.76	$0.58	$1,853.83	$3.51	1	1.25	1.5625	$0.545307
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1975	87	Worthington-WalnutGrve-C-Westbrk-WalnutGrv-2898 - 000G99 - 087	19,507	$10,721.26	$0.55	$64,580.82	$3.31	1	1.25	1.5625	$0.519828
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1975	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	581	$1,589.96	$2.73	$9,577.31	$16.47	1	1.25	1.5625	$1.216694
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1975	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	55	$149.08	$2.73	$898.00	$16.47	1	1.25	1.5625	$1.216694
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1975	85	Worthington-Sanborn-C-Red Rock Central-2884 - 000G99 - 085	1,314	$766.23	$0.58	$4,615.48	$3.51	1	1	1	$0.545307
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1975	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	99	$1,039.75	$10.50	$6,263.06	$63.26	1	1	1	$1.801129
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1975	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	18,596	$10,828.61	$0.58	$65,227.46	$3.51	1	2	4	$0.545307
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1975	80	Worthington-Lorain-T-Worthington Dist-0518 - 000G99 - 080	959	$558.33	$0.58	$3,363.17	$3.51	1	2	4	$0.545307
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1975	82	Worthington-Lamberton-C-Red Rock Central-2884 - 000G99 - 082	1,073	$626.42	$0.58	$3,773.32	$3.52	1	2	4	$0.546543
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1975	84	Worthington-Revere-C-Westbrook-WalnutGrve-2898 - 000G99 - 084	2,044	$1,191.38	$0.58	$7,176.43	$3.51	1	2	4	$0.545307
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1975	87	Worthington-WalnutGrve-C-Westbrk-WalnutGrv-2898 - 000G99 - 087	3,715	$2,134.37	$0.57	$12,856.64	$3.46	1	2	4	$0.539076
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1975	91	Worthington-Appleton-C-Lac Qui Parle Valley - 000G99 - 091	1,841	$1,072.66	$0.58	$6,461.30	$3.51	1	2	4	$0.545307
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1975	448	Fairmont-Manchester-T-Albert Lea - 000G94 - 448	73	$162.00	$2.22	$975.83	$13.37	1	2	4	$1.126131
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1975	457	Fairmont-Pickerel Lake-T-Albert Lea - 000G94 - 457	5,038	$11,180.15	$2.22	$67,345.00	$13.37	1	2	4	$1.126131
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1975	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	4,324	$2,521.85	$0.58	$15,190.67	$3.51	1	3	9	$0.545307
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1975	85	Worthington-Sanborn-C-Red Rock Central-2884 - 000G99 - 085	2,297	$1,339.99	$0.58	$8,071.59	$3.51	1	3	9	$0.545307
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1975	87	Worthington-WalnutGrve-C-Westbrk-WalnutGrv-2898 - 000G99 - 087	3,127	$1,823.88	$0.58	$10,986.36	$3.51	1	3	9	$0.545307
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1975	91	Worthington-Appleton-C-Lac Qui Parle Valley - 000G99 - 091	847	$494.29	$0.58	$2,977.42	$3.52	1	3	9	$0.546543
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1975	123	Fairmont-Glenville-C-Glenville-Emmons-2886 - 000G94 - 123	10	$91.60	$9.35	$551.76	$56.30	1	3	9	$1.750508
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1975	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	26	$242.20	$9.34	$1,458.92	$56.29	1	3	9	$1.750431
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1975	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	59,541	$101,857.42	$1.71	$613,550.61	$10.30	1	4	16	$1.012837
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1975	80	Worthington-Lorain-T-Worthington Dist-0518 - 000G99 - 080	5,580	$9,092.04	$1.63	$54,767.02	$9.81	1	4	16	$0.991669
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1975	82	Worthington-Lamberton-C-Red Rock Central-2884 - 000G99 - 082	2,261	$3,683.59	$1.63	$22,188.55	$9.81	1	4	16	$0.991669
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1975	83	Worthington-Lamberton-T-Red Rock Central-2884 - 000G99 - 083	1,093	$1,780.79	$1.63	$10,726.81	$9.81	1	4	16	$0.991669
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1975	85	Worthington-Sanborn-C-Red Rock Central-2884 - 000G99 - 085	650	$1,059.47	$1.63	$6,381.85	$9.82	1	4	16	$0.992111
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1975	87	Worthington-WalnutGrve-C-Westbrk-WalnutGrv-2898 - 000G99 - 087	75	$121.65	$1.62	$732.77	$9.77	1	4	16	$0.989895
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1975	91	Worthington-Appleton-C-Lac Qui Parle Valley - 000G99 - 091	4,472	$7,285.92	$1.63	$43,887.63	$9.81	1	4	16	$0.991669
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1975	94	Worthington-Butterfield-C-Butterfield-0836 - 000G99 - 094	4,819	$7,851.73	$1.63	$47,295.85	$9.81	1	4	16	$0.991669
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1975	398	Worthington-Butterfield-T-Butterfield-0836 - 000G99 - 398	17,860	$29,099.79	$1.63	$175,286.14	$9.81	1	4	16	$0.991669
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1975	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	20	$123.57	$6.18	$744.34	$37.22	1	4	16	$1.570776
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1975	469	Rochester-Lodi-T-Southland - 000G95 - 469	5,605	$34,632.22	$6.18	$208,611.40	$37.22	1	4	16	$1.570776
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1975	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	28,190	$85,242.08	$3.02	$513,466.08	$18.21	1	6	36	$1.260310
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1975	91	Worthington-Appleton-C-Lac Qui Parle Valley - 000G99 - 091	4,357	$13,145.74	$3.02	$79,184.97	$18.17	1	6	36	$1.259355
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1976	301	Worthington-Hantho-T-Lac Qui Parle Valley-2853 - 000G99 - 301	927	$328.64	$0.35	$1,848.60	$1.99	0	1	1	$0.298853
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1976	314	Worthington-Ortonville-C-Ortonville-2903 - 000G99 - 314	632	$223.33	$0.35	$1,256.23	$1.99	0	1	1	$0.298853
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1976	36	Worthington-Ortonville-T-Ortonville-2903 - 000G99 - 036	28	$9.94	$0.36	$55.91	$2.00	0	2	4	$0.301030
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1976	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	565	$199.73	$0.35	$1,123.48	$1.99	0	2	4	$0.298853
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1976	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	337	$118.93	$0.35	$668.98	$1.99	0	2	4	$0.298853
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1976	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	455	$160.69	$0.35	$903.88	$1.99	0	2	4	$0.298853
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1976	152	Rochester-Eyota-T-Dover-Eyota-0533 - 000G95 - 152	823	$302.96	$0.37	$1,704.15	$2.07	0	2	4	$0.315970
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1976	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	709	$435.77	$0.61	$2,451.21	$3.46	0	2	4	$0.539076
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1976	174	Rochester-Utica-C-St Charles-0858 - 000G95 - 174	3,410	$1,206.54	$0.35	$6,786.79	$1.99	0	2	4	$0.298853
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1976	301	Worthington-Hantho-T-Lac Qui Parle Valley-2853 - 000G99 - 301	3,410	$1,206.54	$0.35	$6,786.79	$1.99	0	2	4	$0.298853
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1976	304	Worthington-Avoca-C-Murray Cty Central-2169 - 000G99 - 304	9,207	$3,258.30	$0.35	$18,327.94	$1.99	0	2	4	$0.298853
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1976	314	Worthington-Ortonville-C-Ortonville-2903 - 000G99 - 314	66,188	$23,173.62	$0.35	$130,351.62	$1.97	0	2	4	$0.294466
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1976	399	Worthington-Westbrook-C-Westbrook Grove-2898 - 000G99 - 399	26,535	$9,390.86	$0.35	$52,823.59	$1.99	0	2	4	$0.298853
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1976	301	Worthington-Hantho-T-Lac Qui Parle Valley-2853 - 000G99 - 301	631	$223.33	$0.35	$1,256.23	$1.99	0	0.75	0.5625	$0.298853
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1976	36	Worthington-Ortonville-T-Ortonville-2903 - 000G99 - 036	2,293	$1,609.15	$0.70	$9,051.47	$3.95	0	4	16	$0.596597
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1976	95	Worthington-Canby-C-Canby-0891 - 000G99 - 095	2,078	$1,470.73	$0.71	$8,272.86	$3.98	0	4	16	$0.599883
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1976	301	Worthington-Hantho-T-Lac Qui Parle Valley-2853 - 000G99 - 301	9,939	$7,034.07	$0.71	$39,566.64	$3.98	0	4	16	$0.599883
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1976	304	Worthington-Avoca-C-Murray Cty Central-2169 - 000G99 - 304	506	$357.70	$0.71	$2,012.06	$3.98	0	4	16	$0.599883
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1976	314	Worthington-Ortonville-C-Ortonville-2903 - 000G99 - 314	28,848	$20,244.60	$0.70	$113,875.87	$3.95	0	4	16	$0.596597
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1976	327	Worthington-Westbrook-C-Westbrk-WalnutGrv-2898 - 000G99 - 327	85	$60.17	$0.71	$338.45	$3.98	0	4	16	$0.599883
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1976	363	Worthington-Big Stone-T-Ortonville - 000G99 - 363	3,328	$1,405.64	$0.42	$7,906.73	$2.38	0	4	16	$0.376577
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1976	399	Worthington-Westbrook-C-Westbrook Grove-2898 - 000G99 - 399	7,322	$5,182.70	$0.71	$29,152.69	$3.98	0	4	16	$0.599883
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1976	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	568	$899.69	$1.58	$5,060.76	$8.91	1	1.25	1.5625	$0.949878

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1976	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	55	$61.50	$1.12	$345.94	$6.29	1	1.25	1.5625	$0.798651
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1976	380	Rochester-St Charles-T-St Charles - 000G95 - 380	929	$1,038.82	$1.12	$5,843.36	$6.29	1	1.25	1.5625	$0.798651
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1976	49	Fairmont-Twin Lakes-C-Albert Lea-0241 - 000G94 - 049	1,016	$1,136.64	$1.12	$6,393.60	$6.29	1	2	4	$0.798651
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1976	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	2,306	$2,577.41	$1.12	$14,497.93	$6.29	1	2	4	$0.798651
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1976	106	Rochester-West Concord-C-Triton-2125 - 000G95 - 106	89	$100.77	$1.13	$566.83	$6.37	1	2	4	$0.804139
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1976	120	Rochester-Rushford-V-Rushford-Peterson-0239 - 000G95 - 120	428	$478.44	$1.12	$2,691.23	$6.29	1	2	4	$0.798651
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1976	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	214	$238.77	$1.12	$1,343.08	$6.28	1	2	4	$0.797960
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1976	136	Rochester-La Crescent-T-LaCrescent-Hokah-0300 - 000G95 - 136	338	$377.67	$1.12	$2,124.39	$6.29	1	2	4	$0.798651
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1976	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	379	$423.97	$1.12	$2,384.83	$6.29	1	2	4	$0.798651
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1976	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	457	$511.12	$1.12	$2,875.05	$6.29	1	2	4	$0.798651
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1976	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	9,897	$12,269.04	$1.24	$69,013.35	$6.97	1	2	4	$0.843233
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1976	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	3,815	$4,266.01	$1.12	$23,996.31	$6.29	1	2	4	$0.798651
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1976	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	1,039	$1,008.10	$0.97	$5,670.56	$5.46	1	3	9	$0.737193
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1976	154	Rochester-High Forest-T-Stewartville-0534 - 000G95 - 154	15,822	$17,692.75	$1.12	$99,521.71	$6.29	1	3	9	$0.798651
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1976	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	1,009	$1,189.67	$1.18	$6,691.89	$6.63	1	3	9	$0.821514
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1976	95	Worthington-Canby-C-Canby-0891 - 000G99 - 095	197	$616.43	$3.13	$3,467.42	$17.60	1	4	16	$1.245513
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1976	314	Worthington-Ortonville-C-Ortonville-2903 - 000G99 - 314	4,220	$14,671.86	$3.48	$82,529.21	$19.56	1	4	16	$1.291369
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1976	326	Worthington-Bingham Lake-C-Windom-0177 - 000G99 - 326	13,814	$63,165.81	$4.57	$355,307.68	$25.72	1	4	16	$1.410271
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1976	327	Worthington-Westbrook-C-Westbrk-WalnutGrv-2898 - 000G99 - 327	132	$411.26	$3.12	$2,313.34	$17.53	1	4	16	$1.243782
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1976	380	Rochester-St Charles-T-St Charles - 000G95 - 380	15	$47.21	$3.15	$265.56	$17.70	1	4	16	$1.247973
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1976	95	Worthington-Canby-C-Canby-0891 - 000G99 - 095	1,467	$8,487.55	$5.79	$47,742.47	$32.54	1	6	36	$1.512418
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1976	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	333	$1,926.47	$5.79	$10,836.39	$32.54	1	6	36	$1.512418
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1976	169	Rochester-Plainview-T-Plainview-2899 - 000G95 - 169	1,699	$9,829.36	$5.79	$55,290.15	$32.54	1	6	36	$1.512418
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1976	314	Worthington-Ortonville-C-Ortonville-2903 - 000G99 - 314	855	$4,946.91	$5.79	$27,826.37	$32.55	1	6	36	$1.512551
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1976	326	Worthington-Bingham Lake-C-Windom-0177 - 000G99 - 326	412	$2,383.12	$5.78	$13,405.05	$32.54	1	6	36	$1.512418
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1977	124	Fairmont-Hayward-C-Albert Lea-0241 - 000G94 - 124	1,424	$141,345.04	$99.26	$740,609.29	$520.09	1	2	4	$2.716079
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1977	386	Rochester-Hayward-T-Albert Lea-0241 - 000G95 - 386	296	$29,380.71	$99.26	$153,946.87	$520.09	1	2	4	$2.716079
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1978	89	Fairmont-Ellendale-C-NRHEG-2168 - 000G94 - 089	281	$4,017.79	$14.30	$19,090.74	$67.94	0	2	4	$1.832126
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1978	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	889	$12,712.55	$14.30	$60,404.35	$67.95	0	2	4	$1.832189
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1978	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	10,261	$137,672.25	$13.42	$654,156.96	$63.75	0	2	4	$1.804480
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1978	115	Rochester-Mabel-C-Mabel-Canton-0238 - 000G95 - 115	342	$4,896.69	$14.32	$23,266.88	$68.03	0	2	4	$1.832700
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1978	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	275	$3,939.32	$14.32	$18,717.89	$68.07	0	2	4	$1.832956
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1978	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	318	$4,551.41	$14.31	$21,626.26	$68.01	0	2	4	$1.832573
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1978	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	1,237	$17,703.41	$14.31	$84,118.69	$68.00	0	2	4	$1.832509
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1978	124	Fairmont-Hayward-C-Albert Lea-0241 - 000G94 - 124	872	$12,477.14	$14.31	$59,285.79	$67.99	0	2	4	$1.832445
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1978	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	439	$6,277.80	$14.30	$29,829.30	$67.95	0	2	4	$1.832189
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1978	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	2,473	$35,359.73	$14.30	$168,013.62	$67.94	0	2	4	$1.832126
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1978	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	521	$7,266.56	$13.95	$34,527.44	$66.27	0	2	4	$1.821317
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1978	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	111	$1,585.15	$14.28	$7,531.92	$67.86	0	2	4	$1.831614
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1978	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	1,845	$26,382.47	$14.30	$125,357.70	$67.94	0	2	4	$1.832126
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1978	148	Rochester-Dover-C-Dover-Eyota-0533 - 000G95 - 148	1,191	$17,169.03	$14.42	$81,579.56	$68.50	0	2	4	$1.835691
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1978	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	1,903	$27,214.28	$14.30	$129,310.09	$67.95	0	2	4	$1.832189
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1978	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	8,201	$117,493.24	$14.33	$558,275.33	$68.07	0	2	4	$1.832956
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1978	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	921	$13,183.39	$14.31	$62,641.57	$68.01	0	2	4	$1.832573
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1978	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	1,188	$17,311.04	$14.57	$82,254.32	$69.24	0	3	9	$1.840357
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1978	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	323	$4,629.88	$14.33	$21,999.12	$68.11	0	3	9	$1.833211
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1978	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	933	$13,340.33	$14.30	$63,387.28	$67.94	0	3	9	$1.832126
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1978	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	3,710	$9,699.21	$2.61	$46,086.31	$12.42	0	4	16	$1.094122
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1978	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	1,473	$42,124.07	$28.60	$200,154.74	$135.88	0	4	16	$2.133156
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1978	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	417	$18,833.41	$45.16	$89,487.94	$214.60	1	2	4	$2.331630
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1978	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	231	$10,436.85	$45.18	$49,591.24	$214.68	1	3	9	$2.331792
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1978	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	164	$7,392.11	$45.07	$35,124.00	$214.17	1	0.75	0.5625	$2.330759
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1979	179	Cloquet-Barnum-C-Barnum-0091 - 000G96 - 179	3,770	$3,819.57	$1.01	$16,792.93	$4.45	0	1.25	1.5625	$0.648360
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1979	180	Cloquet-Carlton-C-Carlton-0093 - 000G96 - 180	1,163	$1,179.51	$1.01	$5,185.78	$4.46	0	1.25	1.5625	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1979	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	18,663	$18,914.70	$1.01	$83,159.45	$4.46	0	1.25	1.5625	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1979	191	Wadena-Crosby-C-Crosby-Ironton-0182 - 000G89 - 191	3,781	$11,746.10	$3.11	$51,642.33	$13.66	0	1.25	1.5625	$1.135451
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1979	192	Wadena-Deerwood-C-Crosby-Ironton-0182 - 000G89 - 192	2,770	$5,382.33	$1.94	$23,663.70	$8.54	0	1.25	1.5625	$0.931458
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1979	193	Wadena-Ironton-C-Crosby-Ironton-0182 - 000G89 - 193	264	$638.00	$2.42	$2,805.00	$10.63	0	1.25	1.5625	$1.026533
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1979	194	Wadena-Deerwood-T-Crosby-Ironton-0182 - 000G89 - 194	675	$684.19	$1.01	$3,008.08	$4.46	0	1.25	1.5625	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1979	195	Wadena-Irondale(Riverton)-T-Crosby-Ironton-0182 - 000G89 - 195	316	$320.71	$1.01	$1,410.02	$4.46	0	1.25	1.5625	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1979	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	688	$810.78	$1.18	$3,564.63	$5.18	0	1.25	1.5625	$0.714330
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1979	255	Wadena-Baudette-C-Lake of Woods-0390 - 000G89 - 255	29,081	$29,474.26	$1.01	$129,585.10	$4.46	0	1.25	1.5625	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1979	257	Wadena-Motley-C-Staples-Motley-2170 - 000G89 - 257	1,810	$1,835.20	$1.01	$8,068.55	$4.46	0	1.25	1.5625	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1979	262	Wadena-Compton-T-Wadena-Deer Creek-2155 - 000G89 - 262	525	$530.96	$1.01	$2,334.39	$4.45	0	1.25	1.5625	$0.648360
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1979	264	Wadena-North-T-Thief River Falls-0564 - 000G89 - 264	681	$689.33	$1.01	$3,030.68	$4.45	0	1.25	1.5625	$0.648360
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1979	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	23,484	$23,800.86	$1.01	$104,641.70	$4.46	0	1.25	1.5625	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1979	272	Wadena-Lake-T-Warroad-0690 - 000G89 - 272	596	$604.08	$1.01	$2,655.87	$4.46	0	1.25	1.5625	$0.649335

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1979	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	31,247	$31,669.01	$1.01	$139,234.44	$4.46	0	1.25	1.5625	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1979	275	Wadena-Warroad-C-Warroad-0690 - 000G89 - 275	16,010	$16,227.12	$1.01	$71,343.37	$4.46	0	1.25	1.5625	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1979	277	Wadena-Bertha-C-Bertha-Hewitt-0786 - 000G89 - 277	964	$976.40	$1.01	$4,292.79	$4.45	0	1.25	1.5625	$0.648360
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1979	278	Wadena-Hewitt-C-Bertha-Hewitt-0786 - 000G89 - 278	7,894	$8,001.57	$1.01	$35,179.31	$4.46	0	1.25	1.5625	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1979	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	10,201	$10,341.41	$1.01	$45,466.54	$4.46	0	1.25	1.5625	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1979	285	Wadena-Menahga-C-Menahga-821 - 000G89 - 285	481	$488.35	$1.02	$2,147.05	$4.46	0	1.25	1.5625	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1979	290	Wadena-Verndale-C-Verndale-818 - 000G89 - 290	6,420	$6,506.83	$1.01	$28,607.60	$4.46	0	1.25	1.5625	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1979	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	12,013	$12,175.19	$1.01	$53,528.85	$4.46	0	1.25	1.5625	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1979	322	Wadena-Staples-T-Staples-Motley-2170- 000G89 - 322	332	$335.63	$1.01	$1,475.62	$4.44	0	1.25	1.5625	$0.647383
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1979	369	Wadena-Wadena-T-Wadena-Deer Creek-2155 - 000G89 - 369	206	$210.81	$1.02	$926.84	$4.50	0	1.25	1.5625	$0.653213
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1979	192	Wadena-Deerwood-C-Crosby-Ironton-0182 - 000G89 - 192	216	$419.00	$1.94	$1,842.16	$8.53	0	1	1	$0.930949
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1979	194	Wadena-Deerwood-T-Crosby-Ironton-0182 - 000G89 - 194	1,203	$1,218.71	$1.01	$5,358.12	$4.45	0	1	1	$0.648360
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1979	195	Wadena-Irondale(Riverton)-T-Crosby-Ironton-0182 - 000G89 - 195	2,179	$2,209.36	$1.01	$9,713.57	$4.46	0	1	1	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1979	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	1,156	$1,172.39	$1.01	$5,154.47	$4.46	0	1	1	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1979	253	Wadena-Todd-C-Park Rapids-0309 - 000G89 - 253	880	$873.05	$0.99	$3,838.41	$4.36	0	1	1	$0.639486
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1979	257	Wadena-Motley-C-Staples-Motley-2170 - 000G89 - 257	858	$869.49	$1.01	$3,822.76	$4.46	0	1	1	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1979	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	228	$231.63	$1.02	$1,018.37	$4.47	0	1	1	$0.650308
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1979	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	747	$759.02	$1.02	$3,337.07	$4.47	0	1	1	$0.650308
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1979	275	Wadena-Warroad-C-Warroad-0690 - 000G89 - 275	277	$281.52	$1.02	$1,237.72	$4.47	0	1	1	$0.650308
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1979	278	Wadena-Hewitt-C-Bertha-Hewitt-0786 - 000G89 - 278	97	$99.78	$1.03	$438.69	$4.52	0	1	1	$0.655138
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1979	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	225	$228.06	$1.01	$1,002.68	$4.46	0	1	1	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1979	288	Wadena-Sebeka-C-Sebeka-820 - 000G89 - 288	126	$128.29	$1.02	$564.03	$4.48	0	1	1	$0.651278
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1979	290	Wadena-Verndale-C-Verndale-818 - 000G89 - 290	913	$1,732.45	$1.90	$7,616.80	$8.34	0	1	1	$0.921166
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1979	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	843	$855.24	$1.01	$3,760.11	$4.46	0	1	1	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1979	368	Wadena-Rainy River-T-Lake Woods - 000G89 - 368	44	$42.76	$0.97	$188.00	$4.27	0	1	1	$0.630428
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	784	$17,706.37	$22.58	$77,846.97	$99.29	0	2	4	$1.996906
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	511	$11,543.86	$22.59	$50,753.18	$99.32	0	2	4	$1.997037
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	106	Rochester-West Concord-C-Triton-2125 - 000G95 - 106	2,182	$49,300.10	$22.59	$216,750.44	$99.34	0	2	4	$1.997124
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	114	Rochester-Lanesboro-C-Lanesboro-0229 - 000G95 - 114	1,089	$24,621.12	$22.61	$108,248.03	$99.40	0	2	4	$1.997386
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	115	Rochester-Mabel-C-Mabel-Canton-0238 - 000G95 - 115	261	$5,902.12	$22.61	$25,948.98	$99.42	0	2	4	$1.997474
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	1,047	$23,637.43	$22.58	$103,923.18	$99.26	0	2	4	$1.996774
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	2,367	$53,466.31	$22.59	$235,067.40	$99.31	0	2	4	$1.996993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	528	$11,919.98	$22.58	$52,406.81	$99.26	0	2	4	$1.996774
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	131	Rochester-Wanamingo-C-Kenyon-Wanamingo-2172 - 000G95 - 131	2,278	$51,470.00	$22.59	$226,290.52	$99.34	0	2	4	$1.997124
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	1,729	$39,058.18	$22.59	$171,721.31	$99.32	0	2	4	$1.997037
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	868	$19,615.89	$22.60	$86,242.28	$99.36	0	2	4	$1.997212
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	110	$2,488.15	$22.62	$10,939.28	$99.45	0	2	4	$1.997605
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	2,843	$64,286.87	$22.61	$282,640.55	$99.42	0	2	4	$1.997474
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	1,962	$51,974.51	$26.49	$228,508.63	$116.47	0	2	4	$2.066214
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	907	$20,483.84	$22.58	$90,058.26	$99.29	0	2	4	$1.996906
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	359	$10,270.85	$28.61	$45,156.32	$125.78	0	2	4	$2.099612
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	2,331	$52,661.66	$22.59	$231,529.71	$99.33	0	2	4	$1.997080
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	177	Wadena-Aitkin-T-Aitkin-0001 - 000G89 - 177	37,916	$132,284.16	$3.49	$581,594.15	$15.34	0	2	4	$1.185825
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	179	Cloquet-Barnum-C-Barnum-0091 - 000G96 - 179	8,332	$8,445.47	$1.01	$37,130.95	$4.46	0	2	4	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	180	Cloquet-Carlton-C-Carlton-0093 - 000G96 - 180	3,690	$3,742.07	$1.01	$16,452.21	$4.46	0	2	4	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	40,083	$40,622.01	$1.01	$178,596.75	$4.46	0	2	4	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	191	Wadena-Crosby-C-Crosby-Ironton-0182 - 000G89 - 191	9,317	$27,764.64	$2.98	$122,068.68	$13.10	0	2	4	$1.117271
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	192	Wadena-Deerwood-C-Crosby-Ironton-0182 - 000G89 - 192	12,928	$25,247.00	$1.95	$110,999.74	$8.59	0	2	4	$0.933993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	193	Wadena-Ironton-C-Crosby-Ironton-0182 - 000G89 - 193	7,104	$17,191.00	$2.42	$75,581.12	$10.64	0	2	4	$1.026942
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	194	Wadena-Deerwood-T-Crosby-Ironton-0182 - 000G89 - 194	33,218	$33,667.85	$1.01	$148,022.44	$4.46	0	2	4	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	195	Wadena-Irondale(Riverton)-T-Crosby-Ironton-0182 - 000G89 - 195	11,162	$11,312.07	$1.01	$49,734.10	$4.46	0	2	4	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	250	Wadena-Henrietta-T-Park Rapids-0309 - 000G89 - 250	3,019	$3,058.74	$1.01	$13,447.91	$4.45	0	2	4	$0.648360
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	95,592	$96,862.87	$1.01	$425,862.62	$4.46	0	2	4	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	252	Wadena-Straight River-T-Park Rapids-0309 - 000G89 - 252	4,251	$4,308.88	$1.01	$18,944.21	$4.46	0	2	4	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	253	Wadena-Todd-C-Park Rapids-0309 - 000G89 - 253	34,617	$35,083.71	$1.01	$154,247.35	$4.46	0	2	4	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	255	Wadena-Baudette-C-Lake of Woods-0390 - 000G89 - 255	7,684	$7,839.66	$1.02	$34,467.47	$4.49	0	2	4	$0.652246
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	257	Wadena-Motley-C-Staples-Motley-2170 - 000G89 - 257	22,297	$22,598.79	$1.01	$99,356.74	$4.46	0	2	4	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	258	Wadena-Motley-T-Staples-Motley-2170 - 000G89 - 258	2,224	$2,254.10	$1.01	$9,910.27	$4.46	0	2	4	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	262	Wadena-Compton-T-Wadena-Deer Creek-2155 - 000G89 - 262	2,779	$2,846.01	$1.02	$12,512.63	$4.50	0	2	4	$0.653213
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	264	Wadena-North-T-Thief River Falls-0564 - 000G89 - 264	6,038	$6,495.73	$1.08	$28,558.82	$4.73	0	2	4	$0.674861
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	266	Wadena-Rocksbury-T-Thief River Falls-0564 - 000G89 - 266	6,934	$7,029.91	$1.01	$30,907.36	$4.46	0	2	4	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	43,273	$44,281.32	$1.02	$194,685.12	$4.50	0	2	4	$0.653213
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	272	Wadena-Lake-T-Warroad-0690 - 000G89 - 272	199	$203.12	$1.02	$893.03	$4.49	0	2	4	$0.652246
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	32,181	$32,143.12	$1.00	$141,318.88	$4.39	0	2	4	$0.642465
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	274	Wadena-Spruce-T-Roseau-0682 - 000G89 - 274	1,389	$1,406.73	$1.01	$6,184.76	$4.45	0	2	4	$0.648360
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	275	Wadena-Warroad-C-Warroad-0690 - 000G89 - 275	42,468	$43,163.94	$1.02	$189,772.50	$4.47	0	2	4	$0.650308
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	277	Wadena-Bertha-C-Bertha-Hewitt-0786 - 000G89 - 277	942	$955.01	$1.01	$4,198.75	$4.46	0	2	4	$0.649335

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	278	Wadena-Hewitt-C-Bertha-Hewitt-0786 - 000G89 - 278	1,004	$1,019.16	$1.02	$4,480.79	$4.46	0	2	4	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	33,488	$34,321.81	$1.02	$150,897.60	$4.51	0	2	4	$0.654177
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	282	Wadena-Villard-T-Staples-Motley-2170 - 000G89 - 282	4,008	$4,062.38	$1.01	$17,860.46	$4.46	0	2	4	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	283	Wadena-Aldrich-T-Verndale-818 - 000G89 - 283	417	$422.66	$1.01	$1,858.25	$4.46	0	2	4	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	284	Wadena-Blueberry-T-Menahga-821 - 000G89 - 284	14	$14.19	$1.01	$62.39	$4.46	0	2	4	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	285	Wadena-Menahga-C-Menahga-821 - 000G89 - 285	42,393	$42,972.31	$1.01	$188,929.98	$4.46	0	2	4	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	286	Wadena-Red Eye-Sebeka-820 - 000G89 - 286	681	$691.32	$1.02	$3,039.42	$4.46	0	2	4	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	287	Wadena-Rockwood-T-Sebeka-820 - 000G89 - 287	562	$569.67	$1.01	$2,504.58	$4.46	0	2	4	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	288	Wadena-Sebeka-C-Sebeka-820 - 000G89 - 288	29,823	$30,229.75	$1.01	$132,906.66	$4.46	0	2	4	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	290	Wadena-Verndale-C-Verndale-818 - 000G89 - 290	5,778	$5,856.81	$1.01	$25,749.77	$4.46	0	2	4	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	14,899	$15,479.51	$1.04	$68,056.44	$4.57	0	2	4	$0.659916
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	322	Wadena-Staples-T-Staples-Motley-2170- 000G89 - 322	354	$358.98	$1.01	$1,578.27	$4.46	0	2	4	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	368	Wadena-Rainy River-T-Lake Woods - 000G89 - 368	2,249	$2,279.14	$1.01	$10,020.36	$4.46	0	2	4	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	369	Wadena-Wadena-T-Wadena-Deer Creek-2155 - 000G89 - 369	631	$655.59	$1.04	$2,882.34	$4.57	0	2	4	$0.659916
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1979	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	1,493	$33,733.87	$22.59	$148,312.70	$99.34	0	2	4	$1.997124
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1979	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	396	$8,939.98	$22.58	$39,305.08	$99.26	0	3	9	$1.996774
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1979	252	Wadena-Straight River-T-Park Rapids-0309 - 000G89 - 252	12	$441.87	$36.82	$1,942.70	$161.89	0	3	9	$2.209220
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1979	255	Wadena-Baudette-C-Lake of Woods-0390 - 000G89 - 255	3,473	$3,520.34	$1.01	$15,477.35	$4.46	0	3	9	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1979	261	Wadena-Bluffton-T-Wadena-Deer Creek-2155 - 000G89 - 261	1,670	$1,692.66	$1.01	$7,441.87	$4.46	0	3	9	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1979	262	Wadena-Compton-T-Wadena-Deer Creek-2155 - 000G89 - 262	3,573	$3,620.92	$1.01	$15,919.56	$4.46	0	3	9	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1979	266	Wadena-Rocksbury-T-Thief River Falls-0564 - 000G89 - 266	9,486	$9,614.57	$1.01	$42,270.95	$4.46	0	3	9	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1979	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	4,073	$4,129.80	$1.01	$18,156.88	$4.46	0	3	9	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1979	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	3,552	$3,599.65	$1.01	$15,826.04	$4.46	0	3	9	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1979	275	Wadena-Warroad-C-Warroad-0690 - 000G89 - 275	5,113	$5,222.35	$1.02	$22,960.33	$4.49	0	3	9	$0.652246
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1979	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	1,943	$1,970.61	$1.01	$8,663.89	$4.46	0	3	9	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1979	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	3,639	$3,687.80	$1.01	$16,213.61	$4.46	0	3	9	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1979	368	Wadena-Rainy River-T-Lake Woods - 000G89 - 368	2,957	$2,997.31	$1.01	$13,177.83	$4.46	0	3	9	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1979	177	Wadena-Aitkin-T-Aitkin-0001 - 000G89 - 177	838	$3,290.00	$3.93	$14,464.66	$17.26	0	0.75	0.5625	$1.237041
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1979	180	Cloquet-Carlton-C-Carlton-0093 - 000G96 - 180	144	$146.10	$1.01	$642.34	$4.46	0	0.75	0.5625	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1979	191	Wadena-Crosby-C-Crosby-Ironton-0182 - 000G89 - 191	1,256	$8,660.86	$6.90	$38,077.93	$30.32	0	0.75	0.5625	$1.481729
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1979	192	Wadena-Deerwood-C-Crosby-Ironton-0182 - 000G89 - 192	144	$1,666.00	$11.57	$7,324.66	$50.87	0	0.75	0.5625	$1.706462
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1979	193	Wadena-Ironton-C-Crosby-Ironton-0182 - 000G89 - 193	193	$1,030.36	$5.34	$4,530.03	$23.47	0	0.75	0.5625	$1.370513
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1979	194	Wadena-Deerwood-T-Crosby-Ironton-0182 - 000G89 - 194	2,697	$2,733.20	$1.01	$12,016.66	$4.46	0	0.75	0.5625	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1979	195	Wadena-Irondale(Riverton)-T-Crosby-Ironton-0182 - 000G89 - 195	167	$167.48	$1.00	$736.33	$4.41	0	0.75	0.5625	$0.644439
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1979	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	4,151	$9,019.20	$2.17	$39,653.37	$9.55	0	0.75	0.5625	$0.980003
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1979	253	Wadena-Todd-C-Park Rapids-0309 - 000G89 - 253	2,072	$1,849.45	$0.89	$8,131.20	$3.92	0	0.75	0.5625	$0.593286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1979	255	Wadena-Baudette-C-Lake of Woods-0390 - 000G89 - 255	1,706	$3,216.72	$1.89	$14,142.48	$8.29	0	0.75	0.5625	$0.918555
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1979	257	Wadena-Motley-C-Staples-Motley-2170 - 000G89 - 257	381	$850.80	$2.23	$3,740.59	$9.82	0	0.75	0.5625	$0.992111
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1979	262	Wadena-Compton-T-Wadena-Deer Creek-2155 - 000G89 - 262	682	$691.34	$1.01	$3,039.51	$4.46	0	0.75	0.5625	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1979	266	Wadena-Rocksbury-T-Thief River Falls-0564 - 000G89 - 266	434	$438.31	$1.01	$1,927.05	$4.44	0	0.75	0.5625	$0.647383
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1979	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	711	$1,101.12	$1.55	$4,841.13	$6.81	0	0.75	0.5625	$0.833147
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1979	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	2,614	$4,384.48	$1.68	$19,276.58	$7.37	0	0.75	0.5625	$0.867467
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1979	274	Wadena-Spruce-T-Roseau-0682 - 000G89 - 274	156	$266.37	$1.71	$1,171.11	$7.51	0	0.75	0.5625	$0.875640
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1979	275	Wadena-Warroad-C-Warroad-0690 - 000G89 - 275	1,366	$4,792.89	$3.51	$21,072.19	$15.43	0	0.75	0.5625	$1.188366
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1979	278	Wadena-Hewitt-C-Bertha-Hewitt-0786 - 000G89 - 278	1,148	$1,703.35	$1.48	$7,488.87	$6.52	0	0.75	0.5625	$0.814248
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1979	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	3,901	$12,454.00	$3.19	$54,754.66	$14.04	0	0.75	0.5625	$1.147367
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1979	282	Wadena-Villard-T-Staples-Motley-2170 - 000G89 - 282	130	$131.67	$1.01	$578.89	$4.45	0	0.75	0.5625	$0.648360
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1979	285	Wadena-Menahga-C-Menahga-821 - 000G89 - 285	2,051	$2,077.56	$1.01	$9,134.10	$4.45	0	0.75	0.5625	$0.648360
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1979	288	Wadena-Sebeka-C-Sebeka-820 - 000G89 - 288	1,860	$4,158.59	$2.24	$18,283.46	$9.83	0	0.75	0.5625	$0.992554
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1979	289	Wadena-Thomastown-T-Staples-Motley-2170 - 000G89 - 289	205	$207.88	$1.01	$913.96	$4.46	0	0.75	0.5625	$0.649335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1979	290	Wadena-Verndale-C-Verndale-818 - 000G89 - 290	56	$56.04	$1.00	$246.39	$4.40	0	0.75	0.5625	$0.643453
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1979	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	1,686	$3,381.10	$2.01	$14,865.18	$8.82	0	0.75	0.5625	$0.945469
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1979	322	Wadena-Staples-T-Staples-Motley-2170- 000G89 - 322	678	$1,027.23	$1.52	$4,516.26	$6.66	0	0.75	0.5625	$0.823474
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1979	369	Wadena-Wadena-T-Wadena-Deer Creek-2155 - 000G89 - 369	42	$1,046.97	$24.93	$4,603.06	$109.60	0	0.75	0.5625	$2.039811
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1979	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	1,252	$56,562.03	$45.18	$248,677.89	$198.62	0	4	16	$2.298023
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1979	177	Wadena-Aitkin-T-Aitkin-0001 - 000G89 - 177	7,095	$24,700.00	$3.48	$108,594.83	$15.31	0	4	16	$1.184975
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1979	191	Wadena-Crosby-C-Crosby-Ironton-0182 - 000G89 - 191	4,862	$13,357.90	$2.75	$58,728.70	$12.08	0	4	16	$1.082067
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1979	195	Wadena-Irondale(Riverton)-T-Crosby-Ironton-0182 - 000G89 - 195	126	$255.59	$2.03	$1,123.71	$8.92	0	4	16	$0.950365
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1979	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	15,696	$32,095.85	$2.04	$141,111.07	$8.99	0	4	16	$0.953760
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1979	252	Wadena-Straight River-T-Park Rapids-0309 - 000G89 - 252	1,120	$2,270.38	$2.03	$9,981.85	$8.91	0	4	16	$0.949878
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1979	253	Wadena-Todd-C-Park Rapids-0309 - 000G89 - 253	14	$28.51	$2.04	$125.35	$8.95	0	4	16	$0.951823
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1979	255	Wadena-Baudette-C-Lake of Woods-0390 - 000G89 - 255	42	$85.52	$2.04	$375.99	$8.95	0	4	16	$0.951823
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1979	257	Wadena-Motley-C-Staples-Motley-2170 - 000G89 - 257	5,755	$11,666.86	$2.03	$51,293.95	$8.91	0	4	16	$0.949878
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1979	261	Wadena-Bluffton-T-Wadena-Deer Creek-2155 - 000G89 - 261	1,681	$3,408.57	$2.03	$14,985.96	$8.91	0	4	16	$0.949878
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1979	262	Wadena-Compton-T-Wadena-Deer Creek-2155 - 000G89 - 262	2,838	$5,754.20	$2.03	$25,298.64	$8.91	0	4	16	$0.949878
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1979	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	1,251	$2,537.20	$2.03	$11,154.94	$8.92	0	4	16	$0.950365
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1979	272	Wadena-Lake-T-Warroad-0690 - 000G89 - 272	11	$21.38	$1.94	$94.00	$8.55	0	4	16	$0.931966

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1979	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	3,316	$6,720.74	$2.03	$29,548.08	$8.91	0	4	16	$0.949878
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1979	275	Wadena-Warroad-C-Warroad-0690 - 000G89 - 275	12,735	$25,813.54	$2.03	$113,490.57	$8.91	0	4	16	$0.949878
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1979	282	Wadena-Villard-T-Staples-Motley-2170 - 000G89 - 282	40	$81.96	$2.05	$360.34	$9.01	0	4	16	$0.954725
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1979	284	Wadena-Blueberry-T-Menahga-821 - 000G89 - 284	2,631	$5,334.54	$2.03	$23,453.58	$8.91	0	4	16	$0.949878
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1979	285	Wadena-Menahga-C-Menahga-821 - 000G89 - 285	8,529	$17,286.48	$2.03	$76,000.90	$8.91	0	4	16	$0.949878
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1979	286	Wadena-Red Eye-Sebeka-820 - 000G89 - 286	160	$324.31	$2.03	$1,425.84	$8.91	0	4	16	$0.949878
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1979	287	Wadena-Rockwood-T-Sebeka-820 - 000G89 - 287	12,971	$26,291.38	$2.03	$115,591.41	$8.91	0	4	16	$0.949878
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1979	288	Wadena-Sebeka-C-Sebeka-820 - 000G89 - 288	3,887	$7,878.87	$2.03	$34,639.86	$8.91	0	4	16	$0.949878
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1979	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	362	$737.64	$2.04	$3,243.07	$8.96	0	4	16	$0.952308
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1979	321	Wadena-Wyandotte-T-Thief River Falls-0564 - 000G89 - 321	1,210	$2,430.30	$2.01	$10,684.94	$8.83	0	4	16	$0.945961
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1979	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	460	$933.63	$2.03	$4,104.75	$8.92	0	6	36	$0.950365
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1979	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	4,581	$9,279.32	$2.03	$40,797.01	$8.91	0	6	36	$0.949878
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	183	Steel 1 1/2 in	1979	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	175	$558.13	$3.19	$2,453.84	$14.02	1	1.5	2.25	$1.146748
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	183	Steel 1 1/2 in	1979	277	Wadena-Bertha-C-Bertha-Hewitt-0786 - 000G89 - 277	9,875	$32,415.75	$3.28	$142,517.52	$14.43	1	1.5	2.25	$1.159266
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	183	Steel 1 1/2 in	1979	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	34,059	$109,316.46	$3.21	$480,615.47	$14.11	1	1.5	2.25	$1.149527
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	183	Steel 1 1/2 in	1979	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	56,262	$180,187.29	$3.20	$792,202.75	$14.08	1	1.5	2.25	$1.148603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	183	Steel 1 1/2 in	1979	322	Wadena-Staples-T-Staples-Motley-2170- 000G89 - 322	2	$6.40	$3.20	$28.14	$14.07	1	1.5	2.25	$1.148294
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1979	180	Cloquet-Carlton-C-Carlton-0093 - 000G96 - 180	1,662	$5,485.65	$3.30	$24,117.94	$14.51	1	1.25	1.5625	$1.161667
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1979	191	Wadena-Crosby-C-Crosby-Ironton-0182 - 000G89 - 191	6,327	$18,855.15	$2.98	$82,897.64	$13.10	1	1.25	1.5625	$1.117271
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1979	192	Wadena-Deerwood-C-Crosby-Ironton-0182 - 000G89 - 192	676	$1,311.48	$1.94	$5,765.98	$8.53	1	1.25	1.5625	$0.930949
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1979	193	Wadena-Ironton-C-Crosby-Ironton-0182 - 000G89 - 193	1,109	$2,683.80	$2.42	$11,799.47	$10.64	1	1.25	1.5625	$1.026942
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1979	194	Wadena-Deerwood-T-Crosby-Ironton-0182 - 000G89 - 194	28	$89.09	$3.18	$391.69	$13.99	1	1.25	1.5625	$1.145818
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1979	255	Wadena-Baudette-C-Lake of Woods-0390 - 000G89 - 255	129	$1,165.26	$9.03	$5,123.13	$39.71	1	1.25	1.5625	$1.598900
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1979	264	Wadena-North-T-Thief River Falls-0564 - 000G89 - 264	2,699	$8,641.26	$3.20	$37,991.75	$14.08	1	1.25	1.5625	$1.148603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1979	266	Wadena-Rocksbury-T-Thief River Falls-0564 - 000G89 - 266	138	$442.39	$3.21	$1,944.99	$14.09	1	1.25	1.5625	$1.148911
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1979	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	10,871	$34,817.66	$3.20	$153,077.65	$14.08	1	1.25	1.5625	$1.148603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1979	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	3	$10.69	$3.56	$47.00	$15.67	1	1.25	1.5625	$1.195069
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1979	277	Wadena-Bertha-C-Bertha-Hewitt-0786 - 000G89 - 277	1,344	$4,307.66	$3.21	$18,938.85	$14.09	1	1.25	1.5625	$1.148911
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1979	278	Wadena-Hewitt-C-Bertha-Hewitt-0786 - 000G89 - 278	93	$299.33	$3.22	$1,316.02	$14.15	1	1.25	1.5625	$1.150756
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1979	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	1,307	$4,190.66	$3.21	$18,424.45	$14.10	1	1.25	1.5625	$1.149219
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1979	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	3,595	$11,514.74	$3.20	$50,625.15	$14.08	1	1.25	1.5625	$1.148603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1979	179	Cloquet-Barnum-C-Barnum-0091 - 000G96 - 179	2,575	$8,249.52	$3.20	$36,269.44	$14.09	1	1	1	$1.148911
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1979	180	Cloquet-Carlton-C-Carlton-0093 - 000G96 - 180	2,473	$8,077.23	$3.27	$35,511.96	$14.36	1	1	1	$1.157154
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1979	191	Wadena-Crosby-C-Crosby-Ironton-0182 - 000G89 - 191	839	$3,142.48	$3.75	$13,816.08	$16.47	1	1	1	$1.216694
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1979	192	Wadena-Deerwood-C-Crosby-Ironton-0182 - 000G89 - 192	472	$915.92	$1.94	$4,026.89	$8.53	1	1	1	$0.930949
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1979	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	88	$281.52	$3.20	$1,237.72	$14.07	1	1	1	$1.148294
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1979	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	2,136	$6,841.90	$3.20	$30,080.77	$14.08	1	1	1	$1.148603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	190	Steel 2 1/2 in	1979	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	16	$49.89	$3.12	$219.34	$13.71	1	2.5	6.25	$1.137037
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	190	Steel 2 1/2 in	1979	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	78	$249.44	$3.20	$1,096.68	$14.06	1	2.5	6.25	$1.147985
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	77	Fairmont-Welcome-C-Martin Cty W-2448 - 000G94 - 077	63	$4,484.46	$71.18	$19,716.16	$312.95	1	2	4	$2.495475
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	879	$45,365.35	$51.61	$199,451.11	$226.91	1	2	4	$2.355854
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	629	$25,518.01	$40.57	$112,191.25	$178.36	1	2	4	$2.251297
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	462	$33,011.39	$71.45	$145,136.28	$314.15	1	2	4	$2.497137
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	1,415	$100,972.63	$71.36	$443,931.39	$313.73	1	2	4	$2.496556
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	397	$28,324.41	$71.35	$124,529.73	$313.68	1	2	4	$2.496487
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	177	Wadena-Aitkin-T-Aitkin-0001 - 000G89 - 177	739	$2,661.93	$3.60	$11,703.31	$15.84	1	2	4	$1.199755
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	179	Cloquet-Barnum-C-Barnum-0091 - 000G96 - 179	7,182	$23,016.57	$3.20	$101,193.54	$14.09	1	2	4	$1.148911
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	180	Cloquet-Carlton-C-Carlton-0093 - 000G96 - 180	11,250	$36,383.62	$3.23	$159,962.47	$14.22	1	2	4	$1.152900
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	191	Wadena-Crosby-C-Crosby-Ironton-0182 - 000G89 - 191	23,963	$71,410.41	$2.98	$313,959.57	$13.10	1	2	4	$1.117271
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	192	Wadena-Deerwood-C-Crosby-Ironton-0182 - 000G89 - 192	9,980	$19,472.20	$1.95	$85,610.54	$8.58	1	2	4	$0.933487
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	193	Wadena-Ironton-C-Crosby-Ironton-0182 - 000G89 - 193	6,097	$15,005.28	$2.46	$65,971.49	$10.82	1	2	4	$1.034227
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	194	Wadena-Deerwood-T-Crosby-Ironton-0182 - 000G89 - 194	294	$940.71	$3.20	$4,135.88	$14.07	1	2	4	$1.148294
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	195	Wadena-Irondale(Riverton)-T-Crosby-Ironton-0182 - 000G89 - 195	389	$1,243.66	$3.20	$5,467.82	$14.06	1	2	4	$1.147985
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	255	Wadena-Baudette-C-Lake of Woods-0390 - 000G89 - 255	1,378	$4,415.16	$3.20	$19,411.48	$14.09	1	2	4	$1.148911
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	262	Wadena-Compton-T-Wadena-Deer Creek-2155 - 000G89 - 262	68	$217.37	$3.20	$955.68	$14.05	1	2	4	$1.147676
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	264	Wadena-North-T-Thief River Falls-0564 - 000G89 - 264	18,571	$59,477.04	$3.20	$261,493.89	$14.08	1	2	4	$1.148603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	266	Wadena-Rocksbury-T-Thief River Falls-0564 - 000G89 - 266	2,738	$8,769.38	$3.20	$38,555.03	$14.08	1	2	4	$1.148603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	102,023	$326,614.21	$3.20	$1,435,976.28	$14.08	1	2	4	$1.148603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	208	$666.37	$3.20	$2,929.73	$14.09	1	2	4	$1.148911
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	275	Wadena-Warroad-C-Warroad-0690 - 000G89 - 275	91	$288.64	$3.17	$1,269.02	$13.95	1	2	4	$1.144574
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	277	Wadena-Bertha-C-Bertha-Hewitt-0786 - 000G89 - 277	3,261	$10,445.20	$3.20	$45,922.86	$14.08	1	2	4	$1.148603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	14,755	$47,868.01	$3.24	$210,454.18	$14.26	1	2	4	$1.154120
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	283	Wadena-Aldrich-T-Verndale-818 - 000G89 - 283	10,107	$32,369.69	$3.20	$142,315.02	$14.08	1	2	4	$1.148603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	284	Wadena-Blueberry-T-Menahga-821 - 000G89 - 284	15	$49.89	$3.33	$219.34	$14.62	1	2	4	$1.164947
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	286	Wadena-Red Eye-Sebeka-820 - 000G89 - 286	72	$235.19	$3.27	$1,034.03	$14.36	1	2	4	$1.157154
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	288	Wadena-Sebeka-C-Sebeka-820 - 000G89 - 288	10	$32.07	$3.21	$141.00	$14.10	1	2	4	$1.149219
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	290	Wadena-Verndale-C-Verndale-818 - 000G89 - 290	267	$855.24	$3.20	$3,760.11	$14.08	1	2	4	$1.148603

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	31,456	$100,748.55	$3.20	$442,946.21	$14.08	1	2	4	$1.148603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	322	Wadena-Staples-T-Staples-Motley-2170- 000G89 - 322	305	$976.49	$3.20	$4,293.19	$14.08	1	2	4	$1.148603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1979	366	Wadena-Stowe Prairie-T-Verndale - 000G89 - 366	5,787	$18,527.62	$3.20	$81,457.64	$14.08	1	2	4	$1.148603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1979	191	Wadena-Crosby-C-Crosby-Ironton-0182 - 000G89 - 191	10,798	$32,461.33	$3.01	$142,717.92	$13.22	1	3	9	$1.121231
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1979	193	Wadena-Ironton-C-Crosby-Ironton-0182 - 000G89 - 193	4,286	$10,730.82	$2.50	$47,178.60	$11.01	1	3	9	$1.041787
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1979	195	Wadena-Irondale(Riverton)-T-Crosby-Ironton-0182 - 000G89 - 195	13,481	$43,175.84	$3.20	$189,824.81	$14.08	1	3	9	$1.148603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1979	196	Wadena-Oak Lawn-T-Brainerd-0181 - 000G89 - 196	5,654	$18,106.09	$3.20	$79,604.36	$14.08	1	3	9	$1.148603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1979	255	Wadena-Baudette-C-Lake of Woods-0390 - 000G89 - 255	129	$409.80	$3.18	$1,801.71	$13.97	1	3	9	$1.145196
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1979	262	Wadena-Compton-T-Wadena-Deer Creek-2155 - 000G89 - 262	9,576	$30,624.62	$3.20	$134,642.73	$14.06	1	3	9	$1.147985
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1979	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	16,027	$51,133.74	$3.19	$224,812.13	$14.03	1	3	9	$1.147058
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1979	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	363	$1,158.13	$3.19	$5,091.78	$14.03	1	3	9	$1.147058
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1979	277	Wadena-Bertha-C-Bertha-Hewitt-0786 - 000G89 - 277	1,957	$6,408.50	$3.27	$28,175.31	$14.40	1	3	9	$1.158362
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1979	278	Wadena-Hewitt-C-Bertha-Hewitt-0786 - 000G89 - 278	1,176	$3,765.52	$3.20	$16,555.30	$14.08	1	3	9	$1.148603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1979	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	9,067	$29,935.05	$3.30	$131,611.00	$14.52	1	3	9	$1.161967
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1979	281	Wadena-Stowe Prairie-T-Bertha-Hewitt-0786- 000G89 - 281	31,578	$101,137.62	$3.20	$444,656.77	$14.08	1	3	9	$1.148603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1979	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	7,353	$23,551.10	$3.20	$103,543.63	$14.08	1	3	9	$1.148603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1979	322	Wadena-Staples-T-Staples-Motley-2170- 000G89 - 322	4,270	$13,676.67	$3.20	$60,130.19	$14.08	1	3	9	$1.148603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1979	366	Wadena-Stowe Prairie-T-Verndale - 000G89 - 366	6,306	$20,196.78	$3.20	$88,796.19	$14.08	1	3	9	$1.148603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1979	367	Wadena-Bertha-T-Bertha-Hewitt-0786 - 000G89 - 367	2,809	$8,996.63	$3.20	$39,554.15	$14.08	1	3	9	$1.148603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1979	191	Wadena-Crosby-C-Crosby-Ironton-0182 - 000G89 - 191	285	$5,386.42	$18.90	$23,681.67	$83.09	1	0.75	0.5625	$1.919549
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1979	192	Wadena-Deerwood-C-Crosby-Ironton-0182 - 000G89 - 192	367	$906.10	$2.47	$3,983.71	$10.85	1	0.75	0.5625	$1.035430
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1979	193	Wadena-Ironton-C-Crosby-Ironton-0182 - 000G89 - 193	1	$304.97	$304.97	$1,340.82	$1,340.82	1	0.75	0.5625	$3.127370
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1979	195	Wadena-Irondale(Riverton)-T-Crosby-Ironton-0182 - 000G89 - 195	181	$580.03	$3.20	$2,550.13	$14.09	1	0.75	0.5625	$1.148911
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1979	264	Wadena-North-T-Thief River Falls-0564 - 000G89 - 264	4	$160.36	$40.09	$705.03	$176.26	1	0.75	0.5625	$2.246154
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1979	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	71	$612.92	$8.63	$2,694.73	$37.95	1	0.75	0.5625	$1.579212
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1979	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	426	$2,128.96	$5.00	$9,360.08	$21.97	1	0.75	0.5625	$1.341830
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1979	369	Wadena-Wadena-T-Wadena-Deer Creek-2155 - 000G89 - 369	32	$102.60	$3.21	$451.09	$14.10	1	0.75	0.5625	$1.149219
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1979	176	Wadena-Aitkin-C-Aitkin-0001 - 000G89 - 176	2,379	$16,265.13	$6.84	$71,510.48	$30.06	1	4	16	$1.477989
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1979	177	Wadena-Aitkin-T-Aitkin-0001 - 000G89 - 177	26,214	$78,642.35	$3.00	$345,755.16	$13.19	1	4	16	$1.120245
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1979	191	Wadena-Crosby-C-Crosby-Ironton-0182 - 000G89 - 191	7,213	$21,512.09	$2.98	$94,579.03	$13.11	1	4	16	$1.117603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1979	192	Wadena-Deerwood-C-Crosby-Ironton-0182 - 000G89 - 192	9,595	$67,891.85	$7.08	$298,490.02	$31.11	1	4	16	$1.492900
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1979	193	Wadena-Ironton-C-Crosby-Ironton-0182 - 000G89 - 193	1,607	$3,795.61	$2.36	$16,687.60	$10.38	1	4	16	$1.016197
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1979	194	Wadena-Deerwood-T-Crosby-Ironton-0182 - 000G89 - 194	25,528	$229,074.12	$8.97	$1,007,136.22	$39.45	1	4	16	$1.596047
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1979	197	Wadena-Rabbit Lake-T-Aitkin-0001 - 000G89 - 197	8,961	$80,256.54	$8.96	$352,852.03	$39.38	1	4	16	$1.595276
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1979	255	Wadena-Baudette-C-Lake of Woods-0390 - 000G89 - 255	5,158	$47,732.93	$9.25	$209,860.30	$40.69	1	4	16	$1.609488
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1979	262	Wadena-Compton-T-Wadena-Deer Creek-2155 - 000G89 - 262	39	$349.22	$8.95	$1,535.36	$39.37	1	4	16	$1.595165
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1979	265	Wadena-Numedal-T-Thief River Falls-0564 - 000G89 - 265	32,978	$295,099.62	$8.95	$1,297,420.74	$39.34	1	4	16	$1.594834
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1979	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	2,296	$22,307.21	$9.72	$98,074.80	$42.72	1	4	16	$1.630631
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1979	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	2,518	$23,201.50	$9.21	$102,006.60	$40.51	1	4	16	$1.607562
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1979	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	1,724	$15,426.56	$8.95	$67,823.67	$39.34	1	4	16	$1.594834
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1979	282	Wadena-Villard-T-Staples-Motley-2170 - 000G89 - 282	31,138	$278,629.59	$8.95	$1,225,009.41	$39.34	1	4	16	$1.594834
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1979	286	Wadena-Red Eye-Sebeka-820 - 000G89 - 286	81	$723.39	$8.93	$3,180.42	$39.26	1	4	16	$1.593950
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1979	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	6,209	$55,558.35	$8.95	$244,265.16	$39.34	1	4	16	$1.594834
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1979	320	Wadena-Mayfield-T-Thief River Falls-0564 - 000G89 - 320	15,480	$138,642.00	$8.96	$609,546.73	$39.38	1	4	16	$1.595276
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1979	321	Wadena-Wyandotte-T-Thief River Falls-0564 - 000G89 - 321	15,117	$135,165.77	$8.94	$594,263.30	$39.31	1	4	16	$1.594503
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1979	322	Wadena-Staples-T-Staples-Motley-2170- 000G89 - 322	10,257	$91,779.72	$8.95	$403,514.28	$39.34	1	4	16	$1.594834
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1979	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	12,690	$212,982.50	$16.78	$936,388.57	$73.79	1	6	36	$1.867998
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1979	272	Wadena-Lake-T-Warroad-0690 - 000G89 - 272	912	$15,112.98	$16.57	$66,445.00	$72.86	1	6	36	$1.862489
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1979	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	3,965	$65,703.60	$16.57	$288,869.28	$72.85	1	6	36	$1.862430
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1979	275	Wadena-Warroad-C-Warroad-0690 - 000G89 - 275	4,284	$70,991.23	$16.57	$312,116.61	$72.86	1	6	36	$1.862489
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1979	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	7,385	$59,877.22	$8.11	$263,253.30	$35.65	1	8	64	$1.552060
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1979	252	Wadena-Straight River-T-Park Rapids-0309 - 000G89 - 252	39,801	$322,707.34	$8.11	$1,418,799.51	$35.65	1	8	64	$1.552060
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1979	261	Wadena-Bluffton-T-Wadena-Deer Creek-2155 - 000G89 - 261	35,802	$290,258.54	$8.11	$1,276,136.68	$35.64	1	8	64	$1.551938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1979	262	Wadena-Compton-T-Wadena-Deer Creek-2155 - 000G89 - 262	17,159	$139,111.29	$8.11	$611,609.99	$35.64	1	8	64	$1.551938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1979	284	Wadena-Blueberry-T-Menahga-821 - 000G89 - 284	35,791	$290,177.98	$8.11	$1,275,782.50	$35.65	1	8	64	$1.552060
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1979	286	Wadena-Red Eye-Sebeka-820 - 000G89 - 286	36,842	$298,713.00	$8.11	$1,313,307.16	$35.65	1	8	64	$1.552060
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1979	287	Wadena-Rockwood-T-Sebeka-820 - 000G89 - 287	32,139	$260,583.67	$8.11	$1,145,669.58	$35.65	1	8	64	$1.552060
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1979	370	Wadena-Leaf River-t-Wadena-Deer Creek-2155 - 000G89 - 370	1,020	$8,269.34	$8.11	$36,356.58	$35.64	1	8	64	$1.551938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1979	371	Wadena-Straight River-T-Menahga-821 - 000G89 - 371	5,204	$42,194.14	$8.11	$185,508.72	$35.65	1	8	64	$1.552060
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1979	372	Wadena-Red Eye-T-Menahga-821 - 000G89 - 372	8,217	$66,619.89	$8.11	$292,897.79	$35.65	1	8	64	$1.552060
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1980	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	271	$693.00	$2.56	$2,835.00	$10.46	0	1.25	1.5625	$1.019532
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1980	444	Rochester-Lodi-T-Leroy-Ostrander - 000G95 - 444	870	$2,224.76	$2.56	$9,101.29	$10.46	0	1.25	1.5625	$1.019532
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1980	457	Fairmont-Pickerel Lake-T-Albert Lea - 000G94 - 457	5,046	$12,903.63	$2.56	$52,787.58	$10.46	0	1.25	1.5625	$1.019532
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1980	463	Rochester-Taopi-C-Southland - 000G95 - 463	3,809	$9,740.37	$2.56	$39,846.97	$10.46	0	1.25	1.5625	$1.019532
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1980	469	Rochester-Lodi-T-Southland - 000G95 - 469	324	$828.53	$2.56	$3,389.44	$10.46	0	1.25	1.5625	$1.019532
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1980	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	2,195	$30,373.10	$13.84	$124,253.59	$56.61	0	2	4	$1.752893
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1980	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	1,075	$14,427.24	$13.42	$59,020.53	$54.90	0	2	4	$1.739572

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1980	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	1,178	$16,272.77	$13.81	$66,570.42	$56.51	0	2	4	$1.752125
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1980	131	Rochester-Wanamingo-C-Kenyon-Wanamingo-2172 - 000G95 - 131	609	$8,402.81	$13.80	$34,375.13	$56.45	0	2	4	$1.751664
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1980	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	1,525	$21,109.51	$13.84	$86,357.09	$56.63	0	2	4	$1.753047
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1980	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	3,017	$41,727.15	$13.83	$170,701.98	$56.58	0	2	4	$1.752663
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1980	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	255	$3,525.08	$13.82	$14,420.78	$56.55	0	2	4	$1.752433
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1980	141	Rochester-Lansing-T-Austin-0492 - 000G95 - 141	331	$7,115.08	$21.50	$29,107.15	$87.94	0	2	4	$1.944186
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1980	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	303	$4,180.91	$13.80	$17,103.72	$56.45	0	2	4	$1.751664
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1980	158	Rochester-Orion-T-Chatfield-0227 - 000G95 - 158	772	$10,698.22	$13.86	$43,765.45	$56.69	0	2	4	$1.753506
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1980	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	3,376	$46,686.86	$13.83	$190,991.70	$56.57	0	2	4	$1.752586
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1980	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	5,585	$70,091.77	$12.55	$286,739.06	$51.34	0	2	4	$1.710456
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1980	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	697	$9,645.28	$13.84	$39,457.96	$56.61	0	2	4	$1.752893
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1980	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	71,802	$253,466.16	$3.53	$1,036,907.02	$14.44	0	2	4	$1.159567
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1980	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	3,398	$46,973.78	$13.82	$192,165.46	$56.55	0	2	4	$1.752433
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1980	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	262	$1,288.09	$4.92	$5,269.46	$20.11	0	2	4	$1.303412
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1980	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	8,155	$40,092.94	$4.92	$164,016.57	$20.11	0	2	4	$1.303412
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1980	457	Fairmont-Pickerel Lake-T-Albert Lea - 000G94 - 457	15,490	$76,154.46	$4.92	$311,540.97	$20.11	0	2	4	$1.303412
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1980	463	Rochester-Taopi-C-Southland - 000G95 - 463	2,279	$11,204.39	$4.92	$45,836.14	$20.11	0	2	4	$1.303412
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1980	469	Rochester-Lodi-T-Southland - 000G95 - 469	1,033	$5,078.60	$4.92	$20,776.09	$20.11	0	2	4	$1.303412
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1980	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	291	$4,016.96	$13.80	$16,433.02	$56.47	0	3	9	$1.751818
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1980	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	289	$3,975.97	$13.76	$16,265.33	$56.28	0	3	9	$1.750354
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1980	167	Rochester-Elgin-C-Elgin-Millville-2899 - 000G95 - 167	476	$6,585.71	$13.84	$26,941.54	$56.60	0	3	9	$1.752816
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1980	448	Fairmont-Manchester-T-Albert Lea - 000G94 - 448	8,435	$64,695.20	$7.67	$264,662.18	$31.38	0	3	9	$1.496653
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1980	449	Fairmont-Manchester-C-Alden-Conger - 000G94 - 449	1,382	$10,599.73	$7.67	$43,362.53	$31.38	0	3	9	$1.496653
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1980	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	1,032	$28,569.57	$27.68	$116,875.51	$113.25	0	4	16	$2.054038
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1980	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	362	$8,853.70	$24.46	$36,219.68	$100.05	0	4	16	$2.000217
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1980	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	344	$19,552.64	$56.88	$79,988.07	$232.71	0	4	16	$2.366815
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1980	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	527	$29,969.33	$56.88	$122,601.80	$232.71	0	4	16	$2.366815
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1980	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	2,371	$65,582.94	$27.66	$268,293.85	$113.16	0	6	36	$2.053693
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1980	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	2,273	$21,898.82	$9.63	$89,586.08	$39.41	0	6	36	$1.595606
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1980	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	76	$3,320.14	$43.69	$13,582.39	$178.72	1	2	4	$2.252173
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1980	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	164	$7,132.14	$43.49	$29,176.94	$177.91	1	2	4	$2.250200
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1980	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	260	$11,354.05	$43.67	$46,448.39	$178.65	1	2	4	$2.252003
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1980	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	2,221	$97,062.75	$43.70	$397,074.89	$178.78	1	2	4	$2.252319
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1980	171	Rochester-Lewiston-C-Lewiston-Altura-0857 - 000G95 - 171	300	$13,116.59	$43.72	$53,658.78	$178.86	1	2	4	$2.252513
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1980	463	Rochester-Taopi-C-Southland - 000G95 - 463	185	$424.47	$2.29	$1,736.47	$9.39	1	2	4	$0.972666
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1980	469	Rochester-Lodi-T-Southland - 000G95 - 469	265	$608.03	$2.29	$2,487.40	$9.39	1	2	4	$0.972666
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1980	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	11	$450.88	$40.99	$1,844.51	$167.68	1	3	9	$2.224481
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1980	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	35	$4,344.87	$124.14	$17,774.47	$507.84	1	4	16	$2.705727
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1980	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	535	$65,296.02	$122.05	$267,120.08	$499.29	1	4	16	$2.698353
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1980	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	2,441	$298,115.45	$122.13	$1,219,563.20	$499.62	1	4	16	$2.698640
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1980	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	1,721	$210,111.35	$122.09	$859,546.43	$499.45	1	4	16	$2.698492
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1980	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	1,193	$145,682.64	$122.11	$595,974.44	$499.56	1	4	16	$2.698588
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1980	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	1,956	$238,884.36	$122.13	$977,254.20	$499.62	1	4	16	$2.698640
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1980	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	244	$55,130.66	$225.95	$225,534.52	$924.32	1	6	36	$2.965822
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1980	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	191	$43,161.77	$225.98	$176,570.88	$924.45	1	6	36	$2.965883
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1980	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	27	$344.82	$12.68	$1,410.63	$51.86	1	8	64	$1.714833
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1980	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	4	$49.32	$12.68	$201.76	$51.87	1	8	64	$1.714916
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1980	457	Fairmont-Pickerel Lake-T-Albert Lea - 000G94 - 457	0	$0.17	$17.00	$0.70	$70.00	1	8	64	$1.845098
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1981	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	1,194	$30,203.18	$25.30	$111,620.45	$93.48	0	2	4	$1.970719
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1981	101	Rochester-Hayfield-T-Hayfield-0203 - 000G95 - 101	2	$50.64	$25.32	$187.14	$93.57	0	2	4	$1.971137
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1981	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	603	$15,249.64	$25.29	$56,357.37	$93.46	0	2	4	$1.970626
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1981	110	Rochester-Canton-C-Mabel-Canton-0238 - 000G95 - 110	238	$5,995.99	$25.19	$22,159.09	$93.11	0	2	4	$1.968996
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1981	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	1,130	$28,563.57	$25.28	$105,561.02	$93.42	0	2	4	$1.970440
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1981	131	Rochester-Wanamingo-C-Kenyon-Wanamingo-2172 - 000G95 - 131	1,324	$33,520.88	$25.32	$123,881.51	$93.57	0	2	4	$1.971137
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1981	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	1,615	$41,027.67	$25.40	$151,624.00	$93.88	0	2	4	$1.972573
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1981	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	4,482	$112,649.04	$25.13	$416,311.67	$92.89	0	2	4	$1.967969
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1981	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	1,169	$29,555.03	$25.28	$109,225.11	$93.43	0	2	4	$1.970486
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1981	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	3,170	$99,760.02	$31.47	$368,678.33	$116.30	0	2	4	$2.065580
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1981	174	Rochester-Utica-C-St Charles-0858 - 000G95 - 174	2,443	$61,801.17	$25.30	$228,395.63	$93.49	0	2	4	$1.970765
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1981	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	14,198	$19,463.82	$1.37	$71,931.51	$5.07	0	2	4	$0.705008
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1981	101	Rochester-Hayfield-T-Hayfield-0203 - 000G95 - 101	304	$7,695.64	$25.31	$28,440.41	$93.55	0	3	9	$1.971044
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1981	174	Rochester-Utica-C-St Charles-0858 - 000G95 - 174	278	$7,034.66	$25.30	$25,997.66	$93.52	0	3	9	$1.970904
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1981	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	12,982	$17,714.14	$1.36	$65,465.30	$5.04	0	3	9	$0.702431
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1981	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	2,691	$136,208.06	$50.62	$503,377.61	$187.06	0	4	16	$2.271981
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1981	101	Rochester-Hayfield-T-Hayfield-0203 - 000G95 - 101	1,524	$77,179.72	$50.64	$285,229.40	$187.16	0	4	16	$2.272213
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1981	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	1,433	$78,089.48	$54.49	$288,591.56	$201.39	0	4	16	$2.304038
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1981	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	434	$21,953.81	$50.58	$81,133.65	$186.94	0	4	16	$2.271702

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1981	174	Rochester-Utica-C-St Charles-0858 - 000G95 - 174	1,218	$67,277.82	$55.24	$248,635.42	$204.13	0	4	16	$2.309907
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1981	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	14,885	$40,809.16	$2.74	$150,816.46	$10.13	0	4	16	$1.005609
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1981	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	1,483	$4,065.95	$2.74	$15,026.34	$10.13	0	6	36	$1.005609
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1981	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	17,842	$79,874.58	$4.48	$295,188.67	$16.54	1	1.25	1.5625	$1.218536
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1981	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	3,501	$12,417.25	$3.55	$45,889.84	$13.11	1	1	1	$1.117603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	186	Steel 10 in	1981	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	84	$921.19	$10.97	$3,404.39	$40.53	1	10	100	$1.607777
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1981	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	1,992	$50,045.25	$25.12	$184,949.84	$92.85	1	2	4	$1.967782
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1981	171	Rochester-Lewiston-C-Lewiston-Altura-0857 - 000G95 - 171	152	$12,180.83	$80.14	$45,016.11	$296.16	1	2	4	$2.471526
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1981	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	783	$62,380.03	$79.67	$230,534.89	$294.43	1	2	4	$2.468982
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1981	174	Rochester-Utica-C-St Charles-0858 - 000G95 - 174	164	$13,065.55	$79.67	$48,285.73	$294.43	1	2	4	$2.468982
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1981	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	22,447	$99,628.39	$4.44	$368,191.90	$16.40	1	2	4	$1.214844
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1981	171	Rochester-Lewiston-C-Lewiston-Altura-0857 - 000G95 - 171	351	$28,091.44	$80.03	$103,816.19	$295.77	1	3	9	$2.470954
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1981	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	201	$44,899.09	$223.38	$165,931.42	$825.53	1	4	16	$2.916733
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1981	174	Rochester-Utica-C-St Charles-0858 - 000G95 - 174	1,650	$368,871.30	$223.56	$1,363,220.02	$826.19	1	4	16	$2.917080
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1982	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	582	$18,776.79	$32.26	$63,558.60	$109.21	0	2	4	$2.038262
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1982	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	1,208	$38,970.69	$32.26	$131,914.06	$109.20	0	2	4	$2.038223
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1982	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	111	$3,587.07	$32.32	$12,142.07	$109.39	0	2	4	$2.038978
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1982	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	113	$3,675.64	$32.53	$12,441.88	$110.11	0	2	4	$2.041827
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1982	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	190	$6,111.31	$32.16	$20,686.51	$108.88	0	2	4	$2.036948
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1982	134	Rochester-Houston-C-Houston-0294 - 000G95 - 134	507	$16,351.53	$32.25	$55,349.20	$109.17	0	2	4	$2.038103
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1982	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	3,906	$104,320.08	$26.71	$353,118.86	$90.40	0	2	4	$1.956168
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1982	136	Rochester-La Crescent-T-LaCrescent-Hokah-0300 - 000G95 - 136	508	$16,399.47	$32.28	$55,511.48	$109.27	0	2	4	$2.038501
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1982	140	Rochester-Brownsdale-C-Hayfield-0203 - 000G95 - 140	326	$10,539.80	$32.33	$35,676.76	$109.44	0	2	4	$2.039176
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1982	144	Rochester-Waltham-C-Hayfield-0203 - 000G95 - 144	1,896	$61,168.83	$32.26	$207,053.78	$109.21	0	2	4	$2.038262
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1982	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	853	$27,500.91	$32.24	$93,089.36	$109.13	0	2	4	$2.037944
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1982	148	Rochester-Dover-C-Dover-Eyota-0533 - 000G95 - 148	3,181	$102,739.22	$32.30	$347,767.71	$109.33	0	2	4	$2.038739
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1982	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	200	$6,465.59	$32.33	$21,885.74	$109.43	0	2	4	$2.039136
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1982	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	377	$12,178.34	$32.30	$41,223.14	$109.35	0	2	4	$2.038819
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1982	171	Rochester-Lewiston-C-Lewiston-Altura-0857 - 000G95 - 171	808	$25,403.35	$31.44	$85,989.22	$106.42	0	2	4	$2.027023
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1982	175	Rochester-Utica-T-Lewiston-Altura-0857 - 000G95 - 175	2,021	$65,203.50	$32.26	$220,710.96	$109.21	0	2	4	$2.038262
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1982	375	Rochester-Houston-T-Houston-0294 - 000G95 - 375	310	$9,997.97	$32.25	$33,842.69	$109.17	0	2	4	$2.038103
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1982	386	Rochester-Hayward-T-Albert Lea-0241 - 000G95 - 386	1,890	$60,980.27	$32.26	$206,415.52	$109.21	0	2	4	$2.038262
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1982	122	Rochester-Spring Valley-T-Kingsland-2137 - 000G95 - 122	5,015	$161,772.64	$32.26	$547,593.23	$109.19	0	3	9	$2.038183
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1982	171	Rochester-Lewiston-C-Lewiston-Altura-0857 - 000G95 - 171	133	$4,561.34	$34.30	$15,439.93	$116.09	0	3	9	$2.064795
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1982	134	Rochester-Houston-C-Houston-0294 - 000G95 - 134	926	$58,278.89	$62.94	$197,271.46	$213.04	0	4	16	$2.328461
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1982	171	Rochester-Lewiston-C-Lewiston-Altura-0857 - 000G95 - 171	4,477	$290,951.65	$64.99	$984,858.46	$219.98	0	4	16	$2.342383
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1982	77	Fairmont-Welcome-C-Martin Cty W-2448 - 000G94 - 077	89	$9,122.68	$102.50	$30,879.87	$346.96	1	2	4	$2.540279
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1982	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	30,795	$53,462.69	$1.74	$180,968.84	$5.88	1	2	4	$0.769377
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1982	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	14,306	$24,838.02	$1.74	$84,075.60	$5.88	1	3	9	$0.769377
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1982	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	689	$196,181.99	$284.73	$664,067.36	$963.81	1	4	16	$2.983991
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1982	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	13,726	$66,578.53	$4.85	$225,365.38	$16.42	1	4	16	$1.215373
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1982	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	9,400	$83,104.87	$8.84	$281,306.31	$29.93	1	6	36	$1.476107
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1983	182	Cloquet-Kettle River-C-Moose Lake-0097 - 000G96 - 182	113	$106.91	$0.95	$349.51	$3.09	0	1.25	1.5625	$0.489958
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1983	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	2,814	$2,673.23	$0.95	$8,739.41	$3.11	0	1.25	1.5625	$0.492760
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1983	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	308	$292.21	$0.95	$955.30	$3.10	0	1	1	$0.491362
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1983	88	Fairmont-Berlin-T-NRHEG-2168 - 000G94 - 088	3,180	$127,698.53	$40.16	$417,475.96	$131.28	0	2	4	$2.118199
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1983	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	1,851	$74,320.04	$40.15	$242,969.36	$131.26	0	2	4	$2.118132
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1983	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	1,851	$74,361.62	$40.17	$243,105.30	$131.34	0	2	4	$2.118397
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1983	113	Rochester-Harmony-C-Fillmore Central-2198 - 000G95 - 113	1,539	$46,131.64	$29.98	$150,814.98	$98.00	0	2	4	$1.991226
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1983	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	473	$18,979.25	$40.13	$62,047.55	$131.18	0	2	4	$2.117868
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1983	122	Rochester-Spring Valley-T-Kingsland-2137 - 000G95 - 122	308	$12,342.00	$40.07	$40,348.85	$131.00	0	2	4	$2.117271
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1983	128	Rochester-Minneola-T-Zumbrota-Mazeppa-2805 - 000G95 - 128	15	$602.65	$40.18	$1,970.20	$131.35	0	2	4	$2.118430
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1983	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	2,352	$95,500.37	$40.60	$312,212.75	$132.74	0	2	4	$2.123002
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1983	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	857	$34,393.03	$40.13	$112,438.75	$131.20	0	2	4	$2.117934
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1983	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	2,196	$97,496.77	$44.40	$318,739.44	$145.15	0	2	4	$2.161817
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1983	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	1,923	$77,233.47	$40.16	$252,494.04	$131.30	0	2	4	$2.118265
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1983	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	280	$11,231.87	$40.11	$36,719.57	$131.14	0	2	4	$2.117735
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1983	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	1,125	$43,783.12	$38.92	$143,137.12	$127.23	0	2	4	$2.104590
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1983	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	192	$7,734.32	$40.28	$25,285.28	$131.69	0	2	4	$2.119553
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1983	171	Rochester-Lewiston-C-Lewiston-Altura-0857 - 000G95 - 171	29	$1,151.92	$39.72	$3,765.89	$129.86	0	2	4	$2.113475
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1983	182	Cloquet-Kettle River-C-Moose Lake-0097 - 000G96 - 182	4,787	$4,547.10	$0.95	$14,865.52	$3.11	0	2	4	$0.492760
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1983	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	2,403	$2,284.24	$0.95	$7,467.71	$3.11	0	2	4	$0.492760
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1983	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	177	$7,130.93	$40.29	$23,312.66	$131.71	0	3	9	$2.119619
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1983	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	1,941	$155,947.98	$80.34	$509,829.93	$262.66	0	4	16	$2.419394
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1983	182	Cloquet-Kettle River-C-Moose Lake-0097 - 000G96 - 182	155	$292.21	$1.89	$955.30	$6.16	0	4	16	$0.789581
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1983	182	Cloquet-Kettle River-C-Moose Lake-0097 - 000G96 - 182	224	$669.95	$2.99	$2,190.22	$9.78	1	1	1	$0.990339
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1983	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	335	$11,519.20	$34.39	$37,658.92	$112.41	1	2	4	$2.050805

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1983	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	304	$4,168.85	$13.71	$13,628.93	$44.83	1	2	4	$1.651569
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1983	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	330	$41,907.94	$126.99	$137,006.73	$415.17	1	2	4	$2.618226
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1983	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	211	$26,768.42	$126.86	$87,512.14	$414.75	1	2	4	$2.617786
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1983	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	726	$70,980.20	$97.77	$232,050.65	$319.63	1	2	4	$2.504648
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1983	182	Cloquet-Kettle River-C-Moose Lake-0097 - 000G96 - 182	4,139	$11,303.61	$2.73	$36,954.11	$8.93	1	2	4	$0.950851
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1983	182	Cloquet-Kettle River-C-Moose Lake-0097 - 000G96 - 182	52	$156.80	$3.02	$512.62	$9.86	1	3	9	$0.993877
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1983	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	434	$153,973.28	$354.78	$503,374.18	$1,159.85	1	4	16	$3.064402
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1983	182	Cloquet-Kettle River-C-Moose Lake-0097 - 000G96 - 182	2,739	$22,974.27	$8.39	$75,108.19	$27.42	1	4	16	$1.438067
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1983	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	18	$136.84	$7.60	$447.36	$24.85	1	8	64	$1.395326
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1984	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	2,801	$3,925.05	$1.40	$12,356.64	$4.41	0	1.25	1.5625	$0.644439
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1984	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	47	$5,704.00	$121.36	$17,957.04	$382.06	0	2	4	$2.582132
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1984	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	1,086	$134,242.94	$123.61	$422,616.66	$389.15	0	2	4	$2.590117
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1984	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	728	$90,070.11	$123.72	$283,554.05	$389.50	0	2	4	$2.590507
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1984	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	151	$18,703.81	$123.87	$58,882.36	$389.95	0	2	4	$2.591009
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1984	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	460	$56,774.68	$123.42	$178,735.10	$388.55	0	2	4	$2.589447
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1984	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	2,002	$259,996.19	$129.87	$818,506.52	$408.84	0	2	4	$2.611553
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1984	138	Rochester-Spring Grove-T-Spring Grove-0297 - 000G95 - 138	144	$17,833.95	$123.85	$56,143.91	$389.89	0	2	4	$2.590942
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1984	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	1,745	$215,690.73	$123.61	$679,026.37	$389.13	0	2	4	$2.590095
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1984	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	218	$26,928.18	$123.52	$84,773.90	$388.87	0	2	4	$2.589804
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1984	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	474	$58,631.80	$123.70	$184,581.59	$389.41	0	2	4	$2.590407
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1984	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	190	$23,479.25	$123.58	$73,916.16	$389.03	0	2	4	$2.589983
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1984	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	341	$42,183.06	$123.70	$132,798.52	$389.44	0	2	4	$2.590441
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1984	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	638	$78,927.42	$123.71	$248,475.21	$389.46	0	2	4	$2.590463
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1984	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	7,731	$11,035.50	$1.43	$34,741.40	$4.49	0	2	4	$0.652246
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1984	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	11,128	$13,719.27	$1.23	$43,190.28	$3.88	0	2	4	$0.588832
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1984	185	Cloquet-Wrenshall-C-Wrenshall-0100 - 000G96 - 185	5,616	$6,923.83	$1.23	$21,797.24	$3.88	0	2	4	$0.588832
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1984	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	163	$20,162.97	$123.70	$63,476.02	$389.42	0	2	4	$2.590418
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1984	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	295	$36,479.06	$123.66	$114,841.49	$389.29	0	3	9	$2.590273
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1984	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	657	$81,315.14	$123.77	$255,992.11	$389.64	0	3	9	$2.590664
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1984	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	824	$3,645.44	$4.42	$11,476.39	$13.93	0	0.75	0.5625	$1.143951
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1984	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	102	$365.11	$3.58	$1,149.42	$11.27	0	4	16	$1.051924
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1984	176	Wadena-Aitkin-C-Aitkin-0001 - 000G89 - 176	16,096	$35,716.00	$2.22	$112,439.26	$6.99	0	4	16	$0.844477
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1984	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	11,273	$27,793.20	$2.47	$87,497.11	$7.76	0	4	16	$0.889862
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1984	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	1,069	$4,162.14	$3.89	$13,103.03	$12.26	1	1.25	1.5625	$1.088490
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1984	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	1,708	$5,163.48	$3.02	$16,255.40	$9.52	1	1.25	1.5625	$0.978637
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1984	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	6,731	$26,224.47	$3.90	$82,558.51	$12.27	1	1	1	$1.088845
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1984	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	2,472	$9,631.98	$3.90	$30,322.90	$12.27	1	1	1	$1.088845
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1984	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	276	$107,845.37	$390.74	$339,513.20	$1,230.12	1	2	4	$3.089947
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1984	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	13,500	$49,970.10	$3.70	$157,313.29	$11.65	1	2	4	$1.066326
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1984	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	8,558	$33,341.03	$3.90	$104,962.51	$12.26	1	2	4	$1.088490
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1984	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	1,765	$6,876.87	$3.90	$21,649.40	$12.27	1	3	9	$1.088845
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1984	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	2,037	$7,935.90	$3.90	$24,983.39	$12.26	1	3	9	$1.088490
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1984	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	253	$26,656.90	$105.36	$83,919.87	$331.70	1	0.75	0.5625	$2.520745
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1984	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	7,432	$78,942.21	$10.62	$248,521.77	$33.44	1	4	16	$1.524266
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1984	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	1,075	$21,669.50	$20.16	$68,218.80	$63.46	1	6	36	$1.802500
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1984	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	48	$969.27	$20.19	$3,051.41	$63.57	1	6	36	$1.803252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1985	187	Cloquet-Moose Lake-T-Moose Lake-0097 - 000G96 - 187	416	$384.86	$0.93	$1,211.60	$2.91	0	1.25	1.5625	$0.463893
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1985	198	Cloquet-Bovey-C-Greenway-0316 - 000G96 - 198	1,717	$1,583.91	$0.92	$4,986.37	$2.90	0	1.25	1.5625	$0.462398
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1985	199	Cloquet-Calumet-C-Greenway-0316 - 000G96 - 199	3,237	$3,000.45	$0.93	$9,445.86	$2.92	0	1.25	1.5625	$0.465383
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1985	201	Cloquet-Coleraine-C-Greenway-0316 - 000G96 - 201	7,648	$7,112.32	$0.93	$22,390.64	$2.93	0	1.25	1.5625	$0.466868
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1985	202	Cloquet-Deer River-C-Deer River-0317 - 000G96 - 202	352	$324.28	$0.92	$1,020.88	$2.90	0	1.25	1.5625	$0.462398
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1985	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	22,060	$24,296.95	$1.10	$76,490.40	$3.47	0	1.25	1.5625	$0.540329
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1985	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	1,386	$1,526.55	$1.10	$4,805.81	$3.47	0	1.25	1.5625	$0.540329
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1985	423	Fairmont-Albert Lea-T-Glenville-Emmons - 000G94 - 423	227	$250.02	$1.10	$787.10	$3.47	0	1.25	1.5625	$0.540329
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1985	425	Fairmont-Bankcroft-T-Albert Lea - 000G94 - 425	4,729	$5,208.54	$1.10	$16,397.26	$3.47	0	1.25	1.5625	$0.540329
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1985	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	2,744	$561.96	$0.20	$1,769.13	$0.64	0	1	1	($0.193820)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1985	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	606	$124.10	$0.20	$390.69	$0.64	0	1	1	($0.193820)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1985	425	Fairmont-Bankcroft-T-Albert Lea - 000G94 - 425	372	$76.18	$0.20	$239.83	$0.64	0	1	1	($0.193820)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1985	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	627	$22,439.96	$35.79	$70,644.32	$112.67	0	2	4	$2.051808
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1985	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	501	$17,939.02	$35.81	$56,474.69	$112.72	0	2	4	$2.052001
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1985	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	224	$8,006.34	$35.74	$25,205.14	$112.52	0	2	4	$2.051230
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1985	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	1,915	$68,505.40	$35.77	$215,665.15	$112.62	0	2	4	$2.051616
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1985	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	775	$27,751.31	$35.81	$87,365.24	$112.73	0	2	4	$2.052040
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1985	134	Rochester-Houston-C-Houston-0294 - 000G95 - 134	1,151	$41,217.99	$35.81	$129,760.34	$112.74	0	2	4	$2.052078
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1985	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	467	$16,674.86	$35.71	$52,494.93	$112.41	0	2	4	$2.050805
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1985	138	Rochester-Spring Grove-T-Spring Grove-0297 - 000G95 - 138	143	$5,116.84	$35.78	$16,108.57	$112.65	0	2	4	$2.051731
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1985	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	2,620	$68,462.06	$26.13	$215,528.71	$82.26	0	2	4	$1.915189

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1985	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	836	$29,918.44	$35.79	$94,187.68	$112.66	0	2	4	$2.051770
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1985	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	552	$19,746.70	$35.77	$62,165.53	$112.62	0	2	4	$2.051616
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1985	171	Rochester-Lewiston-C-Lewiston-Altura-0857 - 000G95 - 171	264	$9,451.10	$35.80	$29,753.46	$112.70	0	2	4	$2.051924
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1985	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	1,112	$56,164.80	$50.51	$176,815.11	$159.01	0	2	4	$2.201424
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1985	185	Cloquet-Wrenshall-C-Wrenshall-0100 - 000G96 - 185	8,784	$8,099.80	$0.92	$25,499.37	$2.90	0	2	4	$0.462398
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1985	187	Cloquet-Moose Lake-T-Moose Lake-0097 - 000G96 - 187	2,618	$2,416.04	$0.92	$7,606.05	$2.91	0	2	4	$0.463893
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1985	190	Cloquet-Twin Lakes-T-Carlton-0093 - 000G96 - 190	4,330	$3,993.10	$0.92	$12,570.87	$2.90	0	2	4	$0.462398
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1985	198	Cloquet-Bovey-C-Greenway-0316 - 000G96 - 198	3,878	$3,576.59	$0.92	$11,259.63	$2.90	0	2	4	$0.462398
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1985	199	Cloquet-Calumet-C-Greenway-0316 - 000G96 - 199	2,659	$2,451.68	$0.92	$7,718.25	$2.90	0	2	4	$0.462398
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1985	201	Cloquet-Coleraine-C-Greenway-0316 - 000G96 - 201	4,200	$5,069.16	$1.21	$15,958.47	$3.80	0	2	4	$0.579784
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1985	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	594	$21,288.56	$35.84	$67,019.54	$112.83	0	2	4	$2.052425
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1985	393	Cloquet-Deer River-T-Deer River-0317 - 000G96 - 393	658	$606.49	$0.92	$1,909.32	$2.90	0	2	4	$0.462398
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1985	397	Cloquet-Iron Range-Greenway - 000G96 - 397	681	$628.07	$0.92	$1,977.26	$2.90	0	2	4	$0.462398
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1985	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	204,115	$114,178.20	$0.56	$359,449.89	$1.76	0	2	4	$0.245513
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1985	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	12,110	$6,774.11	$0.56	$21,325.90	$1.76	0	2	4	$0.245513
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1985	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	239	$8,548.13	$35.77	$26,910.78	$112.60	0	3	9	$2.051538
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1985	134	Rochester-Houston-C-Houston-0294 - 000G95 - 134	877	$31,423.39	$35.83	$98,925.49	$112.80	0	3	9	$2.052309
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1985	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	626	$22,393.68	$35.77	$70,498.62	$112.62	0	3	9	$2.051616
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1985	187	Cloquet-Moose Lake-T-Moose Lake-0097 - 000G96 - 187	5,551	$5,118.00	$0.92	$16,112.22	$2.90	0	3	9	$0.462398
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1985	190	Cloquet-Twin Lakes-T-Carlton-0093 - 000G96 - 190	1,848	$1,702.81	$0.92	$5,360.70	$2.90	0	3	9	$0.462398
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1985	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	2,167	$77,595.31	$35.81	$244,281.53	$112.73	0	3	9	$2.052040
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1985	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	7,346	$7,891.29	$1.07	$24,842.95	$3.38	0	3	9	$0.528917
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1985	187	Cloquet-Moose Lake-T-Moose Lake-0097 - 000G96 - 187	1,367	$1,981.30	$1.45	$6,237.43	$4.56	0	0.75	0.5625	$0.658965
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1985	198	Cloquet-Bovey-C-Greenway-0316 - 000G96 - 198	181	$167.48	$0.93	$527.25	$2.91	0	0.75	0.5625	$0.463893
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1985	199	Cloquet-Calumet-C-Greenway-0316 - 000G96 - 199	254	$919.38	$3.62	$2,894.34	$11.40	0	0.75	0.5625	$1.056905
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1985	201	Cloquet-Coleraine-C-Greenway-0316 - 000G96 - 201	871	$805.35	$0.92	$2,535.36	$2.91	0	0.75	0.5625	$0.463893
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1985	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	436	$23,057.09	$52.88	$72,587.14	$166.48	0	4	16	$2.221362
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1985	187	Cloquet-Moose Lake-T-Moose Lake-0097 - 000G96 - 187	3,134	$5,779.97	$1.84	$18,196.20	$5.81	0	4	16	$0.764176
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1985	190	Cloquet-Twin Lakes-T-Carlton-0093 - 000G96 - 190	13,079	$24,124.78	$1.84	$75,948.38	$5.81	0	4	16	$0.764176
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1985	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	63,172	$102,808.13	$1.63	$323,655.23	$5.12	0	4	16	$0.709270
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1985	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	2,409	$3,920.48	$1.63	$12,342.25	$5.12	0	4	16	$0.709270
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1985	425	Fairmont-Bankcroft-T-Albert Lea - 000G94 - 425	1,127	$1,834.12	$1.63	$5,774.08	$5.12	0	4	16	$0.709270
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1985	201	Cloquet-Coleraine-C-Greenway-0316 - 000G96 - 201	372	$687.75	$1.85	$2,165.14	$5.82	0	6	36	$0.764923
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1985	198	Cloquet-Bovey-C-Greenway-0316 - 000G96 - 198	5,687	$16,604.34	$2.92	$52,272.93	$9.19	1	1.25	1.5625	$0.963316
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1985	199	Cloquet-Calumet-C-Greenway-0316 - 000G96 - 199	4,338	$12,643.24	$2.91	$39,802.79	$9.18	1	1.25	1.5625	$0.962843
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1985	201	Cloquet-Coleraine-C-Greenway-0316 - 000G96 - 201	10,783	$32,028.58	$2.97	$100,830.71	$9.35	1	1.25	1.5625	$0.970812
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1985	187	Cloquet-Moose Lake-T-Moose Lake-0097 - 000G96 - 187	1,357	$3,955.47	$2.91	$12,452.41	$9.18	1	1	1	$0.962843
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1985	199	Cloquet-Calumet-C-Greenway-0316 - 000G96 - 199	1	$584.41	$584.41	$1,839.81	$1,839.81	1	1	1	$3.264773
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1985	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	379	$12,581.40	$33.20	$39,608.11	$104.51	1	2	4	$2.019158
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1985	187	Cloquet-Moose Lake-T-Moose Lake-0097 - 000G96 - 187	6,920	$20,165.75	$2.91	$63,484.77	$9.17	1	2	4	$0.962369
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1985	190	Cloquet-Twin Lakes-T-Carlton-0093 - 000G96 - 190	2,772	$7,654.36	$2.76	$24,097.06	$8.69	1	2	4	$0.939020
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1985	198	Cloquet-Bovey-C-Greenway-0316 - 000G96 - 198	2,776	$8,091.83	$2.91	$25,474.27	$9.18	1	2	4	$0.962843
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1985	199	Cloquet-Calumet-C-Greenway-0316 - 000G96 - 199	4,598	$13,402.26	$2.91	$42,192.30	$9.18	1	2	4	$0.962843
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1985	201	Cloquet-Coleraine-C-Greenway-0316 - 000G96 - 201	2,089	$6,089.14	$2.91	$19,169.52	$9.18	1	2	4	$0.962843
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1985	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	20	$1,330.17	$66.51	$4,187.57	$209.38	1	2	4	$2.320935
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1985	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	592	$1,728.29	$2.92	$5,440.91	$9.19	1	3	9	$0.963316
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1985	201	Cloquet-Coleraine-C-Greenway-0316 - 000G96 - 201	426	$1,240.09	$2.91	$3,903.99	$9.16	1	3	9	$0.961895
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1985	187	Cloquet-Moose Lake-T-Moose Lake-0097 - 000G96 - 187	2,070	$6,032.98	$2.91	$18,992.71	$9.18	1	0.75	0.5625	$0.962843
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1985	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	1,472	$464,969.86	$315.88	$1,463,794.00	$994.43	1	4	16	$2.997574
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1985	187	Cloquet-Moose Lake-T-Moose Lake-0097 - 000G96 - 187	3,268	$26,612.09	$8.14	$83,778.80	$25.64	1	4	16	$1.408918
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1985	190	Cloquet-Twin Lakes-T-Carlton-0093 - 000G96 - 190	63	$513.14	$8.15	$1,615.44	$25.64	1	4	16	$1.408918
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1985	198	Cloquet-Bovey-C-Greenway-0316 - 000G96 - 198	658	$5,357.24	$8.14	$16,865.40	$25.63	1	4	16	$1.408749
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1985	201	Cloquet-Coleraine-C-Greenway-0316 - 000G96 - 201	4,817	$39,222.19	$8.14	$123,477.26	$25.63	1	4	16	$1.408749
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1985	188	Cloquet-Silver Brook-T-Wrenshall-0100 - 000G96 - 188	810	$12,214.09	$15.08	$38,451.76	$47.47	1	6	36	$1.676419
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1985	190	Cloquet-Twin Lakes-T-Carlton-0093 - 000G96 - 190	9,852	$148,559.51	$15.08	$467,687.35	$47.47	1	6	36	$1.676419
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1985	201	Cloquet-Coleraine-C-Greenway-0316 - 000G96 - 201	3,798	$57,272.29	$15.08	$180,301.65	$47.47	1	6	36	$1.676419
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1985	190	Cloquet-Twin Lakes-T-Carlton-0093 - 000G96 - 190	4,547	$33,546.62	$7.38	$105,609.73	$23.23	1	8	64	$1.366049
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1985	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	54	$812.50	$14.94	$2,557.87	$47.02	1	8	64	$1.672283
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1985	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	8	$116.22	$14.94	$365.88	$47.03	1	8	64	$1.672375
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1985	457	Fairmont-Pickerel Lake-T-Albert Lea - 000G94 - 457	0	$0.39	$13.00	$1.23	$41.00	1	8	64	$1.612784
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1986	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	22,168	$76,433.79	$3.45	$249,879.69	$11.27	0	1.25	1.5625	$1.051924
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1986	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	380	$1,289.99	$3.39	$4,217.28	$11.10	0	1	1	$1.045323
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1986	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	649	$41,345.78	$63.71	$135,168.90	$208.27	0	2	4	$2.318627
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1986	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	172	$10,926.48	$63.53	$35,721.18	$207.68	0	2	4	$2.317395
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1986	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	814	$51,747.79	$63.57	$169,175.47	$207.83	0	2	4	$2.317708
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1986	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	930	$59,177.79	$63.63	$193,465.85	$208.03	0	2	4	$2.318126
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1986	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	955	$60,750.75	$63.61	$198,608.23	$207.97	0	2	4	$2.318001

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1986	136	Rochester-La Crescent-T-LaCrescent-Hokah-0300 - 000G95 - 136	11	$699.75	$63.61	$2,287.64	$207.97	0	2	4	$2.318001
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1986	144	Rochester-Waltham-C-Hayfield-0203 - 000G95 - 144	6,417	$408,213.13	$63.61	$1,334,542.93	$207.97	0	2	4	$2.318001
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1986	149	Rochester-Dover-T-Dover-Eyota-0533 - 000G95 - 149	330	$20,995.26	$63.62	$68,638.35	$208.00	0	2	4	$2.318063
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1986	167	Rochester-Elgin-C-Elgin-Millville-2899 - 000G95 - 167	349	$22,202.60	$63.62	$72,585.42	$207.98	0	2	4	$2.318022
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1986	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	186	$16,171.18	$86.94	$52,867.32	$284.23	0	2	4	$2.453670
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1986	171	Rochester-Lewiston-C-Lewiston-Altura-0857 - 000G95 - 171	84	$5,332.12	$63.48	$17,431.93	$207.52	0	2	4	$2.317060
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1986	202	Cloquet-Deer River-C-Deer River-0317 - 000G96 - 202	19,820	$67,186.31	$3.39	$219,647.55	$11.08	0	2	4	$1.044540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1986	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	77,433	$269,459.39	$3.48	$880,924.94	$11.38	0	2	4	$1.056142
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1986	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	1,699	$108,093.75	$63.62	$353,383.41	$207.99	0	2	4	$2.318042
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1986	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	668	$42,503.96	$63.63	$138,955.26	$208.02	0	3	9	$2.318105
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1986	202	Cloquet-Deer River-C-Deer River-0317 - 000G96 - 202	2,612	$8,852.63	$3.39	$28,941.29	$11.08	0	0.75	0.5625	$1.044540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1986	393	Cloquet-Deer River-T-Deer River-0317 - 000G96 - 393	952	$3,226.53	$3.39	$10,548.27	$11.08	0	0.75	0.5625	$1.044540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1986	394	Cloquet-Morse-T-Deer River-0317 - 000G96 - 394	123	$416.87	$3.39	$1,362.84	$11.08	0	0.75	0.5625	$1.044540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1986	202	Cloquet-Deer River-C-Deer River-0317 - 000G96 - 202	7,151	$48,481.42	$6.78	$158,496.95	$22.16	0	4	16	$1.345570
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1986	202	Cloquet-Deer River-C-Deer River-0317 - 000G96 - 202	10	$114.03	$11.40	$372.79	$37.28	1	2	4	$1.571476
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1986	149	Rochester-Dover-T-Dover-Eyota-0533 - 000G95 - 149	512	$287,395.14	$561.32	$939,561.03	$1,835.08	1	4	16	$3.263655
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1987	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	227	$13,498.53	$59.46	$42,495.37	$187.20	0	1	1	$2.272306
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1987	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	714	$72,121.48	$101.01	$227,049.10	$318.00	0	2	4	$2.502427
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1987	120	Rochester-Rushford-V-Rushford-Peterson-0239 - 000G95 - 120	100	$10,101.05	$101.01	$31,799.61	$318.00	0	2	4	$2.502427
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1987	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	50	$4,991.14	$99.82	$15,712.85	$314.26	0	2	4	$2.497289
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1987	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	953	$96,145.19	$100.89	$302,679.30	$317.61	0	2	4	$2.501894
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1987	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	561	$61,624.60	$109.85	$194,003.37	$345.82	0	2	4	$2.538850
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1987	136	Rochester-La Crescent-T-LaCrescent-Hokah-0300 - 000G95 - 136	653	$65,943.61	$100.99	$207,600.26	$317.92	0	2	4	$2.502318
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1987	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	1,296	$130,820.51	$100.94	$411,842.35	$317.78	0	2	4	$2.502127
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1987	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	887	$89,446.55	$100.84	$281,590.99	$317.46	0	2	4	$2.501689
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1987	158	Rochester-Orion-T-Chatfield-0227 - 000G95 - 158	1,007	$101,661.72	$100.96	$320,046.16	$317.82	0	2	4	$2.502181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1987	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	1,474	$148,781.37	$100.94	$468,385.79	$317.77	0	2	4	$2.502113
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1987	169	Rochester-Plainview-T-Plainview-2899 - 000G95 - 169	1,322	$133,568.67	$101.04	$420,493.97	$318.07	0	2	4	$2.502523
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1987	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	1,404	$141,722.21	$100.94	$446,162.51	$317.78	0	2	4	$2.502127
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1987	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	12,076	$21,612.38	$1.79	$68,038.97	$5.63	0	2	4	$0.750508
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1987	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	10,360	$18,540.53	$1.79	$58,368.33	$5.63	0	3	9	$0.750508
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1987	176	Wadena-Aitkin-C-Aitkin-0001 - 000G89 - 176	2,618	$9,487.00	$3.62	$29,866.48	$11.41	0	0.75	0.5625	$1.057286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1987	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	647	$154,725.46	$239.14	$487,098.67	$752.86	0	4	16	$2.876714
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1987	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	2,956	$10,582.38	$3.58	$33,314.90	$11.27	0	4	16	$1.051924
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1987	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	18,461	$103,959.81	$5.63	$327,280.89	$17.73	1	1.25	1.5625	$1.248709
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1987	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	360	$320,878.00	$891.33	$1,010,171.48	$2,806.03	1	4	16	$3.448092
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1988	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	1,239	$64,235.13	$51.84	$186,843.63	$150.80	0	1	1	$2.178401
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1988	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	83	$4,298.49	$51.79	$12,503.21	$150.64	0	2	4	$2.177940
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1988	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	1,416	$73,376.98	$51.82	$213,434.94	$150.73	0	2	4	$2.178200
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1988	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	1,353	$70,107.71	$51.82	$203,925.47	$150.72	0	2	4	$2.178171
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1988	120	Rochester-Rushford-V-Rushford-Peterson-0239 - 000G95 - 120	1	$51.89	$51.89	$150.93	$150.93	0	2	4	$2.178776
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1988	125	Fairmont-Oakland-T-Austin-0492 - 000G94 - 125	1,461	$75,695.54	$51.81	$220,179.04	$150.70	0	2	4	$2.178113
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1988	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	6,806	$352,496.45	$51.79	$1,025,322.37	$150.65	0	2	4	$2.177969
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1988	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	1,087	$56,331.74	$51.82	$163,854.68	$150.74	0	2	4	$2.178229
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1988	136	Rochester-La Crescent-T-LaCrescent-Hokah-0300 - 000G95 - 136	949	$49,200.19	$51.84	$143,110.82	$150.80	0	2	4	$2.178401
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1988	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	942	$49,341.78	$52.38	$143,522.67	$152.36	0	2	4	$2.182871
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1988	148	Rochester-Dover-C-Dover-Eyota-0533 - 000G95 - 148	811	$42,156.68	$51.98	$122,623.04	$151.20	0	2	4	$2.179552
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1988	164	Rochester-Viola-T-Dover-Eyota-0533 - 000G95 - 164	4,915	$214,742.70	$43.69	$624,631.81	$127.09	0	2	4	$2.104111
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1988	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	929	$48,130.94	$51.81	$140,000.64	$150.70	0	2	4	$2.178113
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1988	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	1,405	$72,832.10	$51.84	$211,850.02	$150.78	0	2	4	$2.178344
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1988	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	840	$43,524.14	$51.81	$126,600.63	$150.72	0	2	4	$2.178171
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1988	385	Rochester-Moscow-T-Austin - 000G95 - 385	1,687	$87,404.78	$51.81	$254,238.24	$150.70	0	2	4	$2.178113
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1988	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	2,705	$140,154.88	$51.81	$407,674.84	$150.71	0	3	9	$2.178142
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1988	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	633	$32,804.24	$51.82	$95,419.18	$150.74	0	3	9	$2.178229
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1988	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	1,625	$168,246.40	$103.54	$489,385.92	$301.16	0	4	16	$2.478797
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1988	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	139	$22,703.27	$163.33	$66,038.03	$475.09	1	1.25	1.5625	$2.676776
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1988	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	21,242	$69,217.71	$3.26	$201,336.68	$9.48	1	1.25	1.5625	$0.976808
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1988	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	31	$99.78	$3.22	$290.23	$9.36	1	1	1	$0.971276
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1988	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	2,197	$209,838.79	$95.51	$610,367.58	$277.82	1	2	4	$2.443764
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1988	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	36,770	$120,840.04	$3.29	$351,492.89	$9.56	1	2	4	$0.980458
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1988	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	13,697	$44,630.26	$3.26	$129,818.06	$9.48	1	3	9	$0.976808
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1988	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	110	$50,371.00	$457.92	$146,516.41	$1,331.97	1	4	16	$3.124494
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1988	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	3,398	$30,939.24	$9.11	$89,994.36	$26.48	1	4	16	$1.422918
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1989	204	Cloquet-Grand Rapids-T-Grand Rapids-0318 - 000G96 - 204	302	$235.19	$0.78	$654.26	$2.17	0	1.25	1.5625	$0.336460
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1989	205	Cloquet-Greenway-T-Greenway-0316 - 000G96 - 205	121	$92.65	$0.77	$257.74	$2.13	0	1.25	1.5625	$0.328380
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1989	206	Cloquet-Keewatin-C-Nashwauk-Keewatin-0319 - 000G96 - 206	2,262	$1,621.38	$0.72	$4,510.38	$1.99	0	1.25	1.5625	$0.298853
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1989	207	Cloquet-Laprairie-C-Greenway-0316 - 000G96 - 207	2,359	$1,817.37	$0.77	$5,055.59	$2.14	0	1.25	1.5625	$0.330414

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1989	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	85	$3,040.11	$35.77	$8,457.03	$99.49	0	1	1	$1.997779
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1989	157	Rochester-New Haven-T-Pine Island-0255 - 000G95 - 157	2,250	$80,857.51	$35.94	$224,930.89	$99.97	0	1	1	$1.999870
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1989	312	Rochester-Chatfield-T-Chatfield-0227 - 000G95 - 312	564	$20,229.54	$35.87	$56,274.90	$99.78	0	1	1	$1.999044
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1989	77	Fairmont-Welcome-C-Martin Cty W-2448 - 000G94 - 077	384	$13,573.96	$35.35	$37,760.29	$98.33	0	2	4	$1.992686
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1989	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	796	$28,591.00	$35.92	$79,534.96	$99.92	0	2	4	$1.999652
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1989	110	Rochester-Canton-C-Mabel-Canton-0238 - 000G95 - 110	12,373	$442,980.11	$35.80	$1,232,290.12	$99.60	0	2	4	$1.998259
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1989	120	Rochester-Rushford-V-Rushford-Peterson-0239 - 000G95 - 120	539	$19,391.37	$35.98	$53,943.27	$100.08	0	2	4	$2.000347
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1989	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	788	$28,320.42	$35.94	$78,782.26	$99.98	0	2	4	$1.999913
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1989	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	1,524	$52,988.05	$34.77	$147,403.12	$96.72	0	2	4	$1.985516
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1989	134	Rochester-Houston-C-Houston-0294 - 000G95 - 134	119	$4,284.14	$36.00	$11,917.70	$100.15	0	2	4	$2.000651
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1989	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	2,202	$79,100.86	$35.92	$220,044.20	$99.93	0	2	4	$1.999696
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1989	136	Rochester-La Crescent-T-LaCrescent-Hokah-0300 - 000G95 - 136	1,994	$71,629.03	$35.92	$199,258.94	$99.93	0	2	4	$1.999696
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1989	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	220	$7,936.93	$36.08	$22,079.10	$100.36	0	2	4	$2.001561
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1989	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	193	$6,944.82	$35.98	$19,319.23	$100.10	0	2	4	$2.000434
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1989	148	Rochester-Dover-C-Dover-Eyota-0533 - 000G95 - 148	9,840	$353,611.51	$35.94	$983,682.93	$99.97	0	2	4	$1.999870
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1989	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	1,245	$44,735.44	$35.93	$124,445.86	$99.96	0	2	4	$1.999826
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1989	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	73	$2,615.58	$35.83	$7,276.07	$99.67	0	2	4	$1.998564
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1989	171	Rochester-Lewiston-C-Lewiston-Altura-0857 - 000G95 - 171	453	$16,279.73	$35.94	$45,287.25	$99.97	0	2	4	$1.999870
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1989	174	Rochester-Utica-C-St Charles-0858 - 000G95 - 174	1,553	$55,784.01	$35.92	$155,180.97	$99.92	0	2	4	$1.999652
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1989	204	Cloquet-Grand Rapids-T-Grand Rapids-0318 - 000G96 - 204	36,313	$27,994.69	$0.77	$77,876.14	$2.14	0	2	4	$0.330414
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1989	205	Cloquet-Greenway-T-Greenway-0316 - 000G96 - 205	2,117	$1,632.07	$0.77	$4,540.12	$2.14	0	2	4	$0.330414
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1989	206	Cloquet-Keewatin-C-Nashwauk-Keewatin-0319 - 000G96 - 206	4,789	$3,691.76	$0.77	$10,269.81	$2.14	0	2	4	$0.330414
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1989	207	Cloquet-Laprairie-C-Greenway-0316 - 000G96 - 207	29,103	$22,438.37	$0.77	$62,419.46	$2.14	0	2	4	$0.330414
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1989	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	792	$28,455.71	$35.93	$79,158.61	$99.95	0	2	4	$1.999783
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1989	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	198	$7,125.20	$35.99	$19,821.01	$100.11	0	3	9	$2.000477
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1989	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	638	$22,908.88	$35.91	$63,728.34	$99.89	0	3	9	$1.999522
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1989	204	Cloquet-Grand Rapids-T-Grand Rapids-0318 - 000G96 - 204	1,143	$880.18	$0.77	$2,448.50	$2.14	0	3	9	$0.330414
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1989	205	Cloquet-Greenway-T-Greenway-0316 - 000G96 - 205	15	$10.69	$0.71	$29.74	$1.98	0	3	9	$0.296665
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1989	205	Cloquet-Greenway-T-Greenway-0316 - 000G96 - 205	495	$381.29	$0.77	$1,060.68	$2.14	0	0.75	0.5625	$0.330414
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1989	206	Cloquet-Keewatin-C-Nashwauk-Keewatin-0319 - 000G96 - 206	696	$1,532.30	$2.20	$4,262.58	$6.12	0	0.75	0.5625	$0.786751
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1989	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	121	$8,658.47	$71.56	$24,086.29	$199.06	0	4	16	$2.298984
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1989	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	599	$43,021.79	$71.82	$119,678.80	$199.80	0	4	16	$2.300595
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1989	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	142	$10,191.74	$71.77	$28,351.57	$199.66	0	4	16	$2.300291
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1989	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	94	$12,942.61	$137.69	$36,003.99	$383.02	0	4	16	$2.583221
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1989	204	Cloquet-Grand Rapids-T-Grand Rapids-0318 - 000G96 - 204	1,779	$2,743.88	$1.54	$7,632.98	$4.29	0	4	16	$0.632457
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1989	110	Rochester-Canton-C-Mabel-Canton-0238 - 000G95 - 110	1,236	$140,339.41	$113.54	$390,398.72	$315.86	1	1.25	1.5625	$2.499495
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1989	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	321	$36,437.74	$113.51	$101,363.17	$315.77	1	1.25	1.5625	$2.499371
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1989	206	Cloquet-Keewatin-C-Nashwauk-Keewatin-0319 - 000G96 - 206	12,552	$30,580.25	$2.44	$85,068.68	$6.78	1	1.25	1.5625	$0.831230
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1989	207	Cloquet-Laprairie-C-Greenway-0316 - 000G96 - 207	1,227	$2,986.20	$2.43	$8,307.07	$6.77	1	1.25	1.5625	$0.830589
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1989	110	Rochester-Canton-C-Mabel-Canton-0238 - 000G95 - 110	1,913	$217,225.21	$113.55	$604,281.04	$315.88	1	2	4	$2.499522
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1989	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	240	$27,283.21	$113.68	$75,896.93	$316.24	1	2	4	$2.500017
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1989	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	684	$62,416.55	$91.25	$173,631.49	$253.85	1	2	4	$2.404577
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1989	204	Cloquet-Grand Rapids-T-Grand Rapids-0318 - 000G96 - 204	304	$620.05	$2.04	$1,724.87	$5.67	1	2	4	$0.753583
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1989	206	Cloquet-Keewatin-C-Nashwauk-Keewatin-0319 - 000G96 - 206	5,173	$12,604.03	$2.44	$35,062.12	$6.78	1	2	4	$0.831230
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1989	207	Cloquet-Laprairie-C-Greenway-0316 - 000G96 - 207	3,001	$7,312.18	$2.44	$20,341.16	$6.78	1	2	4	$0.831230
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1989	206	Cloquet-Keewatin-C-Nashwauk-Keewatin-0319 - 000G96 - 206	85	$466.82	$5.49	$1,298.61	$15.28	1	0.75	0.5625	$1.184123
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1989	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	5,266	$35,845.04	$6.81	$99,714.38	$18.94	1	4	16	$1.277380
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1989	206	Cloquet-Keewatin-C-Nashwauk-Keewatin-0319 - 000G96 - 206	3,332	$22,682.35	$6.81	$63,098.17	$18.94	1	4	16	$1.277380
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1989	232	Cloquet-Hibbing-C-Hibbing-0701 - 000G96 - 232	259	$1,763.12	$6.81	$4,904.68	$18.94	1	4	16	$1.277380
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1989	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	22,083	$275,646.51	$12.48	$766,798.47	$34.72	1	6	36	$1.540580
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1989	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	4,040	$24,919.64	$6.17	$69,321.90	$17.16	1	8	64	$1.234517
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1990	178	Wadena-Spencer-T-Aitkin-0001 - 000G89 - 178	231	$326.00	$1.41	$890.68	$3.86	0	1.25	1.5625	$0.586587
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1990	208	Cloquet-Marble-C-Greenway-0316 - 000G96 - 208	360	$555.90	$1.54	$1,518.80	$4.22	0	1.25	1.5625	$0.625312
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1990	209	Cloquet-Nashwauk-C-Nashwauk-Keewatin-0319 - 000G96 - 209	1,052	$1,624.95	$1.54	$4,439.60	$4.22	0	1.25	1.5625	$0.625312
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1990	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	56,172	$86,744.64	$1.54	$236,998.76	$4.22	0	1.25	1.5625	$0.625312
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1990	213	Cloquet-Ranier-C-International Falls-0361 - 000G96 - 213	7,108	$10,981.18	$1.54	$30,002.15	$4.22	0	1.25	1.5625	$0.625312
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1990	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	646	$21,249.59	$32.89	$58,056.92	$89.87	0	1.25	1.5625	$1.953615
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1990	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	603	$19,835.14	$32.89	$54,192.44	$89.87	0	1.25	1.5625	$1.953615
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1990	425	Fairmont-Bankcroft-T-Albert Lea - 000G94 - 425	150	$4,934.11	$32.89	$13,480.69	$89.87	0	1.25	1.5625	$1.953615
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1990	136	Rochester-La Crescent-T-LaCrescent-Hokah-0300 - 000G95 - 136	383	$33,009.72	$86.19	$90,187.27	$235.48	0	1	1	$2.371954
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1990	209	Cloquet-Nashwauk-C-Nashwauk-Keewatin-0319 - 000G96 - 209	226	$470.38	$2.08	$1,285.15	$5.69	0	1	1	$0.755112
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1990	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	1,715	$2,647.67	$1.54	$7,233.81	$4.22	0	1	1	$0.625312
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1990	213	Cloquet-Ranier-C-International Falls-0361 - 000G96 - 213	3,122	$4,340.33	$1.39	$11,858.40	$3.80	0	1	1	$0.579784
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1990	425	Fairmont-Bankcroft-T-Albert Lea - 000G94 - 425	236	$860.29	$3.65	$2,350.44	$9.96	0	1	1	$0.998259
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1990	436	Fairmont-Geneva-T-N.R.H.E.G. - 000G94 - 436	563	$2,052.31	$3.65	$5,607.20	$9.96	0	1	1	$0.998259
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	89	Fairmont-Ellendale-C-NRHEG-2168 - 000G94 - 089	205	$17,579.14	$85.75	$48,028.72	$234.29	0	2	4	$2.369754
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	697	$82,328.97	$118.12	$224,934.51	$322.72	0	2	4	$2.508826

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	112	Rochester-Fountain-C-Fillmore Central-2198 - 000G95 - 112	(13)	($1,128.46)	$86.80	($3,083.11)	$237.16	0	2	4	$2.375041
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	647	$55,721.45	$86.12	$152,238.96	$235.30	0	2	4	$2.371622
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	553	$47,561.34	$86.01	$129,944.38	$234.98	0	2	4	$2.371031
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	583	$49,807.56	$85.43	$136,081.37	$233.42	0	2	4	$2.368138
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	131	Rochester-Wanamingo-C-Kenyon-Wanamingo-2172 - 000G95 - 131	332	$28,614.93	$86.19	$78,180.08	$235.48	0	2	4	$2.371954
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	1,419	$124,589.33	$87.80	$340,395.85	$239.88	0	2	4	$2.379994
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	1,204	$122,370.34	$101.64	$334,333.25	$277.69	0	2	4	$2.443560
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	142	Rochester-Red Rock-C-Hayfield-0203 - 000G95 - 142	1,017	$87,602.71	$86.14	$239,343.12	$235.34	0	2	4	$2.371696
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	2,531	$217,998.96	$86.13	$595,604.30	$235.32	0	2	4	$2.371659
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	1,026	$88,770.32	$86.52	$242,533.20	$236.39	0	2	4	$2.373629
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	167	Rochester-Elgin-C-Elgin-Millville-2899 - 000G95 - 167	856	$73,734.72	$86.14	$201,453.79	$235.34	0	2	4	$2.371696
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	982	$84,575.19	$86.13	$231,071.50	$235.31	0	2	4	$2.371640
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	4,340	$424,473.50	$97.80	$1,159,722.25	$267.22	0	2	4	$2.426869
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	178	Wadena-Spencer-T-Aitkin-0001 - 000G89 - 178	7,473	$33,105.00	$4.43	$90,447.59	$12.10	0	2	4	$1.082785
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	208	Cloquet-Marble-C-Greenway-0316 - 000G96 - 208	9,537	$14,735.04	$1.55	$40,258.23	$4.22	0	2	4	$0.625312
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	209	Cloquet-Nashwauk-C-Nashwauk-Keewatin-0319 - 000G96 - 209	1,631	$2,519.39	$1.54	$6,883.33	$4.22	0	2	4	$0.625312
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	211	Cloquet-Zemple-C-Deer River-0317 - 000G96 - 211	3,312	$5,117.12	$1.55	$13,980.70	$4.22	0	2	4	$0.625312
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	67,507	$107,800.74	$1.60	$294,527.02	$4.36	0	2	4	$0.639486
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	312	Rochester-Chatfield-T-Chatfield-0227 - 000G95 - 312	139	$12,065.82	$86.80	$32,965.54	$237.16	0	2	4	$2.375041
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	380	Rochester-St Charles-T-St Charles - 000G95 - 380	1,625	$158,933.04	$97.80	$434,227.77	$267.22	0	2	4	$2.426869
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	975	$83,909.90	$86.06	$229,253.83	$235.13	0	2	4	$2.371308
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	394	Cloquet-Morse-T-Deer River-0317 - 000G96 - 394	60	$92.70	$1.55	$253.27	$4.22	0	2	4	$0.625312
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	1,304	$6,701.88	$5.14	$18,310.49	$14.04	0	2	4	$1.147367
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	425	Fairmont-Bankcroft-T-Albert Lea - 000G94 - 425	122	$627.02	$5.14	$1,713.11	$14.04	0	2	4	$1.147367
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	426	Fairmont-Bath-T-Albert Lea - 000G94 - 426	723	$3,715.85	$5.14	$10,152.23	$14.04	0	2	4	$1.147367
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	428	Fairmont-Clarks Grove-C-Albert Lea - 000G94 - 428	18,948	$97,382.90	$5.14	$266,063.99	$14.04	0	2	4	$1.147367
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	430	Fairmont-Conger-C-Alden-Conger - 000G94 - 430	5,050	$25,954.38	$5.14	$70,911.07	$14.04	0	2	4	$1.147367
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	433	Fairmont-Geneva-C-N.R.H.E.G. - 000G94 - 433	17,725	$91,097.31	$5.14	$248,890.86	$14.04	0	2	4	$1.147367
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	436	Fairmont-Geneva-T-N.R.H.E.G. - 000G94 - 436	604	$3,104.25	$5.14	$8,481.25	$14.04	0	2	4	$1.147367
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	441	Fairmont-Hollandale-C-Albert Lea - 000G94 - 441	17,207	$88,435.06	$5.14	$241,617.22	$14.04	0	2	4	$1.147367
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	446	Rochester-Lyle-T-Lyle - 000G95 - 446	438	$2,251.09	$5.14	$6,150.30	$14.04	0	2	4	$1.147367
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	454	Fairmont-Newry-T-Albert Lea - 000G94 - 454	5,288	$27,177.58	$5.14	$74,253.03	$14.04	0	2	4	$1.147367
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	457	Fairmont-Pickerel Lake-T-Albert Lea - 000G94 - 457	407	$2,091.77	$5.14	$5,715.01	$14.04	0	2	4	$1.147367
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	468	Rochester-Lyle-C-Lyle - 000G95 - 468	14,930	$76,732.46	$5.14	$209,644.04	$14.04	0	2	4	$1.147367
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1990	471	Fairmont-Moscow-T-Albert Lea - 000G94 - 471	5,078	$26,098.29	$5.14	$71,304.26	$14.04	0	2	4	$1.147367
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1990	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	663	$57,034.54	$86.02	$155,826.51	$235.03	0	3	9	$2.371123
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1990	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	14,127	$21,828.28	$1.55	$59,637.98	$4.22	0	3	9	$0.625312
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1990	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	1,207	$1,360.64	$1.13	$3,717.46	$3.08	0	3	9	$0.488551
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1990	208	Cloquet-Marble-C-Greenway-0316 - 000G96 - 208	160	$2,868.61	$17.93	$7,837.45	$48.98	0	0.75	0.5625	$1.690019
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1990	209	Cloquet-Nashwauk-C-Nashwauk-Keewatin-0319 - 000G96 - 209	202	$466.82	$2.31	$1,275.42	$6.31	0	0.75	0.5625	$0.800029
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1990	211	Cloquet-Zemple-C-Deer River-0317 - 000G96 - 211	1,012	$1,564.37	$1.55	$4,274.08	$4.22	0	0.75	0.5625	$0.625312
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1990	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	762	$11,200.05	$14.70	$30,600.14	$40.16	0	0.75	0.5625	$1.603794
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1990	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	1,400	$245,222.88	$175.16	$669,983.93	$478.56	0	4	16	$2.679936
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1990	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	370	$63,773.21	$172.36	$174,237.52	$470.91	0	4	16	$2.672938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1990	209	Cloquet-Nashwauk-C-Nashwauk-Keewatin-0319 - 000G96 - 209	58	$178.17	$3.07	$486.79	$8.39	0	4	16	$0.923762
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1990	211	Cloquet-Zemple-C-Deer River-0317 - 000G96 - 211	2,558	$7,903.82	$3.09	$21,594.37	$8.44	0	4	16	$0.926342
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1990	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	9,432	$29,143.88	$3.09	$79,625.24	$8.44	0	4	16	$0.926342
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1990	428	Fairmont-Clarks Grove-C-Albert Lea - 000G94 - 428	1,929	$15,483.68	$8.03	$42,303.63	$21.93	0	4	16	$1.341039
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1990	430	Fairmont-Conger-C-Alden-Conger - 000G94 - 430	3,145	$25,244.26	$8.03	$68,970.92	$21.93	0	4	16	$1.341039
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1990	433	Fairmont-Geneva-C-N.R.H.E.G. - 000G94 - 433	2,953	$23,703.11	$8.03	$64,760.28	$21.93	0	4	16	$1.341039
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1990	436	Fairmont-Geneva-T-N.R.H.E.G. - 000G94 - 436	6,483	$52,037.69	$8.03	$142,174.40	$21.93	0	4	16	$1.341039
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1990	457	Fairmont-Pickerel Lake-T-Albert Lea - 000G94 - 457	9,011	$72,329.42	$8.03	$197,614.31	$21.93	0	4	16	$1.341039
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1990	458	Fairmont-Pickerel Lake-T-Alden-Conger - 000G94 - 458	7,862	$63,106.63	$8.03	$172,416.33	$21.93	0	4	16	$1.341039
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1990	426	Fairmont-Bath-T-Albert Lea - 000G94 - 426	17,878	$155,237.48	$8.68	$424,130.97	$23.72	0	6	36	$1.375115
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1990	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	649	$176,475.02	$271.92	$482,154.97	$742.92	1	1.25	1.5625	$2.870942
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1990	208	Cloquet-Marble-C-Greenway-0316 - 000G96 - 208	4,546	$22,193.03	$4.88	$60,634.52	$13.34	1	1.25	1.5625	$1.125156
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1990	209	Cloquet-Nashwauk-C-Nashwauk-Keewatin-0319 - 000G96 - 209	12,219	$59,683.95	$4.88	$163,065.07	$13.35	1	1.25	1.5625	$1.125481
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1990	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	2,408	$12,076.81	$5.02	$32,995.57	$13.70	1	1.25	1.5625	$1.136721
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	186	Steel 10 in	1990	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	79	$992.61	$12.55	$2,711.95	$34.28	1	10	100	$1.535041
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1990	207	Cloquet-Laprairie-C-Greenway-0316 - 000G96 - 207	216	$1,051.23	$4.87	$2,872.11	$13.30	1	2	4	$1.123852
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1990	208	Cloquet-Marble-C-Greenway-0316 - 000G96 - 208	3,503	$17,101.56	$4.88	$46,723.90	$13.34	1	2	4	$1.125156
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1990	209	Cloquet-Nashwauk-C-Nashwauk-Keewatin-0319 - 000G96 - 209	3,582	$17,487.90	$4.88	$47,779.44	$13.34	1	2	4	$1.125156
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1990	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	6,536	$30,770.76	$4.71	$84,070.11	$12.86	1	2	4	$1.109241
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1990	209	Cloquet-Nashwauk-C-Nashwauk-Keewatin-0319 - 000G96 - 209	3,894	$19,008.73	$4.88	$51,934.57	$13.34	1	3	9	$1.125156
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1990	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	2,907	$14,190.36	$4.88	$38,770.09	$13.34	1	3	9	$1.125156
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1990	209	Cloquet-Nashwauk-C-Nashwauk-Keewatin-0319 - 000G96 - 209	223	$3,043.22	$13.65	$8,314.51	$37.28	1	4	16	$1.571476
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1990	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	8,335	$113,694.74	$13.64	$310,630.27	$37.27	1	4	16	$1.571359

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1990	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	16	$256.06	$16.00	$699.60	$43.73	1	4	16	$1.640779
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1990	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	44	$704.19	$16.00	$1,923.95	$43.73	1	4	16	$1.640779
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1990	426	Fairmont-Bath-T-Albert Lea - 000G94 - 426	10	$160.04	$16.00	$437.25	$43.73	1	4	16	$1.640779
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1990	434	Fairmont-Geneva-T-Albert Lea - 000G94 - 434	46	$736.20	$16.00	$2,011.40	$43.73	1	4	16	$1.640779
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1990	436	Fairmont-Geneva-T-N.R.H.E.G. - 000G94 - 436	16	$256.07	$16.00	$699.62	$43.73	1	4	16	$1.640779
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1990	457	Fairmont-Pickerel Lake-T-Albert Lea - 000G94 - 457	7	$112.03	$16.00	$306.08	$43.73	1	4	16	$1.640779
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1990	468	Rochester-Lyle-C-Lyle - 000G95 - 468	177	$2,832.77	$16.00	$7,739.53	$43.73	1	4	16	$1.640779
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1990	207	Cloquet-Laprairie-C-Greenway-0316 - 000G96 - 207	13	$681.52	$52.42	$1,862.01	$143.23	1	6	36	$2.156034
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1990	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	6,479	$168,966.52	$26.08	$461,640.67	$71.25	1	6	36	$1.852785
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1990	435	Fairmont-Geneva-T-Blooming Prairie - 000G94 - 435	16	$14,644.10	$915.26	$40,009.77	$2,500.61	1	6	36	$3.398046
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1990	207	Cloquet-Laprairie-C-Greenway-0316 - 000G96 - 207	3,980	$49,194.29	$12.36	$134,405.83	$33.77	1	8	64	$1.528531
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1991	213	Cloquet-Ranier-C-International Falls-0361 - 000G96 - 213	11,942	$21,161.00	$1.77	$56,601.98	$4.74	0	1.25	1.5625	$0.675778
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1991	214	Cloquet-S InternationalFalls-C-Intrntnl-361 - 000G96 - 214	24,180	$42,846.51	$1.77	$114,606.92	$4.74	0	1.25	1.5625	$0.675778
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1991	215	Cloquet-Silver Bau-C-Lake Superior-0381 - 000G96 - 215	1,833	$3,246.34	$1.77	$8,683.39	$4.74	0	1.25	1.5625	$0.675778
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1991	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	5,466	$9,671.32	$1.77	$25,869.09	$4.73	0	1.25	1.5625	$0.674861
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1991	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	2,601	$4,608.09	$1.77	$12,325.84	$4.74	0	1.25	1.5625	$0.675778
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1991	221	Cloquet-Canosia-T-Proctor-0704 - 000G96 - 221	1,109	$1,967.05	$1.77	$5,261.51	$4.74	0	1.25	1.5625	$0.675778
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1991	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	9,351	$16,571.89	$1.77	$44,326.91	$4.74	0	1.25	1.5625	$0.675778
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1991	396	Cloquet-Balkan-T-Chisholm - 000G96 - 396	88	$155.95	$1.77	$417.14	$4.74	0	1.25	1.5625	$0.675778
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1991	136	Rochester-La Crescent-T-LaCrescent-Hokah-0300 - 000G95 - 136	253	$1,115.28	$4.41	$2,983.18	$11.79	0	1	1	$1.071514
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1991	164	Rochester-Viola-T-Dover-Eyota-0533 - 000G95 - 164	93	$411.80	$4.43	$1,101.49	$11.84	0	1	1	$1.073352
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1991	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	560	$2,470.77	$4.41	$6,608.88	$11.80	0	1	1	$1.071882
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1991	213	Cloquet-Ranier-C-International Falls-0361 - 000G96 - 213	312	$552.34	$1.77	$1,477.41	$4.74	0	1	1	$0.675778
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1991	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	1,999	$3,542.11	$1.77	$9,474.53	$4.74	0	1	1	$0.675778
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1991	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	2,372	$10,885.78	$4.59	$29,117.56	$12.28	0	1	1	$1.089198
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	33	Rosemount-Spring Lk-T-Prior Lk-Savage-0719 - 000G93 - 033	4,541	$20,092.17	$4.42	$53,743.04	$11.84	0	2	4	$1.073352
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	34	Pine City-May-T-Stillwater-0834 - 000G98 - 034	7,802	$34,521.34	$4.42	$92,338.55	$11.84	0	2	4	$1.073352
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	35	Pine City-Scandia-C-Forest Lake-0831 - 000G98 - 035	34,741	$153,703.33	$4.42	$411,129.54	$11.83	0	2	4	$1.072985
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	52	Worthington-Ewington-T-Brewster-0513 - 000G99 - 052	377	$1,664.34	$4.41	$4,451.82	$11.81	0	2	4	$1.072250
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	1,330	$5,885.24	$4.42	$15,741.99	$11.84	0	2	4	$1.073352
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	2,255	$9,968.87	$4.42	$26,664.98	$11.82	0	2	4	$1.072617
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	112	Rochester-Fountain-C-Fillmore Central-2198 - 000G95 - 112	7,871	$40,505.63	$5.15	$108,345.48	$13.77	0	2	4	$1.138934
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	113	Rochester-Harmony-C-Fillmore Central-2198 - 000G95 - 113	1,045	$4,632.69	$4.43	$12,391.64	$11.86	0	2	4	$1.074085
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	124	Fairmont-Hayward-C-Albert Lea-0241 - 000G94 - 124	831	$3,671.84	$4.42	$9,821.53	$11.82	0	2	4	$1.072617
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	131	Rochester-Wanamingo-C-Kenyon-Wanamingo-2172 - 000G95 - 131	459	$2,041.82	$4.45	$5,461.51	$11.90	0	2	4	$1.075547
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	325	$1,441.28	$4.43	$3,855.17	$11.86	0	2	4	$1.074085
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	5,635	$23,641.19	$4.20	$63,236.05	$11.22	0	2	4	$1.049993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	134	Rochester-Houston-C-Houston-0294 - 000G95 - 134	178	$791.82	$4.45	$2,117.98	$11.90	0	2	4	$1.075547
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	702	$3,104.85	$4.42	$8,304.93	$11.83	0	2	4	$1.072985
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	136	Rochester-La Crescent-T-LaCrescent-Hokah-0300 - 000G95 - 136	1,830	$8,099.41	$4.43	$21,664.51	$11.84	0	2	4	$1.073352
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	3,305	$14,618.73	$4.42	$39,102.55	$11.83	0	2	4	$1.072985
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	2,813	$12,182.27	$4.33	$32,585.44	$11.58	0	2	4	$1.063709
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	159	Rochester-Oronoco-C-Rochester-0535 - 000G95 - 159	6,599	$29,185.98	$4.42	$78,067.39	$11.83	0	2	4	$1.072985
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	3,684	$16,300.22	$4.42	$43,600.24	$11.84	0	2	4	$1.073352
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	2,381	$10,535.09	$4.42	$28,179.52	$11.84	0	2	4	$1.073352
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	7,681	$33,990.25	$4.43	$90,917.98	$11.84	0	2	4	$1.073352
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	213	Cloquet-Ranier-C-International Falls-0361 - 000G96 - 213	33,987	$60,229.88	$1.77	$161,104.40	$4.74	0	2	4	$0.675778
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	214	Cloquet-S InternationalFalls-C-Intrntnl-361 - 000G96 - 214	31,446	$55,726.96	$1.77	$149,059.87	$4.74	0	2	4	$0.675778
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	215	Cloquet-Silver Bau-C-Lake Superior-0381 - 000G96 - 215	4,803	$8,509.62	$1.77	$22,761.75	$4.74	0	2	4	$0.675778
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	20,610	$36,519.68	$1.77	$97,683.75	$4.74	0	2	4	$0.675778
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	4,734	$8,389.30	$1.77	$22,439.91	$4.74	0	2	4	$0.675778
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	221	Cloquet-Canosia-T-Proctor-0704 - 000G96 - 221	33,691	$59,701.02	$1.77	$159,689.79	$4.74	0	2	4	$0.675778
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	23,153	$41,698.82	$1.80	$111,537.05	$4.82	0	2	4	$0.683047
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	900	$4,186.58	$4.65	$11,198.37	$12.44	0	2	4	$1.094820
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	309	Rochester-Oronoco-T-Rochester-0535 - 000G95 - 309	2,690	$11,902.72	$4.42	$31,837.70	$11.84	0	2	4	$1.073352
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	318	Rochester-Oronoco-T-Pine Island-0255 - 000G95 - 318	9,802	$43,371.92	$4.42	$116,012.30	$11.84	0	2	4	$1.073352
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	377	Rochester-Caledonia-T-Caledonia-0299 - 000G95 - 377	6,238	$27,601.29	$4.42	$73,828.63	$11.84	0	2	4	$1.073352
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1991	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	1,181	$5,233.23	$4.43	$13,997.98	$11.85	0	2	4	$1.073718
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1991	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	1,144	$5,058.30	$4.42	$13,530.07	$11.83	0	3	9	$1.072985
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1991	108	Rochester-Carrolton-T-Fillmore Central-2198 - 000G95 - 108	13,280	$58,751.98	$4.42	$157,151.27	$11.83	0	3	9	$1.072985
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1991	112	Rochester-Fountain-C-Fillmore Central-2198 - 000G95 - 112	3,715	$17,064.87	$4.59	$45,645.54	$12.29	0	3	9	$1.089552
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1991	213	Cloquet-Ranier-C-International Falls-0361 - 000G96 - 213	1,545	$3,493.32	$2.26	$9,344.02	$6.05	0	3	9	$0.781755
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1991	214	Cloquet-S InternationalFalls-C-Intrntnl-361 - 000G96 - 214	14,644	$25,949.45	$1.77	$69,410.24	$4.74	0	3	9	$0.675778
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1991	221	Cloquet-Canosia-T-Proctor-0704 - 000G96 - 221	377	$669.94	$1.78	$1,791.97	$4.75	0	3	9	$0.676694
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1991	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	4,597	$8,146.14	$1.77	$21,789.50	$4.74	0	3	9	$0.675778
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1991	387	Rochester-Fountain-T-Kingsland - 000G95 - 387	9,695	$42,891.61	$4.42	$114,727.56	$11.83	0	3	9	$1.072985
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1991	388	Rochester-Carrollton-Lanesboro - 000G95 - 388	1,833	$8,109.37	$4.42	$21,691.15	$11.83	0	3	9	$1.072985

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1991	178	Wadena-Spencer-T-Aitkin-0001 - 000G89 - 178	1,243	$1,653.00	$1.33	$4,421.49	$3.56	0	0.75	0.5625	$0.551450
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1991	213	Cloquet-Ranier-C-International Falls-0361 - 000G96 - 213	1,394	$2,148.27	$1.54	$5,746.24	$4.12	0	0.75	0.5625	$0.614897
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1991	214	Cloquet-S InternationalFalls-C-Intrntnl-361 - 000G96 - 214	8,947	$21,033.60	$2.35	$56,261.21	$6.29	0	0.75	0.5625	$0.798651
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1991	215	Cloquet-Silver Bau-C-Lake Superior-0381 - 000G96 - 215	68	$121.16	$1.78	$324.08	$4.77	0	0.75	0.5625	$0.678518
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1991	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	3,193	$7,045.48	$2.21	$18,845.43	$5.90	0	0.75	0.5625	$0.770852
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1991	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	147	$260.13	$1.77	$695.80	$4.73	0	0.75	0.5625	$0.674861
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1991	50	Worthington-Alba-T-Brewster-0513 - 000G99 - 050	6,197	$54,832.39	$8.85	$146,667.05	$23.67	0	4	16	$1.374198
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1991	52	Worthington-Ewington-T-Brewster-0513 - 000G99 - 052	20,327	$179,855.86	$8.85	$481,082.99	$23.67	0	4	16	$1.374198
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1991	78	Worthington-Brewster-C-Brewster-0513 - 000G99 - 078	3,027	$26,789.80	$8.85	$71,658.03	$23.67	0	4	16	$1.374198
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1991	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	263	$2,316.35	$8.81	$6,195.83	$23.56	0	4	16	$1.372175
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1991	112	Rochester-Fountain-C-Fillmore Central-2198 - 000G95 - 112	2,330	$21,259.12	$9.12	$56,864.43	$24.41	0	4	16	$1.387568
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1991	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	570	$4,478.27	$7.86	$11,978.59	$21.02	0	4	16	$1.322633
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1991	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	1,256	$11,118.47	$8.85	$29,739.96	$23.68	0	4	16	$1.374382
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1991	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	925	$8,184.43	$8.85	$21,891.92	$23.67	0	4	16	$1.374198
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1991	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	972	$8,596.22	$8.84	$22,993.39	$23.66	0	4	16	$1.374015
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1991	213	Cloquet-Ranier-C-International Falls-0361 - 000G96 - 213	4,707	$16,681.91	$3.54	$44,621.19	$9.48	0	4	16	$0.976808
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1991	214	Cloquet-S InternationalFalls-C-Intrntnl-361 - 000G96 - 214	1,404	$4,975.86	$3.54	$13,309.56	$9.48	0	4	16	$0.976808
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1991	215	Cloquet-Silver Bau-C-Lake Superior-0381 - 000G96 - 215	95	$334.97	$3.53	$895.99	$9.43	0	4	16	$0.974512
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1991	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	2,980	$10,562.19	$3.54	$28,252.01	$9.48	0	4	16	$0.976808
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1991	221	Cloquet-Canosia-T-Proctor-0704 - 000G96 - 221	1,236	$4,379.53	$3.54	$11,714.48	$9.48	0	4	16	$0.976808
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1991	402	Worthington-Hersy-T-Brewster - 000G99 - 402	1,865	$16,501.76	$8.85	$44,139.32	$23.67	0	4	16	$1.374198
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1991	403	Worthington-Round Lake-Round Lake - 000G99 - 403	629	$5,565.53	$8.85	$14,886.82	$23.67	0	4	16	$1.374198
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1991	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	220	$780.40	$3.55	$2,087.43	$9.49	0	6	36	$0.977266
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1991	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	218	$3,036.99	$13.93	$8,123.42	$37.26	1	1.25	1.5625	$1.571243
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1991	214	Cloquet-S InternationalFalls-C-Intrntnl-361 - 000G96 - 214	85	$477.51	$5.62	$1,277.26	$15.03	1	1.25	1.5625	$1.176959
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1991	215	Cloquet-Silver Bau-C-Lake Superior-0381 - 000G96 - 215	528	$2,957.70	$5.60	$7,911.33	$14.98	1	1.25	1.5625	$1.175512
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1991	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	18,203	$99,789.21	$5.48	$266,918.69	$14.66	1	1.25	1.5625	$1.166134
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1991	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	10,329	$57,837.44	$5.60	$154,705.05	$14.98	1	1.25	1.5625	$1.175512
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1991	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	32,511	$178,315.07	$5.48	$476,961.64	$14.67	1	1.25	1.5625	$1.166430
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1991	215	Cloquet-Silver Bau-C-Lake Superior-0381 - 000G96 - 215	46,712	$261,563.41	$5.60	$699,636.39	$14.98	1	1	1	$1.175512
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1991	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	3	$16.68	$5.56	$44.62	$14.87	1	1	1	$1.172311
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1991	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	736	$9,418.31	$12.80	$25,192.33	$34.23	1	1	1	$1.534407
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1991	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	367	$5,113.12	$13.93	$13,676.70	$37.27	1	2	4	$1.571359
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1991	213	Cloquet-Ranier-C-International Falls-0361 - 000G96 - 213	213	$1,192.76	$5.60	$3,190.42	$14.98	1	2	4	$1.175512
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1991	214	Cloquet-S InternationalFalls-C-Intrntnl-361 - 000G96 - 214	25	$139.99	$5.60	$374.45	$14.98	1	2	4	$1.175512
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1991	215	Cloquet-Silver Bau-C-Lake Superior-0381 - 000G96 - 215	8,406	$47,068.71	$5.60	$125,900.58	$14.98	1	2	4	$1.175512
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1991	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	8,306	$44,273.09	$5.33	$118,422.79	$14.26	1	2	4	$1.154120
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1991	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	4,038	$22,610.04	$5.60	$60,477.91	$14.98	1	2	4	$1.175512
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1991	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	26,287	$147,298.54	$5.60	$393,997.82	$14.99	1	2	4	$1.175802
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1991	411	Bemidji-Marble-T-Ivanhoe-0403 - 000G97 - 411	27	$394.64	$14.62	$1,055.59	$39.10	1	2	4	$1.592177
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1991	214	Cloquet-S InternationalFalls-C-Intrntnl-361 - 000G96 - 214	6	$35.63	$5.94	$95.30	$15.88	1	3	9	$1.200850
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1991	215	Cloquet-Silver Bau-C-Lake Superior-0381 - 000G96 - 215	5,705	$31,945.71	$5.60	$85,449.19	$14.98	1	3	9	$1.175512
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1991	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	3,620	$18,141.42	$5.01	$48,525.13	$13.40	1	3	9	$1.127105
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1991	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	2,188	$12,252.70	$5.60	$32,773.83	$14.98	1	3	9	$1.175512
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1991	52	Worthington-Ewington-T-Brewster-0513 - 000G99 - 052	839	$32,772.02	$39.06	$87,659.42	$104.48	1	4	16	$2.019033
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1991	59	Worthington-Ivanhoe-C-Ivanhoe-0403 - 000G99 - 059	31	$1,218.23	$39.30	$3,258.55	$105.11	1	4	16	$2.021644
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1991	60	Worthington-Marble-T-Canby-0891 - 000G99 - 060	16,102	$628,971.47	$39.06	$1,682,388.72	$104.48	1	4	16	$2.019033
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1991	61	Worthington-Royal-T-Ivanhoe-0403 - 000G99 - 061	48,609	$1,434,779.83	$29.52	$3,837,785.21	$78.95	1	4	16	$1.897352
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1991	95	Worthington-Canby-C-Canby-0891 - 000G99 - 095	228	$8,906.84	$39.07	$23,824.24	$104.49	1	4	16	$2.019075
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1991	96	Worthington-Norman-T-Canby-0891 - 000G99 - 096	26,085	$1,018,939.49	$39.06	$2,725,485.01	$104.48	1	4	16	$2.019033
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1991	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	4,691	$183,232.31	$39.06	$490,114.40	$104.48	1	4	16	$2.019033
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1991	155	Rochester-Kalmar-T-Bryron-0531 - 000G95 - 155	1,062	$41,487.70	$39.07	$110,972.34	$104.49	1	4	16	$2.019075
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1991	214	Cloquet-S InternationalFalls-C-Intrntnl-361 - 000G96 - 214	2,701	$31,301.72	$11.59	$83,726.63	$31.00	1	4	16	$1.491362
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1991	215	Cloquet-Silver Bau-C-Lake Superior-0381 - 000G96 - 215	7,273	$84,287.29	$11.59	$225,453.77	$31.00	1	4	16	$1.491362
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1991	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	4,203	$46,450.31	$11.05	$124,246.46	$29.56	1	4	16	$1.470704
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1991	411	Bemidji-Marble-T-Ivanhoe-0403 - 000G97 - 411	15,856	$619,362.30	$39.06	$1,656,685.87	$104.48	1	4	16	$2.019033
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1992	220	Cloquet-Buhl-C-Mt Iron-Buhl-0712 - 000G96 - 220	10,070	$15,053.45	$1.49	$39,437.98	$3.92	0	1.25	1.5625	$0.593286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1992	223	Cloquet-Duluth-C-Proctor-0704 - 000G96 - 223	1,666	$2,490.93	$1.50	$6,525.90	$3.92	0	1.25	1.5625	$0.593286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1992	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	4,134	$6,184.58	$1.50	$16,202.75	$3.92	0	1.25	1.5625	$0.593286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1992	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	1,083	$1,619.54	$1.50	$4,242.97	$3.92	0	1.25	1.5625	$0.593286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1992	228	Cloquet-Grand Lake-T-Proctor-0704 - 000G96 - 228	1,513	$2,262.81	$1.50	$5,928.25	$3.92	0	1.25	1.5625	$0.593286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1992	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	7,820	$12,637.74	$1.62	$33,109.14	$4.23	0	1.25	1.5625	$0.626340
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1992	232	Cloquet-Hibbing-C-Hibbing-0701 - 000G96 - 232	192	$288.64	$1.50	$756.20	$3.94	0	1.25	1.5625	$0.595496
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1992	235	Cloquet-Leonidas-C-Eveleth-Gilbert-2154 - 000G96 - 235	1,603	$2,395.47	$1.49	$6,275.81	$3.92	0	1.25	1.5625	$0.593286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1992	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	5,924	$8,856.41	$1.50	$23,202.58	$3.92	0	1.25	1.5625	$0.593286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1992	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	81	$121.11	$1.50	$317.29	$3.92	0	1.25	1.5625	$0.593286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1992	348	Cloquet-Floodwood-C-Floodwood-0698 - 000G96 - 348	308	$459.69	$1.49	$1,204.32	$3.91	0	1.25	1.5625	$0.592177

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1992	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	86	$1,470.04	$17.09	$3,851.30	$44.78	0	1	1	$1.651084
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1992	159	Rochester-Oronoco-C-Rochester-0535 - 000G95 - 159	249	$4,237.18	$17.02	$11,100.83	$44.58	0	1	1	$1.649140
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1992	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	2,417	$7,695.44	$3.18	$20,160.99	$8.34	0	1	1	$0.921166
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1992	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	1,220	$3,203.57	$2.63	$8,392.91	$6.88	0	1	1	$0.837588
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1992	228	Cloquet-Grand Lake-T-Proctor-0704 - 000G96 - 228	3,443	$5,145.68	$1.49	$13,480.98	$3.92	0	1	1	$0.593286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1992	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	5,449	$8,146.13	$1.49	$21,341.74	$3.92	0	1	1	$0.593286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1992	235	Cloquet-Leonidas-C-Eveleth-Gilbert-2154 - 000G96 - 235	87	$129.48	$1.49	$339.22	$3.90	0	1	1	$0.591065
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1992	348	Cloquet-Floodwood-C-Floodwood-0698 - 000G96 - 348	229	$342.09	$1.49	$896.23	$3.91	0	1	1	$0.592177
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	77	Fairmont-Welcome-C-Martin Cty W-2448 - 000G94 - 077	279	$4,727.19	$16.94	$12,384.59	$44.39	0	2	4	$1.647285
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	2,440	$41,420.58	$16.98	$108,516.25	$44.47	0	2	4	$1.648067
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	3,100	$52,604.91	$16.97	$137,817.66	$44.46	0	2	4	$1.647969
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	117	Rochester-Peterson-C-Rushford-Peterson-0239 - 000G95 - 117	7,254	$123,092.97	$16.97	$322,486.72	$44.46	0	2	4	$1.647969
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	2,319	$39,345.23	$16.97	$103,079.11	$44.45	0	2	4	$1.647872
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	105	$1,781.74	$16.97	$4,667.92	$44.46	0	2	4	$1.647969
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	1,636	$27,757.84	$16.97	$72,721.74	$44.45	0	2	4	$1.647872
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	1,068	$18,130.51	$16.98	$47,499.45	$44.48	0	2	4	$1.648165
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	1,537	$26,086.03	$16.97	$68,341.83	$44.46	0	2	4	$1.647969
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	2,964	$50,288.27	$16.97	$131,748.38	$44.45	0	2	4	$1.647872
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	140	Rochester-Brownsdale-C-Hayfield-0203 - 000G95 - 140	183	$3,084.20	$16.85	$8,080.18	$44.15	0	2	4	$1.644931
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	2,099	$35,636.77	$16.98	$93,363.46	$44.48	0	2	4	$1.648165
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	159	Rochester-Oronoco-C-Rochester-0535 - 000G95 - 159	28,857	$489,678.63	$16.97	$1,282,890.93	$44.46	0	2	4	$1.647969
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	1,105	$19,600.55	$17.74	$51,350.76	$46.47	0	2	4	$1.667173
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	216	$3,660.69	$16.95	$9,590.51	$44.40	0	2	4	$1.647383
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	167	Rochester-Elgin-C-Elgin-Millville-2899 - 000G95 - 167	934	$15,849.90	$16.97	$41,524.56	$44.46	0	2	4	$1.647969
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	3,937	$66,825.06	$16.97	$175,072.51	$44.47	0	2	4	$1.648067
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	263	$4,467.77	$16.99	$11,704.95	$44.51	0	2	4	$1.648458
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	220	Cloquet-Buhl-C-Mt Iron-Buhl-0712 - 000G96 - 220	12,941	$19,343.22	$1.49	$50,676.58	$3.92	0	2	4	$0.593286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	223	Cloquet-Duluth-C-Proctor-0704 - 000G96 - 223	21,197	$31,850.10	$1.50	$83,442.90	$3.94	0	2	4	$0.595496
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	29,589	$44,227.16	$1.49	$115,869.11	$3.92	0	2	4	$0.593286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	225	Cloquet-Fayal-T-Eveleth-Gilbert-2154 - 000G96 - 225	39,181	$58,562.97	$1.49	$153,426.95	$3.92	0	2	4	$0.593286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	226	Cloquet-Floodwood-T-Floodwood-0698 - 000G96 - 226	2,453	$3,666.68	$1.49	$9,606.21	$3.92	0	2	4	$0.593286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	4,533	$6,774.19	$1.49	$17,747.45	$3.92	0	2	4	$0.593286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	228	Cloquet-Grand Lake-T-Proctor-0704 - 000G96 - 228	14,154	$21,156.42	$1.49	$55,426.92	$3.92	0	2	4	$0.593286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	229	Cloquet-Great Scott-T-Mt Iron-Buhl-0712 - 000G96 - 229	126	$330.33	$2.62	$865.43	$6.87	0	2	4	$0.836957
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	76,840	$114,901.52	$1.50	$301,026.23	$3.92	0	2	4	$0.593286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	232	Cloquet-Hibbing-C-Hibbing-0701 - 000G96 - 232	5,350	$7,996.46	$1.49	$20,949.63	$3.92	0	2	4	$0.593286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	236	Cloquet-Midway-T-Proctor-0704 - 000G96 - 236	3,342	$4,996.01	$1.49	$13,088.86	$3.92	0	2	4	$0.593286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	309	Rochester-Oronoco-T-Rochester-0535 - 000G95 - 309	21	$356.35	$16.97	$933.59	$44.46	0	2	4	$1.647969
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	348	Cloquet-Floodwood-C-Floodwood-0698 - 000G96 - 348	20,171	$30,151.04	$1.49	$78,991.59	$3.92	0	2	4	$0.593286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1992	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	7,321	$124,232.43	$16.97	$325,471.95	$44.46	0	2	4	$1.647969
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1992	117	Rochester-Peterson-C-Rushford-Peterson-0239 - 000G95 - 117	1,860	$31,561.52	$16.97	$82,686.86	$44.46	0	3	9	$1.647969
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1992	120	Rochester-Rushford-V-Rushford-Peterson-0239 - 000G95 - 120	14,495	$245,959.25	$16.97	$644,379.54	$44.46	0	3	9	$1.647969
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1992	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	116	$1,960.06	$16.90	$5,135.09	$44.27	0	3	9	$1.646110
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1992	220	Cloquet-Buhl-C-Mt Iron-Buhl-0712 - 000G96 - 220	6,253	$9,346.95	$1.49	$24,487.73	$3.92	0	3	9	$0.593286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1992	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	10,109	$12,710.31	$1.26	$33,299.27	$3.29	0	3	9	$0.517196
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1992	225	Cloquet-Fayal-T-Eveleth-Gilbert-2154 - 000G96 - 225	4,559	$6,813.39	$1.49	$17,850.15	$3.92	0	3	9	$0.593286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1992	229	Cloquet-Great Scott-T-Mt Iron-Buhl-0712 - 000G96 - 229	3,095	$4,660.77	$1.51	$12,210.58	$3.95	0	3	9	$0.596597
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1992	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	43,223	$64,607.52	$1.49	$169,262.86	$3.92	0	3	9	$0.593286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1992	235	Cloquet-Leonidas-C-Eveleth-Gilbert-2154 - 000G96 - 235	3,297	$4,413.30	$1.34	$11,562.24	$3.51	0	3	9	$0.545307
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1992	236	Cloquet-Midway-T-Proctor-0704 - 000G96 - 236	12,428	$18,576.46	$1.49	$48,667.78	$3.92	0	3	9	$0.593286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1992	220	Cloquet-Buhl-C-Mt Iron-Buhl-0712 - 000G96 - 220	592	$2,522.95	$4.26	$6,609.78	$11.17	0	0.75	0.5625	$1.048053
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1992	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	88	$131.85	$1.50	$345.43	$3.93	0	0.75	0.5625	$0.594393
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1992	226	Cloquet-Floodwood-T-Floodwood-0698 - 000G96 - 226	23	$174.86	$7.60	$458.11	$19.92	0	0.75	0.5625	$1.299289
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1992	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	233	$477.51	$2.05	$1,251.01	$5.37	0	0.75	0.5625	$0.729974
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1992	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	117	$174.61	$1.49	$457.45	$3.91	0	0.75	0.5625	$0.592177
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1992	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	633	$16,602.82	$26.23	$43,497.11	$68.72	0	4	16	$1.837083
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1992	35	Pine City-Scandia-C-Forest Lake-0831 - 000G98 - 035	7,102	$241,029.15	$33.94	$631,463.36	$88.91	0	4	16	$1.948951
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1992	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	708	$24,010.68	$33.91	$62,904.69	$88.85	0	4	16	$1.948657
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1992	117	Rochester-Peterson-C-Rushford-Peterson-0239 - 000G95 - 117	1,496	$50,766.11	$33.93	$133,000.25	$88.90	0	4	16	$1.948902
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1992	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	1,714	$58,167.52	$33.94	$152,390.93	$88.91	0	4	16	$1.948951
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1992	120	Rochester-Rushford-V-Rushford-Peterson-0239 - 000G95 - 120	230	$7,804.95	$33.93	$20,447.90	$88.90	0	4	16	$1.948902
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1992	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	548	$18,591.70	$33.93	$48,707.71	$88.88	0	4	16	$1.948804
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1992	131	Rochester-Wanamingo-C-Kenyon-Wanamingo-2172 - 000G95 - 131	9	$317.07	$35.23	$830.68	$92.30	0	4	16	$1.965202
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1992	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	180	$1,354.74	$7.53	$3,549.23	$19.72	0	4	16	$1.294907
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1992	159	Rochester-Oronoco-C-Rochester-0535 - 000G95 - 159	15,397	$537,150.43	$34.89	$1,407,260.55	$91.40	0	4	16	$1.960946
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1992	220	Cloquet-Buhl-C-Mt Iron-Buhl-0712 - 000G96 - 220	373	$1,115.37	$2.99	$2,922.12	$7.83	0	4	16	$0.893762
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1992	223	Cloquet-Duluth-C-Proctor-0704 - 000G96 - 223	405	$1,211.59	$2.99	$3,174.20	$7.84	0	4	16	$0.894316

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1992	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	5,563	$16,630.93	$2.99	$43,570.76	$7.83	0	4	16	$0.893762
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1992	225	Cloquet-Fayal-T-Eveleth-Gilbert-2154 - 000G96 - 225	7,473	$22,339.36	$2.99	$58,526.06	$7.83	0	4	16	$0.893762
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1992	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	216	$644.99	$2.99	$1,689.79	$7.82	0	4	16	$0.893207
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1992	230	Cloquet-Halden-T-Floodwood-0698 - 000G96 - 230	4,991	$14,920.32	$2.99	$39,089.19	$7.83	0	4	16	$0.893762
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1992	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	30,410	$90,910.62	$2.99	$238,173.37	$7.83	0	4	16	$0.893762
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1992	235	Cloquet-Leonidas-C-Eveleth-Gilbert-2154 - 000G96 - 235	381	$1,136.75	$2.98	$2,978.13	$7.82	0	4	16	$0.893207
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1992	309	Rochester-Oronoco-T-Rochester-0535 - 000G95 - 309	651	$22,539.33	$34.62	$59,049.96	$90.71	0	4	16	$1.957655
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1992	348	Cloquet-Floodwood-C-Floodwood-0698 - 000G96 - 348	3,400	$10,163.06	$2.99	$26,625.83	$7.83	0	4	16	$0.893762
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1992	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	4,160	$12,437.20	$2.99	$32,583.76	$7.83	0	6	36	$0.893762
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1992	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	11,592	$34,654.28	$2.99	$90,789.47	$7.83	0	6	36	$0.893762
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1992	236	Cloquet-Midway-T-Proctor-0704 - 000G96 - 236	664	$1,984.86	$2.99	$5,200.06	$7.83	0	6	36	$0.893762
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1992	220	Cloquet-Buhl-C-Mt Iron-Buhl-0712 - 000G96 - 220	278	$1,315.41	$4.73	$3,446.19	$12.40	1	1.25	1.5625	$1.093422
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1992	223	Cloquet-Duluth-C-Proctor-0704 - 000G96 - 223	206	$972.83	$4.72	$2,548.68	$12.37	1	1.25	1.5625	$1.092370
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1992	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	17,001	$76,165.76	$4.48	$199,543.86	$11.74	1	1.25	1.5625	$1.069668
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1992	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	19,874	$93,870.98	$4.72	$245,929.10	$12.37	1	1.25	1.5625	$1.092370
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1992	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	340	$1,817.38	$5.35	$4,761.29	$14.00	1	1	1	$1.146128
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1992	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	181	$9,704.00	$53.61	$25,423.15	$140.46	1	2	4	$2.147553
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1992	175	Rochester-Utica-T-Lewiston-Altura-0857 - 000G95 - 175	135	$7,206.09	$53.38	$18,878.97	$139.84	1	2	4	$2.145631
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1992	220	Cloquet-Buhl-C-Mt Iron-Buhl-0712 - 000G96 - 220	59	$274.39	$4.65	$718.86	$12.18	1	2	4	$1.085647
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1992	223	Cloquet-Duluth-C-Proctor-0704 - 000G96 - 223	5,425	$25,624.47	$4.72	$67,132.60	$12.37	1	2	4	$1.092370
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1992	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	18,046	$85,234.28	$4.72	$223,302.14	$12.37	1	2	4	$1.092370
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1992	225	Cloquet-Fayal-T-Eveleth-Gilbert-2154 - 000G96 - 225	13	$64.14	$4.93	$168.04	$12.93	1	2	4	$1.111599
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1992	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	5,441	$25,698.23	$4.72	$67,325.84	$12.37	1	2	4	$1.092370
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1992	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	114	$2,436.72	$21.37	$6,383.87	$56.00	1	2	4	$1.748188
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1992	236	Cloquet-Midway-T-Proctor-0704 - 000G96 - 236	3,401	$16,064.19	$4.72	$42,085.98	$12.37	1	2	4	$1.092370
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1992	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	54	$255.06	$4.72	$668.22	$12.37	1	2	4	$1.092370
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1992	396	Cloquet-Balkan-T-Chisholm - 000G96 - 396	3,841	$18,145.28	$4.72	$47,538.15	$12.38	1	2	4	$1.092721
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1992	220	Cloquet-Buhl-C-Mt Iron-Buhl-0712 - 000G96 - 220	4,474	$21,132.27	$4.72	$55,363.65	$12.37	1	3	9	$1.092370
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1992	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	8,679	$41,544.07	$4.79	$108,839.77	$12.54	1	3	9	$1.098298
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1992	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	2,953	$13,949.81	$4.72	$36,546.59	$12.38	1	3	9	$1.092721
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1992	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	2,172	$10,261.84	$4.72	$26,884.61	$12.38	1	3	9	$1.092721
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1992	229	Cloquet-Great Scott-T-Mt Iron-Buhl-0712 - 000G96 - 229	88	$415.65	$4.72	$1,088.95	$12.37	1	3	9	$1.092370
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1992	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	6,405	$30,333.05	$4.74	$79,468.44	$12.41	1	3	9	$1.093772
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1992	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	111	$524.01	$4.72	$1,372.84	$12.37	1	0.75	0.5625	$1.092370
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1992	35	Pine City-Scandia-C-Forest Lake-0831 - 000G98 - 035	6,603	$989,280.29	$149.82	$2,591,778.84	$392.52	1	4	16	$2.593862
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1992	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	108	$16,199.28	$149.99	$42,439.89	$392.96	1	4	16	$2.594348
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1992	131	Rochester-Wanamingo-C-Kenyon-Wanamingo-2172 - 000G95 - 131	119	$17,813.44	$149.69	$46,668.77	$392.17	1	4	16	$2.593474
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1992	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	5,008	$66,092.01	$13.20	$173,152.00	$34.58	1	4	16	$1.538825
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1992	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	4,020	$53,049.63	$13.20	$138,982.76	$34.57	1	4	16	$1.538699
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1992	226	Cloquet-Floodwood-T-Floodwood-0698 - 000G96 - 226	134	$1,771.05	$13.22	$4,639.91	$34.63	1	4	16	$1.539452
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1992	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	3,950	$52,126.69	$13.20	$136,564.79	$34.57	1	4	16	$1.538699
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1992	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	17,486	$230,353.34	$13.17	$603,494.20	$34.51	1	4	16	$1.537945
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1992	236	Cloquet-Midway-T-Proctor-0704 - 000G96 - 236	2,805	$37,009.94	$13.19	$96,960.97	$34.57	1	4	16	$1.538699
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1992	317	Pine City-Scandia-C-Chisago Lakes-2144 - 000G98 - 317	31	$4,669.54	$150.63	$12,233.56	$394.63	1	4	16	$2.596190
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1992	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	7,154	$195,035.88	$27.26	$510,967.28	$71.42	1	6	36	$1.853820
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1992	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	6,815	$166,548.17	$24.44	$436,333.39	$64.03	1	6	36	$1.806384
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1992	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	2,512	$61,395.32	$24.44	$160,847.33	$64.03	1	6	36	$1.806384
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1993	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	6,488	$10,070.41	$1.55	$26,383.09	$4.07	0	1.25	1.5625	$0.609594
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1993	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	2,487	$3,862.82	$1.55	$10,120.06	$4.07	0	1.25	1.5625	$0.609594
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1993	302	Cloquet-White-T-Mesabi E-2711 - 000G96 - 302	556	$862.36	$1.55	$2,259.27	$4.06	0	1.25	1.5625	$0.608526
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1993	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	534	$830.29	$1.55	$2,175.25	$4.07	0	1	1	$0.609594
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1993	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	277	$431.18	$1.56	$1,129.63	$4.08	0	1	1	$0.610660
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1993	302	Cloquet-White-T-Mesabi E-2711 - 000G96 - 302	400	$620.05	$1.55	$1,624.45	$4.06	0	1	1	$0.608526
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1993	65	Worthington-Tracy-C-Tracy-0417 - 000G99 - 065	642	$28,181.76	$43.90	$73,832.35	$115.00	0	2	4	$2.060698
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1993	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	1,050	$46,152.74	$43.95	$120,913.86	$115.16	0	2	4	$2.061302
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1993	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	528	$23,178.48	$43.90	$60,724.44	$115.01	0	2	4	$2.060736
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1993	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	219	$9,598.14	$43.83	$25,145.81	$114.82	0	2	4	$2.060018
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1993	159	Rochester-Oronoco-C-Rochester-0535 - 000G95 - 159	2,405	$105,579.50	$43.90	$276,603.83	$115.01	0	2	4	$2.060736
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1993	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	735	$32,192.98	$43.80	$84,341.20	$114.75	0	2	4	$2.059753
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1993	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	507	$22,259.51	$43.90	$58,316.87	$115.02	0	2	4	$2.060773
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1993	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	2,844	$124,877.88	$43.91	$327,162.94	$115.04	0	2	4	$2.060849
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1993	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	218	$338.53	$1.55	$886.90	$4.07	0	2	4	$0.609594
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1993	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	49,508	$77,210.00	$1.56	$202,279.62	$4.09	0	2	4	$0.611723
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1993	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	14,024	$21,998.06	$1.57	$57,631.91	$4.11	0	2	4	$0.613842
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1993	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	1,326	$58,201.46	$43.89	$152,479.85	$114.99	0	2	4	$2.060660
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1993	302	Cloquet-White-T-Mesabi E-2711 - 000G96 - 302	3,016	$4,682.42	$1.55	$12,267.30	$4.07	0	2	4	$0.609594
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1993	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	7,746	$12,023.20	$1.55	$31,499.14	$4.07	0	3	9	$0.609594

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1993	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	8,513	$13,213.41	$1.55	$34,617.32	$4.07	0	3	9	$0.609594
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1993	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	842	$1,307.80	$1.55	$3,426.26	$4.07	0	0.75	0.5625	$0.609594
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	1993	302	Cloquet-White-T-Mesabi E-2711 - 000G96 - 302	508	$787.53	$1.55	$2,063.22	$4.06	0	0.75	0.5625	$0.608526
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1993	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	1,498	$131,514.88	$87.79	$344,550.97	$230.01	0	4	16	$2.361747
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1993	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	1,861	$163,329.56	$87.76	$427,901.07	$229.93	0	4	16	$2.361596
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1993	223	Cloquet-Duluth-C-Proctor-0704 - 000G96 - 223	4	$12.42	$3.11	$32.54	$8.14	0	4	16	$0.910624
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1993	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	2,779	$8,627.20	$3.10	$22,602.08	$8.13	0	4	16	$0.910091
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1993	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	3,283	$10,193.40	$3.10	$26,705.31	$8.13	0	4	16	$0.910091
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1993	380	Rochester-St Charles-T-St Charles - 000G95 - 380	1,435	$125,941.92	$87.76	$329,950.58	$229.93	0	4	16	$2.361596
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1993	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	6,609	$20,518.55	$3.10	$53,755.79	$8.13	0	6	36	$0.910091
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1993	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	165	$808.91	$4.90	$2,119.23	$12.84	1	1.25	1.5625	$1.108565
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1993	302	Cloquet-White-T-Mesabi E-2711 - 000G96 - 302	1,979	$9,706.31	$4.90	$25,429.20	$12.85	1	1.25	1.5625	$1.108903
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	1993	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	160	$783.97	$4.90	$2,053.89	$12.84	1	1	1	$1.108565
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1993	223	Cloquet-Duluth-C-Proctor-0704 - 000G96 - 223	7	$34.33	$4.90	$89.94	$12.85	1	2	4	$1.108903
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1993	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	1,334	$6,541.80	$4.90	$17,138.62	$12.85	1	2	4	$1.108903
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1993	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	29,778	$146,051.67	$4.90	$382,635.37	$12.85	1	2	4	$1.108903
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1993	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	2,261	$11,092.20	$4.91	$29,060.04	$12.85	1	3	9	$1.108903
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1993	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	6,940	$34,043.93	$4.91	$89,190.44	$12.85	1	3	9	$1.108903
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1993	302	Cloquet-White-T-Mesabi E-2711 - 000G96 - 302	62	$304.17	$4.91	$796.88	$12.85	1	0.75	0.5625	$1.108903
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1993	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	2,563	$993,100.74	$387.48	$2,601,787.90	$1,015.13	1	4	16	$3.006522
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1993	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	8,048	$110,295.48	$13.70	$288,959.05	$35.90	1	4	16	$1.555094
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1993	302	Cloquet-White-T-Mesabi E-2711 - 000G96 - 302	2,182	$29,904.56	$13.71	$78,345.85	$35.91	1	4	16	$1.555215
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1994	176	Wadena-Aitkin-C-Aitkin-0001 - 000G89 - 176	447	$1,117.00	$2.50	$2,678.70	$5.99	0	1.25	1.5625	$0.777427
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1994	194	Wadena-Deerwood-T-Crosby-Ironton-0182 - 000G89 - 194	349	$3,336.49	$9.56	$8,001.30	$22.93	0	1.25	1.5625	$1.360404
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1994	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	96	$944.68	$9.84	$2,265.46	$23.60	0	1.25	1.5625	$1.372912
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	553	$10,078.74	$18.23	$24,170.02	$43.71	0	2	4	$1.640581
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	77	Fairmont-Welcome-C-Martin Cty W-2448 - 000G94 - 077	175	$3,189.81	$18.23	$7,649.54	$43.71	0	2	4	$1.640581
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	1,074	$19,562.26	$18.21	$46,912.63	$43.68	0	2	4	$1.640283
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	718	$13,054.12	$18.18	$31,305.33	$43.60	0	2	4	$1.639486
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	644	$11,713.86	$18.19	$28,091.23	$43.62	0	2	4	$1.639686
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	112	Rochester-Fountain-C-Fillmore Central-2198 - 000G95 - 112	106	$2,565.02	$24.20	$6,151.23	$58.03	0	2	4	$1.763653
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	113	Rochester-Harmony-C-Fillmore Central-2198 - 000G95 - 113	479	$8,738.48	$18.24	$20,955.92	$43.75	0	2	4	$1.640978
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	519	$9,462.22	$18.23	$22,691.53	$43.72	0	2	4	$1.640680
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	1,202	$21,899.82	$18.22	$52,518.38	$43.69	0	2	4	$1.640382
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	752	$13,697.44	$18.21	$32,848.09	$43.68	0	2	4	$1.640283
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	606	$11,043.73	$18.22	$26,484.18	$43.70	0	2	4	$1.640481
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	2,983	$56,308.62	$18.88	$135,034.78	$45.27	0	2	4	$1.655810
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	3,980	$72,490.11	$18.21	$173,839.92	$43.68	0	2	4	$1.640283
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	136	Rochester-La Crescent-T-LaCrescent-Hokah-0300 - 000G95 - 136	5,373	$97,856.72	$18.21	$234,672.07	$43.68	0	2	4	$1.640283
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	573	$10,448.70	$18.24	$25,057.23	$43.73	0	2	4	$1.640779
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	366	$6,674.49	$18.24	$16,006.22	$43.73	0	2	4	$1.640779
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	150	Rochester-Elmira-T-Chatfield-0227 - 000G95 - 150	932	$16,994.48	$18.23	$40,754.79	$43.73	0	2	4	$1.640779
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	563	$10,266.38	$18.24	$24,620.00	$43.73	0	2	4	$1.640779
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	155	Rochester-Kalmar-T-Bryron-0531 - 000G95 - 155	1,899	$34,576.15	$18.21	$82,917.73	$43.66	0	2	4	$1.640084
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	162	Rochester-Salem-T-Bryron-0531 - 000G95 - 162	3,319	$60,453.49	$18.21	$144,974.67	$43.68	0	2	4	$1.640283
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	1,909	$30,316.64	$15.88	$72,702.91	$38.08	0	2	4	$1.580697
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	463	$8,419.59	$18.18	$20,191.18	$43.61	0	2	4	$1.639586
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	169	Rochester-Plainview-T-Plainview-2899 - 000G95 - 169	4,091	$74,515.59	$18.21	$178,697.26	$43.68	0	2	4	$1.640283
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	171	Rochester-Lewiston-C-Lewiston-Altura-0857 - 000G95 - 171	850	$15,493.39	$18.23	$37,154.99	$43.71	0	2	4	$1.640581
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	275	$5,012.57	$18.23	$12,020.74	$43.71	0	2	4	$1.640581
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	194	Wadena-Deerwood-T-Crosby-Ironton-0182 - 000G89 - 194	713	$9,086.92	$12.74	$21,791.52	$30.56	0	2	4	$1.485153
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	195	Wadena-Irondale(Riverton)-T-Crosby-Ironton-0182 - 000G89 - 195	991	$12,625.73	$12.74	$30,278.00	$30.55	0	2	4	$1.485011
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	1,720	$21,911.03	$12.74	$52,545.26	$30.55	0	2	4	$1.485011
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	213	Cloquet-Ranier-C-International Falls-0361 - 000G96 - 213	234	$2,980.55	$12.74	$7,147.71	$30.55	0	2	4	$1.485011
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	3,495	$44,443.81	$12.72	$106,581.55	$30.50	0	2	4	$1.484300
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	252	Wadena-Straight River-T-Park Rapids-0309 - 000G89 - 252	3,155	$40,189.98	$12.74	$96,380.36	$30.55	0	2	4	$1.485011
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	253	Wadena-Todd-C-Park Rapids-0309 - 000G89 - 253	3,306	$38,504.75	$11.65	$92,338.97	$27.93	0	2	4	$1.446071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	258	Wadena-Motley-T-Staples-Motley-2170 - 000G89 - 258	150	$1,919.35	$12.80	$4,602.83	$30.69	0	2	4	$1.486997
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	264	Wadena-North-T-Thief River Falls-0564 - 000G89 - 264	654	$8,322.18	$12.73	$19,957.58	$30.52	0	2	4	$1.484585
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	266	Wadena-Rocksbury-T-Thief River Falls-0564 - 000G89 - 266	309	$3,935.93	$12.74	$9,438.83	$30.55	0	2	4	$1.485011
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	1,383	$17,611.78	$12.73	$42,235.15	$30.54	0	2	4	$1.484869
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	272	Wadena-Lake-T-Warroad-0690 - 000G89 - 272	9,336	$118,924.73	$12.74	$285,195.67	$30.55	0	2	4	$1.485011
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	9,806	$125,238.86	$12.77	$300,337.71	$30.63	0	2	4	$1.486147
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	274	Wadena-Spruce-T-Roseau-0682 - 000G89 - 274	923	$11,788.24	$12.77	$28,269.60	$30.63	0	2	4	$1.486147
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	283	Wadena-Aldrich-T-Verndale-818 - 000G89 - 283	277	$3,529.08	$12.74	$8,463.15	$30.55	0	2	4	$1.485011
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	290	Wadena-Verndale-C-Verndale-818 - 000G89 - 290	3,232	$41,176.83	$12.74	$98,746.95	$30.55	0	2	4	$1.485011
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	342	Bemidji-Eckels-T-Bemidji-0031 - 000G97 - 342	676	$12,303.57	$18.20	$29,505.43	$43.65	0	2	4	$1.639984

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1994	377	Rochester-Caledonia-T-Caledonia-0299 - 000G95 - 377	2,254	$41,047.74	$18.21	$98,437.37	$43.67	0	2	4	$1.640183
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1994	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	761	$13,858.27	$18.21	$33,233.78	$43.67	0	3	9	$1.640183
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1994	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	158	$2,009.32	$12.72	$4,818.59	$30.50	0	3	9	$1.484300
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1994	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	288	$3,673.76	$12.76	$8,810.11	$30.59	0	3	9	$1.485579
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1994	128	Rochester-Minneola-T-Zumbrota-Mazeppa-2805 - 000G95 - 128	4,632	$168,711.72	$36.42	$404,590.80	$87.35	0	4	16	$1.941263
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1994	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	614	$27,304.68	$44.47	$65,479.87	$106.64	0	4	16	$2.027920
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1994	136	Rochester-La Crescent-T-LaCrescent-Hokah-0300 - 000G95 - 136	16,076	$583,440.15	$36.29	$1,399,158.99	$87.03	0	4	16	$1.939669
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1994	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	3,525	$128,410.05	$36.43	$307,942.59	$87.36	0	4	16	$1.941313
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1994	155	Rochester-Kalmar-T-Bryron-0531 - 000G95 - 155	5,981	$217,885.17	$36.43	$522,514.60	$87.36	0	4	16	$1.941313
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1994	178	Wadena-Spencer-T-Aitkin-0001 - 000G89 - 178	3,108	$2,207.00	$0.71	$5,292.65	$1.70	0	4	16	$0.230449
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1994	257	Wadena-Motley-C-Staples-Motley-2170 - 000G89 - 257	3,072	$78,268.11	$25.48	$187,696.25	$61.10	0	4	16	$1.786041
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1994	258	Wadena-Motley-T-Staples-Motley-2170 - 000G89 - 258	42	$1,070.02	$25.48	$2,566.03	$61.10	0	4	16	$1.786041
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1994	272	Wadena-Lake-T-Warroad-0690 - 000G89 - 272	4,119	$104,934.47	$25.48	$251,645.36	$61.09	0	4	16	$1.785970
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1994	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	1,523	$38,791.87	$25.47	$93,027.53	$61.08	0	4	16	$1.785899
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1994	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	694	$39,457.21	$56.85	$94,623.09	$136.34	1	2	4	$2.134623
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1994	177	Wadena-Aitkin-T-Aitkin-0001 - 000G89 - 177	39	$1,559.47	$39.99	$3,739.79	$95.89	1	0.75	0.5625	$1.981773
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1995	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	1,148	$3,184.24	$2.77	$7,381.65	$6.43	0	1.25	1.5625	$0.808211
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1995	122	Rochester-Spring Valley-T-Kingsland-2137 - 000G95 - 122	143	$1,500.91	$10.48	$3,479.38	$24.30	0	1	1	$1.385606
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1995	434	Fairmont-Geneva-T-Albert Lea - 000G94 - 434	138	$1,447.49	$10.48	$3,355.55	$24.30	0	1	1	$1.385606
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	2,335	$55,535.16	$23.78	$128,740.60	$55.14	0	2	4	$1.741467
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	466	$11,075.83	$23.77	$25,675.79	$55.10	0	2	4	$1.741152
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	4,692	$111,705.12	$23.81	$258,952.77	$55.19	0	2	4	$1.741860
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	106	Rochester-West Concord-C-Triton-2125 - 000G95 - 106	317	$7,535.43	$23.77	$17,468.49	$55.11	0	2	4	$1.741230
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	113	Rochester-Harmony-C-Fillmore Central-2198 - 000G95 - 113	4,781	$111,475.92	$23.32	$258,421.45	$54.05	0	2	4	$1.732796
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	114	Rochester-Lanesboro-C-Lanesboro-0229 - 000G95 - 114	657	$15,630.96	$23.79	$36,235.41	$55.15	0	2	4	$1.741546
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	116	Rochester-Newburg-T-Mabel-Canton-0238 - 000G95 - 116	1,427	$33,948.11	$23.79	$78,697.89	$55.15	0	2	4	$1.741546
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	1,023	$24,335.63	$23.79	$56,414.42	$55.15	0	2	4	$1.741546
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	122	Rochester-Spring Valley-T-Kingsland-2137 - 000G95 - 122	3,878	$176,542.63	$45.52	$409,257.92	$105.53	0	2	4	$2.023376
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	128	Rochester-Minneola-T-Zumbrota-Mazeppa-2805 - 000G95 - 128	514	$12,230.22	$23.79	$28,351.87	$55.16	0	2	4	$1.741624
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	825	$19,624.50	$23.79	$45,493.16	$55.14	0	2	4	$1.741467
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	2,666	$63,397.44	$23.78	$146,966.79	$55.13	0	2	4	$1.741388
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	4,178	$92,473.87	$22.13	$214,371.25	$51.31	0	2	4	$1.710202
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	489	$11,637.42	$23.80	$26,977.66	$55.17	0	2	4	$1.741703
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	340	$8,080.68	$23.77	$18,732.49	$55.10	0	2	4	$1.741152
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	159	Rochester-Oronoco-C-Rochester-0535 - 000G95 - 159	616	$14,632.58	$23.75	$33,920.98	$55.07	0	2	4	$1.740915
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	1,363	$32,416.31	$23.78	$75,146.90	$55.13	0	2	4	$1.741388
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	2	$10,732.64	$5,366.32	$24,880.21	$12,440.11	0	2	4	$4.094824
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	179	Cloquet-Barnum-C-Barnum-0091 - 000G96 - 179	1,742	$10,461.88	$6.01	$24,252.54	$13.92	0	2	4	$1.143639
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	180	Cloquet-Carlton-C-Carlton-0093 - 000G96 - 180	168	$1,009.40	$6.01	$2,339.97	$13.93	0	2	4	$1.143951
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	2,542	$15,266.33	$6.01	$35,390.12	$13.92	0	2	4	$1.143639
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	140	$846.87	$6.05	$1,963.20	$14.02	0	2	4	$1.146748
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	190	Cloquet-Twin Lakes-T-Carlton-0093 - 000G96 - 190	806	$4,841.72	$6.01	$11,223.99	$13.93	0	2	4	$1.143951
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	194	Wadena-Deerwood-T-Crosby-Ironton-0182 - 000G89 - 194	2,460	$14,773.24	$6.01	$34,247.06	$13.92	0	2	4	$1.143639
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	364	$2,181.34	$5.99	$5,056.74	$13.89	0	2	4	$1.142702
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	205	Cloquet-Greenway-T-Greenway-0316 - 000G96 - 205	1,235	$7,416.56	$6.01	$17,192.93	$13.92	0	2	4	$1.143639
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	207	Cloquet-Laprairie-C-Greenway-0316 - 000G96 - 207	13	$78.04	$6.00	$180.91	$13.92	0	2	4	$1.143639
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	213	Cloquet-Ranier-C-International Falls-0361 - 000G96 - 213	183	$496.15	$2.71	$1,150.17	$6.29	0	2	4	$0.798651
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	215	Cloquet-Silver Bau-C-Lake Superior-0381 - 000G96 - 215	1,091	$6,552.58	$6.01	$15,190.07	$13.92	0	2	4	$1.143639
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	835	$5,021.36	$6.01	$11,640.43	$13.94	0	2	4	$1.144263
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	4,620	$13,626.96	$2.95	$31,589.77	$6.84	0	2	4	$0.835056
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	3,789	$22,756.03	$6.01	$52,752.61	$13.92	0	2	4	$1.143639
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	223	Cloquet-Duluth-C-Proctor-0704 - 000G96 - 223	276	$1,659.53	$6.01	$3,847.09	$13.94	0	2	4	$1.144263
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	225	Cloquet-Fayal-T-Eveleth-Gilbert-2154 - 000G96 - 225	1,272	$7,635.56	$6.00	$17,700.62	$13.92	0	2	4	$1.143639
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	1,180	$7,086.35	$6.01	$16,427.44	$13.92	0	2	4	$1.143639
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	5,482	$32,925.78	$6.01	$76,327.94	$13.92	0	2	4	$1.143639
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	1,143	$6,980.29	$6.11	$16,181.58	$14.16	0	2	4	$1.151063
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	255	Wadena-Baudette-C-Lake of Woods-0390 - 000G89 - 255	425	$2,549.17	$6.00	$5,909.44	$13.90	0	2	4	$1.143015
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	257	Wadena-Motley-C-Staples-Motley-2170 - 000G89 - 257	878	$5,277.99	$6.01	$12,235.34	$13.94	0	2	4	$1.144263
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	175	$1,052.18	$6.01	$2,439.14	$13.94	0	2	4	$1.144263
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	272	Wadena-Lake-T-Warroad-0690 - 000G89 - 272	357	$2,138.57	$5.99	$4,957.59	$13.89	0	2	4	$1.142702
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	644	$3,866.53	$6.00	$8,963.32	$13.92	0	2	4	$1.143639
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	277	Wadena-Bertha-C-Bertha-Hewitt-0786 - 000G89 - 277	81	$487.59	$6.02	$1,130.32	$13.95	0	2	4	$1.144574
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	177	$1,069.28	$6.04	$2,478.79	$14.00	0	2	4	$1.146128
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	251	$1,514.11	$6.03	$3,509.98	$13.98	0	2	4	$1.145507
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	322	Wadena-Staples-T-Staples-Motley-2170- 000G89 - 322	2,745	$16,484.67	$6.01	$38,214.46	$13.92	0	2	4	$1.143639
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	348	Cloquet-Floodwood-C-Floodwood-0698 - 000G96 - 348	345	$2,070.14	$6.00	$4,798.96	$13.91	0	2	4	$1.143327
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	377	Rochester-Caledonia-T-Caledonia-0299 - 000G95 - 377	720	$17,128.54	$23.79	$39,707.07	$55.15	0	2	4	$1.741546

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	5,195	$123,514.74	$23.78	$286,329.63	$55.12	0	2	4	$1.741309
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1995	467	Rochester-Wykoff-C-Kingsland - 000G95 - 467	15,369	$699,660.59	$45.52	$1,621,940.46	$105.53	0	2	4	$2.023376
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1995	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	187	$248.49	$1.33	$576.05	$3.09	0	3	9	$0.489958
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1995	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	8,165	$388,090.95	$47.53	$899,665.38	$110.19	0	4	16	$2.042142
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1995	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	1,996	$94,904.56	$47.55	$220,006.03	$110.22	0	4	16	$2.042260
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1995	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	311	$14,788.58	$47.55	$34,282.62	$110.23	0	4	16	$2.042300
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1995	215	Cloquet-Silver Bau-C-Lake Superior-0381 - 000G96 - 215	243	$2,917.01	$12.00	$6,762.16	$27.83	0	4	16	$1.444513
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1995	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	23,803	$285,883.96	$12.01	$662,731.00	$27.84	0	4	16	$1.444669
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1995	223	Cloquet-Duluth-C-Proctor-0704 - 000G96 - 223	4,770	$57,298.19	$12.01	$132,827.63	$27.85	0	4	16	$1.444825
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1995	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	2	$24.02	$12.01	$55.68	$27.84	0	4	16	$1.444669
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1995	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	1,276	$11,659.48	$9.14	$27,028.79	$21.18	0	4	16	$1.325926
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1995	257	Wadena-Motley-C-Staples-Motley-2170 - 000G89 - 257	674	$8,100.90	$12.02	$18,779.36	$27.86	0	4	16	$1.444981
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1995	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	3,968	$188,667.99	$47.55	$437,366.70	$110.22	0	4	16	$2.042260
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1995	434	Fairmont-Geneva-T-Albert Lea - 000G94 - 434	1,935	$50,826.36	$26.27	$117,824.74	$60.90	0	4	16	$1.784617
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1995	441	Fairmont-Hollandale-C-Albert Lea - 000G94 - 441	3,206	$84,231.52	$26.27	$195,263.98	$60.90	0	4	16	$1.784617
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1995	454	Fairmont-Newry-T-Albert Lea - 000G94 - 454	688	$18,074.50	$26.27	$41,899.98	$60.90	0	4	16	$1.784617
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1995	460	Fairmont-Riceland-T-Albert Lea - 000G94 - 460	4,451	$116,918.07	$26.27	$271,037.34	$60.90	0	4	16	$1.784617
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1995	467	Rochester-Wykoff-C-Kingsland - 000G95 - 467	2,431	$63,870.49	$26.27	$148,063.41	$60.90	0	4	16	$1.784617
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1995	468	Rochester-Lyle-C-Lyle - 000G95 - 468	3,845	$101,021.21	$26.27	$234,185.53	$60.90	0	4	16	$1.784617
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1995	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	6,212	$50,191.72	$8.08	$116,353.53	$18.73	0	6	36	$1.272538
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1995	122	Rochester-Spring Valley-T-Kingsland-2137 - 000G95 - 122	11,833	$95,609.02	$8.08	$221,639.09	$18.73	0	6	36	$1.272538
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1995	432	Rochester-Fillmore-T-Kingsland - 000G95 - 432	20,749	$167,643.87	$8.08	$388,628.97	$18.73	0	6	36	$1.272538
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1995	434	Fairmont-Geneva-T-Albert Lea - 000G94 - 434	5,132	$41,464.12	$8.08	$96,121.37	$18.73	0	6	36	$1.272538
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1995	435	Fairmont-Geneva-T-Blooming Prairie - 000G94 - 435	19,401	$156,750.48	$8.08	$363,376.11	$18.73	0	6	36	$1.272538
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1995	436	Fairmont-Geneva-T-N.R.H.E.G. - 000G94 - 436	7,370	$59,547.31	$8.08	$138,041.49	$18.73	0	6	36	$1.272538
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	1995	467	Rochester-Wykoff-C-Kingsland - 000G95 - 467	180	$1,457.28	$8.08	$3,378.24	$18.73	0	6	36	$1.272538
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1995	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	72	$1,377.24	$19.13	$3,192.69	$44.34	1	2	4	$1.646796
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1995	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	10	$2,020.02	$202.00	$4,682.77	$468.28	1	2	4	$2.670506
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1995	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	4	$808.01	$202.00	$1,873.11	$468.28	1	2	4	$2.670506
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1995	123	Fairmont-Glenville-C-Glenville-Emmons-2886 - 000G94 - 123	6	$26.81	$4.59	$62.15	$10.64	1	3	9	$1.026942
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1995	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	15	$70.89	$4.59	$164.34	$10.64	1	3	9	$1.026942
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1995	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	12	$641.57	$53.46	$1,487.28	$123.94	1	4	16	$2.093211
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1995	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	12	$2,937.29	$244.77	$6,809.17	$567.43	1	4	16	$2.753912
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	1995	122	Rochester-Spring Valley-T-Kingsland-2137 - 000G95 - 122	27	$1,361.42	$50.42	$3,156.02	$116.89	1	6	36	$2.067777
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1996	192	Wadena-Deerwood-C-Crosby-Ironton-0182 - 000G89 - 192	608	$1,170.00	$1.92	$2,679.79	$4.41	0	1.25	1.5625	$0.644439
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1996	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	390	$3,097.87	$7.94	$7,095.42	$18.19	0	1.25	1.5625	$1.259833
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1996	322	Wadena-Staples-T-Staples-Motley-2170- 000G89 - 322	800	$6,354.61	$7.94	$14,554.72	$18.19	0	1.25	1.5625	$1.259833
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	178	$2,138.61	$12.01	$4,898.31	$27.52	0	2	4	$1.439648
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	28	Cloquet-Windmere-T-Moose Lake-0097 - 000G96 - 028	328	$3,679.33	$11.22	$8,427.21	$25.69	0	2	4	$1.409764
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	2,021	$22,604.90	$11.19	$51,774.70	$25.62	0	2	4	$1.408579
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	89	Fairmont-Ellendale-C-NRHEG-2168 - 000G94 - 089	152	$1,701.69	$11.20	$3,897.58	$25.64	0	2	4	$1.408918
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	2,757	$30,257.83	$10.97	$69,303.12	$25.14	0	2	4	$1.400365
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	930	$10,394.12	$11.18	$23,806.89	$25.60	0	2	4	$1.408240
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	2,797	$31,297.33	$11.19	$71,684.00	$25.63	0	2	4	$1.408749
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	2,349	$26,261.24	$11.18	$60,149.25	$25.61	0	2	4	$1.408410
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	124	Fairmont-Hayward-C-Albert Lea-0241 - 000G94 - 124	1,076	$12,026.82	$11.18	$27,546.46	$25.60	0	2	4	$1.408240
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	1,454	$16,281.05	$11.20	$37,290.43	$25.65	0	2	4	$1.409087
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	131	Rochester-Wanamingo-C-Kenyon-Wanamingo-2172 - 000G95 - 131	1,054	$11,796.86	$11.19	$27,019.75	$25.64	0	2	4	$1.408918
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	645	$7,220.69	$11.19	$16,538.41	$25.64	0	2	4	$1.408918
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	814	$9,106.35	$11.19	$20,857.36	$25.62	0	2	4	$1.408579
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	7,810	$87,381.36	$11.19	$200,139.94	$25.63	0	2	4	$1.408749
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	136	Rochester-La Crescent-T-LaCrescent-Hokah-0300 - 000G95 - 136	471	$5,269.47	$11.19	$12,069.29	$25.62	0	2	4	$1.408579
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	623	$4,179.23	$6.71	$9,572.19	$15.36	0	2	4	$1.186391
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	138	Rochester-Spring Grove-T-Spring Grove-0297 - 000G95 - 138	273	$3,055.07	$11.19	$6,997.39	$25.63	0	2	4	$1.408749
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	140	Rochester-Brownsdale-C-Hayfield-0203 - 000G95 - 140	151	$1,678.70	$11.12	$3,844.93	$25.46	0	2	4	$1.405858
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	2,412	$26,974.11	$11.18	$61,782.02	$25.61	0	2	4	$1.408410
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	148	Rochester-Dover-C-Dover-Eyota-0533 - 000G95 - 148	960	$13,225.12	$13.78	$30,291.07	$31.55	0	2	4	$1.498999
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	4,884	$54,638.09	$11.19	$125,144.13	$25.62	0	2	4	$1.408579
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	1,131	$12,647.71	$11.18	$28,968.56	$25.61	0	2	4	$1.408410
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	167	Rochester-Elgin-C-Elgin-Millville-2899 - 000G95 - 167	551	$6,164.16	$11.19	$14,118.51	$25.62	0	2	4	$1.408579
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	743	$8,301.50	$11.17	$19,013.91	$25.59	0	2	4	$1.408070
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	180	Cloquet-Carlton-C-Carlton-0093 - 000G96 - 180	1,593	$12,660.54	$7.95	$28,997.94	$18.20	0	2	4	$1.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	4,099	$32,575.38	$7.95	$74,611.27	$18.20	0	2	4	$1.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	492	$3,907.57	$7.94	$8,949.97	$18.19	0	2	4	$1.259833
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	405	$3,218.00	$7.95	$7,370.57	$18.20	0	2	4	$1.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	185	Cloquet-Wrenshall-C-Wrenshall-0100 - 000G96 - 185	1,397	$2,353.74	$1.68	$5,391.05	$3.86	0	2	4	$0.586587
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	187	Cloquet-Moose Lake-T-Moose Lake-0097 - 000G96 - 187	293	$2,326.16	$7.94	$5,327.88	$18.18	0	2	4	$1.259594

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	190	Cloquet-Twin Lakes-T-Carlton-0093 - 000G96 - 190	608	$4,836.20	$7.95	$11,076.93	$18.22	0	2	4	$1.260548
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	194	Wadena-Deerwood-T-Crosby-Ironton-0182 - 000G89 - 194	443	$3,521.41	$7.95	$8,065.50	$18.21	0	2	4	$1.260310
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	198	Cloquet-Bovey-C-Greenway-0316 - 000G96 - 198	825	$6,555.53	$7.95	$15,014.91	$18.20	0	2	4	$1.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	199	Cloquet-Calumet-C-Greenway-0316 - 000G96 - 199	301	$2,390.52	$7.94	$5,475.29	$18.19	0	2	4	$1.259833
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	201	Cloquet-Coleraine-C-Greenway-0316 - 000G96 - 201	871	$6,924.06	$7.95	$15,859.00	$18.21	0	2	4	$1.260310
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	202	Cloquet-Deer River-C-Deer River-0317 - 000G96 - 202	759	$6,031.46	$7.95	$13,814.57	$18.20	0	2	4	$1.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	4,059	$32,259.21	$7.95	$73,887.11	$18.20	0	2	4	$1.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	2,958	$23,519.00	$7.95	$53,868.37	$18.21	0	2	4	$1.260310
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	215	Cloquet-Silver Bau-C-Lake Superior-0381 - 000G96 - 215	886	$7,042.83	$7.95	$16,131.03	$18.21	0	2	4	$1.260310
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	1,018	$8,090.98	$7.95	$18,531.74	$18.20	0	2	4	$1.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	220	Cloquet-Buhl-C-Mt Iron-Buhl-0712 - 000G96 - 220	152	$1,204.45	$7.92	$2,758.70	$18.15	0	2	4	$1.258877
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	221	Cloquet-Canosia-T-Proctor-0704 - 000G96 - 221	2,901	$23,059.28	$7.95	$52,815.42	$18.21	0	2	4	$1.260310
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	1,528	$12,145.66	$7.95	$27,818.65	$18.21	0	2	4	$1.260310
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	223	Cloquet-Duluth-C-Proctor-0704 - 000G96 - 223	1,126	$8,955.24	$7.95	$20,511.25	$18.22	0	2	4	$1.260548
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	411	$3,270.17	$7.96	$7,490.06	$18.22	0	2	4	$1.260548
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	225	Cloquet-Fayal-T-Eveleth-Gilbert-2154 - 000G96 - 225	149	$1,186.06	$7.96	$2,716.57	$18.23	0	2	4	$1.260787
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	228	Cloquet-Grand Lake-T-Proctor-0704 - 000G96 - 228	208	$1,654.97	$7.96	$3,790.58	$18.22	0	2	4	$1.260548
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	3,142	$24,978.28	$7.95	$57,210.73	$18.21	0	2	4	$1.260310
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	233	Cloquet--Hoyt Lakes-C-Mesabi E-2711 - 000G96 - 233	3,426	$38,334.05	$11.19	$87,801.04	$25.63	0	2	4	$1.408749
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	968	$7,698.63	$7.95	$17,633.09	$18.22	0	2	4	$1.260548
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	2,735	$20,291.80	$7.42	$46,476.73	$16.99	0	2	4	$1.230193
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	252	Wadena-Straight River-T-Park Rapids-0309 - 000G89 - 252	299	$2,372.13	$7.93	$5,433.17	$18.17	0	2	4	$1.259355
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	264	Wadena-North-T-Thief River Falls-0564 - 000G89 - 264	2,248	$17,867.25	$7.95	$40,923.49	$18.20	0	2	4	$1.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	266	Wadena-Rocksbury-T-Thief River Falls-0564 - 000G89 - 266	522	$4,156.13	$7.96	$9,519.28	$18.24	0	2	4	$1.261025
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	3,874	$30,791.37	$7.95	$70,525.14	$18.20	0	2	4	$1.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	272	Wadena-Lake-T-Warroad-0690 - 000G89 - 272	787	$6,261.31	$7.96	$14,341.02	$18.22	0	2	4	$1.260548
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	756	$6,013.07	$7.95	$13,772.45	$18.22	0	2	4	$1.260548
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	1,248	$9,921.74	$7.95	$22,724.94	$18.21	0	2	4	$1.260310
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	285	Wadena-Menahga-C-Menahga-821 - 000G89 - 285	774	$6,150.98	$7.95	$14,088.32	$18.20	0	2	4	$1.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	288	Wadena-Sebeka-C-Sebeka-820 - 000G89 - 288	597	$4,744.25	$7.95	$10,866.32	$18.20	0	2	4	$1.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	514	$5,748.96	$11.18	$13,167.53	$25.62	0	2	4	$1.408579
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	322	Wadena-Staples-T-Staples-Motley-2170- 000G89 - 322	559	$4,439.74	$7.94	$10,168.87	$18.19	0	2	4	$1.259833
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	378	Rochester-Elgin-T-Elgin-Millville-0806 - 000G95 - 378	4,840	$53,866.48	$11.13	$123,376.82	$25.49	0	2	4	$1.406370
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1996	411	Bemidji-Marble-T-Ivanhoe-0403 - 000G97 - 411	2,170	$24,283.60	$11.19	$55,619.62	$25.63	0	2	4	$1.408749
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1996	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	842	$18,839.79	$22.38	$43,151.02	$51.25	0	4	16	$1.709694
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1996	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	2,015	$45,091.10	$22.38	$103,277.52	$51.25	0	4	16	$1.709694
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1996	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	2,075	$46,428.58	$22.38	$106,340.91	$51.25	0	4	16	$1.709694
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1996	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	194	$4,346.21	$22.40	$9,954.64	$51.31	0	4	16	$1.710202
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1996	167	Rochester-Elgin-C-Elgin-Millville-2899 - 000G95 - 167	491	$10,984.33	$22.37	$25,158.72	$51.24	0	4	16	$1.709609
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1996	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	181	$2,877.81	$15.90	$6,591.39	$36.42	0	4	16	$1.561340
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1996	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	109	$1,732.39	$15.89	$3,967.90	$36.40	0	4	16	$1.561101
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1996	214	Cloquet-S InternationalFalls-C-Intrntnl-361 - 000G96 - 214	160	$2,542.96	$15.89	$5,824.44	$36.40	0	4	16	$1.561101
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1996	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	307	$4,882.17	$15.90	$11,182.22	$36.42	0	4	16	$1.561340
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1996	264	Wadena-North-T-Thief River Falls-0564 - 000G89 - 264	572	$9,093.15	$15.90	$20,827.13	$36.41	0	4	16	$1.561221
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1996	266	Wadena-Rocksbury-T-Thief River Falls-0564 - 000G89 - 266	239	$3,800.43	$15.90	$8,704.57	$36.42	0	4	16	$1.561340
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1996	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	6,743	$107,222.91	$15.90	$245,585.41	$36.42	0	4	16	$1.561340
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1996	378	Rochester-Elgin-T-Elgin-Millville-0806 - 000G95 - 378	727	$16,263.96	$22.37	$37,251.29	$51.24	0	4	16	$1.709609
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1996	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	1,749	$39,115.91	$22.36	$89,591.83	$51.22	0	4	16	$1.709440
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1996	391	Rochester-Canisteo-Kasson-Mantorville - 000G95 - 391	366	$8,190.24	$22.38	$18,759.08	$51.25	0	4	16	$1.709694
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1996	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	17,319	$612,163.44	$35.35	$1,402,110.87	$80.96	1	1.25	1.5625	$1.908270
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1996	138	Rochester-Spring Grove-T-Spring Grove-0297 - 000G95 - 138	1,359	$48,033.89	$35.35	$110,017.75	$80.95	1	1.25	1.5625	$1.908217
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1996	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	54	$1,360.76	$25.20	$3,116.71	$57.72	1	1.25	1.5625	$1.761326
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1996	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	11,592	$418,597.76	$36.11	$958,764.33	$82.71	1	2	4	$1.917558
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1996	138	Rochester-Spring Grove-T-Spring Grove-0297 - 000G95 - 138	62	$2,195.10	$35.40	$5,027.70	$81.09	1	2	4	$1.908967
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1996	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	84	$2,114.69	$25.17	$4,843.53	$57.66	1	2	4	$1.760875
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1996	192	Wadena-Deerwood-C-Crosby-Ironton-0182 - 000G89 - 192	51	$98.81	$1.94	$226.32	$4.44	1	2	4	$0.647383
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1996	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	3,885	$137,331.10	$35.35	$314,545.78	$80.96	1	3	9	$1.908270
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1996	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	2,285	$225,659.54	$98.76	$516,854.93	$226.19	1	4	16	$2.354473
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1996	138	Rochester-Spring Grove-T-Spring Grove-0297 - 000G95 - 138	176	$17,383.39	$98.77	$39,815.25	$226.22	1	4	16	$2.354531
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	1997	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	130	$618.35	$4.74	$1,371.12	$10.51	0	1.25	1.5625	$1.021603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1997	122	Rochester-Spring Valley-T-Kingsland-2137 - 000G95 - 122	138	$2,539.82	$18.43	$5,631.77	$40.87	0	1	1	$1.611405
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1997	434	Fairmont-Geneva-T-Albert Lea - 000G94 - 434	133	$2,449.43	$18.43	$5,431.34	$40.87	0	1	1	$1.611405
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	97	$1,686.47	$17.39	$3,739.56	$38.55	0	2	4	$1.586024
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	65	Worthington-Tracy-C-Tracy-0417 - 000G99 - 065	33	$573.73	$17.39	$1,272.19	$38.55	0	2	4	$1.586024
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	70	Fairmont-Manyaska-T-Martin Cty W-2448 - 000G94 - 070	87	$1,513.52	$17.40	$3,356.07	$38.58	0	2	4	$1.586362
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	77	Fairmont-Welcome-C-Martin Cty W-2448 - 000G94 - 077	1,013	$17,622.99	$17.40	$39,077.06	$38.58	0	2	4	$1.586362
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	2,437	$42,372.11	$17.39	$93,955.55	$38.55	0	2	4	$1.586024

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	312	$5,435.75	$17.42	$12,053.18	$38.63	0	2	4	$1.586925
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	1,214	$21,116.59	$17.39	$46,823.74	$38.57	0	2	4	$1.586250
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	8,236	$143,143.02	$17.38	$317,404.09	$38.54	0	2	4	$1.585912
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	109	Rochester-Harmony-T-Fillmore Central-2198 - 000G95 - 109	1,487	$25,872.82	$17.40	$57,370.17	$38.58	0	2	4	$1.586362
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	113	Rochester-Harmony-C-Fillmore Central-2198 - 000G95 - 113	1,530	$26,613.36	$17.39	$59,012.23	$38.57	0	2	4	$1.586250
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	255	$4,433.25	$17.39	$9,830.25	$38.55	0	2	4	$1.586024
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	716	$12,449.95	$17.39	$27,606.41	$38.56	0	2	4	$1.586137
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	1,675	$29,116.90	$17.38	$64,563.56	$38.55	0	2	4	$1.586024
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	128	Rochester-Minneola-T-Zumbrota-Mazeppa-2805 - 000G95 - 128	293	$5,094.43	$17.39	$11,296.34	$38.55	0	2	4	$1.586024
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	3,355	$58,331.77	$17.39	$129,344.36	$38.55	0	2	4	$1.586024
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	131	Rochester-Wanamingo-C-Kenyon-Wanamingo-2172 - 000G95 - 131	1,295	$22,522.71	$17.39	$49,941.66	$38.56	0	2	4	$1.586137
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	510	$8,873.66	$17.40	$19,676.38	$38.58	0	2	4	$1.586362
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	2,194	$38,139.35	$17.38	$84,569.86	$38.55	0	2	4	$1.586024
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	3,999	$69,388.54	$17.35	$153,861.54	$38.48	0	2	4	$1.585235
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	136	Rochester-La Crescent-T-LaCrescent-Hokah-0300 - 000G95 - 136	4,935	$85,818.38	$17.39	$190,292.93	$38.56	0	2	4	$1.586137
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	211	$3,675.81	$17.42	$8,150.71	$38.63	0	2	4	$1.586925
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	4,258	$74,051.46	$17.39	$164,201.07	$38.56	0	2	4	$1.586137
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	2,107	$36,646.75	$17.39	$81,260.18	$38.57	0	2	4	$1.586250
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	148	Rochester-Dover-C-Dover-Eyota-0533 - 000G95 - 148	219	$3,949.97	$18.04	$8,758.63	$39.99	0	2	4	$1.601951
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	157	Rochester-New Haven-T-Pine Island-0255 - 000G95 - 157	511	$8,884.82	$17.39	$19,701.12	$38.55	0	2	4	$1.586024
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	1,883	$32,748.16	$17.39	$72,615.49	$38.56	0	2	4	$1.586137
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	297	$5,168.41	$17.40	$11,460.39	$38.59	0	2	4	$1.586475
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	167	Rochester-Elgin-C-Elgin-Millville-2899 - 000G95 - 167	877	$15,230.38	$17.37	$33,771.71	$38.51	0	2	4	$1.585574
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	47	$809.54	$17.22	$1,795.07	$38.19	0	2	4	$1.581950
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	171	Rochester-Lewiston-C-Lewiston-Altura-0857 - 000G95 - 171	535	$9,300.05	$17.38	$20,621.85	$38.55	0	2	4	$1.586024
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	2,285	$46,226.14	$20.23	$102,501.44	$44.86	0	2	4	$1.651859
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	175	Rochester-Utica-T-Lewiston-Altura-0857 - 000G95 - 175	267	$4,645.76	$17.40	$10,301.47	$38.58	0	2	4	$1.586362
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	179	Cloquet-Barnum-C-Barnum-0091 - 000G96 - 179	6,860	$46,543.64	$6.78	$103,205.46	$15.04	0	2	4	$1.177248
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	2,869	$19,466.47	$6.79	$43,164.78	$15.05	0	2	4	$1.177537
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	751	$5,100.45	$6.79	$11,309.69	$15.06	0	2	4	$1.177825
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	185	Cloquet-Wrenshall-C-Wrenshall-0100 - 000G96 - 185	1,426	$2,893.99	$2.03	$6,417.11	$4.50	0	2	4	$0.653213
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	187	Cloquet-Moose Lake-T-Moose Lake-0097 - 000G96 - 187	500	$3,389.64	$6.78	$7,516.16	$15.03	0	2	4	$1.176959
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	190	Cloquet-Twin Lakes-T-Carlton-0093 - 000G96 - 190	3,863	$26,205.22	$6.78	$58,107.22	$15.04	0	2	4	$1.177248
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	195	Wadena-Irondale(Riverton)-T-Crosby-Ironton-0182 - 000G89 - 195	6,735	$45,696.23	$6.78	$101,326.42	$15.04	0	2	4	$1.177248
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	199	Cloquet-Calumet-C-Greenway-0316 - 000G96 - 199	89	$599.58	$6.74	$1,329.50	$14.94	0	2	4	$1.174351
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	202	Cloquet-Deer River-C-Deer River-0317 - 000G96 - 202	1,071	$7,266.95	$6.79	$16,113.67	$15.05	0	2	4	$1.177537
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	6,738	$45,714.20	$6.78	$101,366.27	$15.04	0	2	4	$1.177248
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	207	Cloquet-Laprairie-C-Greenway-0316 - 000G96 - 207	574	$3,891.31	$6.78	$8,628.56	$15.03	0	2	4	$1.176959
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	209	Cloquet-Nashwauk-C-Nashwauk-Keewatin-0319 - 000G96 - 209	2,566	$17,403.90	$6.78	$38,591.26	$15.04	0	2	4	$1.177248
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	816	$5,536.81	$6.79	$12,277.27	$15.05	0	2	4	$1.177537
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	214	Cloquet-S InternationalFalls-C-Intrntnl-361 - 000G96 - 214	1,108	$7,518.11	$6.79	$16,670.60	$15.05	0	2	4	$1.177537
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	456	$3,093.85	$6.78	$6,860.28	$15.04	0	2	4	$1.177248
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	584	$3,965.24	$6.79	$8,792.49	$15.06	0	2	4	$1.177825
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	221	Cloquet-Canosia-T-Proctor-0704 - 000G96 - 221	4,974	$33,744.54	$6.78	$74,824.85	$15.04	0	2	4	$1.177248
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	828	$5,620.09	$6.79	$12,461.94	$15.05	0	2	4	$1.177537
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	223	Cloquet-Duluth-C-Proctor-0704 - 000G96 - 223	3,133	$21,257.22	$6.78	$47,135.57	$15.04	0	2	4	$1.177248
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	228	Cloquet-Grand Lake-T-Proctor-0704 - 000G96 - 228	645	$4,372.96	$6.78	$9,696.56	$15.03	0	2	4	$1.176959
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	14,720	$99,877.62	$6.79	$221,467.77	$15.05	0	2	4	$1.177537
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	233	Cloquet--Hoyt Lakes-C-Mesabi E-2711 - 000G96 - 233	813	$14,124.04	$17.37	$31,318.52	$38.52	0	2	4	$1.585686
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	1,066	$7,226.98	$6.78	$16,025.04	$15.03	0	2	4	$1.176959
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	270	$1,830.73	$6.78	$4,059.44	$15.03	0	2	4	$1.176959
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	2,829	$49,205.36	$17.39	$109,107.53	$38.57	0	2	4	$1.586250
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	246	Bemidji-Lake View-T-Detroit Lakes-0022 - 000G97 - 246	2,104	$36,593.03	$17.39	$81,141.06	$38.57	0	2	4	$1.586250
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	7,293	$126,816.77	$17.39	$281,202.41	$38.56	0	2	4	$1.586137
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	662	$11,007.84	$16.63	$24,408.69	$36.87	0	2	4	$1.566673
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	2,487	$43,246.11	$17.39	$95,893.55	$38.56	0	2	4	$1.586137
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	1,288	$8,740.34	$6.79	$19,380.75	$15.05	0	2	4	$1.177537
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	255	Wadena-Baudette-C-Lake of Woods-0390 - 000G89 - 255	4,153	$27,189.10	$6.55	$60,288.87	$14.52	0	2	4	$1.161967
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	257	Wadena-Motley-C-Staples-Motley-2170 - 000G89 - 257	4,156	$28,204.40	$6.79	$62,540.19	$15.05	0	2	4	$1.177537
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	273	$4,745.14	$17.38	$10,521.83	$38.54	0	2	4	$1.585912
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	261	Wadena-Bluffton-T-Wadena-Deer Creek-2155 - 000G89 - 261	2,995	$20,313.88	$6.78	$45,043.82	$15.04	0	2	4	$1.177248
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	264	Wadena-North-T-Thief River Falls-0564 - 000G89 - 264	2,290	$15,534.42	$6.78	$34,445.88	$15.04	0	2	4	$1.177248
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	266	Wadena-Rocksbury-T-Thief River Falls-0564 - 000G89 - 266	2,796	$18,972.44	$6.79	$42,069.33	$15.05	0	2	4	$1.177537
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	5,381	$36,507.68	$6.78	$80,951.81	$15.04	0	2	4	$1.177248
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	59	$399.72	$6.77	$886.34	$15.02	0	2	4	$1.176670
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	2,049	$13,902.34	$6.78	$30,826.93	$15.04	0	2	4	$1.177248
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	283	Wadena-Aldrich-T-Verndale-818 - 000G89 - 283	958	$6,499.48	$6.78	$14,411.89	$15.04	0	2	4	$1.177248

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	285	Wadena-Menahga-C-Menahga-821 - 000G89 - 285	1,542	$10,464.72	$6.79	$23,204.38	$15.05	0	2	4	$1.177537
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	288	Wadena-Sebeka-C-Sebeka-820 - 000G89 - 288	313	$2,126.52	$6.79	$4,715.33	$15.06	0	2	4	$1.177825
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	290	Wadena-Verndale-C-Verndale-818 - 000G89 - 290	407	$2,760.99	$6.78	$6,122.20	$15.04	0	2	4	$1.177248
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	2,055	$13,942.31	$6.78	$30,915.56	$15.04	0	2	4	$1.177248
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	298	Rosemount-Eureka-T-Farmington-0192 - 000G93 - 298	(5)	($86.94)	$17.39	($192.77)	$38.55	0	2	4	$1.586024
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	342	Bemidji-Eckels-T-Bemidji-0031 - 000G97 - 342	2,148	$38,291.21	$17.83	$84,906.59	$39.53	0	2	4	$1.596927
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	351	Rosemount-Eureka-T-Lakeville-0194 - 000G93 - 351	5,338	$92,807.70	$17.39	$205,790.98	$38.55	0	2	4	$1.586024
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	5,938	$103,203.40	$17.38	$228,842.32	$38.54	0	2	4	$1.585912
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	400	Worthington-Monroe-T-Tracy - 000G99 - 400	600	$10,431.43	$17.39	$23,130.56	$38.55	0	2	4	$1.586024
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	411	Bemidji-Marble-T-Ivanhoe-0403 - 000G97 - 411	1,729	$30,074.84	$17.39	$66,687.69	$38.57	0	2	4	$1.586250
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	1	$1,870.06	$2,308.72	$4,146.65	$5,119.32	0	2	4	$3.709212
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1997	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	927	$196,787.36	$212.36	$436,354.58	$470.87	0	2	4	$2.672901
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1997	187	Cloquet-Moose Lake-T-Moose Lake-0097 - 000G96 - 187	12	$79.94	$6.66	$177.26	$14.77	0	3	9	$1.169380
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	1997	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	47	$47.97	$1.02	$106.37	$2.26	0	3	9	$0.354108
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1997	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	2,469	$85,860.25	$34.78	$190,385.77	$77.11	0	4	16	$1.887111
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1997	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	2,158	$75,046.58	$34.78	$166,407.63	$77.11	0	4	16	$1.887111
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1997	105	Rochester-Wasioja-T-Triton-2125 - 000G95 - 105	64	$2,225.62	$34.78	$4,935.07	$77.11	0	4	16	$1.887111
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1997	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	941	$32,725.88	$34.78	$72,566.08	$77.12	0	4	16	$1.887167
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1997	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	1,591	$55,337.71	$34.78	$122,705.36	$77.12	0	4	16	$1.887167
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1997	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	1,207	$41,971.11	$34.77	$93,066.37	$77.11	0	4	16	$1.887111
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1997	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	723	$25,129.20	$34.76	$55,721.27	$77.07	0	4	16	$1.886885
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1997	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	5,847	$203,328.20	$34.77	$450,858.18	$77.11	0	4	16	$1.887111
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1997	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	1,867	$64,917.10	$34.77	$143,946.61	$77.10	0	4	16	$1.887054
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1997	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	357	$4,844.63	$13.57	$10,742.44	$30.09	0	4	16	$1.478422
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1997	202	Cloquet-Deer River-C-Deer River-0317 - 000G96 - 202	1,320	$17,915.55	$13.57	$39,725.78	$30.10	0	4	16	$1.478566
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1997	209	Cloquet-Nashwauk-C-Nashwauk-Keewatin-0319 - 000G96 - 209	4,979	$67,561.03	$13.57	$149,809.24	$30.09	0	4	16	$1.478422
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1997	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	586	$7,954.47	$13.57	$17,638.17	$30.10	0	4	16	$1.478566
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1997	255	Wadena-Baudette-C-Lake of Woods-0390 - 000G89 - 255	4,411	$59,854.39	$13.57	$132,720.60	$30.09	0	4	16	$1.478422
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1997	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	6,998	$94,957.99	$13.57	$210,559.02	$30.09	0	4	16	$1.478422
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1997	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	1,783	$62,005.59	$34.78	$137,490.66	$77.11	0	4	16	$1.887111
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1997	434	Fairmont-Geneva-T-Albert Lea - 000G94 - 434	39	$1,003.87	$25.89	$2,225.97	$57.40	0	4	16	$1.758912
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1997	441	Fairmont-Hollandale-C-Albert Lea - 000G94 - 441	64	$1,663.65	$25.89	$3,688.96	$57.41	0	4	16	$1.758988
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1997	454	Fairmont-Newry-T-Albert Lea - 000G94 - 454	14	$356.99	$25.89	$791.59	$57.40	0	4	16	$1.758912
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1997	460	Fairmont-Riceland-T-Albert Lea - 000G94 - 460	89	$2,309.25	$25.89	$5,120.51	$57.40	0	4	16	$1.758912
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1997	467	Rochester-Wykoff-C-Kingsland - 000G95 - 467	49	$1,261.50	$25.89	$2,797.24	$57.40	0	4	16	$1.758912
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1997	468	Rochester-Lyle-C-Lyle - 000G95 - 468	77	$1,995.27	$25.89	$4,424.29	$57.41	0	4	16	$1.758988
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1997	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	399	$21,943.49	$55.00	$48,657.30	$121.95	1	1.25	1.5625	$2.086182
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1997	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	468	$25,730.69	$54.98	$57,055.01	$121.91	1	2	4	$2.086039
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1997	255	Wadena-Baudette-C-Lake of Woods-0390 - 000G89 - 255	130	$2,758.08	$21.22	$6,115.74	$47.04	1	2	4	$1.672467
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1997	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	399	$21,943.49	$55.00	$48,657.30	$121.95	1	2	4	$2.086182
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1997	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	471	$72,313.83	$153.53	$160,348.06	$340.44	1	4	16	$2.532041
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1997	120	Rochester-Rushford-V-Rushford-Peterson-0239 - 000G95 - 120	526	$80,758.10	$153.53	$179,072.31	$340.44	1	4	16	$2.532041
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1997	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	59	$3,525.55	$59.76	$7,817.52	$132.50	1	4	16	$2.122216
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1997	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	15	$10.90	$0.73	$24.17	$1.61	1	4	16	$0.206826
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	1,651	$18,257.27	$11.06	$39,566.03	$23.96	0	2	4	$1.379487
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	645	$7,127.76	$11.05	$15,446.85	$23.95	0	2	4	$1.379306
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	33	Rosemount-Spring Lk-T-Prior Lk-Savage-0719 - 000G93 - 033	3,427	$37,886.65	$11.06	$82,105.63	$23.96	0	2	4	$1.379487
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	77	Fairmont-Welcome-C-Martin Cty W-2448 - 000G94 - 077	434	$4,799.93	$11.06	$10,402.11	$23.97	0	2	4	$1.379668
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	249	$2,749.33	$11.04	$5,958.18	$23.93	0	2	4	$1.378943
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	456	$5,040.18	$11.05	$10,922.77	$23.95	0	2	4	$1.379306
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	2,014	$0.00	$0.00	($0.02)	$0.00	0	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	105	Rochester-Wasioja-T-Triton-2125 - 000G95 - 105	292	$3,220.20	$11.03	$6,978.62	$23.90	0	2	4	$1.378398
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	106	Rochester-West Concord-C-Triton-2125 - 000G95 - 106	1,503	$17,619.99	$11.72	$38,184.96	$25.41	0	2	4	$1.405005
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	112	Rochester-Fountain-C-Fillmore Central-2198 - 000G95 - 112	548	$6,694.49	$12.22	$14,507.88	$26.47	0	2	4	$1.422754
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	725	$8,004.94	$11.04	$17,347.82	$23.93	0	2	4	$1.378943
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	128	Rochester-Minneola-T-Zumbrota-Mazeppa-2805 - 000G95 - 128	2,537	$28,039.88	$11.05	$60,766.31	$23.95	0	2	4	$1.379306
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	33	$364.73	$11.05	$790.42	$23.95	0	2	4	$1.379306
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	5,504	$60,896.61	$11.06	$131,971.41	$23.98	0	2	4	$1.379849
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	321	$3,539.18	$11.03	$7,669.89	$23.89	0	2	4	$1.378216
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	1,915	$21,175.58	$11.06	$45,890.42	$23.96	0	2	4	$1.379487
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	517	$5,711.30	$11.05	$12,377.18	$23.94	0	2	4	$1.379124
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	3	$34.18	$11.39	$74.07	$24.69	0	2	4	$1.392521
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	1,315	$14,536.49	$11.05	$31,502.59	$23.96	0	2	4	$1.379487
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	179	Cloquet-Barnum-C-Barnum-0091 - 000G96 - 179	318	$1,352.24	$4.25	$2,930.49	$9.22	0	2	4	$0.964731
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	1,436	$6,124.88	$4.27	$13,273.47	$9.24	0	2	4	$0.965672
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	194	Wadena-Deerwood-T-Crosby-Ironton-0182 - 000G89 - 194	541	$2,306.77	$4.26	$4,999.09	$9.24	0	2	4	$0.965672
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	195	Wadena-Irondale(Riverton)-T-Crosby-Ironton-0182 - 000G89 - 195	197	$835.21	$4.24	$1,810.02	$9.19	0	2	4	$0.963316

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	198	Cloquet-Bovey-C-Greenway-0316 - 000G96 - 198	531	$2,253.74	$4.24	$4,884.17	$9.20	0	2	4	$0.963788
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	201	Cloquet-Coleraine-C-Greenway-0316 - 000G96 - 201	482	$2,060.45	$4.27	$4,465.28	$9.26	0	2	4	$0.966611
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	202	Cloquet-Deer River-C-Deer River-0317 - 000G96 - 202	918	$3,910.91	$4.26	$8,475.48	$9.23	0	2	4	$0.965202
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	4,000	$17,043.34	$4.26	$36,935.29	$9.23	0	2	4	$0.965202
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	211	Cloquet-Zemple-C-Deer River-0317 - 000G96 - 211	106	$450.74	$4.25	$976.82	$9.22	0	2	4	$0.964731
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	1,309	$5,578.02	$4.26	$12,088.34	$9.23	0	2	4	$0.965202
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	214	Cloquet-S InternationalFalls-C-Intrntnl-361 - 000G96 - 214	35	$149.14	$4.26	$323.21	$9.23	0	2	4	$0.965202
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	215	Cloquet-Silver Bau-C-Lake Superior-0381 - 000G96 - 215	257	$1,100.35	$4.28	$2,384.61	$9.28	0	2	4	$0.967548
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	358	$1,524.59	$4.26	$3,304.00	$9.23	0	2	4	$0.965202
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	220	Cloquet-Buhl-C-Mt Iron-Buhl-0712 - 000G96 - 220	514	$2,187.45	$4.26	$4,740.51	$9.22	0	2	4	$0.964731
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	297	$1,259.44	$4.24	$2,729.38	$9.19	0	2	4	$0.963316
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	1,159	$4,938.43	$4.26	$10,702.26	$9.23	0	2	4	$0.965202
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	499	$2,134.43	$4.28	$4,625.61	$9.27	0	2	4	$0.967080
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	2,563	$10,930.59	$4.26	$23,688.11	$9.24	0	2	4	$0.965672
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	734	$3,128.73	$4.26	$6,780.39	$9.24	0	2	4	$0.965672
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	240	Bemidji-Audubon-C-Lk Park Audubon-2889 - 000G97 - 240	221	$2,445.53	$11.07	$5,299.80	$23.98	0	2	4	$1.379849
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	253	$2,794.89	$11.05	$6,056.91	$23.94	0	2	4	$1.379124
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	247	Bemidji-Bemidji-T-BemidJi-0031 - 000G97 - 247	3,644	$40,286.80	$11.06	$87,307.09	$23.96	0	2	4	$1.379487
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	248	Bemidji-Bemidji-C-BemidJi-0031 - 000G97 - 248	7,803	$85,627.86	$10.97	$185,567.45	$23.78	0	2	4	$1.376212
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	249	Bemidji-Northern--BemidJi-0031 - 000G97 - 249	750	$8,293.54	$11.06	$17,973.25	$23.96	0	2	4	$1.379487
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	250	Wadena-Henrietta-T-Park Rapids-0309 - 000G89 - 250	12,250	$52,209.03	$4.26	$113,144.22	$9.24	0	2	4	$0.965672
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	2,380	$10,135.15	$4.26	$21,964.27	$9.23	0	2	4	$0.965202
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	253	Wadena-Todd-C-Park Rapids-0309 - 000G89 - 253	3,504	$14,529.72	$4.15	$31,487.93	$8.99	0	2	4	$0.953760
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	257	Wadena-Motley-C-Staples-Motley-2170 - 000G89 - 257	445	$1,897.41	$4.26	$4,111.95	$9.24	0	2	4	$0.965672
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	406	$4,480.94	$11.04	$9,710.82	$23.92	0	2	4	$1.378761
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	262	Wadena-Compton-T-Wadena-Deer Creek-2155 - 000G89 - 262	353	$1,498.08	$4.24	$3,246.55	$9.20	0	2	4	$0.963788
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	266	Wadena-Rocksbury-T-Thief River Falls-0564 - 000G89 - 266	128	$544.97	$4.26	$1,181.03	$9.23	0	2	4	$0.965202
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	1,650	$7,024.96	$4.26	$15,224.06	$9.23	0	2	4	$0.965202
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	1,971	$8,398.99	$4.26	$18,201.78	$9.23	0	2	4	$0.965202
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	275	Wadena-Warroad-C-Warroad-0690 - 000G89 - 275	511	$2,174.20	$4.25	$4,711.79	$9.22	0	2	4	$0.964731
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	277	Wadena-Bertha-C-Bertha-Hewitt-0786 - 000G89 - 277	211	$901.50	$4.27	$1,953.68	$9.26	0	2	4	$0.966611
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	4,939	$21,050.57	$4.26	$45,619.51	$9.24	0	2	4	$0.965672
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	285	Wadena-Menahga-C-Menahga-821 - 000G89 - 285	1,247	$5,316.18	$4.26	$11,520.90	$9.24	0	2	4	$0.965672
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	3,129	$20,791.62	$6.64	$45,058.32	$14.40	0	2	4	$1.158362
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	322	Wadena-Staples-T-Staples-Motley-2170- 000G89 - 322	2,958	$12,607.33	$4.26	$27,321.83	$9.24	0	2	4	$0.965672
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	328	Bemidji-Grant Valley-Bemidji-0031 - 000G97 - 328	2,856	$31,571.88	$11.05	$68,420.65	$23.96	0	2	4	$1.379487
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	931	$10,291.55	$11.05	$22,303.22	$23.96	0	2	4	$1.379487
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	414	Rosemount-Credit River-T-Lakeville SD - 000G93 - 414	15,803	$174,707.53	$11.06	$378,615.47	$23.96	0	2	4	$1.379487
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	0	$416.06	$1,014.78	$901.66	$2,199.17	0	2	4	$3.342259
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1998	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	254	$43,782.11	$172.68	$94,881.91	$374.23	0	2	4	$2.573139
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1998	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	997	$22,465.48	$22.53	$48,685.81	$48.83	0	4	16	$1.688687
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1998	32	Rosemount-New Market-T-New Prague-0721 - 000G93 - 032	3,874	$85,679.32	$22.12	$185,678.98	$47.93	0	4	16	$1.680607
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1998	33	Rosemount-Spring Lk-T-Prior Lk-Savage-0719 - 000G93 - 033	4,634	$102,463.70	$22.11	$222,053.06	$47.92	0	4	16	$1.680517
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1998	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	1,350	$29,851.09	$22.11	$64,691.46	$47.92	0	4	16	$1.680517
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1998	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	1,566	$34,632.37	$22.12	$75,053.15	$47.93	0	4	16	$1.680607
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1998	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	2,815	$23,994.04	$8.52	$51,998.42	$18.47	0	4	16	$1.266467
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1998	214	Cloquet-S InternationalFalls-C-Intrntnl-361 - 000G96 - 214	9,505	$81,017.18	$8.52	$175,575.47	$18.47	0	4	16	$1.266467
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1998	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	761	$6,496.09	$8.54	$14,077.93	$18.50	0	4	16	$1.267172
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1998	248	Bemidji-Bemidji-C-BemidJi-0031 - 000G97 - 248	1,158	$25,609.73	$22.12	$55,499.84	$47.93	0	4	16	$1.680607
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1998	249	Bemidji-Northern--BemidJi-0031 - 000G97 - 249	5,397	$119,329.79	$22.11	$258,604.22	$47.92	0	4	16	$1.680517
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1998	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	3,082	$26,265.56	$8.52	$56,921.12	$18.47	0	4	16	$1.266467
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1998	253	Wadena-Todd-C-Park Rapids-0309 - 000G89 - 253	15,501	$132,121.91	$8.52	$286,326.52	$18.47	0	4	16	$1.266467
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1998	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	486	$4,136.28	$8.51	$8,963.89	$18.44	0	4	16	$1.265761
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1998	340	Rosemount-New Market-T-Lakeville-0194 - 000G93 - 340	6,375	$140,100.79	$21.98	$303,617.85	$47.63	0	4	16	$1.677881
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1998	341	Rosemount-Spring Lk-T-Lakeville-0194 - 000G93 - 341	3,865	$39,498.60	$10.22	$85,598.95	$22.15	0	4	16	$1.345374
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1998	348	Cloquet-Floodwood-C-Floodwood-0698 - 000G96 - 348	232	$1,975.34	$8.51	$4,280.84	$18.45	0	4	16	$1.265996
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1998	356	Rosemount-Cedar Lk-T-Jordan - 000G93 - 356	3,779	$83,558.55	$22.11	$181,082.97	$47.92	0	4	16	$1.680517
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1998	391	Rochester-Canisteo-Kasson-Mantorville - 000G95 - 391	1,349	$29,828.99	$22.11	$64,643.56	$47.92	0	4	16	$1.680517
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1998	414	Rosemount-Credit River-T-Lakeville SD - 000G93 - 414	8,890	$91,410.80	$10.28	$198,099.90	$22.28	0	4	16	$1.347915
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1998	434	Fairmont-Geneva-T-Albert Lea - 000G94 - 434	35	$824.33	$23.43	$1,786.44	$50.77	0	4	16	$1.705607
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1998	441	Fairmont-Hollandale-C-Albert Lea - 000G94 - 441	58	$1,366.12	$23.42	$2,960.57	$50.76	0	4	16	$1.705522
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1998	454	Fairmont-Newry-T-Albert Lea - 000G94 - 454	13	$293.14	$23.43	$635.28	$50.78	0	4	16	$1.705693
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1998	460	Fairmont-Riceland-T-Albert Lea - 000G94 - 460	81	$1,896.25	$23.42	$4,109.44	$50.77	0	4	16	$1.705607
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1998	467	Rochester-Wykoff-C-Kingsland - 000G95 - 467	44	$1,035.89	$23.43	$2,244.92	$50.77	0	4	16	$1.705607
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1998	468	Rochester-Lyle-C-Lyle - 000G95 - 468	70	$1,638.42	$23.43	$3,550.68	$50.77	0	4	16	$1.705607
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	1998	201	Cloquet-Coleraine-C-Greenway-0316 - 000G96 - 201	6	$92.80	$15.47	$201.11	$33.52	1	1.25	1.5625	$1.525304
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1998	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	124	$6,759.39	$54.51	$14,648.54	$118.13	1	2	4	$2.072360

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1998	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	4	$66.29	$16.57	$143.66	$35.92	1	2	4	$1.555336
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	1998	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	40	$543.55	$13.59	$1,177.95	$29.45	1	3	9	$1.469085
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	1998	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	8	$14.37	$1.80	$31.14	$3.89	1	8	64	$0.589950
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1999	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	3,919	$43,720.37	$11.16	$93,164.58	$23.77	0	2	4	$1.376029
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1999	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	604	$6,735.14	$11.15	$14,352.04	$23.76	0	2	4	$1.375846
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1999	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	3,246	$36,207.57	$11.15	$77,155.41	$23.77	0	2	4	$1.376029
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1999	115	Rochester-Mabel-C-Mabel-Canton-0238 - 000G95 - 115	408	$4,528.80	$11.10	$9,650.51	$23.65	0	2	4	$1.373831
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1999	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	1,264	$14,108.96	$11.16	$30,065.05	$23.79	0	2	4	$1.376394
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1999	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	2,843	$31,701.62	$11.15	$67,553.59	$23.76	0	2	4	$1.375846
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1999	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	152	$1,691.10	$11.13	$3,603.60	$23.71	0	2	4	$1.374932
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1999	159	Rochester-Oronoco-C-Rochester-0535 - 000G95 - 159	4,125	$46,042.83	$11.16	$98,113.55	$23.79	0	2	4	$1.376394
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1999	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	2,850	$32,542.79	$11.42	$69,346.07	$24.33	0	2	4	$1.386142
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1999	201	Cloquet-Coleraine-C-Greenway-0316 - 000G96 - 201	543	$10,231.79	$18.84	$21,803.12	$40.15	0	2	4	$1.603686
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1999	206	Cloquet-Keewatin-C-Nashwauk-Keewatin-0319 - 000G96 - 206	465	$8,669.43	$18.64	$18,473.86	$39.73	0	2	4	$1.599119
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1999	207	Cloquet-Laprairie-C-Greenway-0316 - 000G96 - 207	327	$6,194.51	$18.94	$13,200.00	$40.37	0	2	4	$1.606059
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1999	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	1,674	$15,855.93	$9.47	$33,787.71	$20.18	0	2	4	$1.304921
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1999	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	2,710	$30,194.44	$11.14	$64,341.91	$23.74	0	2	4	$1.375481
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1999	244	Bemidji-Detroit-T-Detroit Lakes-0022 - 000G97 - 244	5	$55.65	$11.13	$118.59	$23.72	0	2	4	$1.375115
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1999	245	Bemidji-Frazee-C-Frazee-Vergas-0023 - 000G97 - 245	709	$7,954.43	$11.22	$16,950.25	$23.91	0	2	4	$1.378580
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1999	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	1,249	$13,293.30	$10.64	$28,326.95	$22.68	0	2	4	$1.355643
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1999	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	1,226	$13,644.47	$11.13	$29,075.26	$23.72	0	2	4	$1.375115
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1999	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	179	$1,996.95	$11.16	$4,255.34	$23.77	0	2	4	$1.376029
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1999	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	1	$785.68	$1,007.28	$1,674.22	$2,146.44	0	2	4	$3.331719
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	1999	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	188	$82,677.62	$440.31	$176,179.33	$938.27	0	2	4	$2.972328
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1999	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	804	$17,941.03	$22.31	$38,230.89	$47.55	0	4	16	$1.677151
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1999	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	161	$3,599.82	$22.36	$7,670.93	$47.65	0	4	16	$1.678063
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1999	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	1,421	$31,765.95	$22.35	$67,690.67	$47.64	0	4	16	$1.677972
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1999	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	168	$3,755.58	$22.35	$8,002.85	$47.64	0	4	16	$1.677972
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1999	434	Fairmont-Geneva-T-Albert Lea - 000G94 - 434	325	$13,006.53	$39.99	$27,715.86	$85.21	0	4	16	$1.930491
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1999	441	Fairmont-Hollandale-C-Albert Lea - 000G94 - 441	539	$21,554.95	$39.99	$45,931.86	$85.21	0	4	16	$1.930491
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1999	454	Fairmont-Newry-T-Albert Lea - 000G94 - 454	116	$4,625.29	$39.99	$9,856.12	$85.21	0	4	16	$1.930491
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1999	460	Fairmont-Riceland-T-Albert Lea - 000G94 - 460	748	$29,919.48	$39.99	$63,755.99	$85.21	0	4	16	$1.930491
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1999	467	Rochester-Wykoff-C-Kingsland - 000G95 - 467	409	$16,344.54	$39.99	$34,828.89	$85.21	0	4	16	$1.930491
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	1999	468	Rochester-Lyle-C-Lyle - 000G95 - 468	647	$25,851.45	$39.99	$55,087.35	$85.21	0	4	16	$1.930491
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1999	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	620	$20,534.64	$33.12	$43,757.66	$70.58	1	2	4	$1.848682
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	1999	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	721	$25,416.46	$35.25	$54,160.42	$75.12	1	2	4	$1.875756
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	1999	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	176	$7,416.96	$42.14	$15,804.95	$89.80	1	0.75	0.5625	$1.953276
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	1999	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	186	$1,446.95	$7.78	$3,083.34	$16.58	1	4	16	$1.219585
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	1,543	$16,011.60	$10.38	$32,233.88	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	10,866	$112,741.84	$10.38	$226,967.13	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	72	$752.91	$10.46	$1,515.73	$21.05	0	2	4	$1.323252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	1,238	$12,848.20	$10.38	$25,865.45	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	30	Rosemount-Elko-C-Lakeville-0194 - 000G93 - 030	3,384	$35,106.01	$10.37	$70,673.94	$20.88	0	2	4	$1.319730
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	31	Rosemount-New Market-C-New Prague-0721 - 000G93 - 031	9,632	$99,932.53	$10.38	$201,179.96	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	32	Rosemount-New Market-T-New Prague-0721 - 000G93 - 032	105	$1,089.29	$10.37	$2,192.91	$20.88	0	2	4	$1.319730
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	35	Pine City-Scandia-C-Forest Lake-0831 - 000G98 - 035	702	$7,292.81	$10.39	$14,681.58	$20.91	0	2	4	$1.320354
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	1,443	$14,976.71	$10.38	$30,150.48	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	45	Fairmont-Emmons-C-Glenville-Emmons-2886 - 000G94 - 045	258	$2,675.40	$10.37	$5,386.00	$20.88	0	2	4	$1.319730
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	66	Fairmont-Dunnell-C-Martin Cty W-2448 - 000G94 - 066	1,572	$16,310.37	$10.38	$32,835.35	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	2,120	$21,993.50	$10.37	$44,276.39	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	74	Fairmont-Sherburn-C-Martin Cty W-2448 - 000G94 - 074	383	$3,979.13	$10.39	$8,010.62	$20.92	0	2	4	$1.320562
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	75	Fairmont-Trimont-C-Martin Cty W-2448 - 000G94 - 075	331	$1,303.74	$3.94	$2,624.63	$7.93	0	2	4	$0.899273
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	269	$2,797.62	$10.40	$5,632.05	$20.94	0	2	4	$1.320977
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	88	Fairmont-Berlin-T-NRHEG-2168 - 000G94 - 088	83	$861.30	$10.38	$1,733.93	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	89	Fairmont-Ellendale-C-NRHEG-2168 - 000G94 - 089	1,511	$15,679.94	$10.38	$31,566.20	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	1,447	$15,002.41	$10.37	$30,202.22	$20.87	0	2	4	$1.319522
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	1,046	$10,850.95	$10.37	$21,844.68	$20.88	0	2	4	$1.319730
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	5,503	$57,096.69	$10.38	$114,944.65	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	2,073	$27,031.89	$13.04	$54,419.47	$26.25	0	2	4	$1.419129
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	104	Rochester-Vernon-T-Hayfield-0203 - 000G95 - 104	2,434	$25,246.45	$10.37	$50,825.09	$20.88	0	2	4	$1.319730
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	105	Rochester-Wasioja-T-Triton-2125 - 000G95 - 105	79	$819.07	$10.37	$1,648.92	$20.87	0	2	4	$1.319522
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	112	Rochester-Fountain-C-Fillmore Central-2198 - 000G95 - 112	1,188	$12,966.29	$10.91	$26,103.19	$21.97	0	2	4	$1.341830
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	113	Rochester-Harmony-C-Fillmore Central-2198 - 000G95 - 113	1,706	$17,695.60	$10.37	$35,624.04	$20.88	0	2	4	$1.319730
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	114	Rochester-Lanesboro-C-Lanesboro-0229 - 000G95 - 114	845	$8,773.11	$10.38	$17,661.66	$20.90	0	2	4	$1.320146
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	3,214	$33,342.95	$10.37	$67,124.62	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	641	$6,654.53	$10.38	$13,396.62	$20.90	0	2	4	$1.320146
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	4,152	$35,133.18	$8.46	$70,728.64	$17.03	0	2	4	$1.231215

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	131	Rochester-Wanamingo-C-Kenyon-Wanamingo-2172 - 000G95 - 131	190	$2,784.04	$14.65	$5,604.71	$29.50	0	2	4	$1.469822
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	9,429	$97,836.15	$10.38	$196,959.61	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	1,063	$11,027.50	$10.37	$22,200.10	$20.88	0	2	4	$1.319730
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	2,858	$29,646.59	$10.37	$59,683.26	$20.88	0	2	4	$1.319730
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	1,072	$11,130.56	$10.38	$22,407.58	$20.90	0	2	4	$1.320146
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	3,000	$31,140.46	$10.38	$62,690.66	$20.90	0	2	4	$1.320146
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	153	Rochester-Haverhill-T-Rochester-0535 - 000G95 - 153	210	$2,186.48	$10.41	$4,401.73	$20.96	0	2	4	$1.321391
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	154	Rochester-High Forest-T-Stewartville-0534 - 000G95 - 154	175	$1,816.10	$10.38	$3,656.10	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	156	Rochester-Marion-T-Rochester-0535 - 000G95 - 156	10	$19,040.39	$1,904.04	$38,331.31	$3,833.13	0	2	4	$3.583554
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	91,293	$950,115.04	$10.41	$1,912,731.60	$20.95	0	2	4	$1.321184
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	7,109	$74,615.17	$10.50	$150,212.11	$21.13	0	2	4	$1.324899
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	5,152	$53,457.19	$10.38	$107,617.76	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	377	$3,911.23	$10.37	$7,873.92	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	169	Rochester-Plainview-T-Plainview-2899 - 000G95 - 169	3,665	$38,025.84	$10.38	$76,552.02	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	2,974	$30,855.25	$10.38	$62,116.49	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	180	Cloquet-Carlton-C-Carlton-0093 - 000G96 - 180	1,308	$8,161.26	$6.24	$16,429.91	$12.56	0	2	4	$1.098990
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	1,176	$7,331.65	$6.23	$14,759.77	$12.55	0	2	4	$1.098644
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	185	Cloquet-Wrenshall-C-Wrenshall-0100 - 000G96 - 185	1,428	$2,675.48	$1.87	$5,386.16	$3.77	0	2	4	$0.576341
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	190	Cloquet-Twin Lakes-T-Carlton-0093 - 000G96 - 190	1,348	$8,410.14	$6.24	$16,930.94	$12.56	0	2	4	$1.098990
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	195	Wadena-Irondale(Riverton)-T-Crosby-Ironton-0182 - 000G89 - 195	576	$3,588.06	$6.23	$7,223.33	$12.54	0	2	4	$1.098298
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	198	Cloquet-Bovey-C-Greenway-0316 - 000G96 - 198	348	$2,167.35	$6.23	$4,363.22	$12.54	0	2	4	$1.098298
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	201	Cloquet-Coleraine-C-Greenway-0316 - 000G96 - 201	1,761	$10,981.86	$6.24	$22,108.22	$12.55	0	2	4	$1.098644
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	202	Cloquet-Deer River-C-Deer River-0317 - 000G96 - 202	3,049	$19,018.74	$6.24	$38,287.73	$12.56	0	2	4	$1.098990
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	2,535	$15,824.75	$6.24	$31,857.72	$12.57	0	2	4	$1.099335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	207	Cloquet-Laprairie-C-Greenway-0316 - 000G96 - 207	472	$2,945.17	$6.24	$5,929.09	$12.56	0	2	4	$1.098990
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	208	Cloquet-Marble-C-Greenway-0316 - 000G96 - 208	1,154	$7,196.85	$6.24	$14,488.40	$12.55	0	2	4	$1.098644
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	499	$3,108.28	$6.23	$6,257.46	$12.54	0	2	4	$1.098298
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	215	Cloquet-Silver Bau-C-Lake Superior-0381 - 000G96 - 215	104	$642.95	$6.18	$1,294.36	$12.45	0	2	4	$1.095169
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	1,174	$7,321.29	$6.24	$14,738.91	$12.55	0	2	4	$1.098644
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	673	$4,197.14	$6.24	$8,449.50	$12.55	0	2	4	$1.098644
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	220	Cloquet-Buhl-C-Mt Iron-Buhl-0712 - 000G96 - 220	181	$1,130.34	$6.24	$2,275.55	$12.57	0	2	4	$1.099335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	221	Cloquet-Canosia-T-Proctor-0704 - 000G96 - 221	2,355	$14,694.42	$6.24	$29,582.19	$12.56	0	2	4	$1.098990
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	228	Cloquet-Grand Lake-T-Proctor-0704 - 000G96 - 228	1,354	$8,451.62	$6.24	$17,014.45	$12.57	0	2	4	$1.099335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	3,014	$18,800.98	$6.24	$37,849.34	$12.56	0	2	4	$1.098990
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	4,144	$25,863.01	$6.24	$52,066.32	$12.56	0	2	4	$1.098990
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	3,895	$24,307.49	$6.24	$48,934.82	$12.56	0	2	4	$1.098990
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	2,731	$28,342.84	$10.38	$57,058.61	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	245	Bemidji-Frazee-C-Frazee-Vergas-0023 - 000G97 - 245	735	$7,605.16	$10.35	$15,310.39	$20.83	0	2	4	$1.318689
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	7,007	$72,693.04	$10.37	$146,342.56	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	4,267	$43,373.60	$10.16	$87,317.91	$20.46	0	2	4	$1.310906
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	8,982	$93,192.64	$10.38	$187,611.50	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	504	$3,142.69	$6.24	$6,326.73	$12.55	0	2	4	$1.098644
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	255	Wadena-Baudette-C-Lake of Woods-0390 - 000G89 - 255	353	$2,198.46	$6.23	$4,425.85	$12.54	0	2	4	$1.098298
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	257	Wadena-Motley-C-Staples-Motley-2170 - 000G89 - 257	297	$1,856.25	$6.25	$3,736.92	$12.58	0	2	4	$1.099681
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	534	$5,540.90	$10.38	$11,154.71	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	2,478	$15,461.81	$6.24	$31,127.06	$12.56	0	2	4	$1.098990
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	263	$1,648.85	$6.27	$3,319.40	$12.62	0	2	4	$1.101059
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	277	Wadena-Bertha-C-Bertha-Hewitt-0786 - 000G89 - 277	1,129	$7,041.30	$6.24	$14,175.25	$12.56	0	2	4	$1.098990
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	392	$2,444.42	$6.24	$4,921.00	$12.55	0	2	4	$1.098644
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	285	Wadena-Menahga-C-Menahga-821 - 000G89 - 285	842	$5,257.64	$6.24	$10,584.46	$12.57	0	2	4	$1.099335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	288	Wadena-Sebeka-C-Sebeka-820 - 000G89 - 288	648	$4,044.33	$6.24	$8,141.87	$12.56	0	2	4	$1.098990
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	289	Wadena-Thomastown-T-Staples-Motley-2170 - 000G89 - 289	62	$386.61	$6.24	$778.31	$12.55	0	2	4	$1.098644
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	290	Wadena-Verndale-C-Verndale-818 - 000G89 - 290	69	$430.62	$6.24	$866.91	$12.56	0	2	4	$1.098990
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	1,908	$11,904.69	$6.24	$23,966.02	$12.56	0	2	4	$1.098990
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	6,439	$66,803.28	$10.37	$134,485.55	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	1,627	$21,883.24	$13.45	$44,054.42	$27.08	0	2	4	$1.432649
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	315	Pine City-Pine City-T-Pine City-0578 - 000G98 - 315	1,034	$10,727.82	$10.38	$21,596.80	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	326	Worthington-Bingham Lake-C-Windom-0177 - 000G99 - 326	5,012	$52,002.33	$10.38	$104,688.90	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	340	Rosemount-New Market-T-Lakeville-0194 - 000G93 - 340	493	$5,114.51	$10.37	$10,296.31	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	341	Rosemount-Spring Lk-T-Lakeville-0194 - 000G93 - 341	1,775	$18,415.37	$10.37	$37,073.05	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	348	Cloquet-Floodwood-C-Floodwood-0698 - 000G96 - 348	464	$2,903.63	$6.26	$5,845.47	$12.60	0	2	4	$1.100371
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	369	Wadena-Wadena-T-Wadena-Deer Creek-2155 - 000G89 - 369	369	$2,302.33	$6.24	$4,634.95	$12.56	0	2	4	$1.098990
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	383	Rochester-Zumbrota-T-Zumbrota - 000G95 - 383	30	$311.28	$10.38	$626.66	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	849	$8,810.01	$10.38	$17,735.94	$20.89	0	2	4	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	415	Rochester-Rochester-C-Byron SD-0531 - 000G95 - 415	92	$957.47	$10.41	$1,927.54	$20.95	0	2	4	$1.321184
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	418	Rochester-Adams-C-Southland - 000G95 - 418	566	$1,370.67	$2.42	$2,759.38	$4.88	0	2	4	$0.688420
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	5,795	$14,055.44	$2.43	$28,295.82	$4.88	0	2	4	$0.688420

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	433	Fairmont-Geneva-C-N.R.H.E.G. - 000G94 - 433	150	$363.25	$2.42	$731.28	$4.88	0	2	4	$0.688420
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	442	Rochester-Leroy-C-Leroy-Ostrander - 000G95 - 442	656	$1,588.62	$2.42	$3,198.14	$4.88	0	2	4	$0.688420
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	443	Rochester-Leroy-T-Leroy-Ostrander - 000G95 - 443	11	$26.64	$2.42	$53.63	$4.88	0	2	4	$0.688420
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	457	Fairmont-Pickerel Lake-T-Albert Lea - 000G94 - 457	433	$1,048.59	$2.42	$2,110.98	$4.88	0	2	4	$0.688420
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2000	468	Rochester-Lyle-C-Lyle - 000G95 - 468	190	$460.12	$2.42	$926.29	$4.88	0	2	4	$0.688420
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2000	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	3,336	$69,224.90	$20.75	$139,360.66	$41.77	0	4	16	$1.620864
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2000	66	Fairmont-Dunnell-C-Martin Cty W-2448 - 000G94 - 066	2,212	$45,896.68	$20.75	$92,397.26	$41.77	0	4	16	$1.620864
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2000	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	255	$5,165.74	$20.26	$10,399.46	$40.78	0	4	16	$1.610447
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2000	69	Fairmont-Lake Fremont-T-Martin Cty W-2448 - 000G94 - 069	160	$3,319.63	$20.75	$6,682.94	$41.77	0	4	16	$1.620864
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2000	74	Fairmont-Sherburn-C-Martin Cty W-2448 - 000G94 - 074	897	$18,605.50	$20.74	$37,455.81	$41.76	0	4	16	$1.620760
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2000	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	1,060	$21,984.97	$20.74	$44,259.22	$41.75	0	4	16	$1.620656
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2000	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	1,217	$24,689.64	$20.29	$49,704.14	$40.84	0	4	16	$1.611086
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2000	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	1,999	$69,804.60	$34.92	$140,527.68	$70.30	0	4	16	$1.846955
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2000	105	Rochester-Wasioja-T-Triton-2125 - 000G95 - 105	957	$19,857.04	$20.75	$39,975.35	$41.77	0	4	16	$1.620864
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2000	112	Rochester-Fountain-C-Fillmore Central-2198 - 000G95 - 112	673	$14,609.55	$21.71	$29,411.34	$43.70	0	4	16	$1.640481
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2000	128	Rochester-Minneola-T-Zumbrota-Mazeppa-2805 - 000G95 - 128	222	$4,617.43	$20.80	$9,295.62	$41.87	0	4	16	$1.621903
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2000	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	6,415	$133,131.22	$20.75	$268,014.16	$41.78	0	4	16	$1.620968
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2000	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	267	$5,540.90	$20.75	$11,154.71	$41.78	0	4	16	$1.620968
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2000	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	27,696	$574,837.37	$20.76	$1,157,238.39	$41.78	0	4	16	$1.620968
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2000	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	1,830	$38,003.20	$20.77	$76,506.44	$41.81	0	4	16	$1.621280
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2000	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	1,368	$28,397.16	$20.76	$57,167.97	$41.79	0	4	16	$1.621072
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2000	180	Cloquet-Carlton-C-Carlton-0093 - 000G96 - 180	3,317	$41,387.03	$12.48	$83,318.63	$25.12	0	4	16	$1.400020
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2000	190	Cloquet-Twin Lakes-T-Carlton-0093 - 000G96 - 190	80	$995.53	$12.44	$2,004.16	$25.05	0	4	16	$1.398808
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2000	202	Cloquet-Deer River-C-Deer River-0317 - 000G96 - 202	5,094	$63,573.80	$12.48	$127,984.10	$25.12	0	4	16	$1.400020
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2000	255	Wadena-Baudette-C-Lake of Woods-0390 - 000G89 - 255	1,670	$20,843.88	$12.48	$41,962.02	$25.13	0	4	16	$1.400192
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2000	328	Bemidji-Grant Valley-Bemidji-0031 - 000G97 - 328	9	$176.55	$19.62	$355.42	$39.49	0	4	16	$1.596487
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2000	394	Cloquet-Morse-T-Deer River-0317 - 000G96 - 394	145	$1,809.62	$12.48	$3,643.05	$25.12	0	4	16	$1.400020
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2000	414	Rosemount-Credit River-T-Lakeville SD - 000G93 - 414	2,133	$44,259.38	$20.75	$89,101.12	$41.77	0	4	16	$1.620864
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2000	416	Rochester-Cascade-T-Byron SD-0531 - 000G95 - 416	292	$6,061.03	$20.76	$12,201.81	$41.79	0	4	16	$1.621072
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2000	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	1,272	$19,070.96	$14.99	$38,392.85	$30.18	0	4	16	$1.479719
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2000	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	3,366	$50,466.06	$14.99	$101,596.15	$30.18	0	4	16	$1.479719
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2000	108	Rochester-Carrolton-T-Fillmore Central-2198 - 000G95 - 108	4,623	$95,929.19	$20.75	$193,120.61	$41.77	0	6	36	$1.620864
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2000	112	Rochester-Fountain-C-Fillmore Central-2198 - 000G95 - 112	1,023	$21,227.68	$20.75	$42,734.67	$41.77	0	6	36	$1.620864
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2000	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	22	$135.64	$6.20	$273.06	$12.48	0	6	36	$1.096215
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2000	122	Rochester-Spring Valley-T-Kingsland-2137 - 000G95 - 122	42	$258.37	$6.20	$520.14	$12.48	0	6	36	$1.096215
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2000	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	1,015	$22,267.98	$21.94	$44,828.96	$44.17	0	6	36	$1.645127
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2000	387	Rochester-Fountain-T-Kingsland - 000G95 - 387	9,691	$201,092.33	$20.75	$404,830.61	$41.77	0	6	36	$1.620864
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2000	432	Rochester-Fillmore-T-Kingsland - 000G95 - 432	73	$453.02	$6.20	$912.00	$12.48	0	6	36	$1.096215
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2000	434	Fairmont-Geneva-T-Albert Lea - 000G94 - 434	18	$112.05	$6.20	$225.57	$12.48	0	6	36	$1.096215
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2000	435	Fairmont-Geneva-T-Blooming Prairie - 000G94 - 435	68	$423.60	$6.20	$852.77	$12.48	0	6	36	$1.096215
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2000	436	Fairmont-Geneva-T-N.R.H.E.G. - 000G94 - 436	26	$160.92	$6.20	$323.96	$12.48	0	6	36	$1.096215
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2000	467	Rochester-Wykoff-C-Kingsland - 000G95 - 467	1	$3.94	$6.16	$7.93	$12.39	0	6	36	$1.093071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2000	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	653	$746.93	$1.14	$1,503.69	$2.30	1	2	4	$0.361728
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2000	448	Fairmont-Manchester-T-Albert Lea - 000G94 - 448	37	$85,782.29	$2,318.44	$172,693.29	$4,667.39	1	2	4	$3.669074
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2000	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	184	$15,168.70	$82.44	$30,536.99	$165.96	1	4	16	$2.220003
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2000	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	898	$152,334.28	$169.64	$306,672.96	$341.51	1	6	36	$2.533403
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	2000	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	3,857	$192,582.87	$49.93	$387,699.73	$100.52	1	8	64	$2.002252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2001	30	Rosemount-Elko-C-Lakeville-0194 - 000G93 - 030	237	$1,218.29	$5.14	$2,402.04	$10.14	0	1	1	$1.006038
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2001	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	117	$3,007.10	$25.70	$5,928.95	$50.67	0	1	1	$1.704751
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	6,086	$31,247.99	$5.13	$61,610.08	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	364	$1,866.33	$5.13	$3,679.75	$10.11	0	2	4	$1.004751
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	15,533	$79,765.96	$5.14	$157,270.51	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	9,702	$49,820.51	$5.14	$98,228.58	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	9	Rosemount-Randolph-T-Randolph-0195 - 000G93 - 009	159	$816.51	$5.14	$1,609.87	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	47,503	$243,931.73	$5.14	$480,947.87	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	6,351	$34,155.83	$5.38	$67,343.32	$10.60	0	2	4	$1.025306
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	15	Pine City-Mora-C-Mora-0332 - 000G98 - 015	1,954	$10,034.31	$5.14	$19,784.14	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	17	Pine City-Chengwatana-C-Pine City-0578 - 000G98 - 017	2,537	$13,025.39	$5.13	$25,681.50	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	1,517	$7,789.32	$5.13	$15,357.81	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	24	Pine City-Sandstone-C-E Central-2580 - 000G98 - 024	311	$1,600.63	$5.15	$3,155.88	$10.15	0	2	4	$1.006466
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	27	Pine City-Willow River-C-Willow River-0577 - 000G98 - 027	1,943	$9,979.66	$5.14	$19,676.39	$10.13	0	2	4	$1.005609
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	30	Rosemount-Elko-C-Lakeville-0194 - 000G93 - 030	17,946	$92,153.23	$5.14	$181,693.87	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	31	Rosemount-New Market-C-New Prague-0721 - 000G93 - 031	13,335	$68,474.53	$5.13	$135,007.76	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	32	Rosemount-New Market-T-New Prague-0721 - 000G93 - 032	815	$4,185.02	$5.13	$8,251.40	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	33	Rosemount-Spring Lk-T-Prior Lk-Savage-0719 - 000G93 - 033	5,639	$28,957.19	$5.14	$57,093.42	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	1,148	$5,897.07	$5.14	$11,626.96	$10.13	0	2	4	$1.005609
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	41	Fairmont-Clark-T-United S Central-2134 - 000G94 - 041	800	$4,108.03	$5.14	$8,099.59	$10.12	0	2	4	$1.005181

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	2,781	$14,406.49	$5.18	$28,404.55	$10.21	0	2	4	$1.009026
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	2,633	$11,722.85	$4.45	$23,113.35	$8.78	0	2	4	$0.943495
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	62	Worthington-Cottonwood-C-Lakeview-2167 - 000G99 - 062	1,078	$5,540.65	$5.14	$10,924.22	$10.13	0	2	4	$1.005609
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	3,037	$15,597.65	$5.14	$30,753.09	$10.13	0	2	4	$1.005609
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	75	Fairmont-Trimont-C-Martin Cty W-2448 - 000G94 - 075	308	$1,062.76	$3.45	$2,095.39	$6.80	0	2	4	$0.832509
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	77	Fairmont-Welcome-C-Martin Cty W-2448 - 000G94 - 077	776	$3,985.38	$5.14	$7,857.77	$10.13	0	2	4	$1.005609
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	564	$2,893.67	$5.13	$5,705.30	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	88	Fairmont-Berlin-T-NRHEG-2168 - 000G94 - 088	672	$3,447.52	$5.13	$6,797.30	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	5,010	$25,727.51	$5.14	$50,725.63	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	2,917	$15,014.85	$5.15	$29,604.02	$10.15	0	2	4	$1.006466
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	485	$0.00	$0.00	$0.00	$0.00	0	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	104	Rochester-Vernon-T-Hayfield-0203 - 000G95 - 104	1,387	$7,121.85	$5.13	$14,041.79	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	112	Rochester-Fountain-C-Fillmore Central-2198 - 000G95 - 112	663	$4,037.20	$6.09	$7,959.95	$12.01	0	2	4	$1.079543
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	115	Rochester-Mabel-C-Mabel-Canton-0238 - 000G95 - 115	443	$2,274.58	$5.13	$4,484.67	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	302	$1,548.79	$5.13	$3,053.67	$10.11	0	2	4	$1.004751
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	3,605	$18,501.24	$5.13	$36,477.96	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	131	Rochester-Wanamingo-C-Kenyon-Wanamingo-2172 - 000G95 - 131	1,504	$7,718.03	$5.13	$15,217.25	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	1,468	$7,536.58	$5.13	$14,859.49	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	136	Rochester-La Crescent-T-LaCrescent-Hokah-0300 - 000G95 - 136	326	$1,671.92	$5.13	$3,296.44	$10.11	0	2	4	$1.004751
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	738	$3,790.98	$5.14	$7,474.48	$10.13	0	2	4	$1.005609
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	140	Rochester-Brownsdale-C-Hayfield-0203 - 000G95 - 140	404	$2,073.70	$5.13	$4,088.61	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	1,041	$5,346.24	$5.14	$10,540.91	$10.13	0	2	4	$1.005609
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	2,275	$11,681.01	$5.13	$23,030.85	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	188	$965.56	$5.14	$1,903.75	$10.13	0	2	4	$1.005609
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	148	Rochester-Dover-C-Dover-Eyota-0533 - 000G95 - 148	1,789	$9,329.55	$5.21	$18,394.61	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	78,686	$405,241.66	$5.15	$798,994.51	$10.15	0	2	4	$1.006466
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	1,141	$5,981.31	$5.24	$11,793.05	$10.34	0	2	4	$1.014521
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	417	$2,138.49	$5.13	$4,216.35	$10.11	0	2	4	$1.004751
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	1,470	$7,549.54	$5.14	$14,885.05	$10.13	0	2	4	$1.005609
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	169	Rochester-Plainview-T-Plainview-2899 - 000G95 - 169	480	$2,462.51	$5.13	$4,855.21	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	170	Rochester-Altura-C-Lewiston-Altura-0857 - 000G95 - 170	92	$473.05	$5.14	$932.69	$10.14	0	2	4	$1.006038
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	4,938	$25,357.39	$5.14	$49,995.88	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	179	Cloquet-Barnum-C-Barnum-0091 - 000G96 - 179	314	$8,065.79	$25.69	$15,902.91	$50.65	0	2	4	$1.704579
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	4,904	$32,206.96	$6.57	$63,500.84	$12.95	0	2	4	$1.112270
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	1,589	$36,074.82	$22.70	$71,126.90	$44.76	0	2	4	$1.650890
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	185	Cloquet-Wrenshall-C-Wrenshall-0100 - 000G96 - 185	3,480	$10,173.58	$2.92	$20,058.73	$5.76	0	2	4	$0.760422
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	194	Wadena-Deerwood-T-Crosby-Ironton-0182 - 000G89 - 194	6,856	$176,475.72	$25.74	$347,948.27	$50.75	0	2	4	$1.705436
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	195	Wadena-Irondale(Riverton)-T-Crosby-Ironton-0182 - 000G89 - 195	521	$13,407.72	$25.73	$26,435.32	$50.74	0	2	4	$1.705350
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	197	Wadena-Rabbit Lake-T-Aitkin-0001 - 000G89 - 197	1,261	$32,403.68	$25.70	$63,888.70	$50.67	0	2	4	$1.704751
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	198	Cloquet-Bovey-C-Greenway-0316 - 000G96 - 198	1,101	$23,293.63	$21.16	$45,926.87	$41.71	0	2	4	$1.620240
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	199	Cloquet-Calumet-C-Greenway-0316 - 000G96 - 199	248	$6,379.56	$25.72	$12,578.26	$50.72	0	2	4	$1.705179
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	202	Cloquet-Deer River-C-Deer River-0317 - 000G96 - 202	2,613	$67,173.72	$25.71	$132,443.02	$50.69	0	2	4	$1.704922
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	4,211	$93,575.19	$22.22	$184,497.48	$43.81	0	2	4	$1.641573
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	208	Cloquet-Marble-C-Greenway-0316 - 000G96 - 208	233	$5,986.11	$25.69	$11,802.51	$50.65	0	2	4	$1.704579
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	209	Cloquet-Nashwauk-C-Nashwauk-Keewatin-0319 - 000G96 - 209	4,200	$107,974.80	$25.71	$212,888.46	$50.69	0	2	4	$1.704922
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	776	$16,154.44	$20.82	$31,850.90	$41.04	0	2	4	$1.613207
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	213	Cloquet-Ranier-C-International Falls-0361 - 000G96 - 213	120	$2,394.06	$19.95	$4,720.25	$39.34	0	2	4	$1.594834
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	215	Cloquet-Silver Bau-C-Lake Superior-0381 - 000G96 - 215	310	$7,953.37	$25.66	$15,681.26	$50.58	0	2	4	$1.703979
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	188	$4,833.86	$25.71	$9,530.68	$50.70	0	2	4	$1.705008
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	220	Cloquet-Buhl-C-Mt Iron-Buhl-0712 - 000G96 - 220	2,870	$73,788.15	$25.71	$145,484.37	$50.69	0	2	4	$1.704922
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	561	$14,417.25	$25.70	$28,425.76	$50.67	0	2	4	$1.704751
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	1,142	$11,449.14	$10.03	$22,573.69	$19.77	0	2	4	$1.296007
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	2,709	$51,598.57	$19.05	$101,734.29	$37.55	0	2	4	$1.574610
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	228	Cloquet-Grand Lake-T-Proctor-0704 - 000G96 - 228	189	$4,861.96	$25.72	$9,586.08	$50.72	0	2	4	$1.705179
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	5,495	$141,277.80	$25.71	$278,550.30	$50.69	0	2	4	$1.704922
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	434	$3,333.46	$7.68	$6,572.41	$15.14	0	2	4	$1.180126
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	295	$7,588.03	$25.72	$14,960.94	$50.72	0	2	4	$1.705179
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	240	Bemidji-Audubon-C-Lk Park Audubon-2889 - 000G97 - 240	983	$5,048.15	$5.14	$9,953.18	$10.13	0	2	4	$1.005609
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	2,610	$13,407.68	$5.14	$26,435.25	$10.13	0	2	4	$1.005609
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	954	$4,899.11	$5.14	$9,659.33	$10.13	0	2	4	$1.005609
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	1,278	$5,916.59	$4.63	$11,665.45	$9.13	0	2	4	$0.960471
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	13,751	$70,611.17	$5.13	$139,220.48	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	2,559	$61,308.01	$23.96	$120,877.90	$47.24	0	2	4	$1.674310
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	257	Wadena-Motley-C-Staples-Motley-2170 - 000G89 - 257	96	$2,473.13	$25.76	$4,876.15	$50.79	0	2	4	$1.705778
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	866	$4,445.48	$5.13	$8,764.93	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	1,365	$35,073.55	$25.69	$69,152.75	$50.66	0	2	4	$1.704665
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	570	$14,670.18	$25.74	$28,924.45	$50.74	0	2	4	$1.705350

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	278	Wadena-Hewitt-C-Bertha-Hewitt-0786 - 000G89 - 278	116	$2,979.01	$25.68	$5,873.56	$50.63	0	2	4	$1.704408
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	100	$2,557.44	$25.57	$5,042.38	$50.42	0	2	4	$1.702603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	285	Wadena-Menahga-C-Menahga-821 - 000G89 - 285	194	$4,974.38	$25.64	$9,807.73	$50.56	0	2	4	$1.703807
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	288	Wadena-Sebeka-C-Sebeka-820 - 000G89 - 288	962	$24,731.34	$25.71	$48,761.53	$50.69	0	2	4	$1.704922
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	237	$6,098.53	$25.73	$12,024.16	$50.73	0	2	4	$1.705265
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	2,632	$13,517.90	$5.14	$26,652.56	$10.13	0	2	4	$1.005609
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	2,292	$11,770.24	$5.14	$23,206.79	$10.13	0	2	4	$1.005609
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	5,247	$26,938.59	$5.13	$53,113.46	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	298	Rosemount-Eureka-T-Farmington-0192 - 000G93 - 298	228	$1,172.93	$5.14	$2,312.61	$10.14	0	2	4	$1.006038
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	303	Pine City-Knife Lake-T-Mora-0332 - 000G98 - 303	359	$1,844.07	$5.14	$3,635.86	$10.13	0	2	4	$1.005609
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	309	Rochester-Oronoco-T-Rochester-0535 - 000G95 - 309	15,950	$81,904.45	$5.14	$161,486.87	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	314	Worthington-Ortonville-C-Ortonville-2903 - 000G99 - 314	1,292	$6,635.82	$5.14	$13,083.51	$10.13	0	2	4	$1.005609
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	316	Rosemount-Lakeville-C-Farmington-0192 - 000G93 - 316	3,658	$18,783.95	$5.14	$37,035.36	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	341	Rosemount-Spring Lk-T-Lakeville-0194 - 000G93 - 341	1,955	$10,039.25	$5.14	$19,793.88	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	342	Bemidji-Eckels-T-Bemidji-0031 - 000G97 - 342	5,565	$28,576.19	$5.13	$56,342.23	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	356	Rosemount-Cedar Lk-T-Jordan - 000G93 - 356	5,790	$29,732.59	$5.14	$58,622.25	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	357	Rosemount-Credit River-T-Prior Lake - 000G93 - 357	2,257	$11,590.06	$5.14	$22,851.54	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	393	Cloquet-Deer River-T-Deer River-0317 - 000G96 - 393	158	$4,061.78	$25.71	$8,008.41	$50.69	0	2	4	$1.704922
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	414	Rosemount-Credit River-T-Lakeville SD - 000G93 - 414	3,469	$17,813.87	$5.14	$35,122.71	$10.12	0	2	4	$1.005181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	7,192	$114,917.84	$15.98	$226,577.70	$31.50	0	2	4	$1.498311
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	1,283	$20,500.50	$15.98	$40,419.80	$31.50	0	2	4	$1.498311
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	428	Fairmont-Clarks Grove-C-Albert Lea - 000G94 - 428	677	$10,817.49	$15.98	$21,328.30	$31.50	0	2	4	$1.498311
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	433	Fairmont-Geneva-C-N.R.H.E.G. - 000G94 - 433	114	$1,821.56	$15.98	$3,591.48	$31.50	0	2	4	$1.498311
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	441	Fairmont-Hollandale-C-Albert Lea - 000G94 - 441	463	$7,398.08	$15.98	$14,586.42	$31.50	0	2	4	$1.498311
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	442	Rochester-Leroy-C-Leroy-Ostrander - 000G95 - 442	265	$4,234.32	$15.98	$8,348.59	$31.50	0	2	4	$1.498311
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	457	Fairmont-Pickerel Lake-T-Albert Lea - 000G94 - 457	31	$495.34	$15.98	$976.64	$31.50	0	2	4	$1.498311
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2001	461	Rochester-Rose Creek-C-Southland - 000G95 - 461	567	$9,059.85	$15.98	$17,862.85	$31.50	0	2	4	$1.498311
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	5,820	$59,774.25	$10.27	$117,853.87	$20.25	0	4	16	$1.306425
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	635	$6,521.02	$10.27	$12,857.17	$20.25	0	4	16	$1.306425
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	9	Rosemount-Randolph-T-Randolph-0195 - 000G93 - 009	797	$8,188.74	$10.27	$16,145.33	$20.26	0	4	16	$1.306639
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	7,814	$79,154.60	$10.13	$156,065.12	$19.97	0	4	16	$1.300378
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	41	$420.92	$10.27	$829.90	$20.24	0	4	16	$1.306211
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	30	Rosemount-Elko-C-Lakeville-0194 - 000G93 - 030	74	$758.20	$10.25	$1,494.90	$20.20	0	4	16	$1.305351
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	776	$8,262.37	$10.65	$16,290.50	$20.99	0	4	16	$1.322012
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	426	$4,374.20	$10.27	$8,624.39	$20.25	0	4	16	$1.306425
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	4,158	$42,704.59	$10.27	$84,198.49	$20.25	0	4	16	$1.306425
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	89	Fairmont-Ellendale-C-NRHEG-2168 - 000G94 - 089	1,367	$14,042.80	$10.27	$27,687.48	$20.25	0	4	16	$1.306425
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	1,577	$16,193.30	$10.27	$31,927.51	$20.25	0	4	16	$1.306425
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	920	$9,623.24	$10.46	$18,973.66	$20.62	0	4	16	$1.314289
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	919	$0.00	$0.00	$0.00	$0.00	0	4	16	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	516	$5,299.17	$10.27	$10,448.11	$20.25	0	4	16	$1.306425
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	1,829	$18,779.90	$10.27	$37,027.38	$20.24	0	4	16	$1.306211
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	1,118	$12,681.95	$11.34	$25,004.36	$22.37	0	4	16	$1.349666
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	156	Rochester-Marion-T-Rochester-0535 - 000G95 - 156	1,829	$18,779.90	$10.27	$37,027.38	$20.24	0	4	16	$1.306211
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	157	Rochester-New Haven-T-Pine Island-0255 - 000G95 - 157	127	$1,304.25	$10.27	$2,571.52	$20.25	0	4	16	$1.306425
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	25,583	$264,066.82	$10.32	$520,647.20	$20.35	0	4	16	$1.308564
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	2,049	$21,100.82	$10.30	$41,603.42	$20.30	0	4	16	$1.307496
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	992	$10,193.50	$10.28	$20,098.01	$20.26	0	4	16	$1.306639
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	249	$2,559.71	$10.28	$5,046.85	$20.27	0	4	16	$1.306854
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	943	$35,382.68	$37.52	$69,762.24	$73.98	0	4	16	$1.869114
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	2,821	$68,488.96	$24.28	$135,036.22	$47.87	0	4	16	$1.680063
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	1,708	$39,851.18	$23.33	$78,572.56	$46.00	0	4	16	$1.662758
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	7,139	$73,318.06	$10.27	$144,557.52	$20.25	0	4	16	$1.306425
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	694	$35,691.82	$51.43	$70,371.76	$101.40	0	4	16	$2.006038
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	73	$751.33	$10.29	$1,481.36	$20.29	0	4	16	$1.307282
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	2,318	$42,938.58	$18.52	$84,659.82	$36.52	0	4	16	$1.562531
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	309	Rochester-Oronoco-T-Rochester-0535 - 000G95 - 309	10,402	$106,828.31	$10.27	$210,627.98	$20.25	0	4	16	$1.306425
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	318	Rochester-Oronoco-T-Pine Island-0255 - 000G95 - 318	107	$1,101.01	$10.29	$2,170.81	$20.29	0	4	16	$1.307282
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2001	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	1,221	$14,428.07	$11.82	$28,447.10	$23.30	0	4	16	$1.367356
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2001	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	1,465	$15,047.25	$10.27	$29,667.90	$20.25	0	6	36	$1.306425
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2001	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	855	$9,982.54	$11.68	$19,682.07	$23.02	0	6	36	$1.362105
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2001	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	3,200	$32,861.58	$10.27	$64,791.52	$20.25	0	6	36	$1.306425
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2001	27	Pine City-Willow River-C-Willow River-0577 - 000G98 - 027	16	$259.22	$16.20	$511.09	$31.94	1	2	4	$1.504335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2001	131	Rochester-Wanamingo-C-Kenyon-Wanamingo-2172 - 000G95 - 131	64	$1,030.37	$16.10	$2,031.53	$31.74	1	2	4	$1.501607
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2001	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	64	$1,429.17	$22.33	$2,817.83	$44.03	1	2	4	$1.643749
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2001	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	31	$758.80	$24.48	$1,496.09	$48.26	1	2	4	$1.683587
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2001	197	Wadena-Rabbit Lake-T-Aitkin-0001 - 000G89 - 197	328	$26,642.40	$81.23	$52,529.47	$160.15	1	2	4	$2.204527

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2001	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	119	$9,667.70	$81.24	$19,061.32	$160.18	1	2	4	$2.204608
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2001	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	710	$758.80	$1.07	$1,496.09	$2.11	1	2	4	$0.324282
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2001	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	233	$855.40	$3.67	$1,686.55	$7.24	1	2	4	$0.859739
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2001	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	11	$871.22	$79.20	$1,717.74	$156.16	1	2	4	$2.193570
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2001	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	880	$39,925.10	$45.37	$78,718.30	$89.45	1	4	16	$1.951580
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2001	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	29,805	$71,645.18	$2.40	$141,259.19	$4.74	1	6	36	$0.675778
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	2001	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	863	$2,624.52	$3.04	$5,174.63	$6.00	1	8	64	$0.778151
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	2	Pine City-Harris-C-North Branch-0138 - 000G98 - 002	501	$6,741.78	$13.46	$13,056.87	$26.06	0	2	4	$1.415974
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	158	$2,114.39	$13.38	$4,094.96	$25.92	0	2	4	$1.413635
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	2,671	$35,961.91	$13.46	$69,647.76	$26.08	0	2	4	$1.416308
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	24,967	$335,211.95	$13.43	$649,207.96	$26.00	0	2	4	$1.414973
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	37,055	$496,858.54	$13.41	$962,270.34	$25.97	0	2	4	$1.414472
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	9	Rosemount-Randolph-T-Randolph-0195 - 000G93 - 009	296	$2,973.78	$10.05	$5,759.35	$19.46	0	2	4	$1.289143
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	8,283	$109,293.29	$13.19	$211,669.28	$25.55	0	2	4	$1.407391
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	915	$9,192.62	$10.05	$17,803.42	$19.46	0	2	4	$1.289143
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	17	Pine City-Chengwatana-C-Pine City-0578 - 000G98 - 017	300	$4,038.13	$13.46	$7,820.68	$26.07	0	2	4	$1.416141
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	20	Pine City-Finlayson-C-Hinckley-Finlayson-2165 - 000G98 - 020	185	$2,478.35	$13.40	$4,799.84	$25.95	0	2	4	$1.414137
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	187	$2,513.00	$13.44	$4,866.95	$26.03	0	2	4	$1.415474
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	27	Pine City-Willow River-C-Willow River-0577 - 000G98 - 027	1,852	$24,937.50	$13.47	$48,296.68	$26.08	0	2	4	$1.416308
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	30	Rosemount-Elko-C-Lakeville-0194 - 000G93 - 030	3,360	$45,234.02	$13.46	$87,605.13	$26.07	0	2	4	$1.416141
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	31	Rosemount-New Market-C-New Prague-0721 - 000G93 - 031	9,115	$122,685.65	$13.46	$237,606.39	$26.07	0	2	4	$1.416141
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	32	Rosemount-New Market-T-New Prague-0721 - 000G93 - 032	1,443	$19,422.42	$13.46	$37,615.56	$26.07	0	2	4	$1.416141
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	33	Rosemount-Spring Lk-T-Prior Lk-Savage-0719 - 000G93 - 033	40	$538.40	$13.46	$1,042.73	$26.07	0	2	4	$1.416141
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	945	$12,720.99	$13.46	$24,636.85	$26.07	0	2	4	$1.416141
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	200	$2,837.71	$14.19	$5,495.82	$27.48	0	2	4	$1.439017
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	119	$1,594.45	$13.40	$3,087.99	$25.95	0	2	4	$1.414137
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	2,396	$32,253.07	$13.46	$62,464.81	$26.07	0	2	4	$1.416141
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	76	Fairmont-Truman-C-Truman-0458 - 000G94 - 076	342	$4,613.46	$13.49	$8,934.93	$26.13	0	2	4	$1.417139
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	899	$12,097.06	$13.46	$23,428.48	$26.06	0	2	4	$1.415974
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	80	Worthington-Lorain-T-Worthington Dist-0518 - 000G99 - 080	256	$3,431.54	$13.40	$6,645.89	$25.96	0	2	4	$1.414305
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	3,742	$50,156.04	$13.40	$97,137.65	$25.96	0	2	4	$1.414305
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	112	Rochester-Fountain-C-Fillmore Central-2198 - 000G95 - 112	442	$6,598.36	$14.93	$12,779.11	$28.91	0	2	4	$1.461048
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	113	Rochester-Harmony-C-Fillmore Central-2198 - 000G95 - 113	1,249	$16,811.11	$13.46	$32,558.23	$26.07	0	2	4	$1.416141
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	1,322	$17,781.65	$13.45	$34,437.88	$26.05	0	2	4	$1.415808
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	311	$4,194.12	$13.49	$8,122.79	$26.12	0	2	4	$1.416973
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	7,450	$100,325.70	$13.47	$194,301.67	$26.08	0	2	4	$1.416308
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	276	$3,713.67	$13.46	$7,192.30	$26.06	0	2	4	$1.415974
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	140	Rochester-Brownsdale-C-Hayfield-0203 - 000G95 - 140	798	$10,745.25	$13.47	$20,810.42	$26.08	0	2	4	$1.416308
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	16,845	$227,312.46	$13.49	$440,238.05	$26.13	0	2	4	$1.417139
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	515	$7,531.37	$14.62	$14,586.07	$28.32	0	2	4	$1.452093
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	148	Rochester-Dover-C-Dover-Eyota-0533 - 000G95 - 148	2,841	$38,390.10	$13.51	$74,350.45	$26.17	0	2	4	$1.417804
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	1,511	$20,346.64	$13.47	$39,405.52	$26.08	0	2	4	$1.416308
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	154	Rochester-High Forest-T-Stewartville-0534 - 000G95 - 154	44	$592.58	$13.47	$1,147.66	$26.08	0	2	4	$1.416308
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	155	Rochester-Kalmar-T-Bryron-0531 - 000G95 - 155	519	$6,985.90	$13.46	$13,529.66	$26.07	0	2	4	$1.416141
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	156	Rochester-Marion-T-Rochester-0535 - 000G95 - 156	132	$1,776.79	$13.46	$3,441.12	$26.07	0	2	4	$1.416141
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	159	Rochester-Oronoco-C-Rochester-0535 - 000G95 - 159	498	$6,707.11	$13.47	$12,989.72	$26.08	0	2	4	$1.416308
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	47,633	$632,215.41	$13.27	$1,224,417.18	$25.71	0	2	4	$1.410102
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	6,042	$81,328.57	$13.46	$157,509.76	$26.07	0	2	4	$1.416141
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	162	Rochester-Salem-T-Bryron-0531 - 000G95 - 162	285	$3,830.16	$13.44	$7,417.90	$26.03	0	2	4	$1.415474
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	1,633	$22,125.15	$13.55	$42,849.97	$26.24	0	2	4	$1.418964
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	717	$9,653.39	$13.46	$18,695.81	$26.08	0	2	4	$1.416308
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	167	Rochester-Elgin-C-Elgin-Millville-2899 - 000G95 - 167	1,551	$20,866.58	$13.45	$40,412.49	$26.06	0	2	4	$1.415974
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	2,185	$29,411.27	$13.46	$56,961.07	$26.07	0	2	4	$1.416141
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	169	Rochester-Plainview-T-Plainview-2899 - 000G95 - 169	50	$675.40	$13.51	$1,308.05	$26.16	0	2	4	$1.417638
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	171	Rochester-Lewiston-C-Lewiston-Altura-0857 - 000G95 - 171	870	$11,715.79	$13.47	$22,690.07	$26.08	0	2	4	$1.416308
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	241	$3,258.24	$13.52	$6,310.26	$26.18	0	2	4	$1.417970
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	174	Rochester-Utica-C-St Charles-0858 - 000G95 - 174	1,221	$16,447.16	$13.47	$31,853.36	$26.09	0	2	4	$1.416474
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	179	Cloquet-Barnum-C-Barnum-0091 - 000G96 - 179	161	$2,411.53	$14.98	$4,670.43	$29.01	0	2	4	$1.462548
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	180	Cloquet-Carlton-C-Carlton-0093 - 000G96 - 180	781	$11,723.42	$15.01	$22,704.85	$29.07	0	2	4	$1.463445
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	2,089	$31,373.86	$15.02	$60,762.03	$29.09	0	2	4	$1.463744
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	345	$5,181.22	$15.02	$10,034.51	$29.09	0	2	4	$1.463744
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	187	Cloquet-Moose Lake-T-Moose Lake-0097 - 000G96 - 187	238	$3,581.49	$15.05	$6,936.30	$29.14	0	2	4	$1.464490
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	190	Cloquet-Twin Lakes-T-Carlton-0093 - 000G96 - 190	399	$5,993.03	$15.02	$11,606.75	$29.09	0	2	4	$1.463744
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	194	Wadena-Deerwood-T-Crosby-Ironton-0182 - 000G89 - 194	651	$9,765.53	$15.00	$18,912.99	$29.05	0	2	4	$1.463146
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	195	Wadena-Irondale(Riverton)-T-Crosby-Ironton-0182 - 000G89 - 195	616	$9,240.25	$15.00	$17,895.67	$29.05	0	2	4	$1.463146
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	198	Cloquet-Bovey-C-Greenway-0316 - 000G96 - 198	1,305	$19,602.69	$15.02	$37,964.70	$29.09	0	2	4	$1.463744
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	202	Cloquet-Deer River-C-Deer River-0317 - 000G96 - 202	2,328	$35,721.56	$15.34	$69,182.27	$29.72	0	2	4	$1.473049

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	2,905	$43,670.31	$15.03	$84,576.68	$29.11	0	2	4	$1.464042
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	208	Cloquet-Marble-C-Greenway-0316 - 000G96 - 208	89	$1,337.09	$15.02	$2,589.55	$29.10	0	2	4	$1.463893
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	858	$12,881.27	$15.01	$24,947.27	$29.08	0	2	4	$1.463594
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	994	$14,946.75	$15.04	$28,947.50	$29.12	0	2	4	$1.464191
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	220	Cloquet-Buhl-C-Mt Iron-Buhl-0712 - 000G96 - 220	220	$3,294.97	$14.98	$6,381.40	$29.01	0	2	4	$1.462548
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	223	Cloquet-Duluth-C-Proctor-0704 - 000G96 - 223	438	$6,589.94	$15.05	$12,762.80	$29.14	0	2	4	$1.464490
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	153	$2,298.95	$15.03	$4,452.40	$29.10	0	2	4	$1.463893
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	586	$8,810.47	$15.03	$17,063.32	$29.12	0	2	4	$1.464191
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	5,839	$87,724.48	$15.02	$169,896.78	$29.10	0	2	4	$1.463893
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	726	$10,887.73	$15.00	$21,086.36	$29.04	0	2	4	$1.462997
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	470	$7,067.48	$15.04	$13,687.65	$29.12	0	2	4	$1.464191
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	3,155	$42,463.26	$13.46	$82,238.98	$26.07	0	2	4	$1.416141
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	157	$2,114.39	$13.47	$4,094.96	$26.08	0	2	4	$1.416308
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	1,919	$25,194.10	$13.13	$48,793.64	$25.43	0	2	4	$1.405346
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	1,383	$18,618.53	$13.46	$36,058.67	$26.07	0	2	4	$1.416141
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	413	$6,199.86	$15.01	$12,007.32	$29.07	0	2	4	$1.463445
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	253	Wadena-Todd-C-Park Rapids-0309 - 000G89 - 253	518	$7,776.10	$15.01	$15,060.04	$29.07	0	2	4	$1.463445
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	257	Wadena-Motley-C-Staples-Motley-2170 - 000G89 - 257	284	$4,285.19	$15.09	$8,299.17	$29.22	0	2	4	$1.465680
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	258	Wadena-Motley-T-Staples-Motley-2170 - 000G89 - 258	168	$2,530.91	$15.06	$4,901.64	$29.18	0	2	4	$1.465085
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	465	$6,256.51	$13.45	$12,117.04	$26.06	0	2	4	$1.415974
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	266	Wadena-Rocksbury-T-Thief River Falls-0564 - 000G89 - 266	290	$4,347.77	$14.99	$8,420.37	$29.04	0	2	4	$1.462997
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	273	$4,104.55	$15.03	$7,949.32	$29.12	0	2	4	$1.464191
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	714	$10,744.47	$15.05	$20,808.91	$29.14	0	2	4	$1.464490
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	477	$7,162.98	$15.02	$13,872.61	$29.08	0	2	4	$1.463594
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	661	$6,470.35	$9.79	$12,531.18	$18.96	0	2	4	$1.277838
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	580	$5,677.47	$9.79	$10,995.61	$18.96	0	2	4	$1.277838
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	3,559	$47,725.29	$13.41	$92,429.99	$25.97	0	2	4	$1.414472
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	15,483	$208,411.29	$13.46	$403,631.99	$26.07	0	2	4	$1.416141
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	309	Rochester-Oronoco-T-Rochester-0535 - 000G95 - 309	2,281	$30,710.61	$13.46	$59,477.51	$26.08	0	2	4	$1.416308
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	313	Worthington-Mountain Lake-C-Mountain Lake-0173 - 000G99 - 313	262	$7,323.26	$27.95	$14,183.02	$54.13	0	2	4	$1.733438
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	316	Rosemount-Lakeville-C-Farmington-0192 - 000G93 - 316	3,652	$48,754.50	$13.35	$94,423.27	$25.86	0	2	4	$1.412629
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	340	Rosemount-New Market-T-Lakeville-0194 - 000G93 - 340	4,745	$63,866.54	$13.46	$123,690.90	$26.07	0	2	4	$1.416141
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	348	Cloquet-Floodwood-C-Floodwood-0698 - 000G96 - 348	501	$3,294.97	$6.58	$6,381.40	$12.74	0	2	4	$1.105169
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	357	Rosemount-Credit River-T-Prior Lake - 000G93 - 357	4,155	$55,926.64	$13.46	$108,313.62	$26.07	0	2	4	$1.416141
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	359	Fairmont-Westford-T-Truman - 000G94 - 359	46	$620.52	$13.49	$1,201.77	$26.13	0	2	4	$1.417139
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	377	Rochester-Caledonia-T-Caledonia-0299 - 000G95 - 377	1,003	$13,500.88	$13.46	$26,147.27	$26.07	0	2	4	$1.416141
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	414	Rosemount-Credit River-T-Lakeville SD - 000G93 - 414	3,658	$49,236.98	$13.46	$95,357.69	$26.07	0	2	4	$1.416141
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	3,173	$32,230.76	$10.16	$62,421.60	$19.67	0	2	4	$1.293804
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	442	Rochester-Leroy-C-Leroy-Ostrander - 000G95 - 442	945	$9,599.14	$10.16	$18,590.74	$19.67	0	2	4	$1.293804
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	443	Rochester-Leroy-T-Leroy-Ostrander - 000G95 - 443	2,286	$23,220.77	$10.16	$44,971.87	$19.67	0	2	4	$1.293804
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2002	457	Fairmont-Pickerel Lake-T-Albert Lea - 000G94 - 457	133	$1,350.99	$10.16	$2,616.47	$19.67	0	2	4	$1.293804
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	3	Pine City-Nessel-T-Rush City-0139 - 000G98 - 003	5	$138.64	$27.73	$268.51	$53.70	0	4	16	$1.729974
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	896	$24,124.81	$26.93	$46,722.73	$52.15	0	4	16	$1.717254
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	3,851	$101,681.56	$26.40	$196,927.57	$51.14	0	4	16	$1.708761
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	3,923	$67,558.65	$17.22	$130,841.43	$33.35	0	4	16	$1.523096
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	32	Rosemount-New Market-T-New Prague-0721 - 000G93 - 032	9,031	$243,119.86	$26.92	$470,852.39	$52.14	0	4	16	$1.717171
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	226	$6,083.19	$26.92	$11,781.37	$52.13	0	4	16	$1.717088
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	54	Fairmont-Lakefield-C-Jackson Cty Central-2895 - 000G94 - 054	810	$21,802.44	$26.92	$42,224.98	$52.13	0	4	16	$1.717088
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	972	$15,407.30	$15.85	$29,839.45	$30.70	0	4	16	$1.487138
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	875	$23,552.89	$26.92	$45,615.09	$52.13	0	4	16	$1.717088
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	1,314	$35,372.66	$26.92	$68,506.54	$52.14	0	4	16	$1.717171
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	1,009	$27,157.74	$26.92	$52,596.64	$52.13	0	4	16	$1.717088
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	1,731	$46,013.91	$26.58	$89,115.55	$51.48	0	4	16	$1.711639
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	5,842	$153,310.39	$26.24	$296,917.59	$50.82	0	4	16	$1.706035
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	3,976	$107,532.25	$27.05	$208,258.66	$52.38	0	4	16	$1.719165
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	646	$17,400.36	$26.94	$33,699.43	$52.17	0	4	16	$1.717421
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	9,526	$257,797.62	$27.06	$499,278.94	$52.41	0	4	16	$1.719414
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	3,380	$91,074.36	$26.95	$176,384.52	$52.18	0	4	16	$1.717504
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	1,936	$18,197.60	$9.40	$35,243.45	$18.20	0	4	16	$1.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	704	$18,942.82	$26.91	$36,686.73	$52.11	0	4	16	$1.716921
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	1,576	$42,426.39	$26.92	$82,167.57	$52.14	0	4	16	$1.717171
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	180	Cloquet-Carlton-C-Carlton-0093 - 000G96 - 180	879	$26,407.52	$30.04	$51,143.68	$58.18	0	4	16	$1.764774
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	201	Cloquet-Coleraine-C-Greenway-0316 - 000G96 - 201	636	$19,099.79	$30.03	$36,990.74	$58.16	0	4	16	$1.764624
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	1,997	$60,003.38	$30.05	$116,209.07	$58.19	0	4	16	$1.764848
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	6,985	$157,036.46	$22.48	$304,133.90	$43.54	0	4	16	$1.638888
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	225	Cloquet-Fayal-T-Eveleth-Gilbert-2154 - 000G96 - 225	8,109	$243,613.04	$30.04	$471,807.53	$58.18	0	4	16	$1.764774
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	233	Cloquet--Hoyt Lakes-C-Mesabi E-2711 - 000G96 - 233	3,613	$97,261.81	$26.92	$188,367.81	$52.14	0	4	16	$1.717171

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	235	Cloquet-Leonidas-C-Eveleth-Gilbert-2154 - 000G96 - 235	7,266	$218,332.06	$30.05	$422,845.64	$58.20	0	4	16	$1.764923
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	3,125	$82,770.25	$26.49	$160,301.88	$51.30	0	4	16	$1.710117
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	257	Wadena-Motley-C-Staples-Motley-2170 - 000G89 - 257	58	$1,742.99	$30.05	$3,375.66	$58.20	0	4	16	$1.764923
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	1,846	$49,705.43	$26.93	$96,264.95	$52.15	0	4	16	$1.717254
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	4,542	$117,884.64	$25.95	$228,308.23	$50.27	0	4	16	$1.701309
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2002	312	Rochester-Chatfield-T-Chatfield-0227 - 000G95 - 312	290	$7,938.29	$27.37	$15,374.16	$53.01	0	4	16	$1.724358
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2002	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	6,375	$157,844.71	$24.76	$305,699.25	$47.95	0	6	36	$1.680789
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2002	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	165	$4,443.71	$26.93	$8,606.17	$52.16	0	6	36	$1.717338
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2002	201	Cloquet-Coleraine-C-Greenway-0316 - 000G96 - 201	366	$10,983.24	$30.01	$21,271.34	$58.12	0	6	36	$1.764326
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2002	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	2,319	$69,671.93	$30.04	$134,934.24	$58.19	0	6	36	$1.764848
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	187	Steel 12 in	2002	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	516	$1,354.62	$2.63	$2,623.50	$5.08	1	12	144	$0.705864
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2002	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	74	$3,485.99	$47.11	$6,751.35	$91.23	1	2	4	$1.960138
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2002	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	20	$0.20	$0.01	$0.39	$0.02	1	3	9	($1.698970)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2002	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	277	$68,048.33	$245.66	$131,789.80	$475.78	1	6	36	$2.677406
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	2002	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	34	$3,137.85	$92.29	$6,077.10	$178.74	1	8	64	$2.252222
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	2002	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	5	$448.85	$92.36	$869.29	$178.87	1	8	64	$2.252538
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	2002	457	Fairmont-Pickerel Lake-T-Albert Lea - 000G94 - 457	0	$1.51	$75.50	$2.92	$146.00	1	8	64	$2.164353
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2003	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	57	$6,000.21	$105.27	$11,446.78	$200.82	0	1	1	$2.302807
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	2	Pine City-Harris-C-North Branch-0138 - 000G98 - 002	303	$4,090.13	$13.50	$7,802.87	$25.75	0	2	4	$1.410777
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	7,365	$99,133.56	$13.46	$189,120.13	$25.68	0	2	4	$1.409595
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	4,092	$55,078.05	$13.46	$105,074.09	$25.68	0	2	4	$1.409595
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	16,806	$225,207.40	$13.40	$429,635.07	$25.56	0	2	4	$1.407561
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	14,362	$192,037.48	$13.37	$366,355.79	$25.51	0	2	4	$1.406710
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	11,383	$151,330.74	$13.29	$288,698.30	$25.36	0	2	4	$1.404149
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	828	$7,001.74	$8.46	$13,357.43	$16.13	0	2	4	$1.207634
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	12	Rosemount-Cannon Falls-T-Cannon Falls-0252 - 000G93 - 012	68	$286.21	$4.21	$546.01	$8.03	0	2	4	$0.904716
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	715	$9,618.73	$13.45	$18,349.95	$25.66	0	2	4	$1.409257
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	605	$8,128.26	$13.44	$15,506.53	$25.63	0	2	4	$1.408749
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	30	Rosemount-Elko-C-Lakeville-0194 - 000G93 - 030	7,193	$82,640.01	$11.49	$157,654.89	$21.92	0	2	4	$1.340841
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	31	Rosemount-New Market-C-New Prague-0721 - 000G93 - 031	5,415	$55,016.30	$10.16	$104,956.28	$19.38	0	2	4	$1.287354
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	32	Rosemount-New Market-T-New Prague-0721 - 000G93 - 032	5,267	$57,700.91	$10.96	$110,077.79	$20.90	0	2	4	$1.320146
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	33	Rosemount-Spring Lk-T-Prior Lk-Savage-0719 - 000G93 - 033	2,044	$27,504.36	$13.46	$52,470.91	$25.67	0	2	4	$1.409426
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	35	Pine City-Scandia-C-Forest Lake-0831 - 000G98 - 035	1,748	$23,518.22	$13.45	$44,866.43	$25.67	0	2	4	$1.409426
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	284	$3,830.16	$13.49	$7,306.91	$25.73	0	2	4	$1.410440
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	2,011	$26,949.77	$13.40	$51,412.90	$25.57	0	2	4	$1.407731
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	82	Worthington-Lamberton-C-Red Rock Central-2884 - 000G99 - 082	7,085	$96,346.12	$13.60	$183,802.45	$25.94	0	2	4	$1.413970
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	85	Worthington-Sanborn-C-Red Rock Central-2884 - 000G99 - 085	2,649	$35,609.52	$13.44	$67,933.38	$25.64	0	2	4	$1.408918
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	87	Worthington-WalnutGrve-C-Westbrk-WalnutGrv-2898 - 000G99 - 087	120	$1,357.60	$11.31	$2,589.93	$21.58	0	2	4	$1.334051
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	93	Fairmont-New Richland-C-NRHEG-2168 - 000G94 - 093	2,595	$34,922.05	$13.46	$66,621.87	$25.67	0	2	4	$1.409426
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	242	$3,258.24	$13.46	$6,215.84	$25.69	0	2	4	$1.409764
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	1,050	$14,124.80	$13.45	$26,946.32	$25.66	0	2	4	$1.409257
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	8,970	$120,736.10	$13.46	$230,331.97	$25.68	0	2	4	$1.409595
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	2,105	$28,330.28	$13.46	$54,046.54	$25.68	0	2	4	$1.409595
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	115	Rochester-Mabel-C-Mabel-Canton-0238 - 000G95 - 115	404	$5,424.61	$13.43	$10,348.69	$25.62	0	2	4	$1.408579
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	120	Rochester-Rushford-V-Rushford-Peterson-0239 - 000G95 - 120	667	$15,078.01	$22.61	$28,764.78	$43.13	0	2	4	$1.634779
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	123	Fairmont-Glenville-C-Glenville-Emmons-2886 - 000G94 - 123	20,829	$69,507.83	$3.34	$132,602.22	$6.37	0	2	4	$0.804139
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	3,006	$40,467.98	$13.46	$77,202.01	$25.68	0	2	4	$1.409595
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	7,387	$99,417.15	$13.46	$189,661.15	$25.67	0	2	4	$1.409426
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	2,850	$38,352.18	$13.46	$73,165.63	$25.67	0	2	4	$1.409426
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	290	$3,899.48	$13.45	$7,439.16	$25.65	0	2	4	$1.409087
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	11,773	$158,466.56	$13.46	$302,311.52	$25.68	0	2	4	$1.409595
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	277	$3,728.47	$13.46	$7,112.92	$25.68	0	2	4	$1.409595
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	1,864	$25,730.40	$13.80	$49,086.67	$26.33	0	2	4	$1.420451
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	3,774	$50,797.79	$13.46	$96,908.50	$25.68	0	2	4	$1.409595
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	154	Rochester-High Forest-T-Stewartville-0534 - 000G95 - 154	300	$4,039.14	$13.46	$7,705.59	$25.69	0	2	4	$1.409764
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	155	Rochester-Kalmar-T-Bryron-0531 - 000G95 - 155	141	$1,897.92	$13.46	$3,620.72	$25.68	0	2	4	$1.409595
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	156	Rochester-Marion-T-Rochester-0535 - 000G95 - 156	5,667	$76,277.58	$13.46	$145,517.08	$25.68	0	2	4	$1.409595
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	159	Rochester-Oronoco-C-Rochester-0535 - 000G95 - 159	5,623	$75,702.00	$13.46	$144,419.03	$25.68	0	2	4	$1.409595
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	95,756	$1,280,885.76	$13.38	$2,443,585.06	$25.52	0	2	4	$1.406881
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	2,811	$37,836.35	$13.46	$72,181.56	$25.68	0	2	4	$1.409595
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	1,584	$21,316.17	$13.46	$40,665.52	$25.67	0	2	4	$1.409426
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	449	$6,048.53	$13.47	$11,538.97	$25.70	0	2	4	$1.409933
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	167	Rochester-Elgin-C-Elgin-Millville-2899 - 000G95 - 167	3,109	$41,598.69	$13.38	$79,359.10	$25.53	0	2	4	$1.407051
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	1,620	$21,802.44	$13.46	$41,593.18	$25.67	0	2	4	$1.409426
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	169	Rochester-Plainview-T-Plainview-2899 - 000G95 - 169	1,258	$16,932.42	$13.46	$32,302.50	$25.68	0	2	4	$1.409595
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	5,246	$70,606.66	$13.46	$134,698.49	$25.68	0	2	4	$1.409595
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	174	Rochester-Utica-C-St Charles-0858 - 000G95 - 174	662	$8,908.16	$13.46	$16,994.37	$25.67	0	2	4	$1.409426

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	611	$7,507.85	$12.29	$14,322.96	$23.44	0	2	4	$1.369958
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	185	Cloquet-Wrenshall-C-Wrenshall-0100 - 000G96 - 185	1,191	$1,116.76	$0.94	$2,130.48	$1.79	0	2	4	$0.252853
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	190	Cloquet-Twin Lakes-T-Carlton-0093 - 000G96 - 190	2,037	$25,039.63	$12.29	$47,768.87	$23.45	0	2	4	$1.370143
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	198	Cloquet-Bovey-C-Greenway-0316 - 000G96 - 198	576	$7,077.29	$12.29	$13,501.56	$23.44	0	2	4	$1.369958
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	201	Cloquet-Coleraine-C-Greenway-0316 - 000G96 - 201	2,561	$31,471.08	$12.29	$60,038.34	$23.44	0	2	4	$1.369958
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	1,607	$19,751.84	$12.29	$37,681.19	$23.45	0	2	4	$1.370143
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	206	Cloquet-Keewatin-C-Nashwauk-Keewatin-0319 - 000G96 - 206	986	$12,122.89	$12.30	$23,127.21	$23.46	0	2	4	$1.370328
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	208	Cloquet-Marble-C-Greenway-0316 - 000G96 - 208	402	$4,937.96	$12.28	$9,420.30	$23.43	0	2	4	$1.369772
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	400	$4,918.75	$12.30	$9,383.65	$23.46	0	2	4	$1.370328
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	213	Cloquet-Ranier-C-International Falls-0361 - 000G96 - 213	239	$2,938.93	$12.30	$5,606.69	$23.46	0	2	4	$1.370328
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	100	$1,224.40	$12.24	$2,335.83	$23.36	0	2	4	$1.368473
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	2,836	$34,861.72	$12.29	$66,506.77	$23.45	0	2	4	$1.370143
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	221	Cloquet-Canosia-T-Proctor-0704 - 000G96 - 221	1,173	$1,358.95	$1.16	$2,592.51	$2.21	0	2	4	$0.344392
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	223	Cloquet-Duluth-C-Proctor-0704 - 000G96 - 223	1,435	$17,639.41	$12.29	$33,651.24	$23.45	0	2	4	$1.370143
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	180	$2,206.61	$12.26	$4,209.62	$23.39	0	2	4	$1.369030
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	1,709	$21,003.14	$12.29	$40,068.33	$23.45	0	2	4	$1.370143
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	9,058	$111,406.78	$12.30	$212,534.13	$23.46	0	2	4	$1.370328
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	1,988	$24,434.15	$12.29	$46,613.78	$23.45	0	2	4	$1.370143
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	240	Bemidji-Audubon-C-Lk Park Audubon-2889 - 000G97 - 240	1,147	$15,441.96	$13.46	$29,459.10	$25.68	0	2	4	$1.409595
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	8,214	$110,572.05	$13.46	$210,941.69	$25.68	0	2	4	$1.409595
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	245	Bemidji-Frazee-C-Frazee-Vergas-0023 - 000G97 - 245	649	$8,734.85	$13.46	$16,663.74	$25.68	0	2	4	$1.409595
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	2,215	$29,814.32	$13.46	$56,877.69	$25.68	0	2	4	$1.409595
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	2,481	$32,646.52	$13.16	$62,280.77	$25.10	0	2	4	$1.399674
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	6,564	$88,286.95	$13.45	$168,427.72	$25.66	0	2	4	$1.409257
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	2,516	$27,730.61	$11.02	$52,902.54	$21.03	0	2	4	$1.322839
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	266	Wadena-Rocksbury-T-Thief River Falls-0564 - 000G89 - 266	318	$3,907.81	$12.29	$7,455.05	$23.44	0	2	4	$1.369958
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	2,654	$32,622.32	$12.29	$62,234.60	$23.45	0	2	4	$1.370143
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	1,134	$13,939.31	$12.29	$26,592.45	$23.45	0	2	4	$1.370143
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	282	Wadena-Villard-T-Staples-Motley-2170 - 000G89 - 282	2,385	$29,318.30	$12.29	$55,931.42	$23.45	0	2	4	$1.370143
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	418	$5,139.78	$12.30	$9,805.32	$23.46	0	2	4	$1.370328
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	2,108	$23,261.73	$11.03	$44,377.11	$21.05	0	2	4	$1.323252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	629	$8,457.55	$13.45	$16,134.73	$25.65	0	2	4	$1.409087
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	5,994	$80,676.01	$13.46	$153,908.10	$25.68	0	2	4	$1.409595
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	369	$4,974.01	$13.48	$9,489.07	$25.72	0	2	4	$1.410271
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	309	Rochester-Oronoco-T-Rochester-0535 - 000G95 - 309	3,556	$47,855.72	$13.46	$91,295.83	$25.67	0	2	4	$1.409426
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	313	Worthington-Mountain Lake-C-Mountain Lake-0173 - 000G99 - 313	298	$4,018.86	$13.49	$7,666.91	$25.73	0	2	4	$1.410440
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	314	Worthington-Ortonville-C-Ortonville-2903 - 000G99 - 314	573	$3,830.16	$6.68	$7,306.91	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	316	Rosemount-Lakeville-C-Farmington-0192 - 000G93 - 316	7,318	$97,676.07	$13.35	$186,339.63	$25.46	0	2	4	$1.405858
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	318	Rochester-Oronoco-T-Pine Island-0255 - 000G95 - 318	28	$376.57	$13.45	$718.39	$25.66	0	2	4	$1.409257
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	330	Rosemount-Lakeville-C-Rosemnt-Apple Vly-0196 - 000G93 - 330	66	$880.92	$13.35	$1,680.56	$25.46	0	2	4	$1.405858
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	342	Bemidji-Eckels-T-Bemidji-0031 - 000G97 - 342	2,698	$36,288.58	$13.45	$69,228.84	$25.66	0	2	4	$1.409257
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	384	Rochester-Pine Island-T-Zumbrota - 000G95 - 384	22	$296.05	$13.46	$564.78	$25.67	0	2	4	$1.409426
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	372	$5,006.58	$13.46	$9,551.21	$25.68	0	2	4	$1.409595
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	414	Rosemount-Credit River-T-Lakeville SD - 000G93 - 414	2,058	$19,637.46	$9.54	$37,462.98	$18.20	0	2	4	$1.260071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	1,398	$4,665.22	$3.34	$8,899.98	$6.37	0	2	4	$0.804139
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	428	Fairmont-Clarks Grove-C-Albert Lea - 000G94 - 428	158	$527.26	$3.34	$1,005.87	$6.37	0	2	4	$0.804139
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	433	Fairmont-Geneva-C-N.R.H.E.G. - 000G94 - 433	1,620	$5,406.05	$3.34	$10,313.29	$6.37	0	2	4	$0.804139
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	442	Rochester-Leroy-C-Leroy-Ostrander - 000G95 - 442	957	$3,193.58	$3.34	$6,092.49	$6.37	0	2	4	$0.804139
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	457	Fairmont-Pickerel Lake-T-Albert Lea - 000G94 - 457	1,837	$6,130.20	$3.34	$11,694.77	$6.37	0	2	4	$0.804139
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	462	Fairmont-Shell Rock-T-Glenville-Emmons - 000G94 - 462	1,416	$4,725.29	$3.34	$9,014.58	$6.37	0	2	4	$0.804139
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2003	467	Rochester-Wykoff-C-Kingsland - 000G95 - 467	118	$393.77	$3.34	$751.21	$6.37	0	2	4	$0.804139
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	1,001	$26,949.77	$26.92	$51,412.90	$51.36	0	4	16	$1.710625
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	2,533	$52,157.23	$20.59	$99,501.95	$39.28	0	4	16	$1.594171
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	1,223	$12,330.78	$10.08	$23,523.80	$19.23	0	4	16	$1.283979
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	5,894	$83,765.27	$14.21	$159,801.57	$27.11	0	4	16	$1.433130
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	2,168	$58,363.45	$26.92	$111,341.74	$51.36	0	4	16	$1.710625
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	12	Rosemount-Cannon Falls-T-Cannon Falls-0252 - 000G93 - 012	55	$1,480.63	$26.92	$2,824.65	$51.36	0	4	16	$1.710625
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	30	Rosemount-Elko-C-Lakeville-0194 - 000G93 - 030	3,970	$74,541.74	$18.78	$142,205.56	$35.82	0	4	16	$1.554126
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	426	$6,425.68	$15.08	$12,258.47	$28.78	0	4	16	$1.459091
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	72	Fairmont-Rolling Green-T-Fairmont Area-2752 - 000G94 - 072	29	$437.42	$15.08	$834.48	$28.78	0	4	16	$1.459091
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	82	Worthington-Lamberton-C-Red Rock Central-2884 - 000G99 - 082	3,976	$107,036.52	$26.92	$204,196.85	$51.36	0	4	16	$1.710625
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	85	Worthington-Sanborn-C-Red Rock Central-2884 - 000G99 - 085	671	$18,058.95	$26.91	$34,451.61	$51.34	0	4	16	$1.710456
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	92	Fairmont-New Richland-T-NRHEG-2168 - 000G94 - 092	327	$8,793.43	$26.89	$16,775.50	$51.30	0	4	16	$1.710117
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	93	Fairmont-New Richland-C-NRHEG-2168 - 000G94 - 093	2,302	$61,970.62	$26.92	$118,223.25	$51.36	0	4	16	$1.710625
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	520	$13,986.15	$26.90	$26,681.81	$51.31	0	4	16	$1.710202
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	2,135	$57,487.07	$26.93	$109,669.85	$51.37	0	4	16	$1.710710
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	4,275	$123,571.86	$28.91	$235,741.83	$55.14	0	4	16	$1.741467

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	1,075	$28,931.06	$26.91	$55,192.67	$51.34	0	4	16	$1.710456
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	3,830	$103,101.05	$26.92	$196,689.04	$51.35	0	4	16	$1.710540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	168	$4,523.63	$26.93	$8,629.86	$51.37	0	4	16	$1.710710
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	685	$19,075.28	$27.85	$36,390.50	$53.12	0	4	16	$1.725258
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	1,406	$32,708.48	$23.26	$62,398.97	$44.38	0	4	16	$1.647187
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	155	Rochester-Kalmar-T-Bryron-0531 - 000G95 - 155	3,982	$107,204.27	$26.92	$204,516.87	$51.36	0	4	16	$1.710625
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	19,265	$520,051.42	$26.99	$992,118.05	$51.50	0	4	16	$1.711807
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	397	$10,698.48	$26.95	$20,409.82	$51.41	0	4	16	$1.711048
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	1,072	$28,856.19	$26.92	$55,049.84	$51.35	0	4	16	$1.710540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	2,437	$59,914.79	$24.59	$114,301.28	$46.90	0	4	16	$1.671173
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	338	$8,315.15	$24.60	$15,863.07	$46.93	0	4	16	$1.671451
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	433	$10,642.85	$24.58	$20,303.69	$46.89	0	4	16	$1.671080
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	871	$21,420.24	$24.59	$40,864.05	$46.92	0	4	16	$1.671358
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	240	Bemidji-Audubon-C-Lk Park Audubon-2889 - 000G97 - 240	1,642	$44,194.54	$26.92	$84,311.28	$51.35	0	4	16	$1.710540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	68	$1,837.08	$27.02	$3,504.65	$51.54	0	4	16	$1.712144
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	2,792	$75,165.07	$26.92	$143,394.71	$51.36	0	4	16	$1.710625
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	1,111	$29,913.39	$26.92	$57,066.69	$51.37	0	4	16	$1.710710
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	299	Rosemount-Rosemount-C-Inver Grove Hts-0199 - 000G93 - 299	6,793	$239,802.31	$35.30	$457,478.22	$67.35	0	4	16	$1.828338
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	340	Rosemount-New Market-T-Lakeville-0194 - 000G93 - 340	3,739	$86,409.26	$23.11	$164,845.61	$44.09	0	4	16	$1.644340
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	384	Rochester-Pine Island-T-Zumbrota - 000G95 - 384	61	$1,640.91	$26.90	$3,130.41	$51.32	0	4	16	$1.710287
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	4,336	$37,150.22	$8.57	$70,872.61	$16.35	0	4	16	$1.213518
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2003	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	243	$2,081.99	$8.57	$3,971.88	$16.35	0	4	16	$1.213518
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2003	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	1,441	$40,554.63	$28.14	$77,367.31	$53.69	0	6	36	$1.729893
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2003	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	950	$25,572.26	$26.92	$48,784.98	$51.35	0	6	36	$1.710540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2003	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	3,064	$83,230.46	$27.16	$158,781.30	$51.82	0	6	36	$1.714497
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2003	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	3,303	$80,485.70	$24.37	$153,545.04	$46.49	0	6	36	$1.667360
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2003	309	Rochester-Oronoco-T-Rochester-0535 - 000G95 - 309	6,186	$166,533.99	$26.92	$317,702.00	$51.36	0	6	36	$1.710625
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2003	318	Rochester-Oronoco-T-Pine Island-0255 - 000G95 - 318	6,128	$164,974.19	$26.92	$314,726.32	$51.36	0	6	36	$1.710625
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	183	Steel 1 1/2 in	2003	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	91	$0.91	$0.01	$1.74	$0.02	1	1.5	2.25	($1.698970)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2003	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	254	$2.54	$0.01	$4.85	$0.02	1	1.25	1.5625	($1.698970)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2003	123	Fairmont-Glenville-C-Glenville-Emmons-2886 - 000G94 - 123	279	$6,830.66	$24.48	$13,031.06	$46.71	1	2	4	$1.669410
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2003	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	12	$293.79	$24.48	$560.47	$46.71	1	2	4	$1.669410
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2003	469	Rochester-Lodi-T-Southland - 000G95 - 469	126	$3,084.81	$24.48	$5,884.99	$46.71	1	2	4	$1.669410
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	2003	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	214	$17,886.50	$83.50	$34,122.62	$159.30	1	8	64	$2.202216
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	2003	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	31	$2,558.52	$83.50	$4,880.97	$159.30	1	8	64	$2.202216
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	2003	457	Fairmont-Pickerel Lake-T-Albert Lea - 000G94 - 457	0	$8.61	$86.10	$16.43	$164.30	1	8	64	$2.215638
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	2	Pine City-Harris-C-North Branch-0138 - 000G98 - 002	1,059	$8,221.51	$7.76	$13,496.68	$12.74	0	2	4	$1.105169
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	3	Pine City-Nessel-T-Rush City-0139 - 000G98 - 003	108	$838.74	$7.77	$1,376.91	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	3,184	$24,734.71	$7.77	$40,605.26	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	5,766	$44,780.60	$7.77	$73,513.21	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	38,991	$302,832.95	$7.77	$497,139.93	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	12,510	$97,165.95	$7.77	$159,510.62	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	19,273	$149,762.19	$7.77	$245,854.23	$12.76	0	2	4	$1.105851
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	2,146	$16,666.01	$7.77	$27,359.44	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	13	Pine City-Arthur-T-Mora-0332 - 000G98 - 013	1,485	$11,530.16	$7.76	$18,928.27	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	15	Pine City-Mora-C-Mora-0332 - 000G98 - 015	1,219	$9,464.76	$7.76	$15,537.64	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	2,281	$17,716.34	$7.77	$29,083.69	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	4,187	$32,511.43	$7.76	$53,371.77	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	24	Pine City-Sandstone-C-E Central-2580 - 000G98 - 024	1,385	$12,111.68	$8.74	$19,882.91	$14.36	0	2	4	$1.157154
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	27	Pine City-Willow River-C-Willow River-0577 - 000G98 - 027	857	$6,657.41	$7.77	$10,929.01	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	30	Rosemount-Elko-C-Lakeville-0194 - 000G93 - 030	108	$832.17	$7.71	$1,366.12	$12.65	0	2	4	$1.102091
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	33	Rosemount-Spring Lk-T-Prior Lk-Savage-0719 - 000G93 - 033	31	$240.76	$7.77	$395.24	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	35	Pine City-Scandia-C-Forest Lake-0831 - 000G98 - 035	436	$2,999.12	$6.88	$4,923.45	$11.29	0	2	4	$1.052694
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	1,052	$8,172.95	$7.77	$13,416.97	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	62	$392.03	$6.32	$643.57	$10.38	0	2	4	$1.016197
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	2,287	$17,766.48	$7.77	$29,166.00	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	54	Fairmont-Lakefield-C-Jackson Cty Central-2895 - 000G94 - 054	1,265	$9,825.71	$7.77	$16,130.19	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	9,375	$72,810.49	$7.77	$119,527.95	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	77	Fairmont-Welcome-C-Martin Cty W-2448 - 000G94 - 077	246	$1,904.98	$7.74	$3,127.27	$12.71	0	2	4	$1.104146
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	82	Worthington-Lamberton-C-Red Rock Central-2884 - 000G99 - 082	12,637	$98,142.73	$7.77	$161,114.14	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	83	Worthington-Lamberton-T-Red Rock Central-2884 - 000G99 - 083	797	$6,190.21	$7.77	$10,162.04	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	85	Worthington-Sanborn-C-Red Rock Central-2884 - 000G99 - 085	9,580	$74,404.65	$7.77	$122,144.97	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	92	Fairmont-New Richland-T-NRHEG-2168 - 000G94 - 092	10	$77.99	$7.80	$128.03	$12.80	0	2	4	$1.107210
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	93	Fairmont-New Richland-C-NRHEG-2168 - 000G94 - 093	951	$7,387.31	$7.77	$12,127.24	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	95	Worthington-Canby-C-Canby-0891 - 000G99 - 095	1,753	$5,885.40	$3.36	$9,661.65	$5.51	0	2	4	$0.741152
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	1,401	$10,881.98	$7.77	$17,864.19	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	885	$6,878.00	$7.77	$11,291.14	$12.76	0	2	4	$1.105851

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	2,455	$19,069.89	$7.77	$31,305.72	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	186	$1,443.78	$7.76	$2,370.15	$12.74	0	2	4	$1.105169
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	874	$7,065.57	$8.08	$11,599.06	$13.27	0	2	4	$1.122871
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	123	Fairmont-Glenville-C-Glenville-Emmons-2886 - 000G94 - 123	7,508	$89,180.15	$11.88	$146,400.89	$19.50	0	2	4	$1.290035
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	323	$2,506.55	$7.76	$4,114.83	$12.74	0	2	4	$1.105169
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	1,652	$12,838.86	$7.77	$21,076.67	$12.76	0	2	4	$1.105851
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	131	Rochester-Wanamingo-C-Kenyon-Wanamingo-2172 - 000G95 - 131	2,454	$19,051.75	$7.76	$31,275.94	$12.74	0	2	4	$1.105169
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	4,538	$35,250.31	$7.77	$57,867.99	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	2,593	$20,141.48	$7.77	$33,064.88	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	3,125	$12,452.58	$3.98	$20,442.54	$6.54	0	2	4	$0.815578
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	136	Rochester-La Crescent-T-LaCrescent-Hokah-0300 - 000G95 - 136	3,083	$23,942.64	$7.77	$39,304.98	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	140	Rochester-Brownsdale-C-Hayfield-0203 - 000G95 - 140	234	$1,819.25	$7.77	$2,986.54	$12.76	0	2	4	$1.105851
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	3,599	$27,954.16	$7.77	$45,890.41	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	1,343	$10,430.59	$7.77	$17,123.18	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	1,839	$14,922.43	$8.11	$24,497.12	$13.32	0	2	4	$1.124504
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	148	Rochester-Dover-C-Dover-Eyota-0533 - 000G95 - 148	1,373	$10,808.40	$7.87	$17,743.40	$12.92	0	2	4	$1.111263
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	153	Rochester-Haverhill-T-Rochester-0535 - 000G95 - 153	412	$3,199.92	$7.77	$5,253.08	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	156	Rochester-Marion-T-Rochester-0535 - 000G95 - 156	7,096	$55,117.04	$7.77	$90,481.84	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	157	Rochester-New Haven-T-Pine Island-0255 - 000G95 - 157	109	$846.94	$7.77	$1,390.36	$12.76	0	2	4	$1.105851
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	159	Rochester-Oronoco-C-Rochester-0535 - 000G95 - 159	2,215	$17,205.01	$7.77	$28,244.28	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	112,624	$875,911.40	$7.78	$1,437,923.21	$12.77	0	2	4	$1.106191
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	250	$1,941.67	$7.77	$3,187.51	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	390	$3,027.93	$7.76	$4,970.74	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	167	Rochester-Elgin-C-Elgin-Millville-2899 - 000G95 - 167	2,833	$22,000.78	$7.77	$36,117.16	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	6,590	$51,175.82	$7.77	$84,011.81	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	7,322	$56,860.61	$7.77	$93,344.14	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	179	Cloquet-Barnum-C-Barnum-0091 - 000G96 - 179	137	$826.91	$6.04	$1,357.48	$9.91	0	2	4	$0.996074
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	180	Cloquet-Carlton-C-Carlton-0093 - 000G96 - 180	137	$826.91	$6.04	$1,357.48	$9.91	0	2	4	$0.996074
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	4,474	$27,236.70	$6.09	$44,712.61	$9.99	0	2	4	$0.999565
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	1,660	$10,100.26	$6.08	$16,580.91	$9.99	0	2	4	$0.999565
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	824	$5,010.09	$6.08	$8,224.72	$9.98	0	2	4	$0.999131
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	185	Cloquet-Wrenshall-C-Wrenshall-0100 - 000G96 - 185	1,923	$5,622.98	$2.92	$9,230.86	$4.80	0	2	4	$0.681241
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	187	Cloquet-Moose Lake-T-Moose Lake-0097 - 000G96 - 187	170	$1,034.37	$6.08	$1,698.05	$9.99	0	2	4	$0.999565
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	190	Cloquet-Twin Lakes-T-Carlton-0093 - 000G96 - 190	2,151	$13,094.35	$6.09	$21,496.09	$9.99	0	2	4	$0.999565
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	195	Wadena-Irondale(Riverton)-T-Crosby-Ironton-0182 - 000G89 - 195	404	$2,461.27	$6.09	$4,040.50	$10.00	0	2	4	$1.000000
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	198	Cloquet-Bovey-C-Greenway-0316 - 000G96 - 198	1,379	$8,394.42	$6.09	$13,780.53	$9.99	0	2	4	$0.999565
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	201	Cloquet-Coleraine-C-Greenway-0316 - 000G96 - 201	185	$1,129.62	$6.11	$1,854.42	$10.02	0	2	4	$1.000868
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	7,645	$46,546.33	$6.09	$76,411.90	$10.00	0	2	4	$1.000000
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	206	Cloquet-Keewatin-C-Nashwauk-Keewatin-0319 - 000G96 - 206	81	$496.14	$6.13	$814.48	$10.06	0	2	4	$1.002598
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	726	$4,416.67	$6.08	$7,250.54	$9.99	0	2	4	$0.999565
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	213	Cloquet-Ranier-C-International Falls-0361 - 000G96 - 213	735	$3,980.96	$5.42	$6,535.27	$8.89	0	2	4	$0.948902
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	214	Cloquet-S InternationalFalls-C-Intrntnl-361 - 000G96 - 214	1,309	$7,089.89	$5.42	$11,638.97	$8.89	0	2	4	$0.948902
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	215	Cloquet-Silver Bau-C-Lake Superior-0381 - 000G96 - 215	705	$4,290.20	$6.09	$7,042.92	$9.99	0	2	4	$0.999565
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	174	$3,794.15	$21.81	$6,228.60	$35.80	0	2	4	$1.553883
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	223	Cloquet-Duluth-C-Proctor-0704 - 000G96 - 223	519	$3,161.71	$6.09	$5,190.36	$10.00	0	2	4	$1.000000
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	219	$1,332.78	$6.09	$2,187.93	$9.99	0	2	4	$0.999565
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	3,206	$19,513.55	$6.09	$32,034.05	$9.99	0	2	4	$0.999565
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	201	$1,225.77	$6.10	$2,012.26	$10.01	0	2	4	$1.000434
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	679	$4,134.55	$6.09	$6,787.41	$10.00	0	2	4	$1.000000
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	726	$5,634.74	$7.76	$9,250.16	$12.74	0	2	4	$1.105169
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	245	Bemidji-Frazee-C-Frazee-Vergas-0023 - 000G97 - 245	2,573	$19,982.28	$7.77	$32,803.53	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	973	$7,559.78	$7.77	$12,410.37	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	5,350	$40,906.15	$7.65	$67,152.81	$12.55	0	2	4	$1.098644
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	2,057	$15,972.86	$7.77	$26,221.54	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	3,069	$18,665.84	$6.08	$30,642.41	$9.98	0	2	4	$0.999131
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	253	Wadena-Todd-C-Park Rapids-0309 - 000G89 - 253	2,377	$13,676.45	$5.75	$22,451.68	$9.45	0	2	4	$0.975432
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	257	Wadena-Motley-C-Staples-Motley-2170 - 000G89 - 257	110	$671.26	$6.10	$1,101.96	$10.02	0	2	4	$1.000868
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	721	$5,594.64	$7.76	$9,184.33	$12.74	0	2	4	$1.105169
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	1,801	$10,963.83	$6.09	$17,998.56	$9.99	0	2	4	$0.999565
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	395	$2,405.59	$6.09	$3,949.09	$10.00	0	2	4	$1.000000
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	274	Wadena-Spruce-T-Roseau-0682 - 000G89 - 274	471	$2,867.16	$6.09	$4,706.82	$9.99	0	2	4	$0.999565
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	275	Wadena-Warroad-C-Warroad-0690 - 000G89 - 275	517	$3,103.34	$6.00	$5,094.54	$9.85	0	2	4	$0.993436
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	277	Wadena-Bertha-C-Bertha-Hewitt-0786 - 000G89 - 277	1,081	$6,581.20	$6.09	$10,803.91	$9.99	0	2	4	$0.999565
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	285	Wadena-Menahga-C-Menahga-821 - 000G89 - 285	1,802	$10,973.57	$6.09	$18,014.55	$10.00	0	2	4	$1.000000
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	662	$4,027.53	$6.08	$6,611.72	$9.99	0	2	4	$0.999565
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	1,161	$9,023.50	$7.77	$14,813.26	$12.76	0	2	4	$1.105851
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	2,182	$16,950.38	$7.77	$27,826.27	$12.75	0	2	4	$1.105510

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	4,526	$35,245.54	$7.79	$57,860.17	$12.78	0	2	4	$1.106531
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	80	$621.32	$7.77	$1,019.98	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	307	Pine City-Pokegama-T-Pine City-0578 - 000G98 - 307	14	$108.71	$7.77	$178.47	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	314	Worthington-Ortonville-C-Ortonville-2903 - 000G99 - 314	1,604	$12,452.58	$7.76	$20,442.54	$12.74	0	2	4	$1.105169
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	315	Pine City-Pine City-T-Pine City-0578 - 000G98 - 315	193	$1,519.89	$7.88	$2,495.10	$12.93	0	2	4	$1.111599
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	316	Rosemount-Lakeville-C-Farmington-0192 - 000G93 - 316	3,080	$23,923.12	$7.77	$39,272.93	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	348	Cloquet-Floodwood-C-Floodwood-0698 - 000G96 - 348	542	$3,297.91	$6.08	$5,413.95	$9.99	0	2	4	$0.999565
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	352	Rosemount-Eureka-T-Northfield SD - 000G93 - 352	968	$7,513.84	$7.76	$12,334.95	$12.74	0	2	4	$1.105169
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	354	Rosemount-Burnsville-C-Rosemount - 000G93 - 354	21	$163.21	$7.77	$267.93	$12.76	0	2	4	$1.105851
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	355	Rosemount-Spring Lake-T-Jordan - 000G93 - 355	7,217	$56,049.86	$7.77	$92,013.18	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	358	Rosemount-Stanton-T-Randolph - 000G93 - 358	214	$1,661.94	$7.77	$2,728.29	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	377	Rochester-Caledonia-T-Caledonia-0299 - 000G95 - 377	1,966	$15,271.17	$7.77	$25,069.62	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	380	Rochester-St Charles-T-St Charles - 000G95 - 380	23	$178.61	$7.77	$293.21	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	414	Rosemount-Credit River-T-Lakeville SD - 000G93 - 414	4,518	$35,088.44	$7.77	$57,602.27	$12.75	0	2	4	$1.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	3,127	$37,142.57	$11.88	$60,974.39	$19.50	0	2	4	$1.290035
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	428	Fairmont-Clarks Grove-C-Albert Lea - 000G94 - 428	726	$8,623.44	$11.88	$14,156.51	$19.50	0	2	4	$1.290035
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	457	Fairmont-Pickerel Lake-T-Albert Lea - 000G94 - 457	92	$1,092.78	$11.88	$1,793.94	$19.50	0	2	4	$1.290035
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2004	467	Rochester-Wykoff-C-Kingsland - 000G95 - 467	160	$1,900.48	$11.88	$3,119.89	$19.50	0	2	4	$1.290035
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	2	Pine City-Harris-C-North Branch-0138 - 000G98 - 002	2,704	$42,005.79	$15.53	$68,958.00	$25.50	0	4	16	$1.406540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	4,705	$73,085.30	$15.53	$119,979.09	$25.50	0	4	16	$1.406540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	5,751	$89,332.33	$15.53	$146,650.71	$25.50	0	4	16	$1.406540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	2,663	$48,089.84	$18.06	$78,945.76	$29.65	0	4	16	$1.472025
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	6,100	$72,678.89	$11.91	$119,311.91	$19.56	0	4	16	$1.291369
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	10	$153.97	$15.40	$252.77	$25.28	0	4	16	$1.402777
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	15	Pine City-Mora-C-Mora-0332 - 000G98 - 015	2,694	$41,843.25	$15.53	$68,691.17	$25.50	0	4	16	$1.406540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	16	Pine City-Barry-T-Hinckley-Finlayson-2165 - 000G98 - 016	19	$295.11	$15.53	$484.46	$25.50	0	4	16	$1.406540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	1,216	$18,886.63	$15.53	$31,004.88	$25.50	0	4	16	$1.406540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	2,764	$42,932.32	$15.53	$70,479.02	$25.50	0	4	16	$1.406540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	30	Rosemount-Elko-C-Lakeville-0194 - 000G93 - 030	3,188	$49,520.04	$15.53	$81,293.62	$25.50	0	4	16	$1.406540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	31	Rosemount-New Market-C-New Prague-0721 - 000G93 - 031	695	$10,795.61	$15.53	$17,722.41	$25.50	0	4	16	$1.406540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	32	Rosemount-New Market-T-New Prague-0721 - 000G93 - 032	3,928	$61,014.64	$15.53	$100,163.52	$25.50	0	4	16	$1.406540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	33	Rosemount-Spring Lk-T-Prior Lk-Savage-0719 - 000G93 - 033	1,299	$20,182.80	$15.54	$33,132.71	$25.51	0	4	16	$1.406710
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	1,092	$16,609.38	$15.21	$27,266.47	$24.97	0	4	16	$1.397419
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	1,545	$24,001.80	$15.54	$39,402.10	$25.50	0	4	16	$1.406540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	131	Rochester-Wanamingo-C-Kenyon-Wanamingo-2172 - 000G95 - 131	1,144	$17,766.48	$15.53	$29,166.00	$25.49	0	4	16	$1.406370
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	3,634	$56,447.67	$15.53	$92,666.24	$25.50	0	4	16	$1.406540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	1,381	$22,037.20	$15.96	$36,176.94	$26.20	0	4	16	$1.418301
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	77	$1,196.12	$15.53	$1,963.59	$25.50	0	4	16	$1.406540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	820	$12,860.60	$15.68	$21,112.35	$25.75	0	4	16	$1.410777
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	154	Rochester-High Forest-T-Stewartville-0534 - 000G95 - 154	626	$9,725.57	$15.54	$15,965.79	$25.50	0	4	16	$1.406540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	156	Rochester-Marion-T-Rochester-0535 - 000G95 - 156	2,303	$35,773.59	$15.53	$58,727.03	$25.50	0	4	16	$1.406540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	157	Rochester-New Haven-T-Pine Island-0255 - 000G95 - 157	184	$2,858.47	$15.54	$4,692.55	$25.50	0	4	16	$1.406540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	159	Rochester-Oronoco-C-Rochester-0535 - 000G95 - 159	2,034	$40,305.45	$19.82	$66,166.67	$32.53	0	4	16	$1.512284
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	18,892	$294,767.49	$15.60	$483,899.43	$25.61	0	4	16	$1.408410
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	1,674	$26,107.73	$15.60	$42,859.26	$25.60	0	4	16	$1.408240
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	17	$264.11	$15.54	$433.57	$25.50	0	4	16	$1.406540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	462	$7,176.66	$15.53	$11,781.43	$25.50	0	4	16	$1.406540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	985	$11,997.35	$12.18	$19,695.22	$20.00	0	4	16	$1.301030
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	190	Cloquet-Twin Lakes-T-Carlton-0093 - 000G96 - 190	5,343	$65,055.33	$12.18	$106,796.84	$19.99	0	4	16	$1.300813
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	214	Cloquet-S InternationalFalls-C-Intrntnl-361 - 000G96 - 214	2,674	$32,560.76	$12.18	$53,452.75	$19.99	0	4	16	$1.300813
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	2,178	$26,519.45	$12.18	$43,535.15	$19.99	0	4	16	$1.300813
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	233	Cloquet--Hoyt Lakes-C-Mesabi E-2711 - 000G96 - 233	2,190	$34,018.99	$15.53	$55,846.63	$25.50	0	4	16	$1.406540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	143	$1,741.38	$12.18	$2,858.70	$19.99	0	4	16	$1.300813
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	685	$4,007.44	$5.85	$6,578.74	$9.60	0	4	16	$0.982271
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	8	$1,040.74	$130.09	$1,708.52	$213.57	0	4	16	$2.329540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	4,410	$68,502.46	$15.53	$112,455.75	$25.50	0	4	16	$1.406540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	307	Pine City-Pokegama-T-Pine City-0578 - 000G98 - 307	4,889	$75,938.66	$15.53	$124,663.25	$25.50	0	4	16	$1.406540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	312	Rochester-Chatfield-T-Chatfield-0227 - 000G95 - 312	447	$7,010.60	$15.68	$11,508.82	$25.75	0	4	16	$1.410777
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	316	Rosemount-Lakeville-C-Farmington-0192 - 000G93 - 316	603	$9,369.20	$15.54	$15,380.77	$25.51	0	4	16	$1.406710
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	340	Rosemount-New Market-T-Lakeville-0194 - 000G93 - 340	183	$2,842.59	$15.53	$4,666.48	$25.50	0	4	16	$1.406540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2004	380	Rochester-St Charles-T-St Charles - 000G95 - 380	1,839	$28,566.85	$15.53	$46,896.22	$25.50	0	4	16	$1.406540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2004	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	1,023	$15,893.70	$15.54	$26,091.59	$25.50	0	6	36	$1.406540
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2004	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	6,876	$107,781.19	$15.67	$176,936.94	$25.73	0	6	36	$1.410440
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2004	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	1,730	$27,105.85	$15.67	$44,497.80	$25.72	0	6	36	$1.410271
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2004	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	3,059	$37,240.08	$12.17	$61,134.47	$19.99	0	6	36	$1.300813
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2004	123	Fairmont-Glenville-C-Glenville-Emmons-2886 - 000G94 - 123	141	$7,109.71	$50.41	$11,671.52	$82.75	1	2	4	$1.917768
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2004	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	20	$1,022.63	$50.40	$1,678.78	$82.74	1	2	4	$1.917716

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2004	367	Wadena-Bertha-T-Bertha-Hewitt-0786 - 000G89 - 367	262	$5,029.55	$19.20	$8,256.66	$31.51	1	3	9	$1.498448
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2004	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	2,732	$146,859.03	$53.76	$241,088.32	$88.25	1	4	16	$1.945715
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	2005	191	Wadena-Crosby-C-Crosby-Ironton-0182 - 000G89 - 191	1,727	$10,012.84	$5.80	$13,252.29	$7.67	0	1.25	1.5625	$0.884795
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	2005	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	741	$3,115.72	$4.20	$4,123.75	$5.57	0	1.25	1.5625	$0.745855
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	2005	207	Cloquet-Laprairie-C-Greenway-0316 - 000G96 - 207	101	$422.78	$4.19	$559.56	$5.54	0	1.25	1.5625	$0.743510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	2005	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	979	$4,126.73	$4.22	$5,461.85	$5.58	0	1.25	1.5625	$0.746634
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	2005	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	5,271	$22,186.93	$4.21	$29,365.05	$5.57	0	1.25	1.5625	$0.745855
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	2005	278	Wadena-Hewitt-C-Bertha-Hewitt-0786 - 000G89 - 278	503	$2,123.10	$4.22	$2,809.99	$5.59	0	1.25	1.5625	$0.747412
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	3	Pine City-Nessel-T-Rush City-0139 - 000G98 - 003	67	$521.36	$7.78	$690.04	$10.30	0	2	4	$1.012837
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	3,471	$26,951.11	$7.76	$35,670.58	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	1,944	$15,099.50	$7.77	$19,984.63	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	26,226	$203,691.20	$7.77	$269,591.29	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	26,827	$214,705.06	$8.00	$284,168.47	$10.59	0	2	4	$1.024896
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	9	Rosemount-Randolph-T-Randolph-0195 - 000G93 - 009	1,472	$10,416.05	$7.08	$13,785.95	$9.37	0	2	4	$0.971740
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	61,756	$479,648.94	$7.77	$634,829.50	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	13,962	$104,423.48	$7.48	$138,207.55	$9.90	0	2	4	$0.995635
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	15	Pine City-Mora-C-Mora-0332 - 000G98 - 015	3,059	$23,762.16	$7.77	$31,449.92	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	519	$4,130.81	$7.96	$5,467.25	$10.53	0	2	4	$1.022428
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	1,760	$13,668.63	$7.77	$18,090.84	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	26	Pine City-Sturgeon Lake-C-Willow River-0577 - 000G98 - 026	201	$1,564.09	$7.78	$2,070.12	$10.30	0	2	4	$1.012837
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	29	Rosemount-Webster-T-Northfield-0659 - 000G93 - 029	822	$6,386.71	$7.77	$8,453.00	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	30	Rosemount-Elko-C-Lakeville-0194 - 000G93 - 030	9,183	$67,411.10	$7.34	$89,220.58	$9.72	0	2	4	$0.987666
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	31	Rosemount-New Market-C-New Prague-0721 - 000G93 - 031	6,703	$47,264.38	$7.05	$62,555.80	$9.33	0	2	4	$0.969882
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	32	Rosemount-New Market-T-New Prague-0721 - 000G93 - 032	4,488	$28,781.01	$6.41	$38,092.51	$8.49	0	2	4	$0.928908
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	33	Rosemount-Spring Lk-T-Prior Lk-Savage-0719 - 000G93 - 033	2,158	$17,087.44	$7.92	$22,615.73	$10.48	0	2	4	$1.020361
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	619	$4,812.59	$7.77	$6,369.60	$10.29	0	2	4	$1.012415
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	622	$4,832.64	$7.77	$6,396.14	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	54	Fairmont-Lakefield-C-Jackson Cty Central-2895 - 000G94 - 054	639	$4,963.27	$7.77	$6,569.04	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	55	Worthington-Madison-C-Lac Qui Parle Valley-2853 - 000G99 - 055	16,633	$129,187.98	$7.77	$170,984.10	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	56	Worthington-Madison-T-Lac Qui Parle Valley-2853 - 000G99 - 056	2,967	$23,040.27	$7.77	$30,494.47	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	3,539	$27,748.69	$7.84	$36,726.21	$10.38	0	2	4	$1.016197
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	76	Fairmont-Truman-C-Truman-0458 - 000G94 - 076	2,816	$21,970.86	$7.80	$29,079.09	$10.33	0	2	4	$1.014100
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	4,582	$35,904.74	$7.84	$47,520.98	$10.37	0	2	4	$1.015779
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	82	Worthington-Lamberton-C-Red Rock Central-2884 - 000G99 - 082	153	$1,193.12	$7.80	$1,579.13	$10.32	0	2	4	$1.013680
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	88	Fairmont-Berlin-T-NRHEG-2168 - 000G94 - 088	6,595	$51,224.01	$7.77	$67,796.48	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	92	Fairmont-New Richland-T-NRHEG-2168 - 000G94 - 092	271	$2,105.36	$7.77	$2,786.51	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	93	Fairmont-New Richland-C-NRHEG-2168 - 000G94 - 093	2,116	$16,438.92	$7.77	$21,757.39	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	95	Worthington-Canby-C-Canby-0891 - 000G99 - 095	249	$380.99	$1.53	$504.25	$2.03	0	2	4	$0.307496
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	97	Rochester-Claremont-C-Triton-2125 - 000G95 - 097	212	$1,749.78	$8.25	$2,315.88	$10.92	0	2	4	$1.038223
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	2,464	$19,130.05	$7.76	$25,319.18	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	1,273	$9,885.87	$7.77	$13,084.24	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	8,962	$69,602.94	$7.77	$92,121.55	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	110	Rochester-Canton-C-Mabel-Canton-0238 - 000G95 - 110	649	$5,033.17	$7.76	$6,661.55	$10.26	0	2	4	$1.011147
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	113	Rochester-Harmony-C-Fillmore Central-2198 - 000G95 - 113	800	$6,216.26	$7.77	$8,227.40	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	115	Rochester-Mabel-C-Mabel-Canton-0238 - 000G95 - 115	954	$7,419.68	$7.78	$9,820.17	$10.29	0	2	4	$1.012415
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	116	Rochester-Newburg-T-Mabel-Canton-0238 - 000G95 - 116	9	$69.92	$7.77	$92.54	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	1,745	$13,555.46	$7.77	$17,941.05	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	199	$1,550.87	$7.79	$2,052.62	$10.31	0	2	4	$1.013259
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	2,517	$19,551.15	$7.77	$25,876.52	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	131	Rochester-Wanamingo-C-Kenyon-Wanamingo-2172 - 000G95 - 131	8,144	$63,250.14	$7.77	$83,713.42	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	5,405	$41,979.83	$7.77	$55,561.54	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	134	Rochester-Houston-C-Houston-0294 - 000G95 - 134	1,900	$14,758.61	$7.77	$19,533.45	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	392	$3,037.95	$7.75	$4,020.82	$10.26	0	2	4	$1.011147
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	140	Rochester-Brownsdale-C-Hayfield-0203 - 000G95 - 140	798	$6,196.21	$7.76	$8,200.87	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	141	Rochester-Lansing-T-Austin-0492 - 000G95 - 141	1,677	$20,363.47	$12.14	$26,951.66	$16.07	0	2	4	$1.206016
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	7,442	$57,795.18	$7.77	$76,493.62	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	222	$1,725.89	$7.77	$2,284.27	$10.29	0	2	4	$1.012415
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	1,476	$12,936.41	$8.76	$17,121.72	$11.60	0	2	4	$1.064458
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	148	Rochester-Dover-C-Dover-Eyota-0533 - 000G95 - 148	939	$838.98	$0.89	$1,110.41	$1.18	0	2	4	$0.071882
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	153	Rochester-Haverhill-T-Rochester-0535 - 000G95 - 153	1,024	$7,953.56	$7.77	$10,526.78	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	156	Rochester-Marion-T-Rochester-0535 - 000G95 - 156	1,532	$11,851.57	$7.74	$15,685.90	$10.24	0	2	4	$1.010300
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	159	Rochester-Oronoco-C-Rochester-0535 - 000G95 - 159	12,905	$100,226.70	$7.77	$132,652.98	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	91,791	$714,057.21	$7.78	$945,075.73	$10.30	0	2	4	$1.012837
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	1,049	$8,148.15	$7.77	$10,784.31	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	149	$1,163.04	$7.81	$1,539.32	$10.33	0	2	4	$1.014100
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	2,243	$17,425.58	$7.77	$23,063.27	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	179	Cloquet-Barnum-C-Barnum-0091 - 000G96 - 179	384	$1,612.94	$4.20	$2,134.77	$5.56	0	2	4	$0.745075

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	180	Cloquet-Carlton-C-Carlton-0093 - 000G96 - 180	1,012	$4,240.14	$4.19	$5,611.95	$5.55	0	2	4	$0.744293
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	12,168	$51,404.97	$4.22	$68,035.99	$5.59	0	2	4	$0.747412
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	551	$2,325.31	$4.22	$3,077.62	$5.59	0	2	4	$0.747412
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	660	$2,775.67	$4.21	$3,673.68	$5.57	0	2	4	$0.745855
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	185	Cloquet-Wrenshall-C-Wrenshall-0100 - 000G96 - 185	3,571	$10,826.93	$3.03	$14,329.76	$4.01	0	2	4	$0.603144
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	194	Wadena-Deerwood-T-Crosby-Ironton-0182 - 000G89 - 194	368	$1,553.27	$4.22	$2,055.80	$5.59	0	2	4	$0.747412
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	7,585	$33,020.74	$4.35	$43,703.92	$5.76	0	2	4	$0.760422
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	206	Cloquet-Keewatin-C-Nashwauk-Keewatin-0319 - 000G96 - 206	1,003	$4,218.64	$4.21	$5,583.49	$5.57	0	2	4	$0.745855
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	207	Cloquet-Laprairie-C-Greenway-0316 - 000G96 - 207	3,441	$14,481.26	$4.21	$19,166.38	$5.57	0	2	4	$0.745855
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	209	Cloquet-Nashwauk-C-Nashwauk-Keewatin-0319 - 000G96 - 209	666	$2,803.24	$4.21	$3,710.17	$5.57	0	2	4	$0.745855
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	246	$1,038.58	$4.22	$1,374.59	$5.59	0	2	4	$0.747412
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	215	Cloquet-Silver Bau-C-Lake Superior-0381 - 000G96 - 215	1,932	$8,133.98	$4.21	$10,765.56	$5.57	0	2	4	$0.745855
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	220	Cloquet-Buhl-C-Mt Iron-Buhl-0712 - 000G96 - 220	248	$1,038.58	$4.19	$1,374.59	$5.54	0	2	4	$0.743510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	225	Cloquet-Fayal-T-Eveleth-Gilbert-2154 - 000G96 - 225	648	$2,727.47	$4.21	$3,609.89	$5.57	0	2	4	$0.745855
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	303	$1,279.79	$4.22	$1,693.84	$5.59	0	2	4	$0.747412
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	2,090	$8,795.13	$4.21	$11,640.61	$5.57	0	2	4	$0.745855
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	233	Cloquet--Hoyt Lakes-C-Mesabi E-2711 - 000G96 - 233	284	$2,205.77	$7.77	$2,919.40	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	7	$152.54	$21.79	$201.89	$28.84	0	2	4	$1.459995
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	3,378	$14,218.38	$4.21	$18,818.44	$5.57	0	2	4	$0.745855
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	14,904	$126,035.73	$8.46	$166,811.99	$11.19	0	2	4	$1.048830
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	244	Bemidji-Detroit-T-Detroit Lakes-0022 - 000G97 - 244	1,575	$12,232.00	$7.77	$16,189.41	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	245	Bemidji-Frazee-C-Frazee-Vergas-0023 - 000G97 - 245	1,023	$6,984.54	$6.83	$9,244.24	$9.04	0	2	4	$0.956168
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	1,662	$12,908.85	$7.77	$17,085.24	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	1,931	$14,359.02	$7.44	$19,004.58	$9.84	0	2	4	$0.992995
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	1,417	$11,008.80	$7.77	$14,570.47	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	250	Wadena-Henrietta-T-Park Rapids-0309 - 000G89 - 250	410	$1,727.90	$4.21	$2,286.93	$5.58	0	2	4	$0.746634
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	7,693	$32,379.67	$4.21	$42,855.45	$5.57	0	2	4	$0.745855
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	252	Wadena-Straight River-T-Park Rapids-0309 - 000G89 - 252	913	$3,841.81	$4.21	$5,084.75	$5.57	0	2	4	$0.745855
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	255	Wadena-Baudette-C-Lake of Woods-0390 - 000G89 - 255	20	$82.71	$4.14	$109.47	$5.47	0	2	4	$0.737987
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	1,302	$10,116.47	$7.77	$13,389.45	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	266	Wadena-Rocksbury-T-Thief River Falls-0564 - 000G89 - 266	114	$479.76	$4.21	$634.97	$5.57	0	2	4	$0.745855
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	3,002	$12,637.30	$4.21	$16,725.84	$5.57	0	2	4	$0.745855
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	272	Wadena-Lake-T-Warroad-0690 - 000G89 - 272	1,532	$6,445.63	$4.21	$8,530.98	$5.57	0	2	4	$0.745855
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	8,453	$35,582.53	$4.21	$47,094.52	$5.57	0	2	4	$0.745855
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	274	Wadena-Spruce-T-Roseau-0682 - 000G89 - 274	440	$1,852.16	$4.21	$2,451.39	$5.57	0	2	4	$0.745855
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	275	Wadena-Warroad-C-Warroad-0690 - 000G89 - 275	713	$3,002.65	$4.21	$3,974.10	$5.57	0	2	4	$0.745855
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	278	Wadena-Hewitt-C-Bertha-Hewitt-0786 - 000G89 - 278	295	$1,240.77	$4.21	$1,642.20	$5.57	0	2	4	$0.745855
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	354	$1,488.94	$4.21	$1,970.66	$5.57	0	2	4	$0.745855
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	285	Wadena-Menahga-C-Menahga-821 - 000G89 - 285	64	$266.54	$4.16	$352.77	$5.51	0	2	4	$0.741152
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	290	Wadena-Verndale-C-Verndale-818 - 000G89 - 290	100	$422.78	$4.23	$559.56	$5.60	0	2	4	$0.748188
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	1,069	$4,503.56	$4.21	$5,960.59	$5.58	0	2	4	$0.746634
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	293	Rosemount-Castle Rock-T-Farmington-0192 - 000G93 - 293	1,167	$9,064.54	$7.77	$11,997.18	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	5,360	$32,394.75	$6.04	$42,875.40	$8.00	0	2	4	$0.903090
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	7,491	$58,177.09	$7.77	$76,999.08	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	9,238	$71,749.78	$7.77	$94,962.93	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	307	Pine City-Pokegama-T-Pine City-0578 - 000G98 - 307	626	$4,861.44	$7.77	$6,434.26	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	316	Rosemount-Lakeville-C-Farmington-0192 - 000G93 - 316	159	$1,234.95	$7.77	$1,634.49	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	328	Bemidji-Grant Valley-Bemidji-0031 - 000G97 - 328	1,582	$12,293.41	$7.77	$16,270.69	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	330	Rosemount-Lakeville-C-Rosemnt-Apple Vly-0196 - 000G93 - 330	5,167	$40,128.05	$7.77	$53,110.66	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	340	Rosemount-New Market-T-Lakeville-0194 - 000G93 - 340	10,526	$67,501.98	$6.41	$89,340.86	$8.49	0	2	4	$0.928908
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	356	Rosemount-Cedar Lk-T-Jordan - 000G93 - 356	49	$377.45	$7.70	$499.56	$10.20	0	2	4	$1.008600
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	359	Fairmont-Westford-T-Truman - 000G94 - 359	3,532	$27,557.20	$7.80	$36,472.76	$10.33	0	2	4	$1.014100
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	377	Rochester-Caledonia-T-Caledonia-0299 - 000G95 - 377	2,506	$19,460.91	$7.77	$25,757.09	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	382	Rochester-Minneola-T-Kenyon Wanamingo - 000G95 - 382	42	$326.19	$7.77	$431.72	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	414	Rosemount-Credit River-T-Lakeville SD - 000G93 - 414	1,978	$15,662.16	$7.92	$20,729.33	$10.48	0	2	4	$1.020361
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	7,485	$84,303.70	$11.26	$111,578.43	$14.91	0	2	4	$1.173478
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2005	457	Fairmont-Pickerel Lake-T-Albert Lea - 000G94 - 457	155	$1,745.76	$11.26	$2,310.56	$14.91	0	2	4	$1.173478
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2005	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	845	$6,564.69	$7.77	$8,688.56	$10.28	0	3	9	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2005	15	Pine City-Mora-C-Mora-0332 - 000G98 - 015	12	$90.23	$7.52	$119.42	$9.95	0	3	9	$0.997823
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2005	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	14	$169.03	$12.07	$223.71	$15.98	0	3	9	$1.203577
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2005	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	225	$1,754.59	$7.80	$2,322.25	$10.32	0	3	9	$1.013680
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2005	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	576	$2,426.41	$4.21	$3,211.43	$5.58	0	3	9	$0.746634
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2005	293	Rosemount-Castle Rock-T-Farmington-0192 - 000G93 - 293	274	$2,128.06	$7.77	$2,816.55	$10.28	0	3	9	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	2,391	$37,141.23	$15.53	$49,157.51	$20.56	0	4	16	$1.313023
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	1,010	$15,691.05	$15.54	$20,767.57	$20.56	0	4	16	$1.313023
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	21,337	$326,656.06	$15.31	$432,338.88	$20.26	0	4	16	$1.306639
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	15,531	$240,283.31	$15.47	$318,022.03	$20.48	0	4	16	$1.311330

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	502	$7,797.70	$15.53	$10,320.48	$20.56	0	4	16	$1.313023
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	15	Pine City-Mora-C-Mora-0332 - 000G98 - 015	284	$4,411.54	$15.53	$5,838.80	$20.56	0	4	16	$1.313023
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	405	$6,416.79	$15.84	$8,492.81	$20.97	0	4	16	$1.321598
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	1,978	$30,730.39	$15.54	$40,672.58	$20.56	0	4	16	$1.313023
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	394	$6,269.80	$15.91	$8,298.26	$21.06	0	4	16	$1.323458
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	55	Worthington-Madison-C-Lac Qui Parle Valley-2853 - 000G99 - 055	2,996	$46,537.53	$15.53	$61,593.79	$20.56	0	4	16	$1.313023
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	2,693	$41,837.57	$15.54	$55,373.26	$20.56	0	4	16	$1.313023
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	2,411	$38,053.20	$15.78	$50,364.52	$20.89	0	4	16	$1.319938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	1,201	$16,692.81	$13.90	$22,093.43	$18.40	0	4	16	$1.264818
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	2,622	$40,734.44	$15.54	$53,913.23	$20.56	0	4	16	$1.313023
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	562	$2,663.43	$4.74	$3,525.13	$6.27	0	4	16	$0.797268
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	148	Rochester-Dover-C-Dover-Eyota-0533 - 000G95 - 148	1,089	$16,914.25	$15.53	$22,386.51	$20.56	0	4	16	$1.313023
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	153	Rochester-Haverhill-T-Rochester-0535 - 000G95 - 153	546	$8,480.14	$15.53	$11,223.72	$20.56	0	4	16	$1.313023
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	155	Rochester-Kalmar-T-Bryron-0531 - 000G95 - 155	772	$11,993.51	$15.54	$15,873.76	$20.56	0	4	16	$1.313023
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	156	Rochester-Marion-T-Rochester-0535 - 000G95 - 156	1,281	$19,892.04	$15.53	$26,327.70	$20.55	0	4	16	$1.312812
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	19,079	$333,439.58	$17.48	$441,317.09	$23.13	0	4	16	$1.364176
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	1,027	$14,738.56	$14.35	$19,506.92	$18.99	0	4	16	$1.278525
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	79	$1,233.23	$15.61	$1,632.22	$20.66	0	4	16	$1.315130
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	996	$8,382.14	$8.42	$11,094.01	$11.14	0	4	16	$1.046885
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	1,730	$14,558.45	$8.42	$19,268.54	$11.14	0	4	16	$1.046885
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	215	Cloquet-Silver Bau-C-Lake Superior-0381 - 000G96 - 215	2,238	$18,837.51	$8.42	$24,932.00	$11.14	0	4	16	$1.046885
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	744	$11,560.24	$15.54	$15,300.32	$20.56	0	4	16	$1.313023
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	224	$1,884.14	$8.41	$2,493.71	$11.13	0	4	16	$1.046495
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	255	Wadena-Baudette-C-Lake of Woods-0390 - 000G89 - 255	412	$3,707.23	$9.00	$4,906.63	$11.91	0	4	16	$1.075912
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	795	$6,691.01	$8.42	$8,855.75	$11.14	0	4	16	$1.046885
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	4,719	$39,723.23	$8.42	$52,574.86	$11.14	0	4	16	$1.046885
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	293	Rosemount-Castle Rock-T-Farmington-0192 - 000G93 - 293	4,066	$63,158.33	$15.53	$83,591.91	$20.56	0	4	16	$1.313023
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	671	$8,284.03	$12.35	$10,964.15	$16.34	0	4	16	$1.213252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	1,027	$15,292.45	$14.89	$20,240.01	$19.71	0	4	16	$1.294687
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	330	Rosemount-Lakeville-C-Rosemnt-Apple Vly-0196 - 000G93 - 330	1,410	$21,900.97	$15.53	$28,986.58	$20.56	0	4	16	$1.313023
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2005	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	937	$55,288.87	$59.01	$73,176.45	$78.10	0	4	16	$1.892651
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2005	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	10,622	$165,271.78	$15.56	$218,742.06	$20.59	0	6	36	$1.313656
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2005	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	6,135	$96,762.63	$15.77	$128,068.18	$20.88	0	6	36	$1.319730
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2005	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	3,704	$57,540.54	$15.53	$76,156.60	$20.56	0	6	36	$1.313023
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2005	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	578	$8,983.50	$15.54	$11,889.93	$20.57	0	6	36	$1.313234
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2005	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	2,527	$39,253.13	$15.53	$51,952.67	$20.56	0	6	36	$1.313023
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2005	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	1,470	$22,839.75	$15.54	$30,229.08	$20.56	0	6	36	$1.313023
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2005	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	4,334	$67,319.38	$15.53	$89,099.18	$20.56	0	6	36	$1.313023
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2005	154	Rochester-High Forest-T-Stewartville-0534 - 000G95 - 154	176	$2,737.16	$15.55	$3,622.71	$20.58	0	6	36	$1.313445
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2005	155	Rochester-Kalmar-T-Bryron-0531 - 000G95 - 155	34	$528.11	$15.53	$698.97	$20.56	0	6	36	$1.313023
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2005	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	5,502	$87,309.49	$15.87	$115,556.68	$21.00	0	6	36	$1.322219
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2005	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	2,945	$24,787.96	$8.42	$32,807.59	$11.14	0	6	36	$1.046885
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2005	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	3,763	$31,678.94	$8.42	$41,928.00	$11.14	0	6	36	$1.046885
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2005	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	2,265	$19,071.20	$8.42	$25,241.29	$11.14	0	6	36	$1.046885
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2005	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	997	$8,391.33	$8.42	$11,106.17	$11.14	0	6	36	$1.046885
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2005	293	Rosemount-Castle Rock-T-Farmington-0192 - 000G93 - 293	212	$3,298.63	$15.56	$4,365.83	$20.59	0	6	36	$1.313656
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2005	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	17,156	$259,277.81	$15.11	$343,161.81	$20.00	0	6	36	$1.301030
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2005	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	203	$2,692.94	$13.27	$3,564.19	$17.56	1	1.25	1.5625	$1.244525
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2005	201	Cloquet-Coleraine-C-Greenway-0316 - 000G96 - 201	8	$101.10	$12.64	$133.81	$16.73	1	1.25	1.5625	$1.223496
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2005	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	107	$1,433.79	$13.40	$1,897.66	$17.74	1	1.25	1.5625	$1.248954
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2005	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	1,457	$14,595.21	$10.02	$19,317.19	$13.26	1	1.25	1.5625	$1.122544
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2005	123	Fairmont-Glenville-C-Glenville-Emmons-2886 - 000G94 - 123	151	$35,146.18	$232.83	$46,517.00	$308.16	1	2	4	$2.488776
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2005	179	Cloquet-Barnum-C-Barnum-0091 - 000G96 - 179	340	$4,531.14	$13.33	$5,997.10	$17.64	1	2	4	$1.246499
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2005	180	Cloquet-Carlton-C-Carlton-0093 - 000G96 - 180	16	$211.40	$13.21	$279.79	$17.49	1	2	4	$1.242790
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2005	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	195	$2,591.84	$13.29	$3,430.38	$17.59	1	2	4	$1.245266
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2005	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	356	$4,742.52	$13.32	$6,276.86	$17.63	1	2	4	$1.246252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2005	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	10	$137.86	$13.79	$182.46	$18.25	1	2	4	$1.261263
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2005	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	15	$193.01	$12.87	$255.45	$17.03	1	2	4	$1.231215
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2005	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	1,688	$20,808.84	$12.33	$27,541.11	$16.32	1	2	4	$1.212720
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2005	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	665	$8,841.69	$13.30	$11,702.24	$17.60	1	2	4	$1.245513
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2005	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	244	$3,253.59	$13.33	$4,306.22	$17.65	1	2	4	$1.246745
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2005	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	1,139	$16,909.62	$14.85	$22,380.38	$19.65	1	2	4	$1.293363
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2005	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	22	$5,055.27	$232.85	$6,690.80	$308.19	1	2	4	$2.488819
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2005	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	1,654	$21,993.91	$13.30	$29,109.59	$17.60	1	3	9	$1.245513
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2005	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	8	$101.10	$12.64	$133.81	$16.73	1	3	9	$1.223496
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2005	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	55	$2,045.19	$37.19	$2,706.87	$49.22	1	4	16	$1.692142
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2005	190	Cloquet-Twin Lakes-T-Carlton-0093 - 000G96 - 190	54	$2,008.02	$37.19	$2,657.67	$49.22	1	4	16	$1.692142

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2005	191	Wadena-Crosby-C-Crosby-Ironton-0182 - 000G89 - 191	153	$5,268.31	$34.43	$6,972.76	$45.57	1	4	16	$1.658679
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2005	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	13	$477.93	$36.76	$632.55	$48.66	1	4	16	$1.687172
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2005	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	26	$965.05	$37.12	$1,277.27	$49.13	1	4	16	$1.691347
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2005	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	7	$266.54	$38.08	$352.77	$50.40	1	4	16	$1.702431
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2005	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	374	$13,896.70	$37.16	$18,392.69	$49.18	1	4	16	$1.691789
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2005	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	65	$9,917.02	$152.57	$13,125.47	$201.93	1	6	36	$2.305201
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2005	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	77	$5,312.36	$68.99	$7,031.06	$91.31	1	6	36	$1.960518
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2005	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	883	$60,770.48	$68.82	$80,431.52	$91.09	1	6	36	$1.959471
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	2005	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	3,574	$121,112.79	$33.89	$160,296.34	$44.85	1	8	64	$1.651762
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	11,864	$43,820.18	$3.69	$53,550.22	$4.51	0	2	4	$0.654177
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	8,929	$35,429.26	$3.97	$43,296.14	$4.85	0	2	4	$0.685742
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	6	Pine City-Rusheba-T-Rush City-0139 - 000G98 - 006	62	$245.61	$3.96	$300.15	$4.84	0	2	4	$0.684845
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	14,469	$69,535.16	$4.81	$84,975.05	$5.87	0	2	4	$0.768638
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	3,176	$28,188.59	$8.88	$34,447.72	$10.85	0	2	4	$1.035430
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	22,677	$149,042.78	$6.57	$182,136.94	$8.03	0	2	4	$0.904716
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	6,333	$102,216.36	$16.14	$124,912.96	$19.72	0	2	4	$1.294907
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	17	Pine City-Chengwatana-C-Pine City-0578 - 000G98 - 017	293	$539.17	$1.84	$658.89	$2.25	0	2	4	$0.352183
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	785	$18,854.29	$24.02	$23,040.79	$29.35	0	2	4	$1.467608
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	7,946	$32,380.42	$4.08	$39,570.33	$4.98	0	2	4	$0.697229
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	24	Pine City-Sandstone-C-E Central-2580 - 000G98 - 024	868	$6,504.54	$7.49	$7,948.84	$9.16	0	2	4	$0.961895
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	26	Pine City-Sturgeon Lake-C-Willow River-0577 - 000G98 - 026	126	$752.72	$5.97	$919.86	$7.30	0	2	4	$0.863323
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	27	Pine City-Willow River-C-Willow River-0577 - 000G98 - 027	901	$2,603.97	$2.89	$3,182.17	$3.53	0	2	4	$0.547775
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	30	Rosemount-Elko-C-Lakeville-0194 - 000G93 - 030	2,910	$38,036.04	$13.07	$46,481.75	$15.97	0	2	4	$1.203305
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	31	Rosemount-New Market-C-New Prague-0721 - 000G93 - 031	4,153	$53,854.55	$12.97	$65,812.66	$15.85	0	2	4	$1.200029
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	163	$1,131.69	$6.94	$1,382.97	$8.48	0	2	4	$0.928396
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	1,458	$7,862.78	$5.39	$9,608.67	$6.59	0	2	4	$0.818885
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	54	Fairmont-Lakefield-C-Jackson Cty Central-2895 - 000G94 - 054	30	$1,362.16	$45.41	$1,664.62	$55.49	0	2	4	$1.744215
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	55	Worthington-Madison-C-Lac Qui Parle Valley-2853 - 000G99 - 055	24,390	$238,024.95	$9.76	$290,877.14	$11.93	0	2	4	$1.076640
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	56	Worthington-Madison-T-Lac Qui Parle Valley-2853 - 000G99 - 056	561	$5,551.65	$9.90	$6,784.36	$12.09	0	2	4	$1.082426
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	63	Worthington-Fairview-T-Marshall-0413 - 000G99 - 063	786	$2,727.58	$3.47	$3,333.22	$4.24	0	2	4	$0.627366
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	3,832	$65,225.38	$17.02	$79,708.33	$20.80	0	2	4	$1.318063
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	73	Fairmont-Rutland-T-Fairmont Area-2752 - 000G94 - 073	1,815	$8,029.59	$4.42	$9,812.52	$5.41	0	2	4	$0.733197
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	3,510	$35,387.91	$10.08	$43,245.60	$12.32	0	2	4	$1.090611
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	80	Worthington-Lorain-T-Worthington Dist-0518 - 000G99 - 080	16	$161.31	$10.08	$197.13	$12.32	0	2	4	$1.090611
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	81	Worthington-Worthington-T-Worthington Admn-0518 - 000G99 - 081	497	$5,010.77	$10.08	$6,123.39	$12.32	0	2	4	$1.090611
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	89	Fairmont-Ellendale-C-NRHEG-2168 - 000G94 - 089	411	$1,502.66	$3.66	$1,836.31	$4.47	0	2	4	$0.650308
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	90	Worthington-Appleton-T-Lac Qui Parle Valley - 000G99 - 090	1,190	$5,355.71	$4.50	$6,544.92	$5.50	0	2	4	$0.740363
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	91	Worthington-Appleton-C-Lac Qui Parle Valley - 000G99 - 091	23,917	$250,952.71	$10.49	$306,675.44	$12.82	0	2	4	$1.107888
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	97	Rochester-Claremont-C-Triton-2125 - 000G95 - 097	969	$5,346.48	$5.52	$6,533.64	$6.74	0	2	4	$0.828660
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	1,703	$7,205.38	$4.23	$8,805.29	$5.17	0	2	4	$0.713491
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	177	$1,940.09	$10.96	$2,370.88	$13.39	0	2	4	$1.126781
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	586	$3,594.00	$6.13	$4,392.04	$7.49	0	2	4	$0.874482
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	112	Rochester-Fountain-C-Fillmore Central-2198 - 000G95 - 112	124	$906.04	$7.31	$1,107.22	$8.93	0	2	4	$0.950851
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	115	Rochester-Mabel-C-Mabel-Canton-0238 - 000G95 - 115	118	$1,595.57	$13.52	$1,949.86	$16.52	0	2	4	$1.218010
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	750	$3,877.50	$5.17	$4,738.48	$6.32	0	2	4	$0.800717
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	2,161	$8,966.22	$4.15	$10,957.13	$5.07	0	2	4	$0.705008
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	2,559	$9,646.64	$3.77	$11,788.63	$4.61	0	2	4	$0.663701
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	482	$3,521.87	$7.31	$4,303.88	$8.93	0	2	4	$0.950851
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	1,092	$4,310.40	$3.95	$5,267.50	$4.82	0	2	4	$0.683047
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	1,240	$10,538.81	$8.50	$12,878.90	$10.39	0	2	4	$1.016616
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	79	$9,423.84	$119.29	$11,516.35	$145.78	0	2	4	$2.163698
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	136	Rochester-La Crescent-T-LaCrescent-Hokah-0300 - 000G95 - 136	2,952	$27,143.09	$9.19	$33,170.07	$11.24	0	2	4	$1.050766
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	1,680	$16,547.99	$9.85	$20,222.38	$12.04	0	2	4	$1.080626
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	138	Rochester-Spring Grove-T-Spring Grove-0297 - 000G95 - 138	2	$21.38	$10.69	$26.13	$13.07	0	2	4	$1.116276
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	141	Rochester-Lansing-T-Austin-0492 - 000G95 - 141	5	$33.43	$6.69	$40.85	$8.17	0	2	4	$0.912222
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	142	Rochester-Red Rock-C-Hayfield-0203 - 000G95 - 142	11	$102.01	$9.27	$124.66	$11.33	0	2	4	$1.054230
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	1,547	$9,487.91	$6.13	$11,594.65	$7.49	0	2	4	$0.874482
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	541	$2,598.54	$4.80	$3,175.53	$5.87	0	2	4	$0.768638
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	69	$963.43	$13.96	$1,177.35	$17.06	0	2	4	$1.231979
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	148	Rochester-Dover-C-Dover-Eyota-0533 - 000G95 - 148	1,125	$4,832.83	$4.30	$5,905.94	$5.25	0	2	4	$0.720159
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	149	Rochester-Dover-T-Dover-Eyota-0533 - 000G95 - 149	5	$143.74	$28.75	$175.66	$35.13	0	2	4	$1.545678
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	156	Rochester-Marion-T-Rochester-0535 - 000G95 - 156	668	$2,957.77	$4.43	$3,614.53	$5.41	0	2	4	$0.733197
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	77,391	$459,398.88	$5.94	$561,405.97	$7.25	0	2	4	$0.860338
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	3,598	$13,871.33	$3.86	$16,951.38	$4.71	0	2	4	$0.673021
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	10	$808.84	$80.88	$988.44	$98.84	0	2	4	$1.994933
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	680	$3,478.65	$5.12	$4,251.06	$6.25	0	2	4	$0.795880
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	167	Rochester-Elgin-C-Elgin-Millville-2899 - 000G95 - 167	287	$1,571.54	$5.48	$1,920.49	$6.69	0	2	4	$0.825426

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	1,379	$13,015.90	$9.44	$15,906.01	$11.53	0	2	4	$1.061829
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	5,392	$35,111.96	$6.51	$42,908.38	$7.96	0	2	4	$0.900913
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	176	Wadena-Aitkin-C-Aitkin-0001 - 000G89 - 176	50,939	$111,709.98	$2.19	$136,514.59	$2.68	0	2	4	$0.428135
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	177	Wadena-Aitkin-T-Aitkin-0001 - 000G89 - 177	6,916	$36,156.21	$5.23	$44,184.50	$6.39	0	2	4	$0.805501
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	388	$9,299.87	$23.97	$11,364.86	$29.29	0	2	4	$1.466719
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	191	Wadena-Crosby-C-Crosby-Ironton-0182 - 000G89 - 191	52	$85.53	$1.64	$104.52	$2.01	0	2	4	$0.303196
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	201	Cloquet-Coleraine-C-Greenway-0316 - 000G96 - 201	580	$7,117.53	$12.27	$8,697.94	$15.00	0	2	4	$1.176091
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	505	$3,944.64	$7.81	$4,820.52	$9.55	0	2	4	$0.980003
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	207	Cloquet-Laprairie-C-Greenway-0316 - 000G96 - 207	198	$1,147.21	$5.79	$1,401.94	$7.08	0	2	4	$0.850033
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	214	Cloquet-S InternationalFalls-C-Intrntnl-361 - 000G96 - 214	75	$1,484.14	$19.79	$1,813.69	$24.18	0	2	4	$1.383456
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	265	$1,217.45	$4.59	$1,487.78	$5.61	0	2	4	$0.748963
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	223	Cloquet-Duluth-C-Proctor-0704 - 000G96 - 223	301	$1,284.09	$4.27	$1,569.22	$5.21	0	2	4	$0.716838
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	10,702	$207,984.80	$19.43	$254,166.73	$23.75	0	2	4	$1.375664
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	172	$940.50	$5.47	$1,149.33	$6.68	0	2	4	$0.824776
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	1,511	$22,793.78	$15.09	$27,855.01	$18.43	0	2	4	$1.265525
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	918	$2,536.31	$2.76	$3,099.48	$3.38	0	2	4	$0.528917
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	2,243	$15,650.70	$6.98	$19,125.86	$8.53	0	2	4	$0.930949
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	3,015	$25,575.29	$8.48	$31,254.15	$10.37	0	2	4	$1.015779
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	3,202	$14,256.30	$4.45	$17,421.84	$5.44	0	2	4	$0.735599
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	250	Wadena-Henrietta-T-Park Rapids-0309 - 000G89 - 250	26	$407.14	$15.66	$497.55	$19.14	0	2	4	$1.281942
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	402	($1,514.11)	($3.77)	($1,850.31)	($4.60)	0	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	792	$4,128.42	$5.21	$5,045.12	$6.37	0	2	4	$0.804139
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	1,489	$5,834.83	$3.92	$7,130.42	$4.79	0	2	4	$0.680336
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	275	Wadena-Warroad-C-Warroad-0690 - 000G89 - 275	469	$2,975.06	$6.34	$3,635.66	$7.75	0	2	4	$0.889302
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	1,093	$4,540.06	$4.15	$5,548.16	$5.08	0	2	4	$0.705864
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	285	Wadena-Menahga-C-Menahga-821 - 000G89 - 285	375	$1,866.97	$4.98	$2,281.52	$6.08	0	2	4	$0.783904
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	704	$8,270.82	$11.75	$10,107.31	$14.36	0	2	4	$1.157154
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	293	Rosemount-Castle Rock-T-Farmington-0192 - 000G93 - 293	41	$170.59	$4.16	$208.47	$5.08	0	2	4	$0.705864
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	668	$10,854.26	$16.25	$13,264.39	$19.86	0	2	4	$1.297979
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	1,099	$9,635.03	$8.77	$11,774.43	$10.71	0	2	4	$1.029789
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	745	$7,003.79	$9.40	$8,558.95	$11.49	0	2	4	$1.060320
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	1,322	$7,619.84	$5.76	$9,311.79	$7.04	0	2	4	$0.847573
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	307	Pine City-Pokegama-T-Pine City-0578 - 000G98 - 307	423	$1,878.45	$4.44	$2,295.55	$5.43	0	2	4	$0.734800
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	313	Worthington-Mountain Lake-C-Mountain Lake-0173 - 000G99 - 313	2,333	$28,582.66	$12.25	$34,929.29	$14.97	0	2	4	$1.175222
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	330	Rosemount-Lakeville-C-Rosemnt-Apple Vly-0196 - 000G93 - 330	6,633	$47,840.89	$7.21	$58,463.71	$8.81	0	2	4	$0.944976
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	340	Rosemount-New Market-T-Lakeville-0194 - 000G93 - 340	276	$3,537.51	$12.82	$4,323.00	$15.66	0	2	4	$1.194792
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	342	Bemidji-Eckels-T-Bemidji-0031 - 000G97 - 342	2,847	$9,822.14	$3.45	$12,003.09	$4.22	0	2	4	$0.625312
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	1,411	$8,653.82	$6.13	$10,575.35	$7.49	0	2	4	$0.874482
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	4,533	$48,773.44	$10.76	$59,603.33	$13.15	0	2	4	$1.118926
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	433	Fairmont-Geneva-C-N.R.H.E.G. - 000G94 - 433	3,107	$33,430.19	$10.76	$40,853.19	$13.15	0	2	4	$1.118926
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	442	Rochester-Leroy-C-Leroy-Ostrander - 000G95 - 442	5,126	$55,153.90	$10.76	$67,400.53	$13.15	0	2	4	$1.118926
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2006	443	Rochester-Leroy-T-Leroy-Ostrander - 000G95 - 443	30	$322.79	$10.76	$394.46	$13.15	0	2	4	$1.118926
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	3,741	$42,485.82	$11.36	$51,919.57	$13.88	0	4	16	$1.142389
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	4,288	$85,005.48	$19.82	$103,880.51	$24.23	0	4	16	$1.384353
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	1,605	$18,212.76	$11.35	$22,256.80	$13.87	0	4	16	$1.142076
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	485	$24,729.35	$50.99	$30,220.37	$62.31	0	4	16	$1.794558
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	301	$12,784.66	$42.47	$15,623.43	$51.91	0	4	16	$1.715251
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	301	$7,051.97	$23.43	$8,617.82	$28.63	0	4	16	$1.456821
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	30	Rosemount-Elko-C-Lakeville-0194 - 000G93 - 030	1,005	$17,838.49	$17.75	$21,799.43	$21.69	0	4	16	$1.336260
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	31	Rosemount-New Market-C-New Prague-0721 - 000G93 - 031	339	$6,017.17	$17.75	$7,353.25	$21.69	0	4	16	$1.336260
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	39	Worthington-Mountain Lake-T-Mountain Lake-0173 - 000G99 - 039	36	$667.73	$18.55	$816.00	$22.67	0	4	16	$1.355452
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	55	Worthington-Madison-C-Lac Qui Parle Valley-2853 - 000G99 - 055	3,620	$71,991.95	$19.89	$87,977.39	$24.30	0	4	16	$1.385606
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	982	$17,144.08	$17.46	$20,950.83	$21.33	0	4	16	$1.328991
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	1,953	$34,073.70	$17.45	$41,639.59	$21.32	0	4	16	$1.328787
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	91	Worthington-Appleton-C-Lac Qui Parle Valley - 000G99 - 091	1,887	$24,221.56	$12.84	$29,599.83	$15.69	0	4	16	$1.195623
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	382	$3,175.92	$8.31	$3,881.12	$10.16	0	4	16	$1.006894
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	641	$5,882.48	$9.18	$7,188.65	$11.21	0	4	16	$1.049606
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	113	Rochester-Harmony-C-Fillmore Central-2198 - 000G95 - 113	74	$9,311.54	$125.83	$11,379.12	$153.77	0	4	16	$2.186872
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	491	$8,674.49	$17.67	$10,600.61	$21.59	0	4	16	$1.334253
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	2,148	$18,664.34	$8.69	$22,808.66	$10.62	0	4	16	$1.026125
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	138	Rochester-Spring Grove-T-Spring Grove-0297 - 000G95 - 138	440	$9,054.47	$20.58	$11,064.97	$25.15	0	4	16	$1.400538
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	140	Rochester-Brownsdale-C-Hayfield-0203 - 000G95 - 140	489	$8,993.09	$18.39	$10,989.96	$22.47	0	4	16	$1.351603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	141	Rochester-Lansing-T-Austin-0492 - 000G95 - 141	1,965	$22,702.95	$11.55	$27,744.02	$14.12	0	4	16	$1.149835
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	142	Rochester-Red Rock-C-Hayfield-0203 - 000G95 - 142	2,052	$37,737.91	$18.39	$46,117.42	$22.47	0	4	16	$1.351603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	1,970	$15,186.41	$7.71	$18,558.47	$9.42	0	4	16	$0.974051
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	148	Rochester-Dover-C-Dover-Eyota-0533 - 000G95 - 148	623	$6,535.12	$10.49	$7,986.20	$12.82	0	4	16	$1.107888
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	149	Rochester-Dover-T-Dover-Eyota-0533 - 000G95 - 149	199	$11,345.06	$57.01	$13,864.17	$69.67	0	4	16	$1.843046

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	159	Rochester-Oronoco-C-Rochester-0535 - 000G95 - 159	729	$30,970.17	$42.48	$37,846.94	$51.92	0	4	16	$1.715335
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	12,799	$232,047.95	$18.13	$283,572.98	$22.16	0	4	16	$1.345570
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	900	$11,975.39	$13.31	$14,634.46	$16.26	0	4	16	$1.211121
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	176	Wadena-Aitkin-C-Aitkin-0001 - 000G89 - 176	153	$1,895.92	$12.39	$2,316.90	$15.14	0	4	16	$1.180126
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	3,118	$27,150.97	$8.71	$33,179.70	$10.64	0	4	16	$1.026942
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	2,021	$49,470.51	$24.48	$60,455.18	$29.91	0	4	16	$1.475816
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	215	Cloquet-Silver Bau-C-Lake Superior-0381 - 000G96 - 215	320	$6,309.91	$19.72	$7,710.99	$24.10	0	4	16	$1.382017
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	233	Cloquet--Hoyt Lakes-C-Mesabi E-2711 - 000G96 - 233	72	$5,972.28	$82.95	$7,298.39	$101.37	0	4	16	$2.005909
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	4,564	$46,835.72	$10.26	$57,235.34	$12.54	0	4	16	$1.098298
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	244	Bemidji-Detroit-T-Detroit Lakes-0022 - 000G97 - 244	5	$78.18	$15.64	$95.54	$19.11	0	4	16	$1.281261
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	246	Bemidji-Lake View-T-Detroit Lakes-0022 - 000G97 - 246	370	$2,914.24	$7.88	$3,561.34	$9.63	0	4	16	$0.983626
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	250	Wadena-Henrietta-T-Park Rapids-0309 - 000G89 - 250	1	$19,622.94	$19,622.94	$23,980.11	$23,980.11	0	4	16	$4.379851
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	2,526	$27,250.85	$10.79	$33,301.76	$13.18	0	4	16	$1.119915
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	272	$19,456.60	$71.53	$23,776.83	$87.41	0	4	16	$1.941561
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	1,289	$17,064.07	$13.24	$20,853.06	$16.18	0	4	16	$1.208979
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	313	Worthington-Mountain Lake-C-Mountain Lake-0173 - 000G99 - 313	1,493	$27,877.58	$18.67	$34,067.65	$22.82	0	4	16	$1.358316
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	330	Rosemount-Lakeville-C-Rosemnt-Apple Vly-0196 - 000G93 - 330	939	$8,234.56	$8.77	$10,063.00	$10.72	0	4	16	$1.030195
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	340	Rosemount-New Market-T-Lakeville-0194 - 000G93 - 340	518	$9,194.37	$17.75	$11,235.93	$21.69	0	4	16	$1.336260
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	971	$5,979.88	$6.16	$7,307.68	$7.53	0	4	16	$0.876795
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2006	425	Fairmont-Bankcroft-T-Albert Lea - 000G94 - 425	4,389	$27,029.50	$6.16	$33,031.26	$7.53	0	4	16	$0.876795
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2006	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	5,798	$44,499.50	$7.67	$54,380.39	$9.38	0	6	36	$0.972203
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2006	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	2,897	$74,380.36	$25.67	$90,896.12	$31.38	0	6	36	$1.496653
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2006	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	103	$6,756.84	$65.60	$8,257.16	$80.17	0	6	36	$1.904012
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2006	30	Rosemount-Elko-C-Lakeville-0194 - 000G93 - 030	180	$3,190.41	$17.72	$3,898.82	$21.66	0	6	36	$1.335658
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2006	31	Rosemount-New Market-C-New Prague-0721 - 000G93 - 031	2,753	$48,795.56	$17.72	$59,630.36	$21.66	0	6	36	$1.335658
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2006	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	4,340	$102,926.46	$23.72	$125,780.74	$28.98	0	6	36	$1.462098
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2006	73	Fairmont-Rutland-T-Fairmont Area-2752 - 000G94 - 073	843	$19,992.40	$23.72	$24,431.61	$28.98	0	6	36	$1.462098
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2006	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	558	($3,245.00)	($5.82)	($3,965.53)	($7.11)	0	6	36	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2006	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	1,512	$83,879.70	$55.48	$102,504.75	$67.79	0	6	36	$1.831166
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2006	159	Rochester-Oronoco-C-Rochester-0535 - 000G95 - 159	3,126	$62,662.83	$20.05	$76,576.78	$24.50	0	6	36	$1.389166
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2006	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	6,732	$125,511.36	$18.64	$153,380.50	$22.78	0	6	36	$1.357554
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2006	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	601	$11,050.01	$18.39	$13,503.60	$22.47	0	6	36	$1.351603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2006	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	1,930	$40,749.12	$21.11	$49,797.25	$25.80	0	6	36	$1.411620
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2006	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	605	$13,298.74	$21.98	$16,251.66	$26.86	0	6	36	$1.429106
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2006	244	Bemidji-Detroit-T-Detroit Lakes-0022 - 000G97 - 244	3,044	$66,911.34	$21.98	$81,768.65	$26.86	0	6	36	$1.429106
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2006	246	Bemidji-Lake View-T-Detroit Lakes-0022 - 000G97 - 246	1,293	$28,421.93	$21.98	$34,732.87	$26.86	0	6	36	$1.429106
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2006	250	Wadena-Henrietta-T-Park Rapids-0309 - 000G89 - 250	5,125	$135,822.25	$26.50	$165,980.86	$32.39	0	6	36	$1.510411
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2006	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	6,729	$132,219.08	$19.65	$161,577.63	$24.01	0	6	36	$1.380392
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2006	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	3,256	$112,650.02	$34.60	$137,663.36	$42.28	0	6	36	$1.626135
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2006	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	2,131	$73,727.64	$34.60	$90,098.47	$42.28	0	6	36	$1.626135
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2006	309	Rochester-Oronoco-T-Rochester-0535 - 000G95 - 309	6,043	$100,630.21	$16.65	$122,974.62	$20.35	0	6	36	$1.308564
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2006	316	Rosemount-Lakeville-C-Farmington-0192 - 000G93 - 316	2,626	$67,422.44	$25.67	$82,393.24	$31.38	0	6	36	$1.496653
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2006	330	Rosemount-Lakeville-C-Rosemnt-Apple Vly-0196 - 000G93 - 330	2,645	$67,910.26	$25.67	$82,989.38	$31.38	0	6	36	$1.496653
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2006	340	Rosemount-New Market-T-Lakeville-0194 - 000G93 - 340	10,038	$177,918.55	$17.72	$217,424.43	$21.66	0	6	36	$1.335658
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2006	209	Cloquet-Nashwauk-C-Nashwauk-Keewatin-0319 - 000G96 - 209	88	$3,074.38	$34.94	$3,757.03	$42.69	1	1.25	1.5625	$1.630326
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	186	Steel 10 in	2006	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	78	$232,836.21	$2,985.08	$284,536.26	$3,647.90	1	10	100	$3.562043
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	187	Steel 12 in	2006	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	4,083	$812,209.48	$198.92	$992,556.32	$243.09	1	12	144	$2.385767
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2006	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	48	$2,865.80	$59.70	$3,502.13	$72.96	1	2	4	$1.863085
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2006	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	30	$879.58	$29.32	$1,074.89	$35.83	1	2	4	$1.554247
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2006	27	Pine City-Willow River-C-Willow River-0577 - 000G98 - 027	2	$131.96	$65.98	$161.26	$80.63	1	2	4	$1.906497
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2006	45	Fairmont-Emmons-C-Glenville-Emmons-2886 - 000G94 - 045	141	$1,169.85	$8.30	$1,429.61	$10.14	1	2	4	$1.006038
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2006	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	50	$2,216.15	$44.32	$2,708.23	$54.16	1	2	4	$1.733679
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2006	106	Rochester-West Concord-C-Triton-2125 - 000G95 - 106	373	$10,838.29	$29.06	$13,244.88	$35.51	1	2	4	$1.550351
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2006	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	58	$4,500.42	$77.59	$5,499.71	$94.82	1	2	4	$1.976900
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2006	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	82	$2,382.69	$29.06	$2,911.75	$35.51	1	2	4	$1.550351
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2006	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	5	$1,922.14	$384.43	$2,348.94	$469.79	1	2	4	$2.671904
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2006	177	Wadena-Aitkin-T-Aitkin-0001 - 000G89 - 177	280	$1,383.62	$4.94	$1,690.85	$6.04	1	2	4	$0.781037
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2006	190	Cloquet-Twin Lakes-T-Carlton-0093 - 000G96 - 190	2,828	$129,752.82	$45.88	$158,563.75	$56.07	1	2	4	$1.748731
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2006	245	Bemidji-Frazee-C-Frazee-Vergas-0023 - 000G97 - 245	48	$1,368.84	$28.52	$1,672.78	$34.85	1	2	4	$1.542203
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2006	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	4	$2,578.84	$644.71	$3,151.46	$787.87	1	2	4	$2.896455
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2006	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	10	$4,348.04	$434.80	$5,313.50	$531.35	1	2	4	$2.725381
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2006	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	45	$11,320.83	$251.57	$13,834.56	$307.43	1	2	4	$2.487746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2006	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	6	$6,029.40	$1,004.90	$7,368.20	$1,228.03	1	2	4	$3.089209
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2006	142	Rochester-Red Rock-C-Hayfield-0203 - 000G95 - 142	4	$97.43	$24.36	$119.06	$29.77	1	3	9	$1.473779
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2006	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	12	$8,546.55	$712.21	$10,444.26	$870.36	1	3	9	$2.939699
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2006	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	4,313	$130,098.18	$30.16	$158,985.79	$36.86	1	4	16	$1.566555
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2006	24	Pine City-Sandstone-C-E Central-2580 - 000G98 - 024	16	$8,720.25	$545.02	$10,656.54	$666.03	1	4	16	$2.823494

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2006	113	Rochester-Harmony-C-Fillmore Central-2198 - 000G95 - 113	17	$7,936.89	$466.88	$9,699.23	$570.54	1	4	16	$2.756286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2006	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	86	$13,960.15	$162.33	$17,059.91	$198.37	1	4	16	$2.297476
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2006	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	68	$7,903.56	$116.23	$9,658.50	$142.04	1	4	16	$2.152411
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2006	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	86	$817.18	$9.50	$998.63	$11.61	1	4	16	$1.064832
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2006	190	Cloquet-Twin Lakes-T-Carlton-0093 - 000G96 - 190	4	$2,302.69	$575.67	$2,813.99	$703.50	1	4	16	$2.847264
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2006	191	Wadena-Crosby-C-Crosby-Ironton-0182 - 000G89 - 191	1,572	$19,202.37	$12.22	$23,466.16	$14.93	1	4	16	$1.174060
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2006	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	28	$5,279.22	$188.54	$6,451.44	$230.41	1	4	16	$2.362501
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2006	313	Worthington-Mountain Lake-C-Mountain Lake-0173 - 000G99 - 313	25	$8,274.60	$330.98	$10,111.93	$404.48	1	4	16	$2.606897
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2006	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	345	$22,280.50	$64.58	$27,227.77	$78.92	1	4	16	$1.897187
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2006	443	Rochester-Leroy-T-Leroy-Ostrander - 000G95 - 443	2,652	$171,767.08	$64.77	$209,907.05	$79.15	1	4	16	$1.898451
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2006	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	951	$120,856.35	$127.08	$147,691.87	$155.30	1	6	36	$2.191171
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2006	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	3,439	$260,706.61	$75.81	$318,595.15	$92.64	1	6	36	$1.966799
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2006	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	26	$22,775.48	$875.98	$27,832.66	$1,070.49	1	6	36	$3.029583
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2006	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	1,072	$146,457.77	$136.62	$178,977.94	$166.96	1	6	36	$2.222612
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2006	246	Bemidji-Lake View-T-Detroit Lakes-0022 - 000G97 - 246	189	$19,662.78	$104.04	$24,028.80	$127.14	1	6	36	$2.104282
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2006	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	4	$13,263.43	$3,315.86	$16,208.50	$4,052.13	1	6	36	$3.607683
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2006	316	Rosemount-Lakeville-C-Farmington-0192 - 000G93 - 316	744	$97,074.00	$130.48	$118,628.77	$159.45	1	6	36	$2.202625
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	2006	190	Cloquet-Twin Lakes-T-Carlton-0093 - 000G96 - 190	4	$466.35	$116.59	$569.90	$142.48	1	8	64	$2.153754
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	2006	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	8,420	$210,458.04	$25.00	$257,189.14	$30.55	1	8	64	$1.485011
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	207	Rectifiers	2006	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	1	$12,520.57	$12,520.57	$15,300.70	$15,300.70	#N/A	#N/A	#N/A	$4.184711
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	207	Rectifiers	2006	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	1	$23,573.22	$23,573.22	$28,807.53	$28,807.53	#N/A	#N/A	#N/A	$4.459506
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	2007	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	97	($450.07)	($4.64)	($576.72)	($5.95)	0	1.25	1.5625	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2007	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	187	$297.98	$1.59	$381.83	$2.04	0	1	1	$0.309630
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2007	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	185	$7,085.05	$38.30	$9,078.83	$49.07	0	1	1	$1.690816
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	4,759	$15,444.98	$3.25	$19,791.30	$4.16	0	2	4	$0.619093
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	7,986	$110,908.83	$13.89	$142,119.35	$17.80	0	2	4	$1.250420
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	1,272	$8,106.73	$6.37	$10,388.02	$8.17	0	2	4	$0.912222
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	7,861	$111,124.62	$14.14	$142,395.86	$18.11	0	2	4	$1.257918
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	4,750	$75,363.49	$15.87	$96,571.31	$20.33	0	2	4	$1.308137
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	12	Rosemount-Cannon Falls-T-Cannon Falls-0252 - 000G93 - 012	141	$2,286.53	$16.22	$2,929.97	$20.78	0	2	4	$1.317646
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	15	Pine City-Mora-C-Mora-0332 - 000G98 - 015	2,096	$10,597.87	$5.06	$13,580.19	$6.48	0	2	4	$0.811575
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	413	$3,648.76	$8.83	$4,675.55	$11.32	0	2	4	$1.053846
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	4,753	$36,708.93	$7.72	$47,039.08	$9.90	0	2	4	$0.995635
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	24	Pine City-Sandstone-C-E Central-2580 - 000G98 - 024	1,008	$5,983.90	$5.94	$7,667.81	$7.61	0	2	4	$0.881385
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	31	Rosemount-New Market-C-New Prague-0721 - 000G93 - 031	373	$9,287.22	$24.90	$11,900.71	$31.91	0	2	4	$1.503927
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	32	Rosemount-New Market-T-New Prague-0721 - 000G93 - 032	92	$3,708.67	$40.31	$4,752.32	$51.66	0	2	4	$1.713154
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	33	Rosemount-Spring Lk-T-Prior Lk-Savage-0719 - 000G93 - 033	7	$129.73	$18.53	$166.24	$23.75	0	2	4	$1.375664
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	140	$1,186.21	$8.47	$1,520.02	$10.86	0	2	4	$1.035830
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	7,540	$97,643.72	$12.95	$125,121.34	$16.59	0	2	4	$1.219846
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	44	Fairmont-Alden-C-Alden-Conger-0242 - 000G94 - 044	98	$1,311.65	$13.38	$1,680.76	$17.15	0	2	4	$1.234264
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	55	Worthington-Madison-C-Lac Qui Parle Valley-2853 - 000G99 - 055	187	$1,644.49	$8.79	$2,107.26	$11.27	0	2	4	$1.051924
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	62	Worthington-Cottonwood-C-Lakeview-2167 - 000G99 - 062	22,526	$334,016.28	$14.83	$428,010.82	$19.00	0	2	4	$1.278754
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	4,832	$62,976.64	$13.03	$80,698.71	$16.70	0	2	4	$1.222716
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	73	Fairmont-Rutland-T-Fairmont Area-2752 - 000G94 - 073	2,066	$24,813.74	$12.01	$31,796.50	$15.39	0	2	4	$1.187239
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	74	Fairmont-Sherburn-C-Martin Cty W-2448 - 000G94 - 074	127	$1,039.91	$8.19	$1,332.54	$10.49	0	2	4	$1.020775
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	6,383	$108,281.56	$16.96	$138,752.75	$21.74	0	2	4	$1.337260
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	84	Worthington-Revere-C-Westbrook-WalnutGrve-2898 - 000G99 - 084	5,038	$44,156.05	$8.76	$56,581.87	$11.23	0	2	4	$1.050380
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	90	Worthington-Appleton-T-Lac Qui Parle Valley - 000G99 - 090	2,336	$30,745.71	$13.16	$39,397.77	$16.87	0	2	4	$1.227115
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	91	Worthington-Appleton-C-Lac Qui Parle Valley - 000G99 - 091	17,171	$257,133.64	$14.97	$329,492.85	$19.19	0	2	4	$1.283075
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	93	Fairmont-New Richland-C-NRHEG-2168 - 000G94 - 093	466	$5,607.06	$12.03	$7,184.93	$15.42	0	2	4	$1.188084
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	2,140	$20,769.32	$9.71	$26,613.95	$12.44	0	2	4	$1.094820
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	3,368	$15,113.25	$4.49	$19,366.23	$5.75	0	2	4	$0.759668
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	113	Rochester-Harmony-C-Fillmore Central-2198 - 000G95 - 113	455	$2,310.94	$5.08	$2,961.26	$6.51	0	2	4	$0.813581
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	189	$5,082.29	$26.89	$6,512.48	$34.46	0	2	4	$1.537315
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	1,561	$31,568.09	$20.22	$40,451.58	$25.91	0	2	4	$1.413467
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	66	$2,040.66	$30.92	$2,614.92	$39.62	0	2	4	$1.597914
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	55	$678.56	$12.34	$869.51	$15.81	0	2	4	$1.198932
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	134	Rochester-Houston-C-Houston-0294 - 000G95 - 134	153	$2,424.95	$15.85	$3,107.35	$20.31	0	2	4	$1.307710
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	80	$756.71	$9.46	$969.65	$12.12	0	2	4	$1.083503
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	329	$4,965.02	$15.09	$6,362.21	$19.34	0	2	4	$1.286456
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	1,528	$6,836.85	$4.47	$8,760.79	$5.73	0	2	4	$0.758155
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	156	Rochester-Marion-T-Rochester-0535 - 000G95 - 156	401	$2,694.52	$6.72	$3,452.77	$8.61	0	2	4	$0.935003
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	43,678	$373,655.53	$8.55	$478,804.84	$10.96	0	2	4	$1.039811
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	557	$2,700.03	$4.85	$3,459.85	$6.21	0	2	4	$0.793092
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	754	$6,146.12	$8.15	$7,875.68	$10.45	0	2	4	$1.019116
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	167	Rochester-Elgin-C-Elgin-Millville-2899 - 000G95 - 167	3	$1,612.89	$537.63	$2,066.77	$688.92	0	2	4	$2.838169
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	2,382	$6,825.46	$2.87	$8,746.19	$3.67	0	2	4	$0.564666

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	176	Wadena-Aitkin-C-Aitkin-0001 - 000G89 - 176	932	$5,060.42	$5.43	$6,484.46	$6.96	0	2	4	$0.842609
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	1,805	$15,203.70	$8.42	$19,482.13	$10.79	0	2	4	$1.033021
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	2,032	$8,727.08	$4.29	$11,182.94	$5.50	0	2	4	$0.740363
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	343	$1,514.43	$4.42	$1,940.60	$5.66	0	2	4	$0.752816
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	187	Cloquet-Moose Lake-T-Moose Lake-0097 - 000G96 - 187	399	$1,713.64	$4.29	$2,195.87	$5.50	0	2	4	$0.740363
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	190	Cloquet-Twin Lakes-T-Carlton-0093 - 000G96 - 190	113	$1,187.26	$10.51	$1,521.37	$13.46	0	2	4	$1.129045
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	191	Wadena-Crosby-C-Crosby-Ironton-0182 - 000G89 - 191	280	$1,708.91	$6.10	$2,189.81	$7.82	0	2	4	$0.893207
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	194	Wadena-Deerwood-T-Crosby-Ironton-0182 - 000G89 - 194	464	$2,591.81	$5.59	$3,321.16	$7.16	0	2	4	$0.854913
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	195	Wadena-Irondale(Riverton)-T-Crosby-Ironton-0182 - 000G89 - 195	651	$3,850.94	$5.92	$4,934.61	$7.58	0	2	4	$0.879669
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	201	Cloquet-Coleraine-C-Greenway-0316 - 000G96 - 201	81	$1,577.31	$19.47	$2,021.18	$24.95	0	2	4	$1.397071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	202	Cloquet-Deer River-C-Deer River-0317 - 000G96 - 202	700	$3,237.36	$4.62	$4,148.38	$5.93	0	2	4	$0.773055
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	1,909	$21,698.91	$11.37	$27,805.14	$14.57	0	2	4	$1.163460
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	207	Cloquet-Laprairie-C-Greenway-0316 - 000G96 - 207	186	$1,048.84	$5.64	$1,343.99	$7.23	0	2	4	$0.859138
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	209	Cloquet-Nashwauk-C-Nashwauk-Keewatin-0319 - 000G96 - 209	220	$1,230.00	$5.59	$1,576.13	$7.16	0	2	4	$0.854913
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	708	$4,622.41	$6.53	$5,923.19	$8.37	0	2	4	$0.922725
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	267	$5,519.80	$20.67	$7,073.11	$26.49	0	2	4	$1.423082
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	10,604	$142,197.21	$13.41	$182,212.51	$17.18	0	2	4	$1.235023
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	414	$7,521.39	$18.17	$9,637.97	$23.28	0	2	4	$1.366983
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	933	$6,718.24	$7.20	$8,608.80	$9.23	0	2	4	$0.965202
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	226	Cloquet-Floodwood-T-Floodwood-0698 - 000G96 - 226	173	$3,377.37	$19.52	$4,327.78	$25.02	0	2	4	$1.398287
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	26,333	$191,657.79	$7.28	$245,591.63	$9.33	0	2	4	$0.969882
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	350	$1,913.74	$5.47	$2,452.28	$7.01	0	2	4	$0.845718
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	112	$1,545.34	$13.80	$1,980.21	$17.68	0	2	4	$1.247482
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	8,017	$84,959.68	$10.60	$108,867.94	$13.58	0	2	4	$1.132900
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	1,540	$7,598.21	$4.93	$9,736.40	$6.32	0	2	4	$0.800717
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	4,721	$39,082.56	$8.28	$50,080.67	$10.61	0	2	4	$1.025715
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	9,976	$55,018.07	$5.52	$70,500.54	$7.07	0	2	4	$0.849419
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	16,202	$215,421.24	$13.30	$276,042.29	$17.04	0	2	4	$1.231470
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	253	Wadena-Todd-C-Park Rapids-0309 - 000G89 - 253	45	$596.20	$13.25	$763.97	$16.98	0	2	4	$1.229938
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	255	Wadena-Baudette-C-Lake of Woods-0390 - 000G89 - 255	9	$7,542.09	$838.01	$9,664.49	$1,073.83	0	2	4	$3.030936
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	257	Wadena-Motley-C-Staples-Motley-2170 - 000G89 - 257	108	$801.50	$7.42	$1,027.05	$9.51	0	2	4	$0.978181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	544	$9,004.35	$16.55	$11,538.24	$21.21	0	2	4	$1.326541
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	3,098	$32,130.62	$10.37	$41,172.41	$13.29	0	2	4	$1.123525
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	320	$2,284.60	$7.14	$2,927.50	$9.15	0	2	4	$0.961421
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	275	Wadena-Warroad-C-Warroad-0690 - 000G89 - 275	4,620	$26,644.68	$5.77	$34,142.69	$7.39	0	2	4	$0.868644
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	7,408	$66,738.85	$9.01	$85,519.64	$11.54	0	2	4	$1.062206
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	285	Wadena-Menahga-C-Menahga-821 - 000G89 - 285	396	$2,370.46	$5.99	$3,037.52	$7.67	0	2	4	$0.884795
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	288	Wadena-Sebeka-C-Sebeka-820 - 000G89 - 288	1,800	$22,345.40	$12.41	$28,633.55	$15.91	0	2	4	$1.201670
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	1,825	$11,945.24	$6.55	$15,306.71	$8.39	0	2	4	$0.923762
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	6	($132.40)	($22.07)	($169.66)	($28.28)	0	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	971	$8,444.68	$8.70	$10,821.07	$11.14	0	2	4	$1.046885
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	1,424	$29,149.72	$20.47	$37,352.67	$26.23	0	2	4	$1.418798
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	302	Cloquet-White-T-Mesabi E-2711 - 000G96 - 302	140	$2,943.76	$21.03	$3,772.15	$26.94	0	2	4	$1.430398
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	307	Pine City-Pokegama-T-Pine City-0578 - 000G98 - 307	54	$334.75	$6.20	$428.95	$7.94	0	2	4	$0.899821
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	322	Wadena-Staples-T-Staples-Motley-2170- 000G89 - 322	1,508	$15,563.17	$10.32	$19,942.75	$13.22	0	2	4	$1.121231
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	330	Rosemount-Lakeville-C-Rosemnt-Apple Vly-0196 - 000G93 - 330	2,012	$6,848.53	$3.40	$8,775.75	$4.36	0	2	4	$0.639486
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	348	Cloquet-Floodwood-C-Floodwood-0698 - 000G96 - 348	7	$1,751.34	$250.19	$2,244.18	$320.60	0	2	4	$2.505964
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	351	Rosemount-Eureka-T-Lakeville-0194 - 000G93 - 351	1,311	$8,219.15	$6.27	$10,532.08	$8.03	0	2	4	$0.904716
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	400	Worthington-Monroe-T-Tracy - 000G99 - 400	213	$1,039.70	$4.88	$1,332.28	$6.25	0	2	4	$0.795880
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	414	Rosemount-Credit River-T-Lakeville SD - 000G93 - 414	24	$252.26	$10.51	$323.25	$13.47	0	2	4	$1.129368
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	415	Rochester-Rochester-C-Byron SD-0531 - 000G95 - 415	1,676	$7,770.49	$4.64	$9,957.16	$5.94	0	2	4	$0.773786
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	5,103	$79,280.90	$15.54	$101,591.10	$19.91	0	2	4	$1.299071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	424	Fairmont-Alden-C-Alden-Conger-0242 - 000G94 - 044	98	$1,311.65	$13.38	$1,680.76	$17.15	0	2	4	$1.234264
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2007	428	Fairmont-Clarks Grove-C-Albert Lea - 000G94 - 428	295	$4,583.16	$15.54	$5,872.89	$19.91	0	2	4	$1.299071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2007	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	3	($854.88)	($284.96)	($1,095.45)	($365.15)	0	3	9	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2007	255	Wadena-Baudette-C-Lake of Woods-0390 - 000G89 - 255	7	$8,458.85	$1,208.41	$10,839.23	$1,548.46	0	3	9	$3.189900
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	801	$16,260.27	$20.30	$20,836.02	$26.01	0	4	16	$1.415140
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	305	$3,287.53	$10.78	$4,212.66	$13.81	0	4	16	$1.140194
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	286	$3,447.20	$12.05	$4,417.27	$15.45	0	4	16	$1.188928
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	972	$33,624.11	$34.59	$43,086.18	$44.33	0	4	16	$1.646698
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	1,101	$13,929.67	$12.65	$17,849.58	$16.21	0	4	16	$1.209783
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	1,883	$20,617.75	$10.95	$26,419.73	$14.03	0	4	16	$1.147058
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	30	Rosemount-Elko-C-Lakeville-0194 - 000G93 - 030	2,725	$24,509.18	$8.99	$31,406.24	$11.53	0	4	16	$1.061829
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	33	Rosemount-Spring Lk-T-Prior Lk-Savage-0719 - 000G93 - 033	13	$281.89	$21.68	$361.22	$27.79	0	4	16	$1.443889
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	39	Worthington-Mountain Lake-T-Mountain Lake-0173 - 000G99 - 039	1,671	$8,550.90	$5.12	$10,957.18	$6.56	0	4	16	$0.816904
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	2,708	$91,788.64	$33.90	$117,618.61	$43.43	0	4	16	$1.637790
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	1,442	$44,109.25	$30.59	$56,521.91	$39.20	0	4	16	$1.593286

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	1,780	$48,595.75	$27.30	$62,270.94	$34.98	0	4	16	$1.543820
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	93	Fairmont-New Richland-C-NRHEG-2168 - 000G94 - 093	2,077	$45,023.00	$21.68	$57,692.79	$27.78	0	4	16	$1.443732
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	2,303	$47,105.87	$20.45	$60,361.79	$26.21	0	4	16	$1.418467
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	2,672	$81,339.53	$30.44	$104,229.05	$39.01	0	4	16	$1.591176
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	225	$7,395.51	$32.87	$9,476.65	$42.12	0	4	16	$1.624488
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	1,578	$21,966.87	$13.92	$28,148.50	$17.84	0	4	16	$1.251395
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	4,994	$98,457.49	$19.72	$126,164.12	$25.26	0	4	16	$1.402433
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	136	Rochester-La Crescent-T-LaCrescent-Hokah-0300 - 000G95 - 136	2,099	$40,851.33	$19.46	$52,347.18	$24.94	0	4	16	$1.396896
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	624	$11,689.63	$18.73	$14,979.18	$24.01	0	4	16	$1.380392
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	138	Rochester-Spring Grove-T-Spring Grove-0297 - 000G95 - 138	4,231	$79,260.94	$18.73	$101,565.52	$24.01	0	4	16	$1.380392
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	9	$85.30	$9.48	$109.31	$12.15	0	4	16	$1.084576
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	156	Rochester-Marion-T-Rochester-0535 - 000G95 - 156	331	$3,741.18	$11.30	$4,793.98	$14.48	0	4	16	$1.160769
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	159	Rochester-Oronoco-C-Rochester-0535 - 000G95 - 159	236	$6,308.62	$26.73	$8,083.91	$34.25	0	4	16	$1.534661
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	5,242	$104,724.08	$19.98	$134,194.17	$25.60	0	4	16	$1.408240
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	1,276	$9,712.04	$7.61	$12,445.07	$9.75	0	4	16	$0.989005
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	175	Rochester-Utica-T-Lewiston-Altura-0857 - 000G95 - 175	785	$23,894.57	$30.44	$30,618.67	$39.00	0	4	16	$1.591065
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	13,724	$148,824.96	$10.84	$190,705.35	$13.90	0	4	16	$1.143015
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	1,628	$38,472.41	$23.63	$49,298.82	$30.28	0	4	16	$1.481156
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	12,177	$312,209.97	$25.64	$400,068.05	$32.85	0	4	16	$1.516535
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	224	$11,749.00	$52.45	$15,055.25	$67.21	0	4	16	$1.827434
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	1,468	$29,481.07	$20.08	$37,777.25	$25.73	0	4	16	$1.410440
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	3,512	$36,280.30	$10.33	$46,489.83	$13.24	0	4	16	$1.121888
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	1,603	$34,967.75	$21.81	$44,807.92	$27.95	0	4	16	$1.446382
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	253	Wadena-Todd-C-Park Rapids-0309 - 000G89 - 253	1,243	$27,114.73	$21.81	$34,745.01	$27.95	0	4	16	$1.446382
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	220	$5,519.34	$25.09	$7,072.52	$32.15	0	4	16	$1.507181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	488	$10,389.78	$21.29	$13,313.53	$27.28	0	4	16	$1.435844
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	427	$7,181.52	$16.82	$9,202.45	$21.55	0	4	16	$1.333447
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	60	$4,425.75	$73.76	$5,671.18	$94.52	0	4	16	$1.975524
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	322	Wadena-Staples-T-Staples-Motley-2170- 000G89 - 322	2,763	$58,825.80	$21.29	$75,379.79	$27.28	0	4	16	$1.435844
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	238	$4,290.47	$18.03	$5,497.84	$23.10	0	4	16	$1.363612
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	194	$3,497.27	$18.03	$4,481.43	$23.10	0	4	16	$1.363612
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	434	Fairmont-Geneva-T-Albert Lea - 000G94 - 434	221	$3,984.01	$18.03	$5,105.14	$23.10	0	4	16	$1.363612
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2007	441	Fairmont-Hollandale-C-Albert Lea - 000G94 - 441	97	$1,748.64	$18.03	$2,240.72	$23.10	0	4	16	$1.363612
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2007	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	7,369	$85,811.84	$11.64	$109,959.89	$14.92	0	6	36	$1.173769
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2007	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	3,321	$29,322.63	$8.83	$37,574.23	$11.31	0	6	36	$1.053463
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2007	33	Rosemount-Spring Lk-T-Prior Lk-Savage-0719 - 000G93 - 033	1,852	$38,419.81	$20.75	$49,231.41	$26.58	0	6	36	$1.424555
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2007	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	2,129	$42,868.96	$20.14	$54,932.58	$25.80	0	6	36	$1.411620
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2007	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	599	$15,070.64	$25.16	$19,311.63	$32.24	0	6	36	$1.508395
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2007	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	12,280	$236,054.26	$19.22	$302,481.60	$24.63	0	6	36	$1.391464
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2007	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	2,578	$71,732.50	$27.82	$91,918.53	$35.65	0	6	36	$1.552060
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2007	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	673	$32,121.26	$47.73	$41,160.41	$61.16	0	6	36	$1.786467
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2007	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	4,251	$92,577.50	$21.78	$118,629.46	$27.91	0	6	36	$1.445760
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2007	253	Wadena-Todd-C-Park Rapids-0309 - 000G89 - 253	771	$16,790.70	$21.78	$21,515.72	$27.91	0	6	36	$1.445760
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2007	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	4,313	$188,907.47	$43.80	$242,067.36	$56.13	0	6	36	$1.749195
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2007	341	Rosemount-Spring Lk-T-Lakeville-0194 - 000G93 - 341	1,213	$25,163.73	$20.75	$32,244.98	$26.58	0	6	36	$1.424555
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2007	414	Rosemount-Credit River-T-Lakeville SD - 000G93 - 414	143	$2,966.54	$20.75	$3,801.35	$26.58	0	6	36	$1.424555
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2007	206	Cloquet-Keewatin-C-Nashwauk-Keewatin-0319 - 000G96 - 206	2	$6,325.16	$3,162.58	$8,105.11	$4,052.56	1	1.25	1.5625	$3.607729
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2007	24	Pine City-Sandstone-C-E Central-2580 - 000G98 - 024	3	$1,718.94	$572.98	$2,202.66	$734.22	1	2	4	$2.865826
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2007	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	26	$4,550.76	$175.03	$5,831.38	$224.28	1	2	4	$2.350791
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2007	44	Fairmont-Alden-C-Alden-Conger-0242 - 000G94 - 044	78	$4,873.24	$62.48	$6,244.60	$80.06	1	2	4	$1.903416
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2007	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	2	$1,006.74	$503.37	$1,290.04	$645.02	1	2	4	$2.809573
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2007	77	Fairmont-Welcome-C-Martin Cty W-2448 - 000G94 - 077	2	$1,006.73	$503.37	$1,290.03	$645.02	1	2	4	$2.809573
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2007	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	31	$4,746.38	$153.11	$6,082.04	$196.19	1	2	4	$2.292677
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2007	91	Worthington-Appleton-C-Lac Qui Parle Valley - 000G99 - 091	6	$154.31	$25.72	$197.74	$32.96	1	2	4	$1.517987
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2007	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	9	($153.92)	($17.10)	($197.23)	($21.91)	1	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2007	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	63	$3,829.67	$60.79	$4,907.37	$77.89	1	2	4	$1.891482
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2007	134	Rochester-Houston-C-Houston-0294 - 000G95 - 134	12	$3,697.28	$308.11	$4,737.72	$394.81	1	2	4	$2.596388
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2007	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	1,044	$49,323.96	$47.25	$63,204.07	$60.54	1	2	4	$1.782042
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2007	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	808	$26,598.87	$32.92	$34,083.98	$42.18	1	2	4	$1.625107
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2007	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	650	$17,870.75	$27.49	$22,899.71	$35.23	1	2	4	$1.546913
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2007	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	49	$2,006.37	$40.95	$2,570.98	$52.47	1	2	4	$1.719911
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2007	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	59	$1,021.29	$17.31	$1,308.69	$22.18	1	2	4	$1.345962
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2007	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	22	$335.33	$15.24	$429.69	$19.53	1	2	4	$1.290702
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2007	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	458	$8,941.37	$19.52	$11,457.53	$25.02	1	2	4	$1.398287
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2007	424	Fairmont-Alden-C-Alden-Conger-0242 - 000G94 - 044	78	$4,873.24	$62.48	$6,244.60	$80.06	1	2	4	$1.903416
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2007	65	Worthington-Tracy-C-Tracy-0417 - 000G99 - 065	44	$6,850.54	$155.69	$8,778.33	$199.51	1	3	9	$2.299965
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2007	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	69	$2,835.89	$41.10	$3,633.93	$52.67	1	3	9	$1.721563

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2007	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	1	$3,048.52	$3,048.52	$3,906.39	$3,906.39	1	3	9	$3.591776
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2007	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	315	$26,040.62	$82.67	$33,368.63	$105.93	1	3	9	$2.025019
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2007	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	5	$4,863.22	$972.64	$6,231.76	$1,246.35	1	3	9	$3.095640
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2007	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	4	$93.52	$23.38	$119.83	$29.96	1	4	16	$1.476542
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2007	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	97	$13,736.87	$141.62	$17,602.52	$181.47	1	4	16	$2.258805
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2007	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	245	$14,822.58	$60.50	$18,993.76	$77.53	1	4	16	$1.889470
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2007	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	50	$11,280.55	$225.61	$14,454.98	$289.10	1	4	16	$2.461048
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2007	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	316	$12,198.66	$38.60	$15,631.45	$49.47	1	4	16	$1.694342
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2007	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	3	$7,041.00	$2,347.00	$9,022.39	$3,007.46	1	4	16	$3.478200
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2007	154	Rochester-High Forest-T-Stewartville-0534 - 000G95 - 154	356	$22,467.40	$63.11	$28,789.88	$80.87	1	4	16	$1.907787
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2007	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	39	$8,270.75	$212.07	$10,598.20	$271.75	1	4	16	$2.434170
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2007	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	40	$5,322.11	$133.05	$6,819.79	$170.49	1	4	16	$2.231699
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2007	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	5	$1,844.67	$368.93	$2,363.77	$472.75	1	4	16	$2.674632
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2007	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	82	$9,258.63	$112.91	$11,864.07	$144.68	1	4	16	$2.160409
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2007	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	2	$389.22	$194.61	$498.75	$249.38	1	4	16	$2.396862
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2007	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	121	$8,148.33	$67.34	$10,441.33	$86.29	1	4	16	$1.935960
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2007	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	2,035	$115,472.57	$56.74	$147,967.36	$72.71	1	4	16	$1.861594
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2007	282	Wadena-Villard-T-Staples-Motley-2170 - 000G89 - 282	1,077	$58,325.66	$54.16	$74,738.91	$69.40	1	4	16	$1.841359
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2007	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	9,999	$430,169.96	$43.02	$551,222.82	$55.13	1	6	36	$1.741388
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2007	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	527	$31,905.96	$60.54	$40,884.52	$77.58	1	6	36	$1.889750
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2007	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	4,052	$235,378.33	$58.09	$301,615.44	$74.44	1	6	36	$1.871806
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2007	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	750	$53,109.45	$70.81	$68,054.82	$90.74	1	6	36	$1.957799
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2007	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	791	$108,950.89	$137.74	$139,610.44	$176.50	1	6	36	$2.246745
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2007	299	Rosemount-Rosemount-C-Inver Grove Hts-0199 - 000G93 - 299	2,364	$80,631.56	$34.11	$103,321.85	$43.71	1	6	36	$1.640581
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2007	316	Rosemount-Lakeville-C-Farmington-0192 - 000G93 - 316	1,316	$31,218.83	$23.72	$40,004.03	$30.40	1	6	36	$1.482874
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	2007	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	1	$496.30	$496.30	$635.97	$635.97	1	8	64	$2.803437
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2008	47	Fairmont-Freeman-T-Glenville-Emmons-2886 - 000G94 - 047	424	$45.30	$0.11	$57.28	$0.14	0	1	1	($0.853872)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2008	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	5	$1,040.65	$208.13	$1,315.86	$263.17	0	1	1	$2.420236
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	2	Pine City-Harris-C-North Branch-0138 - 000G98 - 002	229	$4,224.47	$18.45	$5,341.69	$23.33	0	2	4	$1.367915
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	4	$2,185.65	$546.41	$2,763.67	$690.92	0	2	4	$2.839428
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	6	Pine City-Rusheba-T-Rush City-0139 - 000G98 - 006	1	$74.93	$74.93	$94.75	$94.75	0	2	4	$1.976579
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	262	$13,172.14	$50.28	$16,655.69	$63.57	0	2	4	$1.803252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	4,374	$32,097.82	$7.34	$40,586.50	$9.28	0	2	4	$0.967548
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	1,892	$11,075.12	$5.85	$14,004.08	$7.40	0	2	4	$0.869232
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	423	$17,684.85	$41.81	$22,361.84	$52.86	0	2	4	$1.723127
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	15	Pine City-Mora-C-Mora-0332 - 000G98 - 015	4,132	$37,550.54	$9.09	$47,481.26	$11.49	0	2	4	$1.060320
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	1,137	$18,690.30	$16.44	$23,633.19	$20.79	0	2	4	$1.317854
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	31	Rosemount-New Market-C-New Prague-0721 - 000G93 - 031	1,493	$25,559.44	$17.12	$32,318.96	$21.65	0	2	4	$1.335458
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	39	Worthington-Mountain Lake-T-Mountain Lake-0173 - 000G99 - 039	847	$4,135.12	$4.88	$5,228.71	$6.17	0	2	4	$0.790285
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	3	($613.06)	($204.35)	($775.19)	($258.40)	0	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	20,664	$295,052.81	$14.28	$373,083.32	$18.05	0	2	4	$1.256477
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	51	Fairmont-DesMoines-T-Jackson Cty Centrl-2895 - 000G94 - 051	2,118	$17,190.23	$8.12	$21,736.40	$10.26	0	2	4	$1.011147
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	1,139	$18,156.39	$15.94	$22,958.09	$20.16	0	2	4	$1.304491
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	54	Fairmont-Lakefield-C-Jackson Cty Central-2895 - 000G94 - 054	1,096	$24,164.22	$22.05	$30,554.75	$27.88	0	2	4	$1.445293
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	57	Worthington-Hendricks-C-Hendricks-0402 - 000G99 - 057	3	$40.46	$13.49	$51.16	$17.05	0	2	4	$1.231724
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	65	Worthington-Tracy-C-Tracy-0417 - 000G99 - 065	64	$863.25	$13.49	$1,091.55	$17.06	0	2	4	$1.231979
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	1,936	$25,611.09	$13.23	$32,384.27	$16.73	0	2	4	$1.223496
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	2,306	$57,243.62	$24.82	$72,382.43	$31.39	0	2	4	$1.496791
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	81	Worthington-Worthington-T-Worthington Admn-0518 - 000G99 - 081	1,170	$19,192.05	$16.40	$24,267.64	$20.74	0	2	4	$1.316809
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	89	Fairmont-Ellendale-C-NRHEG-2168 - 000G94 - 089	828	$15,975.87	$19.29	$20,200.89	$24.40	0	2	4	$1.387390
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	95	Worthington-Canby-C-Canby-0891 - 000G99 - 095	489	$9,430.33	$19.28	$11,924.30	$24.39	0	2	4	$1.387212
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	1,587	$7,751.53	$4.88	$9,801.52	$6.18	0	2	4	$0.790988
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	494	$5,105.81	$10.34	$6,456.11	$13.07	0	2	4	$1.116276
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	4,384	$59,493.62	$13.57	$75,227.46	$17.16	0	2	4	$1.234517
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	946	$30,835.89	$32.60	$38,990.84	$41.22	0	2	4	$1.615108
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	112	Rochester-Fountain-C-Fillmore Central-2198 - 000G95 - 112	175	$2,132.00	$12.18	$2,695.83	$15.40	0	2	4	$1.187521
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	1,102	$6,930.13	$6.29	$8,762.89	$7.95	0	2	4	$0.900367
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	3,735	$62,003.16	$16.60	$78,400.69	$20.99	0	2	4	$1.322012
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	123	Fairmont-Glenville-C-Glenville-Emmons-2886 - 000G94 - 123	3	$22.25	$7.42	$28.13	$9.38	0	2	4	$0.972203
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	6	($294.87)	($49.15)	($372.85)	($62.14)	0	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	134	Rochester-Houston-C-Houston-0294 - 000G95 - 134	98	$2,960.93	$30.21	$3,743.99	$38.20	0	2	4	$1.582063
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	442	$13,801.70	$31.23	$17,451.73	$39.48	0	2	4	$1.596377
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	136	Rochester-La Crescent-T-LaCrescent-Hokah-0300 - 000G95 - 136	224	$2,897.51	$12.94	$3,663.79	$16.36	0	2	4	$1.213783
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	819	$4,620.50	$5.64	$5,842.47	$7.13	0	2	4	$0.853090
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	1,121	$5,944.12	$5.30	$7,516.11	$6.70	0	2	4	$0.826075
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	148	Rochester-Dover-C-Dover-Eyota-0533 - 000G95 - 148	2	($389.07)	($194.54)	($491.96)	($245.98)	0	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	153	Rochester-Haverhill-T-Rochester-0535 - 000G95 - 153	150	$866.25	$5.78	$1,095.34	$7.30	0	2	4	$0.863323

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	154	Rochester-High Forest-T-Stewartville-0534 - 000G95 - 154	4	$89.98	$22.50	$113.77	$28.44	0	2	4	$1.453930
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	156	Rochester-Marion-T-Rochester-0535 - 000G95 - 156	3,680	$21,871.62	$5.94	$27,655.85	$7.52	0	2	4	$0.876218
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	19,816	$255,102.23	$12.87	$322,567.27	$16.28	0	2	4	$1.211654
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	96	$613.24	$6.39	$775.41	$8.08	0	2	4	$0.907411
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	1,445	$24,082.48	$16.67	$30,451.39	$21.07	0	2	4	$1.323665
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	1,628	$14,408.68	$8.85	$18,219.24	$11.19	0	2	4	$1.048830
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	177	$8,683.84	$49.06	$10,980.40	$62.04	0	2	4	$1.792672
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	176	Wadena-Aitkin-C-Aitkin-0001 - 000G89 - 176	1,839	$9,663.39	$5.25	$12,219.00	$6.64	0	2	4	$0.822168
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	2,643	$42,241.93	$15.98	$53,413.34	$20.21	0	2	4	$1.305566
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	1,089	$13,671.96	$12.55	$17,287.68	$15.87	0	2	4	$1.200577
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	191	Wadena-Crosby-C-Crosby-Ironton-0182 - 000G89 - 191	1,914	$12,741.68	$6.66	$16,111.38	$8.42	0	2	4	$0.925312
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	192	Wadena-Deerwood-C-Crosby-Ironton-0182 - 000G89 - 192	213	$1,686.82	$7.92	$2,132.92	$10.01	0	2	4	$1.000434
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	194	Wadena-Deerwood-T-Crosby-Ironton-0182 - 000G89 - 194	228	$1,386.56	$6.08	$1,753.25	$7.69	0	2	4	$0.885926
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	201	Cloquet-Coleraine-C-Greenway-0316 - 000G96 - 201	3	$3,331.30	$1,110.43	$4,212.30	$1,404.10	0	2	4	$3.147398
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	3,068	$25,814.51	$8.41	$32,641.49	$10.64	0	2	4	$1.026942
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	206	Cloquet-Keewatin-C-Nashwauk-Keewatin-0319 - 000G96 - 206	233	$1,686.42	$7.24	$2,132.42	$9.15	0	2	4	$0.961421
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	209	Cloquet-Nashwauk-C-Nashwauk-Keewatin-0319 - 000G96 - 209	1,854	$8,461.67	$4.56	$10,699.47	$5.77	0	2	4	$0.761176
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	631	$2,097.51	$3.32	$2,652.23	$4.20	0	2	4	$0.623249
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	213	Cloquet-Ranier-C-International Falls-0361 - 000G96 - 213	338	$1,950.98	$5.77	$2,466.94	$7.30	0	2	4	$0.863323
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	215	Cloquet-Silver Bau-C-Lake Superior-0381 - 000G96 - 215	1,041	$8,454.21	$8.12	$10,690.03	$10.27	0	2	4	$1.011570
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	7	$23.18	$3.31	$29.31	$4.19	0	2	4	$0.622214
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	13,943	$164,515.39	$11.80	$208,023.59	$14.92	0	2	4	$1.173769
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	220	Cloquet-Buhl-C-Mt Iron-Buhl-0712 - 000G96 - 220	1,976	$20,424.44	$10.34	$25,825.95	$13.07	0	2	4	$1.116276
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	221	Cloquet-Canosia-T-Proctor-0704 - 000G96 - 221	664	$7,219.95	$10.87	$9,129.36	$13.75	0	2	4	$1.138303
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	267	$7,808.28	$29.24	$9,873.28	$36.98	0	2	4	$1.567967
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	223	Cloquet-Duluth-C-Proctor-0704 - 000G96 - 223	368	$4,357.76	$11.84	$5,510.22	$14.97	0	2	4	$1.175222
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	2,057	$18,798.75	$9.14	$23,770.33	$11.56	0	2	4	$1.062958
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	225	Cloquet-Fayal-T-Eveleth-Gilbert-2154 - 000G96 - 225	206	$1,238.17	$6.01	$1,565.62	$7.60	0	2	4	$0.880814
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	383	$3,898.00	$10.18	$4,928.87	$12.87	0	2	4	$1.109579
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	1,810	$17,031.96	$9.41	$21,536.30	$11.90	0	2	4	$1.075547
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	233	Cloquet--Hoyt Lakes-C-Mesabi E-2711 - 000G96 - 233	3,531	$39,708.66	$11.25	$50,210.12	$14.22	0	2	4	$1.152900
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	236	Cloquet-Midway-T-Proctor-0704 - 000G96 - 236	234	$670.81	$2.87	$848.22	$3.62	0	2	4	$0.558709
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	6,229	$37,394.55	$6.00	$47,284.02	$7.59	0	2	4	$0.880242
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	312	$4,032.68	$12.93	$5,099.19	$16.34	0	2	4	$1.213252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	5,279	$57,191.05	$10.83	$72,315.95	$13.70	0	2	4	$1.136721
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	245	Bemidji-Frazee-C-Frazee-Vergas-0023 - 000G97 - 245	2,093	$25,024.49	$11.96	$31,642.54	$15.12	0	2	4	$1.179552
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	1,196	$13,194.29	$11.03	$16,683.69	$13.95	0	2	4	$1.144574
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	2,594	$40,722.94	$15.70	$51,492.64	$19.85	0	2	4	$1.297761
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	10,919	$168,326.99	$15.42	$212,843.22	$19.49	0	2	4	$1.289812
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	498	$6,304.48	$12.66	$7,971.78	$16.01	0	2	4	$1.204391
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	255	Wadena-Baudette-C-Lake of Woods-0390 - 000G89 - 255	2	$1,619.08	$809.54	$2,047.27	$1,023.64	0	2	4	$3.010147
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	264	Wadena-North-T-Thief River Falls-0564 - 000G89 - 264	4,726	$57,200.03	$12.10	$72,327.32	$15.30	0	2	4	$1.184691
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	840	$7,015.40	$8.35	$8,870.71	$10.56	0	2	4	$1.023664
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	192	$911.37	$4.75	$1,152.39	$6.00	0	2	4	$0.778151
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	275	Wadena-Warroad-C-Warroad-0690 - 000G89 - 275	113	$1,516.60	$13.42	$1,917.68	$16.97	0	2	4	$1.229682
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	277	Wadena-Bertha-C-Bertha-Hewitt-0786 - 000G89 - 277	227	$1,818.21	$8.01	$2,299.06	$10.13	0	2	4	$1.005609
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	510	$2,503.03	$4.91	$3,164.98	$6.21	0	2	4	$0.793092
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	285	Wadena-Menahga-C-Menahga-821 - 000G89 - 285	255	$2,051.49	$8.05	$2,594.03	$10.17	0	2	4	$1.007321
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	290	Wadena-Verndale-C-Verndale-818 - 000G89 - 290	100	$1,039.71	$10.40	$1,314.67	$13.15	0	2	4	$1.118926
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	1,030	$11,635.86	$11.30	$14,713.11	$14.28	0	2	4	$1.154728
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	293	Rosemount-Castle Rock-T-Farmington-0192 - 000G93 - 293	9	$46.59	$5.18	$58.91	$6.55	0	2	4	$0.816241
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	319	$11,302.79	$35.43	$14,291.94	$44.80	0	2	4	$1.651278
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	167	$2,732.30	$16.36	$3,454.89	$20.69	0	2	4	$1.315760
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	307	Pine City-Pokegama-T-Pine City-0578 - 000G98 - 307	468	$3,671.84	$7.85	$4,642.90	$9.92	0	2	4	$0.996512
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	311	Fairmont-Freeborn-T-United S Central-2134 - 000G94 - 311	433	$2,468.63	$5.70	$3,121.49	$7.21	0	2	4	$0.857935
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	313	Worthington-Mountain Lake-C-Mountain Lake-0173 - 000G99 - 313	1,233	$7,073.17	$5.74	$8,943.76	$7.25	0	2	4	$0.860338
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	314	Worthington-Ortonville-C-Ortonville-2903 - 000G99 - 314	42	$1,546.20	$36.81	$1,955.11	$46.55	0	2	4	$1.667920
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	316	Rosemount-Lakeville-C-Farmington-0192 - 000G93 - 316	1,515	$1,238.90	$0.82	$1,566.55	$1.03	0	2	4	$0.012837
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	351	Rosemount-Eureka-T-Lakeville-0194 - 000G93 - 351	39	$1,574.51	$40.37	$1,990.91	$51.05	0	2	4	$1.707996
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	6,993	$227,944.36	$32.60	$288,227.17	$41.22	0	2	4	$1.615108
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	6,014	$44,594.41	$7.42	$56,387.97	$9.38	0	2	4	$0.972203
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	1,916	$14,207.33	$7.42	$17,964.64	$9.38	0	2	4	$0.972203
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2008	441	Fairmont-Hollandale-C-Albert Lea - 000G94 - 441	347	$2,573.04	$7.42	$3,253.51	$9.38	0	2	4	$0.972203
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2008	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	4	$975.51	$243.88	$1,233.50	$308.38	0	3	9	$2.489086
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2008	105	Rochester-Wasioja-T-Triton-2125 - 000G95 - 105	25	$1,745.24	$69.81	$2,206.79	$88.27	0	3	9	$1.945813
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2008	175	Rochester-Utica-T-Lewiston-Altura-0857 - 000G95 - 175	5	$4,961.66	$992.33	$6,273.83	$1,254.77	0	3	9	$3.098564
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2008	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	1	$2,420.97	$2,420.97	$3,061.23	$3,061.23	0	3	9	$3.485896

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2008	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	1	$625.37	$625.37	$790.76	$790.76	0	3	9	$2.898045
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	1,851	$32,455.47	$17.53	$41,038.74	$22.17	0	4	16	$1.345766
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	13	Pine City-Arthur-T-Mora-0332 - 000G98 - 013	178	$3,042.29	$17.09	$3,846.86	$21.61	0	4	16	$1.334655
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	1	($2.30)	($2.30)	($2.91)	($2.91)	0	4	16	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	31	Rosemount-New Market-C-New Prague-0721 - 000G93 - 031	305	$13,924.07	$45.65	$17,606.46	$57.73	0	4	16	$1.761402
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	2,224	$74,407.29	$33.46	$94,085.25	$42.30	0	4	16	$1.626340
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	54	Fairmont-Lakefield-C-Jackson Cty Central-2895 - 000G94 - 054	957	$47,669.56	$49.81	$60,276.38	$62.98	0	4	16	$1.799203
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	740	$7,140.22	$9.65	$9,028.55	$12.20	0	4	16	$1.086360
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	78	Worthington-Brewster-C-Brewster-0513 - 000G99 - 078	351	$9,234.58	$26.31	$11,676.78	$33.27	0	4	16	$1.522053
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	846	$53,933.32	$63.75	$68,196.67	$80.61	0	4	16	$1.906389
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	93	Fairmont-New Richland-C-NRHEG-2168 - 000G94 - 093	568	$25,112.54	$44.21	$31,753.87	$55.90	0	4	16	$1.747412
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	1,378	$18,260.69	$13.25	$23,089.96	$16.76	0	4	16	$1.224274
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	1,053	$31,932.63	$30.33	$40,377.62	$38.35	0	4	16	$1.583765
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	114	Rochester-Lanesboro-C-Lanesboro-0229 - 000G95 - 114	194	$12,933.21	$66.67	$16,353.56	$84.30	0	4	16	$1.925828
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	993	$12,164.80	$12.25	$15,381.94	$15.49	0	4	16	$1.190051
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	232	$2,899.06	$12.50	$3,665.76	$15.80	0	4	16	$1.198657
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	153	Rochester-Haverhill-T-Rochester-0535 - 000G95 - 153	67	$1,085.80	$16.21	$1,372.96	$20.49	0	4	16	$1.311542
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	156	Rochester-Marion-T-Rochester-0535 - 000G95 - 156	483	$6,723.37	$13.92	$8,501.45	$17.60	0	4	16	$1.245513
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	9,829	$237,413.72	$24.15	$300,200.83	$30.54	0	4	16	$1.484869
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	213	Cloquet-Ranier-C-International Falls-0361 - 000G96 - 213	333	$19,951.44	$59.91	$25,227.85	$75.76	0	4	16	$1.879440
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	2,633	$58,123.69	$22.08	$73,495.24	$27.91	0	4	16	$1.445760
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	492	$5,647.02	$11.48	$7,140.45	$14.51	0	4	16	$1.161667
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	261	Wadena-Bluffton-T-Wadena-Deer Creek-2155 - 000G89 - 261	3	$842.20	$280.73	$1,064.93	$354.98	0	4	16	$2.550204
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	275	Wadena-Warroad-C-Warroad-0690 - 000G89 - 275	16	$6,980.80	$436.30	$8,826.96	$551.69	0	4	16	$2.741695
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	81	$2,768.95	$34.18	$3,501.24	$43.23	0	4	16	$1.635785
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	1,278	$29,709.61	$23.25	$37,566.70	$29.39	0	4	16	$1.468200
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	312	Rochester-Chatfield-T-Chatfield-0227 - 000G95 - 312	3,643	$45,242.63	$12.42	$57,207.62	$15.70	0	4	16	$1.195900
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	316	Rosemount-Lakeville-C-Farmington-0192 - 000G93 - 316	10	$15.38	$1.54	$19.45	$1.95	0	4	16	$0.290035
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	340	Rosemount-New Market-T-Lakeville-0194 - 000G93 - 340	2,456	$42,740.55	$17.40	$54,043.85	$22.00	0	4	16	$1.342423
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	347	Rochester-Ashland-T-Triton - 000G95 - 347	8,599	$113,950.42	$13.25	$144,086.07	$16.76	0	4	16	$1.224274
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2008	351	Rosemount-Eureka-T-Lakeville-0194 - 000G93 - 351	1,314	$14,804.27	$11.27	$18,719.45	$14.25	0	4	16	$1.153815
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2008	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	29	$7,806.22	$269.18	$9,870.68	$340.37	0	6	36	$2.531951
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2008	31	Rosemount-New Market-C-New Prague-0721 - 000G93 - 031	2,378	$123,618.63	$51.98	$156,311.16	$65.73	0	6	36	$1.817764
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2008	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	99	$15,792.42	$159.52	$19,968.93	$201.71	0	6	36	$2.304727
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2008	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	3,444	$106,126.86	$30.82	$134,193.47	$38.96	0	6	36	$1.590619
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2008	316	Rosemount-Lakeville-C-Farmington-0192 - 000G93 - 316	1,345	$1,981.59	$1.47	$2,505.65	$1.86	0	6	36	$0.269513
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	182	Plastic 8 in	2008	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	8,007	$346,818.77	$43.31	$438,539.44	$54.77	0	8	64	$1.738543
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2008	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	2	$2,331.55	$1,165.78	$2,948.16	$1,474.08	1	1.25	1.5625	$3.168521
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2008	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	2	$6,711.48	$3,355.74	$8,486.42	$4,243.21	1	1.25	1.5625	$3.627695
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	187	Steel 12 in	2008	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	10,201	$2,476,357.16	$242.76	$3,131,261.54	$306.96	1	12	144	$2.487082
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2008	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	6	$2,283.86	$380.64	$2,887.86	$481.31	1	2	4	$2.682425
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2008	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	533	$20,433.64	$38.34	$25,837.58	$48.48	1	2	4	$1.685563
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2008	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	41	$2,871.74	$70.04	$3,631.21	$88.57	1	2	4	$1.947287
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2008	24	Pine City-Sandstone-C-E Central-2580 - 000G98 - 024	47	$17,013.34	$361.99	$21,512.74	$457.72	1	2	4	$2.660600
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2008	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	2	$218.23	$109.12	$275.94	$137.97	1	2	4	$2.139785
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2008	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	158	$21,927.16	$138.78	$27,726.10	$175.48	1	2	4	$2.244228
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2008	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	6	$1,086.79	$181.13	$1,374.21	$229.04	1	2	4	$2.359911
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2008	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	33	$4,881.63	$147.93	$6,172.64	$187.05	1	2	4	$2.271958
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2008	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	10	$3,169.67	$316.97	$4,007.93	$400.79	1	2	4	$2.602917
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2008	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	57	$12,547.93	$220.14	$15,866.39	$278.36	1	2	4	$2.444607
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2008	171	Rochester-Lewiston-C-Lewiston-Altura-0857 - 000G95 - 171	100	$12,609.91	$126.10	$15,944.76	$159.45	1	2	4	$2.202625
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2008	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	105	$7,381.16	$70.30	$9,333.20	$88.89	1	2	4	$1.948853
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2008	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	7	$492.08	$70.30	$622.22	$88.89	1	2	4	$1.948853
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2008	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	1,849	$53,853.80	$29.13	$68,096.12	$36.83	1	2	4	$1.566202
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2008	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	68	$22,136.95	$325.54	$27,991.35	$411.64	1	2	4	$2.614518
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2008	223	Cloquet-Duluth-C-Proctor-0704 - 000G96 - 223	11	$48,796.37	$4,436.03	$61,701.20	$5,609.20	1	2	4	$3.748901
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2008	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	26	$1,347.98	$51.85	$1,704.47	$65.56	1	2	4	$1.816639
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2008	262	Wadena-Compton-T-Wadena-Deer Creek-2155 - 000G89 - 262	42	$380.11	$9.05	$480.63	$11.44	1	2	4	$1.058426
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2008	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	2	$10,793.06	$5,396.53	$13,647.42	$6,823.71	1	2	4	$3.834021
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2008	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	61	$552.07	$9.05	$698.08	$11.44	1	2	4	$1.058426
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2008	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	38	$829.67	$21.83	$1,049.09	$27.61	1	2	4	$1.441066
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2008	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	24	$12,879.53	$536.65	$16,285.69	$678.57	1	3	9	$2.831595
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2008	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	3	$3,520.13	$1,173.38	$4,451.07	$1,483.69	1	3	9	$3.171343
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2008	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	12	$28,854.28	$2,404.52	$36,485.16	$3,040.43	1	3	9	$3.482935
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2008	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	4	$6,220.83	$1,555.21	$7,866.01	$1,966.50	1	3	9	$3.293694
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2008	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	2,745	$76,809.17	$27.98	$97,122.34	$35.38	1	4	16	$1.548758
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2008	24	Pine City-Sandstone-C-E Central-2580 - 000G98 - 024	12	$3,170.49	$264.21	$4,008.97	$334.08	1	4	16	$2.523850

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2008	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	19	$1,304.68	$68.67	$1,649.72	$86.83	1	4	16	$1.938670
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2008	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	16	$420.94	$26.31	$532.27	$33.27	1	4	16	$1.522053
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2008	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	42	$11,042.42	$262.91	$13,962.73	$332.45	1	4	16	$2.521726
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2008	209	Cloquet-Nashwauk-C-Nashwauk-Keewatin-0319 - 000G96 - 209	12	$3,689.72	$307.48	$4,665.51	$388.79	1	4	16	$2.589715
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2008	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	1	$6,177.21	$6,177.21	$7,810.85	$7,810.85	1	4	16	$3.892698
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2008	220	Cloquet-Buhl-C-Mt Iron-Buhl-0712 - 000G96 - 220	286	$11,005.42	$38.48	$13,915.94	$48.66	1	4	16	$1.687172
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2008	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	479	$45,473.49	$94.93	$57,499.53	$120.04	1	4	16	$2.079326
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2008	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	2,755	$104,252.10	$37.84	$131,822.90	$47.85	1	4	16	$1.679882
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2008	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	4	$158.07	$39.52	$199.88	$49.97	1	4	16	$1.698709
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2008	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	1,247	$55,786.82	$44.74	$70,540.36	$56.57	1	4	16	$1.752586
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2008	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	7,830	$430,839.89	$55.02	$544,781.01	$69.58	1	6	36	$1.842484
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2008	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	1,254	$107,981.27	$86.11	$136,538.30	$108.88	1	6	36	$2.036948
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2008	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	6	$9,442.59	$1,573.77	$11,939.80	$1,989.97	1	6	36	$3.298847
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2008	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	217	$27,770.12	$127.97	$35,114.28	$161.82	1	6	36	$2.209032
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2008	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	23	$35,199.78	$1,530.43	$44,508.81	$1,935.17	1	6	36	$3.286719
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2008	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	103	$32,099.71	$311.65	$40,588.89	$394.07	1	6	36	$2.595573
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2008	298	Rosemount-Eureka-T-Farmington-0192 - 000G93 - 298	7,950	$459,170.63	$57.76	$580,604.19	$73.03	1	6	36	$1.863501
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2008	351	Rosemount-Eureka-T-Lakeville-0194 - 000G93 - 351	7,363	$405,143.57	$55.02	$512,288.98	$69.58	1	6	36	$1.842484
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	2008	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	47	$78,857.00	$1,677.81	$99,711.74	$2,121.53	1	8	64	$3.326649
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	2008	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	6	$10,066.85	$1,677.81	$12,729.16	$2,121.53	1	8	64	$3.326649
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	2008	351	Rosemount-Eureka-T-Lakeville-0194 - 000G93 - 351	210	$31,567.41	$150.32	$39,915.82	$190.08	1	8	64	$2.278936
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	205	Groundbed	2008		Cloquet-Tax District Unassigned - 000G96 - 000	1	$20,155.56	$20,155.56	$25,485.96	$25,485.96	#N/A	#N/A	#N/A	$4.406301
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	2009	290	Wadena-Verndale-C-Verndale-818 - 000G89 - 290	3	$52.35	$17.45	$61.61	$20.54	0	1.25	1.5625	$1.312600
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	1	Pine City-Mayhew Lake-T-Sauk Rapids-0047 - 000G98 - 001	679	$11,101.11	$16.35	$13,065.15	$19.24	0	2	4	$1.284205
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	102	$3,705.51	$36.33	$4,361.10	$42.76	0	2	4	$1.631038
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	3	$12.41	$4.14	$14.61	$4.87	0	2	4	$0.687529
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	8,523	$99,588.49	$11.68	$117,207.99	$13.75	0	2	4	$1.138303
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	2,405	$19,839.91	$8.25	$23,350.04	$9.71	0	2	4	$0.987219
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	931	$42,983.81	$46.17	$50,588.63	$54.34	0	2	4	$1.735120
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	1,431	$37,377.76	$26.12	$43,990.75	$30.74	0	2	4	$1.487704
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	5,769	$44,058.06	$7.64	$51,852.96	$8.99	0	2	4	$0.953760
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	5	$1,578.17	$315.63	$1,857.38	$371.48	0	2	4	$2.569935
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	27	Pine City-Willow River-C-Willow River-0577 - 000G98 - 027	404	$7,782.82	$19.26	$9,159.78	$22.67	0	2	4	$1.355452
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	29	Rosemount-Webster-T-Northfield-0659 - 000G93 - 029	175	$4,589.63	$26.23	$5,401.64	$30.87	0	2	4	$1.489537
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	30	Rosemount-Elko-C-Lakeville-0194 - 000G93 - 030	1,052	$3,369.70	$3.20	$3,965.87	$3.77	0	2	4	$0.576341
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	31	Rosemount-New Market-C-New Prague-0721 - 000G93 - 031	808	$6,726.77	$8.33	$7,916.89	$9.80	0	2	4	$0.991226
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	32	Rosemount-New Market-T-New Prague-0721 - 000G93 - 032	1,604	$12,542.60	$7.82	$14,761.68	$9.20	0	2	4	$0.963788
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	37	Worthington-Great Bend-T-Windom-0177 - 000G99 - 037	208	$1,561.52	$7.51	$1,837.79	$8.84	0	2	4	$0.946452
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	3,987	$59,009.73	$14.80	$69,449.91	$17.42	0	2	4	$1.241048
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	49	Fairmont-Twin Lakes-C-Albert Lea-0241 - 000G94 - 049	989	$11,116.98	$11.24	$13,083.83	$13.23	0	2	4	$1.121560
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	52	Worthington-Ewington-T-Brewster-0513 - 000G99 - 052	264	$8,617.35	$32.64	$10,141.96	$38.42	0	2	4	$1.584557
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	54	Fairmont-Lakefield-C-Jackson Cty Central-2895 - 000G94 - 054	5,967	$82,842.24	$13.88	$97,498.94	$16.34	0	2	4	$1.213252
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	55	Worthington-Madison-C-Lac Qui Parle Valley-2853 - 000G99 - 055	2,614	$59,478.61	$22.75	$70,001.75	$26.78	0	2	4	$1.427811
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	59	Worthington-Ivanhoe-C-Ivanhoe-0403 - 000G99 - 059	100	$795.19	$7.95	$935.88	$9.36	0	2	4	$0.971276
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	2,602	$99,122.05	$38.09	$116,659.02	$44.83	0	2	4	$1.651569
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	77	Fairmont-Welcome-C-Martin Cty W-2448 - 000G94 - 077	426	$11,904.56	$27.94	$14,010.75	$32.89	0	2	4	$1.517064
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	11	$7,388.99	$671.73	$8,696.27	$790.57	0	2	4	$2.897940
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	91	Worthington-Appleton-C-Lac Qui Parle Valley - 000G99 - 091	8	($1,807.12)	($225.89)	($2,126.84)	($265.86)	0	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	93	Fairmont-New Richland-C-NRHEG-2168 - 000G94 - 093	4,023	$63,032.93	$15.67	$74,184.90	$18.44	0	2	4	$1.265761
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	563	$4,642.66	$8.25	$5,464.05	$9.71	0	2	4	$0.987219
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	23	$189.66	$8.25	$223.22	$9.71	0	2	4	$0.987219
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	115	Rochester-Mabel-C-Mabel-Canton-0238 - 000G95 - 115	3	$493.21	$164.40	$580.47	$193.49	0	2	4	$2.286659
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	901	$18,516.33	$20.55	$21,792.30	$24.19	0	2	4	$1.383636
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	6	($1,228.37)	($204.73)	($1,445.70)	($240.95)	0	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	388	$2,597.30	$6.69	$3,056.82	$7.88	0	2	4	$0.896526
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	798	$10,568.02	$13.24	$12,437.74	$15.59	0	2	4	$1.192846
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	1,048	$10,414.66	$9.94	$12,257.25	$11.70	0	2	4	$1.068186
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	2,813	$41,173.07	$14.64	$48,457.54	$17.23	0	2	4	$1.236285
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	136	Rochester-La Crescent-T-LaCrescent-Hokah-0300 - 000G95 - 136	74	$866.06	$11.70	$1,019.28	$13.77	0	2	4	$1.138934
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	218	$8,715.49	$39.98	$10,257.46	$47.05	0	2	4	$1.672560
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	140	Rochester-Brownsdale-C-Hayfield-0203 - 000G95 - 140	2	($478.62)	($239.31)	($563.30)	($281.65)	0	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	1,398	$9,631.95	$6.89	$11,336.07	$8.11	0	2	4	$0.909021
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	148	Rochester-Dover-C-Dover-Eyota-0533 - 000G95 - 148	28	$9,350.60	$333.95	$11,004.94	$393.03	0	2	4	$2.594426
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	150	Rochester-Elmira-T-Chatfield-0227 - 000G95 - 150	1,055	$37,601.56	$35.64	$44,254.14	$41.95	0	2	4	$1.622732
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	926	$57,750.71	$62.37	$67,968.14	$73.40	0	2	4	$1.865696
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	154	Rochester-High Forest-T-Stewartville-0534 - 000G95 - 154	588	$2,660.74	$4.53	$3,131.49	$5.33	0	2	4	$0.726727
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	1,894	$58,905.34	$31.10	$69,327.06	$36.60	0	2	4	$1.563481

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	2,344	$17,909.20	$7.64	$21,077.74	$8.99	0	2	4	$0.953760
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	5	$1,290.84	$258.17	$1,519.22	$303.84	0	2	4	$2.482645
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	171	Rochester-Lewiston-C-Lewiston-Altura-0857 - 000G95 - 171	1,180	$23,102.02	$19.58	$27,189.30	$23.04	0	2	4	$1.362482
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	176	Wadena-Aitkin-C-Aitkin-0001 - 000G89 - 176	27	$198.71	$7.36	$233.87	$8.66	0	2	4	$0.937518
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	177	Wadena-Aitkin-T-Aitkin-0001 - 000G89 - 177	106	$780.13	$7.36	$918.15	$8.66	0	2	4	$0.937518
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	180	Cloquet-Carlton-C-Carlton-0093 - 000G96 - 180	106	$688.63	$6.50	$810.46	$7.65	0	2	4	$0.883661
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	1,115	$13,757.44	$12.34	$16,191.46	$14.52	0	2	4	$1.161967
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	614	$15,468.35	$25.19	$18,205.05	$29.65	0	2	4	$1.472025
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	80	$672.08	$8.40	$790.99	$9.89	0	2	4	$0.995196
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	191	Wadena-Crosby-C-Crosby-Ironton-0182 - 000G89 - 191	409	$4,020.97	$9.83	$4,732.38	$11.57	0	2	4	$1.063333
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	194	Wadena-Deerwood-T-Crosby-Ironton-0182 - 000G89 - 194	561	$8,067.65	$14.38	$9,495.00	$16.93	0	2	4	$1.228657
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	198	Cloquet-Bovey-C-Greenway-0316 - 000G96 - 198	49	$2,555.55	$52.15	$3,007.68	$61.38	0	2	4	$1.788027
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	201	Cloquet-Coleraine-C-Greenway-0316 - 000G96 - 201	853	$8,608.03	$10.09	$10,130.99	$11.88	0	2	4	$1.074816
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	3,029	$33,594.97	$11.09	$39,538.70	$13.05	0	2	4	$1.115611
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	3	$195.44	$65.15	$230.02	$76.67	0	2	4	$1.884625
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	162	$2,733.30	$16.87	$3,216.88	$19.86	0	2	4	$1.297979
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	220	Cloquet-Buhl-C-Mt Iron-Buhl-0712 - 000G96 - 220	927	$17,201.42	$18.56	$20,244.75	$21.84	0	2	4	$1.339253
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	221	Cloquet-Canosia-T-Proctor-0704 - 000G96 - 221	537	$2,542.55	$4.73	$2,992.39	$5.57	0	2	4	$0.745855
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	580	$5,361.77	$9.24	$6,310.39	$10.88	0	2	4	$1.036629
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	223	Cloquet-Duluth-C-Proctor-0704 - 000G96 - 223	5	($2,034.24)	($406.85)	($2,394.14)	($478.83)	0	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	2,802	$36,861.17	$13.16	$43,382.77	$15.48	0	2	4	$1.189771
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	1,011	$9,221.03	$9.12	$10,852.45	$10.73	0	2	4	$1.030600
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	34	$447.28	$13.16	$526.41	$15.48	0	2	4	$1.189771
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	240	Bemidji-Audubon-C-Lk Park Audubon-2889 - 000G97 - 240	34	$457.89	$13.47	$538.90	$15.85	0	2	4	$1.200029
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	241	Bemidji-Audubon-T-Lk Park Audubon-2889 - 000G97 - 241	379	$2,262.86	$5.97	$2,663.21	$7.03	0	2	4	$0.846955
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	196	$3,168.69	$16.17	$3,729.30	$19.03	0	2	4	$1.279439
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	7,305	$110,242.53	$15.09	$129,746.98	$17.76	0	2	4	$1.249443
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	4,090	$35,433.16	$8.66	$41,702.10	$10.20	0	2	4	$1.008600
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	119	$2,745.60	$23.07	$3,231.36	$27.15	0	2	4	$1.433770
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	308	$2,263.34	$7.35	$2,663.78	$8.65	0	2	4	$0.937016
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	277	Wadena-Bertha-C-Bertha-Hewitt-0786 - 000G89 - 277	300	$10,424.44	$34.75	$12,268.77	$40.90	0	2	4	$1.611723
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	788	$12,922.54	$16.40	$15,208.83	$19.30	0	2	4	$1.285557
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	285	Wadena-Menahga-C-Menahga-821 - 000G89 - 285	3,468	$52,075.58	$15.02	$61,288.95	$17.67	0	2	4	$1.247237
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	290	Wadena-Verndale-C-Verndale-818 - 000G89 - 290	1,327	$25,409.47	$19.15	$29,904.99	$22.54	0	2	4	$1.352954
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	740	$5,353.68	$7.23	$6,300.87	$8.51	0	2	4	$0.929930
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	6	$107.36	$17.89	$126.35	$21.06	0	2	4	$1.323458
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	28	$11,316.99	$404.18	$13,319.22	$475.69	0	2	4	$2.677324
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	32	$6,055.36	$189.23	$7,126.70	$222.71	0	2	4	$2.347740
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	3,231	$29,194.15	$9.04	$34,359.27	$10.63	0	2	4	$1.026533
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	307	Pine City-Pokegama-T-Pine City-0578 - 000G98 - 307	9	$707.27	$78.59	$832.40	$92.49	0	2	4	$1.966095
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	318	Rochester-Oronoco-T-Pine Island-0255 - 000G95 - 318	2	($542.50)	($271.25)	($638.48)	($319.24)	0	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	330	Rosemount-Lakeville-C-Rosemnt-Apple Vly-0196 - 000G93 - 330	1,817	$12,287.32	$6.76	$14,461.23	$7.96	0	2	4	$0.900913
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	340	Rosemount-New Market-T-Lakeville-0194 - 000G93 - 340	961	$10,115.72	$10.53	$11,905.42	$12.39	0	2	4	$1.093071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	194	$1,599.78	$8.25	$1,882.82	$9.71	0	2	4	$0.987219
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	418	Rochester-Adams-C-Southland - 000G95 - 418	93	$1,399.12	$15.04	$1,646.66	$17.71	0	2	4	$1.248219
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	15,316	$230,419.15	$15.04	$271,185.62	$17.71	0	2	4	$1.248219
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	782	$11,764.67	$15.04	$13,846.11	$17.71	0	2	4	$1.248219
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	425	Fairmont-Bankcroft-T-Albert Lea - 000G94 - 425	1,360	$20,460.31	$15.04	$24,080.21	$17.71	0	2	4	$1.248219
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2009	442	Rochester-Leroy-C-Leroy-Ostrander - 000G95 - 442	2	$30.08	$15.04	$35.40	$17.70	0	2	4	$1.247973
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2009	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	4	($4,307.79)	($1,076.95)	($5,069.94)	($1,267.49)	0	3	9	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2009	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	2	($458.40)	($229.20)	($539.50)	($269.75)	0	3	9	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2009	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	4	$3,898.38	$974.60	$4,588.09	$1,147.02	0	3	9	$3.059571
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2009	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	19	($16.73)	($0.88)	($19.69)	($1.04)	0	3	9	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2009	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	1,096	$29,020.58	$26.48	$34,155.00	$31.16	0	4	16	$1.493597
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2009	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	12	$2,726.11	$227.18	$3,208.42	$267.37	0	4	16	$2.427113
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2009	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	58	$672.26	$11.59	$791.20	$13.64	0	4	16	$1.134814
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2009	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	275	$17,975.91	$65.37	$21,156.26	$76.93	0	4	16	$1.886096
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2009	15	Pine City-Mora-C-Mora-0332 - 000G98 - 015	822	$20,695.25	$25.18	$24,356.72	$29.63	0	4	16	$1.471732
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2009	31	Rosemount-New Market-C-New Prague-0721 - 000G93 - 031	12	$2,028.51	$169.04	$2,387.40	$198.95	0	4	16	$2.298744
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2009	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	519	$29,129.60	$56.13	$34,283.30	$66.06	0	4	16	$1.819939
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2009	54	Fairmont-Lakefield-C-Jackson Cty Central-2895 - 000G94 - 054	107	$3,335.21	$31.17	$3,925.29	$36.68	0	4	16	$1.564429
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2009	63	Worthington-Fairview-T-Marshall-0413 - 000G99 - 063	2,134	$72,065.91	$33.77	$84,816.03	$39.75	0	4	16	$1.599337
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2009	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	4	$1,508.76	$377.19	$1,775.69	$443.92	0	4	16	$2.647305
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2009	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	379	$4,004.35	$10.57	$4,712.81	$12.43	0	4	16	$1.094471
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2009	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	443	$24,600.60	$55.53	$28,953.01	$65.36	0	4	16	$1.815312
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2009	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	94	$2,550.12	$27.13	$3,001.30	$31.93	0	4	16	$1.504199
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2009	123	Fairmont-Glenville-C-Glenville-Emmons-2886 - 000G94 - 123	461	$17,397.67	$37.75	$20,475.72	$44.43	0	4	16	$1.647676

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2009	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	478	$4,796.74	$10.04	$5,645.39	$11.81	0	4	16	$1.072250
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2009	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	3,853	$78,601.65	$20.40	$92,508.09	$24.01	0	4	16	$1.380392
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2009	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	1,251	$12,782.82	$10.22	$15,044.40	$12.03	0	4	16	$1.080266
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2009	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	160	$22,481.45	$140.51	$26,458.94	$165.37	0	4	16	$2.218457
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2009	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	960	$21,048.27	$21.93	$24,772.19	$25.80	0	4	16	$1.411620
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2009	240	Bemidji-Audubon-C-Lk Park Audubon-2889 - 000G97 - 240	283	$11,129.77	$39.33	$13,098.89	$46.29	0	4	16	$1.665487
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2009	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	4,206	$24,147.29	$5.74	$28,419.50	$6.76	0	4	16	$0.829947
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2009	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	83	$2,108.96	$25.41	$2,482.09	$29.90	0	4	16	$1.475671
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2009	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	427	$12,923.93	$30.27	$15,210.47	$35.62	0	4	16	$1.551694
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2009	340	Rosemount-New Market-T-Lakeville-0194 - 000G93 - 340	4	$1,717.18	$429.30	$2,020.99	$505.25	0	4	16	$2.703506
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2009	351	Rosemount-Eureka-T-Lakeville-0194 - 000G93 - 351	20	$3,805.47	$190.27	$4,478.75	$223.94	0	4	16	$2.350132
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2009	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	4,731	$178,620.81	$37.75	$210,222.95	$44.43	0	4	16	$1.647676
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2009	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	106	$4,020.17	$37.76	$4,731.43	$44.43	0	4	16	$1.647676
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2009	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	7,968	$262,056.33	$32.89	$308,420.14	$38.71	0	6	36	$1.587823
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2009	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	4	$1,096.89	$274.22	$1,290.96	$322.74	0	6	36	$2.508853
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2009	63	Worthington-Fairview-T-Marshall-0413 - 000G99 - 063	5,560	$206,178.89	$37.08	$242,656.69	$43.64	0	6	36	$1.639885
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2009	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	17	$3,013.60	$177.27	$3,546.78	$208.63	0	6	36	$2.319377
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2009	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	867	$15,574.85	$17.96	$18,330.41	$21.14	0	6	36	$1.325105
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2009	240	Bemidji-Audubon-C-Lk Park Audubon-2889 - 000G97 - 240	246	$6,410.72	$26.06	$7,544.93	$30.67	0	6	36	$1.486714
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2009	241	Bemidji-Audubon-T-Lk Park Audubon-2889 - 000G97 - 241	7,741	$201,729.26	$26.06	$237,419.82	$30.67	0	6	36	$1.486714
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2009	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	18	$90.16	$5.01	$106.11	$5.90	0	6	36	$0.770852
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	182	Plastic 8 in	2009	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	488	$177,063.58	$362.84	$208,390.21	$427.03	0	8	64	$2.630458
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	182	Plastic 8 in	2009	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	3,686	$181,077.73	$49.13	$213,114.56	$57.82	0	8	64	$1.762078
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	182	Plastic 8 in	2009	187	Cloquet-Moose Lake-T-Moose Lake-0097 - 000G96 - 187	3,157	$155,090.19	$49.13	$182,529.23	$57.82	0	8	64	$1.762078
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2009	198	Cloquet-Bovey-C-Greenway-0316 - 000G96 - 198	9	$9,274.12	$1,030.46	$10,914.93	$1,212.77	1	1.25	1.5625	$3.083778
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2009	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	6	$1,272.74	$212.12	$1,497.92	$249.65	1	1.25	1.5625	$2.397332
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2009	209	Cloquet-Nashwauk-C-Nashwauk-Keewatin-0319 - 000G96 - 209	3	$6,453.48	$2,151.16	$7,595.25	$2,531.75	1	1.25	1.5625	$3.403421
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2009	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	27	$14,520.45	$537.79	$17,089.45	$632.94	1	1.25	1.5625	$2.801363
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2009	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	6	$6,618.82	$1,103.14	$7,789.85	$1,298.31	1	1.25	1.5625	$3.113378
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2009	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	5	$781.31	$156.26	$919.54	$183.91	1	1.25	1.5625	$2.264605
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	2009	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	6	$1,619.89	$269.98	$1,906.49	$317.75	1	1	1	$2.502086
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	187	Steel 12 in	2009	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	11,316	$2,113,949.94	$186.81	$2,487,956.47	$219.86	1	12	144	$2.342146
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2009	31	Rosemount-New Market-C-New Prague-0721 - 000G93 - 031	292	$9,830.87	$33.67	$11,570.18	$39.62	1	2	4	$1.597914
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2009	63	Worthington-Fairview-T-Marshall-0413 - 000G99 - 063	229	$18,516.85	$80.86	$21,792.91	$95.17	1	2	4	$1.978500
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2009	65	Worthington-Tracy-C-Tracy-0417 - 000G99 - 065	95	$5,353.94	$56.36	$6,301.18	$66.33	1	2	4	$1.821710
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2009	77	Fairmont-Welcome-C-Martin Cty W-2448 - 000G94 - 077	37	$4,977.54	$134.53	$5,858.18	$158.33	1	2	4	$2.199563
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2009	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	10	($1,472.84)	($147.28)	($1,733.42)	($173.34)	1	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2009	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	22	$6,434.38	$292.47	$7,572.77	$344.22	1	2	4	$2.536836
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2009	115	Rochester-Mabel-C-Mabel-Canton-0238 - 000G95 - 115	17	$10,019.73	$589.40	$11,792.45	$693.67	1	2	4	$2.841153
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2009	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	23	$12,500.59	$543.50	$14,712.24	$639.66	1	2	4	$2.805949
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2009	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	12	($1,170.65)	($97.55)	($1,377.77)	($114.81)	1	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2009	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	2	$2,114.49	$1,057.25	$2,488.59	$1,244.30	1	2	4	$3.094925
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2009	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	139	$14,442.42	$103.90	$16,997.60	$122.28	1	2	4	$2.087355
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2009	171	Rochester-Lewiston-C-Lewiston-Altura-0857 - 000G95 - 171	28	$2,415.78	$86.28	$2,843.19	$101.54	1	2	4	$2.006637
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2009	180	Cloquet-Carlton-C-Carlton-0093 - 000G96 - 180	469	$31,304.06	$66.75	$36,842.47	$78.56	1	2	4	$1.895201
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2009	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	15	($233.92)	($15.59)	($275.30)	($18.35)	1	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2009	198	Cloquet-Bovey-C-Greenway-0316 - 000G96 - 198	759	$29,834.45	$39.31	$35,112.85	$46.26	1	2	4	$1.665206
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2009	201	Cloquet-Coleraine-C-Greenway-0316 - 000G96 - 201	86	$4,016.03	$46.70	$4,726.56	$54.96	1	2	4	$1.740047
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2009	209	Cloquet-Nashwauk-C-Nashwauk-Keewatin-0319 - 000G96 - 209	3	$228.05	$76.02	$268.40	$89.47	1	2	4	$1.951677
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2009	215	Cloquet-Silver Bau-C-Lake Superior-0381 - 000G96 - 215	92	$3,836.63	$41.70	$4,515.42	$49.08	1	2	4	$1.690905
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2009	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	2	$3,856.51	$1,928.26	$4,538.82	$2,269.41	1	2	4	$3.355913
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2009	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	89	$6,301.50	$70.80	$7,416.38	$83.33	1	2	4	$1.920801
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2009	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	8	($58.28)	($7.29)	($68.59)	($8.57)	1	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2009	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	158	$8,693.82	$55.02	$10,231.96	$64.76	1	2	4	$1.811307
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2009	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	57	$3,125.03	$54.83	$3,677.92	$64.52	1	2	4	$1.809694
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2009	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	83	$5,814.18	$70.05	$6,842.84	$82.44	1	2	4	$1.916138
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2009	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	226	$13,234.62	$58.56	$15,576.13	$68.92	1	3	9	$1.838345
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2009	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	20	$5,767.02	$288.35	$6,787.34	$339.37	1	3	9	$2.530673
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2009	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	12	$2,344.19	$195.35	$2,758.93	$229.91	1	3	9	$2.361558
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2009	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	4	$6,900.33	$1,725.08	$8,121.16	$2,030.29	1	3	9	$3.307558
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2009	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	44	$64,961.40	$1,476.40	$76,454.57	$1,737.60	1	4	16	$3.239950
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2009	15	Pine City-Mora-C-Mora-0332 - 000G98 - 015	221	$10,156.66	$45.96	$11,953.61	$54.09	1	4	16	$1.733117
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2009	54	Fairmont-Lakefield-C-Jackson Cty Central-2895 - 000G94 - 054	362	$23,158.85	$63.97	$27,256.19	$75.29	1	4	16	$1.876737
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2009	63	Worthington-Fairview-T-Marshall-0413 - 000G99 - 063	47	$5,329.94	$113.40	$6,272.93	$133.47	1	4	16	$2.125384
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2009	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	156	$13,441.20	$86.16	$15,819.26	$101.41	1	4	16	$2.006081
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2009	74	Fairmont-Sherburn-C-Martin Cty W-2448 - 000G94 - 074	32	($715.81)	($22.37)	($842.45)	($26.33)	1	4	16	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2009	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	5	$8,814.63	$1,762.93	$10,374.14	$2,074.83	1	4	16	$3.316983

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2009	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	13	$9,883.95	$760.30	$11,632.65	$894.82	1	4	16	$2.951736
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2009	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	252	$12,225.94	$48.52	$14,388.99	$57.10	1	4	16	$1.756636
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2009	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	111	$8,367.70	$75.38	$9,848.14	$88.72	1	4	16	$1.948022
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2009	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	2	$2,910.37	$1,455.19	$3,425.28	$1,712.64	1	4	16	$3.233666
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2009	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	324	$35,324.19	$109.03	$41,573.85	$128.31	1	4	16	$2.108261
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2009	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	68	$1,881.44	$27.67	$2,214.31	$32.56	1	6	36	$1.512684
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2009	15	Pine City-Mora-C-Mora-0332 - 000G98 - 015	362	$73,909.64	$204.17	$86,985.96	$240.29	1	6	36	$2.380736
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2009	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	44	$3,417.86	$77.68	$4,022.56	$91.42	1	6	36	$1.961041
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2009	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	702	$48,079.39	$68.49	$56,585.74	$80.61	1	6	36	$1.906389
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2009	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	1,679	$95,920.88	$57.13	$112,891.50	$67.24	1	6	36	$1.827628
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2009	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	3	$34.82	$11.61	$40.99	$13.66	1	6	36	$1.135451
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2009	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	15	$30,503.68	$2,033.58	$35,900.48	$2,393.37	1	6	36	$3.379010
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	2009	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	1,543	$181,265.33	$117.48	$213,335.35	$138.26	1	8	64	$2.140697
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	2010	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	1	$2,605.15	$2,605.15	$2,913.65	$2,913.65	0	1.25	1.5625	$3.464437
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2010	215	Cloquet-Silver Bau-C-Lake Superior-0381 - 000G96 - 215	1	$1,596.24	$1,596.24	$1,785.27	$1,785.27	0	1	1	$3.251704
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	7	$6,743.09	$963.30	$7,541.61	$1,077.37	0	2	4	$3.032365
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	3,489	$39,538.11	$11.33	$44,220.25	$12.67	0	2	4	$1.102777
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	3	$1,190.73	$396.91	$1,331.74	$443.91	0	2	4	$2.647295
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	2,078	$12,346.05	$5.94	$13,808.08	$6.64	0	2	4	$0.822168
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	36	$6,803.86	$189.00	$7,609.58	$211.38	0	2	4	$2.325064
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	17	Pine City-Chengwatana-C-Pine City-0578 - 000G98 - 017	9	$1,261.07	$140.12	$1,410.41	$156.71	0	2	4	$2.195097
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	577	$9,162.59	$15.88	$10,247.63	$17.76	0	2	4	$1.249443
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	377	$3,391.90	$9.00	$3,793.57	$10.06	0	2	4	$1.002598
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	9,028	$163,243.19	$18.08	$182,574.62	$20.22	0	2	4	$1.305781
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	1,870	$16,130.90	$8.63	$18,041.14	$9.65	0	2	4	$0.984527
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	55	Worthington-Madison-C-Lac Qui Parle Valley-2853 - 000G99 - 055	466	$10,521.56	$22.58	$11,767.53	$25.25	0	2	4	$1.402261
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	65	Worthington-Tracy-C-Tracy-0417 - 000G99 - 065	593	$12,830.92	$21.64	$14,350.38	$24.20	0	2	4	$1.383815
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	13,715	$301,436.67	$21.98	$337,133.12	$24.58	0	2	4	$1.390582
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	73	Fairmont-Rutland-T-Fairmont Area-2752 - 000G94 - 073	948	$7,022.27	$7.41	$7,853.85	$8.28	0	2	4	$0.918030
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	74	Fairmont-Sherburn-C-Martin Cty W-2448 - 000G94 - 074	100	$7,125.69	$71.26	$7,969.52	$79.70	0	2	4	$1.901458
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	77	Fairmont-Welcome-C-Martin Cty W-2448 - 000G94 - 077	619	$3,571.78	$5.77	$3,994.75	$6.45	0	2	4	$0.809560
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	6,601	$180,641.88	$27.37	$202,033.68	$30.61	0	2	4	$1.485863
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	81	Worthington-Worthington-T-Worthington Admn-0518 - 000G99 - 081	1,881	$32,710.88	$17.39	$36,584.54	$19.45	0	2	4	$1.288920
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	82	Worthington-Lamberton-C-Red Rock Central-2884 - 000G99 - 082	1,469	$9,626.30	$6.55	$10,766.25	$7.33	0	2	4	$0.865104
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	93	Fairmont-New Richland-C-NRHEG-2168 - 000G94 - 093	3,879	$94,205.94	$24.29	$105,361.90	$27.16	0	2	4	$1.433930
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	96	Worthington-Norman-T-Canby-0891 - 000G99 - 096	54	$10,793.48	$199.88	$12,071.65	$223.55	0	2	4	$2.349375
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	98	Rochester-Concord-T-Triton-2125 - 000G95 - 098	326	$2,745.32	$8.42	$3,070.42	$9.42	0	2	4	$0.974051
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	2,125	$13,314.89	$6.27	$14,891.65	$7.01	0	2	4	$0.845718
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	556	$6,543.72	$11.77	$7,318.63	$13.16	0	2	4	$1.119256
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	691	$17,667.77	$25.57	$19,760.01	$28.60	0	2	4	$1.456366
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	113	Rochester-Harmony-C-Fillmore Central-2198 - 000G95 - 113	154	$2,866.26	$18.61	$3,205.68	$20.82	0	2	4	$1.318481
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	296	$9,701.16	$32.77	$10,849.98	$36.66	0	2	4	$1.564192
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	1,546	$18,829.99	$12.18	$21,059.87	$13.62	0	2	4	$1.134177
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	555	$23,309.81	$42.00	$26,070.19	$46.97	0	2	4	$1.671821
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	1,207	$15,366.95	$12.73	$17,186.72	$14.24	0	2	4	$1.153510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	134	Rochester-Houston-C-Houston-0294 - 000G95 - 134	218	$9,270.87	$42.53	$10,368.74	$47.56	0	2	4	$1.677242
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	141	Rochester-Lansing-T-Austin-0492 - 000G95 - 141	140	$2,281.83	$16.30	$2,552.04	$18.23	0	2	4	$1.260787
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	1,145	$18,078.38	$15.79	$20,219.24	$17.66	0	2	4	$1.246991
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	2,504	$19,417.59	$7.75	$21,717.04	$8.67	0	2	4	$0.938019
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	130	$3,494.38	$26.88	$3,908.19	$30.06	0	2	4	$1.477989
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	153	Rochester-Haverhill-T-Rochester-0535 - 000G95 - 153	757	($1,301.58)	($1.72)	($1,455.71)	($1.92)	0	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	159	Rochester-Oronoco-C-Rochester-0535 - 000G95 - 159	2	$1,097.29	$548.65	$1,227.23	$613.62	0	2	4	$2.787900
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	4,604	$121,826.48	$26.46	$136,253.30	$29.59	0	2	4	$1.471145
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	169	Rochester-Plainview-T-Plainview-2899 - 000G95 - 169	240	$1,882.84	$7.85	$2,105.81	$8.77	0	2	4	$0.943000
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	177	Wadena-Aitkin-T-Aitkin-0001 - 000G89 - 177	382	$2,931.81	$7.67	$3,279.00	$8.58	0	2	4	$0.933487
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	3,438	$42,045.42	$12.23	$47,024.48	$13.68	0	2	4	$1.136086
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	22	$377.96	$17.18	$422.72	$19.21	0	2	4	$1.283527
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	191	Wadena-Crosby-C-Crosby-Ironton-0182 - 000G89 - 191	872	$8,956.65	$10.27	$10,017.31	$11.49	0	2	4	$1.060320
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	1,734	$41,493.91	$23.93	$46,407.66	$26.76	0	2	4	$1.427486
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	1,193	$14,501.53	$12.16	$16,218.81	$13.59	0	2	4	$1.133219
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	1,184	$10,221.86	$8.63	$11,432.34	$9.66	0	2	4	$0.984977
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	852	$13,061.45	$15.33	$14,608.20	$17.15	0	2	4	$1.234264
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	447	$12,036.54	$26.93	$13,461.92	$30.12	0	2	4	$1.478855
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	1,167	$10,112.05	$8.66	$11,309.53	$9.69	0	2	4	$0.986324
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	667	$6,758.81	$10.13	$7,559.19	$11.33	0	2	4	$1.054230
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	1,164	$14,215.26	$12.21	$15,898.65	$13.66	0	2	4	$1.135451
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	236	Cloquet-Midway-T-Proctor-0704 - 000G96 - 236	198	$1,378.93	$6.96	$1,542.22	$7.79	0	2	4	$0.891537

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	134	$1,643.65	$12.27	$1,838.29	$13.72	0	2	4	$1.137354
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	336	$2,245.36	$6.68	$2,511.26	$7.47	0	2	4	$0.873321
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	241	Bemidji-Audubon-T-Lk Park Audubon-2889 - 000G97 - 241	10	$384.15	$38.42	$429.64	$42.96	0	2	4	$1.633064
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	2,742	$41,597.53	$15.17	$46,523.55	$16.97	0	2	4	$1.229682
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	1,214	$5,443.98	$4.48	$6,088.66	$5.02	0	2	4	$0.700704
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	3,799	$23,655.34	$6.23	$26,456.62	$6.96	0	2	4	$0.842609
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	884	$5,789.87	$6.55	$6,475.52	$7.33	0	2	4	$0.865104
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	250	Wadena-Henrietta-T-Park Rapids-0309 - 000G89 - 250	96	$2,020.14	$21.04	$2,259.37	$23.54	0	2	4	$1.371806
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	2,315	$43,269.75	$18.69	$48,393.79	$20.90	0	2	4	$1.320146
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	255	Wadena-Baudette-C-Lake of Woods-0390 - 000G89 - 255	5	$3,522.14	$704.43	$3,939.23	$787.85	0	2	4	$2.896444
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	257	Wadena-Motley-C-Staples-Motley-2170 - 000G89 - 257	201	$4,781.10	$23.79	$5,347.28	$26.60	0	2	4	$1.424882
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	268	$4,725.50	$17.63	$5,285.11	$19.72	0	2	4	$1.294907
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	260	Bemidji-McDonaldsville-T-Ada-Borup-2854 - 000G97 - 260	243	$3,108.81	$12.79	$3,476.95	$14.31	0	2	4	$1.155640
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	262	Wadena-Compton-T-Wadena-Deer Creek-2155 - 000G89 - 262	3	$48.87	$16.29	$54.66	$18.22	0	2	4	$1.260548
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	266	Wadena-Rocksbury-T-Thief River Falls-0564 - 000G89 - 266	405	$3,017.35	$7.45	$3,374.67	$8.33	0	2	4	$0.920645
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	1,543	$12,528.36	$8.12	$14,011.99	$9.08	0	2	4	$0.958086
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	277	Wadena-Bertha-C-Bertha-Hewitt-0786 - 000G89 - 277	170	$3,450.05	$20.29	$3,858.61	$22.70	0	2	4	$1.356026
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	657	$15,364.84	$23.39	$17,184.38	$26.16	0	2	4	$1.417638
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	290	Wadena-Verndale-C-Verndale-818 - 000G89 - 290	926	$16,070.99	$17.36	$17,974.14	$19.41	0	2	4	$1.288026
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	776	$40,735.17	$52.49	$45,559.06	$58.71	0	2	4	$1.768712
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	2,846	$54,304.27	$19.08	$60,735.04	$21.34	0	2	4	$1.329194
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	2,106	$18,968.41	$9.01	$21,214.67	$10.07	0	2	4	$1.003029
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	307	Pine City-Pokegama-T-Pine City-0578 - 000G98 - 307	2	$522.15	$261.08	$583.98	$291.99	0	2	4	$2.465368
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	315	Pine City-Pine City-T-Pine City-0578 - 000G98 - 315	7	$980.83	$140.12	$1,096.98	$156.71	0	2	4	$2.195097
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	330	Rosemount-Lakeville-C-Rosemnt-Apple Vly-0196 - 000G93 - 330	1,443	$22,176.77	$15.37	$24,802.97	$17.19	0	2	4	$1.235276
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	348	Cloquet-Floodwood-C-Floodwood-0698 - 000G96 - 348	144	$1,103.19	$7.66	$1,233.83	$8.57	0	2	4	$0.932981
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	3,649	$93,877.64	$25.73	$104,994.73	$28.77	0	2	4	$1.458940
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	415	Rochester-Rochester-C-Byron SD-0531 - 000G95 - 415	143	$1,108.91	$7.75	$1,240.23	$8.67	0	2	4	$0.938019
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	418	Rochester-Adams-C-Southland - 000G95 - 418	4	$95.15	$23.79	$106.42	$26.61	0	2	4	$1.425045
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	7,775	$184,949.82	$23.79	$206,851.77	$26.60	0	2	4	$1.424882
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2010	457	Fairmont-Pickerel Lake-T-Albert Lea - 000G94 - 457	2	$47.58	$23.79	$53.21	$26.61	0	2	4	$1.425045
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2010	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	3	$1,605.44	$535.15	$1,795.56	$598.52	0	3	9	$2.777079
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2010	112	Rochester-Fountain-C-Fillmore Central-2198 - 000G95 - 112	4	$3,732.66	$933.17	$4,174.69	$1,043.67	0	3	9	$3.018563
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2010	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	2	$476.72	$238.36	$533.17	$266.59	0	3	9	$2.425844
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2010	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	9	$398.40	$44.27	$445.58	$49.51	0	3	9	$1.694693
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2010	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	4	$1,261.96	$315.49	$1,411.40	$352.85	0	3	9	$2.547590
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	2,711	$32,736.30	$12.08	$36,612.96	$13.51	0	4	16	$1.130655
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	614	$35,738.87	$58.21	$39,971.11	$65.10	0	4	16	$1.813581
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	1,325	$53,883.48	$40.67	$60,264.42	$45.48	0	4	16	$1.657820
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	17	Pine City-Chengwatana-C-Pine City-0578 - 000G98 - 017	440	$113,470.60	$257.89	$126,907.90	$288.43	0	4	16	$2.460040
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	24	Pine City-Sandstone-C-E Central-2580 - 000G98 - 024	10	$5,610.68	$561.07	$6,275.10	$627.51	0	4	16	$2.797621
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	1,721	$52,950.83	$30.77	$59,221.32	$34.41	0	4	16	$1.536685
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	2,201	$84,954.25	$38.60	$95,014.62	$43.17	0	4	16	$1.635182
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	73	Fairmont-Rutland-T-Fairmont Area-2752 - 000G94 - 073	765	$9,576.78	$12.52	$10,710.87	$14.00	0	4	16	$1.146128
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	95	Worthington-Canby-C-Canby-0891 - 000G99 - 095	47	$7,322.03	$155.79	$8,189.11	$174.24	0	4	16	$2.241148
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	1,731	$23,795.00	$13.75	$26,612.83	$15.37	0	4	16	$1.186674
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	18,599	$255,669.08	$13.75	$285,945.68	$15.37	0	4	16	$1.186674
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	113	Rochester-Harmony-C-Fillmore Central-2198 - 000G95 - 113	3,207	$86,489.39	$26.97	$96,731.55	$30.16	0	4	16	$1.479431
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	1,077	$14,078.33	$13.07	$15,745.51	$14.62	0	4	16	$1.164947
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	123	Fairmont-Glenville-C-Glenville-Emmons-2886 - 000G94 - 123	41	$1,361.99	$33.07	$1,523.28	$36.98	0	4	16	$1.567967
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	632	$117,705.67	$186.24	$131,644.50	$208.30	0	4	16	$2.318689
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	111	$2,138.23	$19.26	$2,391.44	$21.54	0	4	16	$1.333246
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	149	Rochester-Dover-T-Dover-Eyota-0533 - 000G95 - 149	464	$11,548.44	$24.89	$12,916.02	$27.84	0	4	16	$1.444669
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	155	Rochester-Kalmar-T-Bryron-0531 - 000G95 - 155	1,327	$25,562.42	$19.26	$28,589.55	$21.54	0	4	16	$1.333246
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	483	$39,129.79	$81.01	$43,763.58	$90.61	0	4	16	$1.957176
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	4,474	$95,223.24	$21.28	$106,499.68	$23.80	0	4	16	$1.376577
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	166	Fairmont-Blooming-T-Blooming Prairie-0756 - 000G94 - 166	670	$10,958.19	$16.36	$12,255.87	$18.29	0	4	16	$1.262214
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	230	$1,393.95	$6.06	$1,559.03	$6.78	0	4	16	$0.831230
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	214	Cloquet-S InternationalFalls-C-Intrntnl-361 - 000G96 - 214	398	$8,873.57	$22.30	$9,924.39	$24.94	0	4	16	$1.396896
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	626	$702.24	$1.12	$785.40	$1.25	0	4	16	$0.096910
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	222	$249.04	$1.12	$278.53	$1.25	0	4	16	$0.096910
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	196	$13,009.81	$66.38	$14,550.45	$74.24	0	4	16	$1.870638
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	496	$12,330.39	$24.86	$13,790.57	$27.80	0	4	16	$1.444045
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	11	$1,128.27	$102.57	$1,261.88	$114.72	0	4	16	$2.059639
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	315	Pine City-Pine City-T-Pine City-0578 - 000G98 - 315	308	$79,429.42	$257.89	$88,835.54	$288.43	0	4	16	$2.460040
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	349	Worthington-North Hero-T-Westbrook-WAlnut Grove - 000G99 - 349	8,251	$87,013.78	$10.55	$97,318.05	$11.79	0	4	16	$1.071514
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	388	Rochester-Carrollton-Lanesboro - 000G95 - 388	2,930	$111,730.89	$38.13	$124,962.18	$42.65	0	4	16	$1.629919

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	423	$13,983.46	$33.07	$15,639.40	$36.98	0	4	16	$1.567967
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2010	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	10	$314.72	$33.06	$351.99	$36.97	0	4	16	$1.567849
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2010	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	337	$9,534.12	$28.29	$10,663.16	$31.64	0	6	36	$1.500236
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2010	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	200	$32,122.40	$160.61	$35,926.38	$179.63	0	6	36	$2.254379
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2010	73	Fairmont-Rutland-T-Fairmont Area-2752 - 000G94 - 073	164	$4,252.36	$25.93	$4,755.93	$29.00	0	6	36	$1.462398
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2010	115	Rochester-Mabel-C-Mabel-Canton-0238 - 000G95 - 115	965	$36,641.84	$37.97	$40,981.01	$42.47	0	6	36	$1.628082
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2010	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	10	$397.88	$39.79	$445.00	$44.50	0	6	36	$1.648360
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2010	155	Rochester-Kalmar-T-Bryron-0531 - 000G95 - 155	10	$397.87	$39.79	$444.98	$44.50	0	6	36	$1.648360
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2010	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	875	$85,748.33	$98.00	$95,902.74	$109.60	0	6	36	$2.039811
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2010	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	2,475	$103,176.91	$41.69	$115,395.23	$46.62	0	6	36	$1.668572
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2010	241	Bemidji-Audubon-T-Lk Park Audubon-2889 - 000G97 - 241	408	$39,139.48	$95.93	$43,774.42	$107.29	0	6	36	$2.030559
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2010	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	4	$5,658.88	$1,414.72	$6,329.01	$1,582.25	0	6	36	$3.199275
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2010	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	3	$3,103.41	$1,034.47	$3,470.92	$1,156.97	1	1.25	1.5625	$3.063322
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2010	198	Cloquet-Bovey-C-Greenway-0316 - 000G96 - 198	2	$10,470.07	$5,235.04	$11,709.95	$5,854.98	1	1.25	1.5625	$3.767525
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2010	209	Cloquet-Nashwauk-C-Nashwauk-Keewatin-0319 - 000G96 - 209	4	$3,522.59	$880.65	$3,939.74	$984.94	1	1.25	1.5625	$2.993410
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	2010	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	6	$4,149.32	$691.55	$4,640.68	$773.45	1	1	1	$2.888432
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	2010	215	Cloquet-Silver Bau-C-Lake Superior-0381 - 000G96 - 215	3	$1,583.17	$527.72	$1,770.65	$590.22	1	1	1	$2.771014
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	186	Steel 10 in	2010	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	10	$14,632.31	$1,463.23	$16,365.08	$1,636.51	1	10	100	$3.213919
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	187	Steel 12 in	2010	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	14	$75,859.46	$5,418.53	$84,842.82	$6,060.20	1	12	144	$3.782487
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	187	Steel 12 in	2010	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	1,882	$343,020.81	$182.26	$383,641.70	$203.85	1	12	144	$2.309311
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2010	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	6	$4,132.26	$688.71	$4,621.61	$770.27	1	2	4	$2.886643
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2010	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	5	$4,350.21	$870.04	$4,865.37	$973.07	1	2	4	$2.988144
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2010	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	5	$7,954.13	$1,590.83	$8,896.07	$1,779.21	1	2	4	$3.250227
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2010	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	120	$7,104.65	$59.21	$7,945.99	$66.22	1	2	4	$1.820989
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2010	110	Rochester-Canton-C-Mabel-Canton-0238 - 000G95 - 110	12	$5,258.87	$438.24	$5,881.63	$490.14	1	2	4	$2.690320
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2010	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	270	$29,477.73	$109.18	$32,968.52	$122.11	1	2	4	$2.086751
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2010	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	52	$6,533.05	$125.64	$7,306.71	$140.51	1	2	4	$2.147707
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2010	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	10	$9,184.98	$918.50	$10,272.68	$1,027.27	1	2	4	$3.011685
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2010	171	Rochester-Lewiston-C-Lewiston-Altura-0857 - 000G95 - 171	14	$11,345.07	$810.36	$12,688.56	$906.33	1	2	4	$2.957286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2010	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	23	$20,967.91	$911.65	$23,450.95	$1,019.61	1	2	4	$3.008434
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2010	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	9	$1,018.44	$113.16	$1,139.04	$126.56	1	2	4	$2.102296
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2010	191	Wadena-Crosby-C-Crosby-Ironton-0182 - 000G89 - 191	524	$32,602.60	$62.22	$36,463.43	$69.59	1	2	4	$1.842547
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2010	198	Cloquet-Bovey-C-Greenway-0316 - 000G96 - 198	279	$13,843.45	$49.62	$15,482.81	$55.49	1	2	4	$1.744215
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2010	209	Cloquet-Nashwauk-C-Nashwauk-Keewatin-0319 - 000G96 - 209	4	$210.64	$52.66	$235.58	$58.90	1	2	4	$1.770115
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2010	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	2	$129.06	$64.53	$144.34	$72.17	1	2	4	$1.858357
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2010	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	890	$45,121.06	$50.70	$50,464.35	$56.70	1	2	4	$1.753583
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2010	236	Cloquet-Midway-T-Proctor-0704 - 000G96 - 236	1,007	$43,347.39	$43.05	$48,480.63	$48.14	1	2	4	$1.682506
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2010	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	605	$26,042.86	$43.05	$29,126.89	$48.14	1	2	4	$1.682506
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2010	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	492	$24,418.14	$49.63	$27,309.76	$55.51	1	2	4	$1.744371
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2010	245	Bemidji-Frazee-C-Frazee-Vergas-0023 - 000G97 - 245	78	$6,392.10	$81.95	$7,149.06	$91.65	1	2	4	$1.962132
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2010	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	341	$9,347.38	$27.41	$10,454.31	$30.66	1	2	4	$1.486572
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2010	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	13	$3,495.80	$268.91	$3,909.77	$300.75	1	2	4	$2.478206
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2010	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	2	$2,764.22	$1,382.11	$3,091.56	$1,545.78	1	2	4	$3.189148
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2010	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	30	$13,536.16	$451.21	$15,139.13	$504.64	1	2	4	$2.702982
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2010	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	17	$23,114.88	$1,359.70	$25,852.17	$1,520.72	1	2	4	$3.182049
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2010	396	Cloquet-Balkan-T-Chisholm - 000G96 - 396	3	$152.09	$50.70	$170.10	$56.70	1	2	4	$1.753583
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2010	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	6	$10,028.50	$1,671.42	$11,216.09	$1,869.35	1	3	9	$3.271691
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2010	245	Bemidji-Frazee-C-Frazee-Vergas-0023 - 000G97 - 245	74	$9,707.38	$131.18	$10,856.94	$146.72	1	3	9	$2.166489
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2010	24	Pine City-Sandstone-C-E Central-2580 - 000G98 - 024	20	$64,536.28	$3,226.81	$72,178.73	$3,608.94	1	4	16	$3.557380
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2010	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	129	$5,954.81	$46.16	$6,659.98	$51.63	1	4	16	$1.712902
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2010	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	7,876	$766,801.90	$97.36	$857,607.39	$108.89	1	4	16	$2.036988
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2010	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	88	$18,094.02	$205.61	$20,236.73	$229.96	1	4	16	$2.361652
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2010	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	113	$34,436.22	$304.75	$38,514.19	$340.83	1	4	16	$2.532538
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2010	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	9	$5,374.20	$597.13	$6,010.62	$667.85	1	4	16	$2.824679
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2010	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	11	$46,103.09	$4,191.19	$51,562.67	$4,687.52	1	4	16	$3.670943
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2010	388	Rochester-Carrollton-Lanesboro - 000G95 - 388	28	$2,197.11	$78.47	$2,457.29	$87.76	1	4	16	$1.943297
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2010	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	4,779	$655,287.05	$137.12	$732,886.83	$153.36	1	6	36	$2.185712
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2010	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	6	$5,418.78	$903.13	$6,060.48	$1,010.08	1	6	36	$3.004356
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	2010	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	1,219	$136,853.18	$112.27	$153,059.48	$125.56	1	8	64	$2.098851
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	2010	207	Cloquet-Laprairie-C-Greenway-0316 - 000G96 - 207	17	$53,976.31	$3,175.08	$60,368.24	$3,551.07	1	8	64	$3.550359
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	2011	75	Fairmont-Trimont-C-Martin Cty W-2448 - 000G94 - 075	5	($6,221.07)	($1,244.21)	($6,405.27)	($1,281.05)	0	1.25	1.5625	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	331	$3,153.33	$9.53	$3,246.69	$9.81	0	2	4	$0.991669
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	7,208	$58,098.28	$8.06	$59,818.56	$8.30	0	2	4	$0.919078
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	14,953	$145,318.43	$9.72	$149,621.26	$10.01	0	2	4	$1.000434
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	15,631	$311,789.59	$19.95	$321,021.60	$20.54	0	2	4	$1.312600
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	991	$32,276.05	$32.57	$33,231.74	$33.53	0	2	4	$1.525434
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	15	Pine City-Mora-C-Mora-0332 - 000G98 - 015	2,236	$15,684.81	$7.01	$16,149.23	$7.22	0	2	4	$0.858537

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	4,628	$60,726.81	$13.12	$62,524.92	$13.51	0	2	4	$1.130655
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	30	Rosemount-Elko-C-Lakeville-0194 - 000G93 - 030	12	$657.01	$54.75	$676.46	$56.37	0	2	4	$1.751048
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	124	$989.48	$7.98	$1,018.77	$8.22	0	2	4	$0.914872
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	1,330	$22,937.10	$17.25	$23,616.27	$17.76	0	2	4	$1.249443
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	50	Worthington-Alba-T-Brewster-0513 - 000G99 - 050	6	$183.10	$30.52	$188.52	$31.42	0	2	4	$1.497206
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	3,824	$135,681.66	$35.48	$139,699.14	$36.53	0	2	4	$1.562650
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	54	Fairmont-Lakefield-C-Jackson Cty Central-2895 - 000G94 - 054	17,221	$383,535.40	$22.27	$394,891.77	$22.93	0	2	4	$1.360404
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	65	Worthington-Tracy-C-Tracy-0417 - 000G99 - 065	126	$26.36	$0.21	$27.14	$0.22	0	2	4	($0.657577)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	2,442	$55,365.53	$22.67	$57,004.88	$23.34	0	2	4	$1.368101
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	76	Fairmont-Truman-C-Truman-0458 - 000G94 - 076	162	$3,344.35	$20.64	$3,443.38	$21.26	0	2	4	$1.327563
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	6,161	$192,361.13	$31.22	$198,056.89	$32.15	0	2	4	$1.507181
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	80	Worthington-Lorain-T-Worthington Dist-0518 - 000G99 - 080	1,301	$17,566.77	$13.50	$18,086.92	$13.90	0	2	4	$1.143015
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	81	Worthington-Worthington-T-Worthington Admn-0518 - 000G99 - 081	4,492	$31,968.17	$7.12	$32,914.74	$7.33	0	2	4	$0.865104
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	82	Worthington-Lamberton-C-Red Rock Central-2884 - 000G99 - 082	390	$7,572.65	$19.42	$7,796.87	$19.99	0	2	4	$1.300813
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	83	Worthington-Lamberton-T-Red Rock Central-2884 - 000G99 - 083	92	$1,786.37	$19.42	$1,839.26	$19.99	0	2	4	$1.300813
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	91	Worthington-Appleton-C-Lac Qui Parle Valley - 000G99 - 091	92	$1,675.19	$18.21	$1,724.79	$18.75	0	2	4	$1.273001
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	93	Fairmont-New Richland-C-NRHEG-2168 - 000G94 - 093	78	$4,693.87	$60.18	$4,832.86	$61.96	0	2	4	$1.792111
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	94	Worthington-Butterfield-C-Butterfield-0836 - 000G99 - 094	450	$8,672.54	$19.27	$8,929.33	$19.84	0	2	4	$1.297542
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	95	Worthington-Canby-C-Canby-0891 - 000G99 - 095	935	$15,760.02	$16.86	$16,226.67	$17.35	0	2	4	$1.239299
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	114	Rochester-Lanesboro-C-Lanesboro-0229 - 000G95 - 114	418	$22,581.14	$54.02	$23,249.76	$55.62	0	2	4	$1.745231
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	115	Rochester-Mabel-C-Mabel-Canton-0238 - 000G95 - 115	418	$11,593.36	$27.74	$11,936.63	$28.56	0	2	4	$1.455758
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	688	$14,051.13	$20.42	$14,467.18	$21.03	0	2	4	$1.322839
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	8	$807.57	$100.95	$831.48	$103.94	0	2	4	$2.016783
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	538	$15,125.23	$28.11	$15,573.09	$28.95	0	2	4	$1.461649
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	136	Rochester-La Crescent-T-LaCrescent-Hokah-0300 - 000G95 - 136	1,630	$46,522.51	$28.54	$47,900.03	$29.39	0	2	4	$1.468200
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	144	Rochester-Waltham-C-Hayfield-0203 - 000G95 - 144	12	$7,216.13	$601.34	$7,429.80	$619.15	0	2	4	$2.791796
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	1,622	$52,722.37	$32.50	$54,283.46	$33.47	0	2	4	$1.524656
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	1,941	$14,082.05	$7.26	$14,499.02	$7.47	0	2	4	$0.873321
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	147	$965.19	$6.57	$993.77	$6.76	0	2	4	$0.829947
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	155	Rochester-Kalmar-T-Bryron-0531 - 000G95 - 155	230	$3,140.03	$13.65	$3,233.01	$14.06	0	2	4	$1.147985
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	5,667	$167,297.52	$29.52	$172,251.16	$30.40	0	2	4	$1.482874
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	850	$10,829.06	$12.74	$11,149.70	$13.12	0	2	4	$1.117934
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	1,099	$29,610.66	$26.94	$30,487.42	$27.74	0	2	4	$1.443106
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	305	$43,731.44	$143.38	$45,026.31	$147.63	0	2	4	$2.169175
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	167	Rochester-Elgin-C-Elgin-Millville-2899 - 000G95 - 167	4	$1,077.20	$269.30	$1,109.10	$277.28	0	2	4	$2.442919
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	73	$1,339.71	$18.35	$1,379.38	$18.90	0	2	4	$1.276462
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	180	Cloquet-Carlton-C-Carlton-0093 - 000G96 - 180	48	$919.27	$19.15	$946.49	$19.72	0	2	4	$1.294907
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	2,825	$49,492.33	$17.52	$50,957.78	$18.04	0	2	4	$1.256237
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	171	$3,885.21	$22.72	$4,000.25	$23.39	0	2	4	$1.369030
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	187	Cloquet-Moose Lake-T-Moose Lake-0097 - 000G96 - 187	10	$227.20	$22.72	$233.93	$23.39	0	2	4	$1.369030
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	191	Wadena-Crosby-C-Crosby-Ironton-0182 - 000G89 - 191	517	$7,460.83	$14.43	$7,681.74	$14.86	0	2	4	$1.172019
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	192	Wadena-Deerwood-C-Crosby-Ironton-0182 - 000G89 - 192	336	$5,645.41	$16.80	$5,812.57	$17.30	0	2	4	$1.238046
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	198	Cloquet-Bovey-C-Greenway-0316 - 000G96 - 198	115	$3,028.46	$26.33	$3,118.13	$27.11	0	2	4	$1.433130
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	199	Cloquet-Calumet-C-Greenway-0316 - 000G96 - 199	70	$1,377.87	$19.68	$1,418.66	$20.27	0	2	4	$1.306854
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	201	Cloquet-Coleraine-C-Greenway-0316 - 000G96 - 201	159	$5,883.66	$37.00	$6,057.87	$38.10	0	2	4	$1.580925
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	989	$9,171.24	$9.27	$9,442.79	$9.55	0	2	4	$0.980003
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	211	Cloquet-Zemple-C-Deer River-0317 - 000G96 - 211	393	$2,595.88	$6.61	$2,672.74	$6.80	0	2	4	$0.832509
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	2	$62.72	$31.36	$64.58	$32.29	0	2	4	$1.509068
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	213	Cloquet-Ranier-C-International Falls-0361 - 000G96 - 213	1,114	$28,080.60	$25.21	$28,912.06	$25.95	0	2	4	$1.414137
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	116	$2,048.48	$17.66	$2,109.13	$18.18	0	2	4	$1.259594
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	445	$3,557.84	$8.00	$3,663.19	$8.23	0	2	4	$0.915400
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	220	Cloquet-Buhl-C-Mt Iron-Buhl-0712 - 000G96 - 220	4	$1,929.24	$482.31	$1,986.36	$496.59	0	2	4	$2.695998
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	221	Cloquet-Canosia-T-Proctor-0704 - 000G96 - 221	240	$2,600.52	$10.84	$2,677.52	$11.16	0	2	4	$1.047664
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	266	$4,471.41	$16.81	$4,603.81	$17.31	0	2	4	$1.238297
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	223	Cloquet-Duluth-C-Proctor-0704 - 000G96 - 223	304	$11,580.77	$38.09	$11,923.68	$39.22	0	2	4	$1.593508
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	3,028	$32,207.83	$10.64	$33,161.50	$10.95	0	2	4	$1.039414
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	592	$14,674.59	$24.79	$15,109.10	$25.52	0	2	4	$1.406881
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	3,523	$29,151.42	$8.27	$30,014.58	$8.52	0	2	4	$0.930440
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	1,218	$26,536.22	$21.79	$27,321.95	$22.43	0	2	4	$1.350829
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	461	$6,574.19	$14.26	$6,768.86	$14.68	0	2	4	$1.166726
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	348	$8,181.67	$23.51	$8,423.92	$24.21	0	2	4	$1.383995
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	257	Wadena-Motley-C-Staples-Motley-2170 - 000G89 - 257	3,243	$41,280.13	$12.73	$42,502.42	$13.11	0	2	4	$1.117603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	264	Wadena-North-T-Thief River Falls-0564 - 000G89 - 264	398	$8,475.20	$21.29	$8,726.14	$21.92	0	2	4	$1.340841
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	266	Wadena-Rocksbury-T-Thief River Falls-0564 - 000G89 - 266	176	$1,443.28	$8.20	$1,486.02	$8.44	0	2	4	$0.926342
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	2,380	$32,473.13	$13.64	$33,434.65	$14.05	0	2	4	$1.147676
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	456	$15,786.89	$34.62	$16,254.34	$35.65	0	2	4	$1.552060
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	275	Wadena-Warroad-C-Warroad-0690 - 000G89 - 275	150	$1,332.69	$8.88	$1,372.15	$9.15	0	2	4	$0.961421

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	278	Wadena-Hewitt-C-Bertha-Hewitt-0786 - 000G89 - 278	2	$1,678.52	$839.26	$1,728.22	$864.11	0	2	4	$2.936569
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	260	$6,026.84	$23.18	$6,205.29	$23.87	0	2	4	$1.377852
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	290	Wadena-Verndale-C-Verndale-818 - 000G89 - 290	2,200	$44,055.47	$20.03	$45,359.94	$20.62	0	2	4	$1.314289
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	1,329	$9,117.46	$6.86	$9,387.42	$7.06	0	2	4	$0.848805
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	2,675	$29,396.45	$10.99	$30,266.87	$11.31	0	2	4	$1.053463
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	7,859	$58,419.89	$7.43	$60,149.68	$7.65	0	2	4	$0.883661
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	2,944	$15,969.56	$5.42	$16,442.41	$5.59	0	2	4	$0.747412
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	307	Pine City-Pokegama-T-Pine City-0578 - 000G98 - 307	1,662	$17,168.50	$10.33	$17,676.85	$10.64	0	2	4	$1.026942
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	330	Rosemount-Lakeville-C-Rosemnt-Apple Vly-0196 - 000G93 - 330	2,861	$16,715.56	$5.84	$17,210.50	$6.02	0	2	4	$0.779596
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	342	Bemidji-Eckels-T-Bemidji-0031 - 000G97 - 342	222	$1,654.79	$7.45	$1,703.79	$7.67	0	2	4	$0.884795
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	348	Cloquet-Floodwood-C-Floodwood-0698 - 000G96 - 348	2	$169.77	$84.89	$174.80	$87.40	0	2	4	$1.941511
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	351	Rosemount-Eureka-T-Lakeville-0194 - 000G93 - 351	10	($1,393.82)	($139.38)	($1,435.09)	($143.51)	0	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	374	Fairmont-Heron Lake-T-Jackson Cty Central - 000G94 - 374	6	$133.63	$22.27	$137.59	$22.93	0	2	4	$1.360404
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	163	$2,471.16	$15.16	$2,544.33	$15.61	0	2	4	$1.193403
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	393	Cloquet-Deer River-T-Deer River-0317 - 000G96 - 393	730	$5,074.08	$6.95	$5,224.32	$7.16	0	2	4	$0.854913
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	13,438	$287,412.97	$21.39	$295,923.18	$22.02	0	2	4	$1.342817
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	1,352	$28,916.68	$21.39	$29,772.89	$22.02	0	2	4	$1.342817
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	436	Fairmont-Geneva-T-N.R.H.E.G. - 000G94 - 436	1,623	$34,712.84	$21.39	$35,740.68	$22.02	0	2	4	$1.342817
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2011	468	Rochester-Lyle-C-Lyle - 000G95 - 468	4	$85.55	$21.39	$88.08	$22.02	0	2	4	$1.342817
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2011	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	4	$10,319.90	$2,579.98	$10,625.47	$2,656.37	0	3	9	$3.424289
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2011	15	Pine City-Mora-C-Mora-0332 - 000G98 - 015	8	$963.06	$120.38	$991.58	$123.95	0	3	9	$2.093247
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2011	214	Cloquet-S InternationalFalls-C-Intrntnl-361 - 000G96 - 214	7	$4,379.20	$625.60	$4,508.87	$644.12	0	3	9	$2.808967
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	530	$27,145.70	$51.22	$27,949.47	$52.73	0	4	16	$1.722058
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	192	$1,998.50	$10.41	$2,057.67	$10.72	0	4	16	$1.030195
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	1,481	$72,235.90	$48.78	$74,374.79	$50.22	0	4	16	$1.700877
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	15	Pine City-Mora-C-Mora-0332 - 000G98 - 015	754	$7,161.85	$9.50	$7,373.91	$9.78	0	4	16	$0.990339
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	325	$5,350.64	$16.46	$5,509.07	$16.95	0	4	16	$1.229170
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	7,438	$203,458.95	$27.35	$209,483.30	$28.16	0	4	16	$1.449633
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	48	Fairmont-Nunda-T-Glenville-Emmons-2886 - 000G94 - 048	407	$15,663.44	$38.49	$16,127.23	$39.62	0	4	16	$1.597914
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	50	Worthington-Alba-T-Brewster-0513 - 000G99 - 050	350	$15,923.93	$45.50	$16,395.43	$46.84	0	4	16	$1.670617
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	1,970	$77,696.60	$39.44	$79,997.17	$40.61	0	4	16	$1.608633
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	54	Fairmont-Lakefield-C-Jackson Cty Central-2895 - 000G94 - 054	4,413	$119,543.91	$27.09	$123,083.57	$27.89	0	4	16	$1.445449
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	1,370	$54,473.80	$39.76	$56,086.75	$40.94	0	4	16	$1.612148
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	2,442	$99,493.73	$40.74	$102,439.70	$41.95	0	4	16	$1.622732
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	80	Worthington-Lorain-T-Worthington Dist-0518 - 000G99 - 080	3	$68.46	$22.82	$70.49	$23.50	0	4	16	$1.371068
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	8	$304.43	$38.05	$313.44	$39.18	0	4	16	$1.593064
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	16	$608.86	$38.05	$626.89	$39.18	0	4	16	$1.593064
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	114	Rochester-Lanesboro-C-Lanesboro-0229 - 000G95 - 114	2,192	$175,969.63	$80.28	$181,180.04	$82.66	0	4	16	$1.917295
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	619	$74,471.69	$120.31	$76,676.77	$123.87	0	4	16	$2.092966
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	136	Rochester-La Crescent-T-LaCrescent-Hokah-0300 - 000G95 - 136	422	$22,324.58	$52.90	$22,985.61	$54.47	0	4	16	$1.736157
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	48	$2,317.51	$48.28	$2,386.13	$49.71	0	4	16	$1.696444
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	34	$808.61	$23.78	$832.56	$24.49	0	4	16	$1.388989
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	159	Rochester-Oronoco-C-Rochester-0535 - 000G95 - 159	2,517	$22,370.74	$8.89	$23,033.13	$9.15	0	4	16	$0.961421
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	1,446	$46,664.50	$32.27	$48,046.22	$33.23	0	4	16	$1.521530
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	1,366	$42,333.88	$30.99	$43,587.37	$31.91	0	4	16	$1.503927
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	394	$11,805.97	$29.96	$12,155.54	$30.85	0	4	16	$1.489255
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	233	$5,140.50	$22.06	$5,292.71	$22.72	0	4	16	$1.356408
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	308	$5,802.36	$18.84	$5,974.16	$19.40	0	4	16	$1.287802
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	907	$10,791.33	$11.90	$11,110.86	$12.25	0	4	16	$1.088136
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	299	Rosemount-Rosemount-C-Inver Grove Hts-0199 - 000G93 - 299	1,112	$28,684.83	$25.80	$29,534.17	$26.56	0	4	16	$1.424228
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	348	Cloquet-Floodwood-C-Floodwood-0698 - 000G96 - 348	593	$74,767.59	$126.08	$76,981.44	$129.82	0	4	16	$2.113342
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	358	Rosemount-Stanton-T-Randolph - 000G93 - 358	326	$4,449.83	$13.65	$4,581.59	$14.05	0	4	16	$1.147676
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	381	Rochester-Utica-St Charles - 000G95 - 381	2	$2,903.74	$1,451.87	$2,989.72	$1,494.86	0	4	16	$3.174601
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	215	$11,885.15	$55.28	$12,237.07	$56.92	0	4	16	$1.755265
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	2,392	$93,426.37	$39.06	$96,192.70	$40.21	0	4	16	$1.604334
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2011	458	Fairmont-Pickerel Lake-T-Alden-Conger - 000G94 - 458	15	$585.87	$39.06	$603.22	$40.21	0	4	16	$1.604334
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2011	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	4	$110.57	$27.64	$113.84	$28.46	0	6	36	$1.454235
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2011	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	9	($1,040.08)	($115.56)	($1,070.88)	($118.99)	0	6	36	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2011	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	123	$22,165.30	$180.21	$22,821.61	$185.54	0	6	36	$2.268438
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2011	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	4,644	$240,560.72	$51.80	$247,683.65	$53.33	0	6	36	$1.726972
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2011	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	2,372	$122,870.39	$51.80	$126,508.54	$53.33	0	6	36	$1.726972
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2011	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	344	$15,581.70	$45.30	$16,043.07	$46.64	0	6	36	$1.668759
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2011	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	6,881	$300,289.24	$43.64	$309,180.71	$44.93	0	6	36	$1.652536
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2011	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	5	($1,440.57)	($288.11)	($1,483.22)	($296.64)	0	6	36	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2011	457	Fairmont-Pickerel Lake-T-Albert Lea - 000G94 - 457	1	($288.12)	($288.12)	($296.65)	($296.65)	0	6	36	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2011	65	Worthington-Tracy-C-Tracy-0417 - 000G99 - 065	306	$2,906.57	$9.50	$2,992.63	$9.78	1	1.25	1.5625	$0.990339
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2011	198	Cloquet-Bovey-C-Greenway-0316 - 000G96 - 198	1	$3,100.79	$3,100.79	$3,192.60	$3,192.60	1	1.25	1.5625	$3.504145

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2011	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	3	$5,040.87	$1,680.29	$5,190.13	$1,730.04	1	1.25	1.5625	$3.238056
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2011	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	1	$3,271.68	$3,271.68	$3,368.55	$3,368.55	1	1.25	1.5625	$3.527443
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2011	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	67	$2,462.78	$36.76	$2,535.70	$37.85	1	2	4	$1.578066
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2011	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	1,194	$44,446.79	$37.23	$45,762.84	$38.33	1	2	4	$1.583539
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2011	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	6	$2,011.66	$335.28	$2,071.21	$345.20	1	2	4	$2.538071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2011	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	102	$28,240.31	$276.87	$29,076.49	$285.06	1	2	4	$2.454936
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2011	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	7	$339.79	$48.54	$349.85	$49.98	1	2	4	$1.698796
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2011	74	Fairmont-Sherburn-C-Martin Cty W-2448 - 000G94 - 074	12	$5,140.78	$428.40	$5,293.00	$441.08	1	2	4	$2.644517
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2011	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	15	$1,567.89	$104.53	$1,614.31	$107.62	1	2	4	$2.031893
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2011	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	31	$13,578.16	$438.01	$13,980.21	$450.97	1	2	4	$2.654148
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2011	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	20	$3,337.92	$166.90	$3,436.75	$171.84	1	2	4	$2.235124
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2011	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	17	$10,743.85	$631.99	$11,061.97	$650.70	1	2	4	$2.813381
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2011	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	2	$2,368.15	$1,184.08	$2,438.27	$1,219.14	1	2	4	$3.086054
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2011	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	2	$4,183.05	$2,091.53	$4,306.91	$2,153.46	1	2	4	$3.333137
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2011	192	Wadena-Deerwood-C-Crosby-Ironton-0182 - 000G89 - 192	73	$7,581.16	$103.85	$7,805.64	$106.93	1	2	4	$2.029100
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2011	193	Wadena-Ironton-C-Crosby-Ironton-0182 - 000G89 - 193	184	$8,021.26	$43.59	$8,258.77	$44.88	1	2	4	$1.652053
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2011	209	Cloquet-Nashwauk-C-Nashwauk-Keewatin-0319 - 000G96 - 209	71	$5,133.72	$72.31	$5,285.73	$74.45	1	2	4	$1.871865
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2011	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	33	$13,017.19	$394.46	$13,402.62	$406.14	1	2	4	$2.608676
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2011	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	4	$404.39	$101.10	$416.36	$104.09	1	2	4	$2.017409
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2011	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	1	$3,165.91	$3,165.91	$3,259.65	$3,259.65	1	2	4	$3.513171
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2011	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	18	$15,813.47	$878.53	$16,281.71	$904.54	1	3	9	$2.956428
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2011	154	Rochester-High Forest-T-Stewartville-0534 - 000G95 - 154	29	$9,964.48	$343.60	$10,259.53	$353.78	1	3	9	$2.548733
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2011	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	5	$3,561.42	$712.28	$3,666.87	$733.37	1	3	9	$2.865323
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2011	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	1,275	$90,737.84	$71.17	$93,424.56	$73.27	1	4	16	$1.864926
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2011	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	243	$23,008.43	$94.68	$23,689.70	$97.49	1	4	16	$1.988960
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2011	54	Fairmont-Lakefield-C-Jackson Cty Central-2895 - 000G94 - 054	59	$10,285.51	$174.33	$10,590.06	$179.49	1	4	16	$2.254040
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2011	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	67	$60,651.46	$905.25	$62,447.33	$932.05	1	4	16	$2.969439
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2011	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	12	$14,879.55	$1,239.96	$15,320.13	$1,276.68	1	4	16	$3.106082
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2011	155	Rochester-Kalmar-T-Bryron-0531 - 000G95 - 155	13	$16,119.51	$1,239.96	$16,596.80	$1,276.68	1	4	16	$3.106082
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2011	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	316	$67,952.92	$215.04	$69,964.99	$221.41	1	4	16	$2.345197
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2011	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	2	$5,933.53	$2,966.77	$6,109.22	$3,054.61	1	4	16	$3.484956
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2011	193	Wadena-Ironton-C-Crosby-Ironton-0182 - 000G89 - 193	36	$878.95	$24.42	$904.98	$25.14	1	4	16	$1.400365
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2011	198	Cloquet-Bovey-C-Greenway-0316 - 000G96 - 198	55	$6,698.72	$121.79	$6,897.07	$125.40	1	4	16	$2.098298
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2011	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	156	$24,657.69	$158.06	$25,387.80	$162.74	1	6	36	$2.211494
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2011	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	3	$11,173.16	$3,724.39	$11,503.99	$3,834.66	1	6	36	$3.583727
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	207	Rectifiers	2011	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	1	$16,796.21	$16,796.21	$17,293.54	$17,293.54	#N/A	#N/A	#N/A	$4.237884
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2012	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	4	$2,321.51	$580.38	$2,150.07	$537.52	0	1	1	$2.730395
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2012	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	624	$67.40	$0.11	$62.42	$0.10	0	1	1	($1.000000)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	1	Pine City-Mayhew Lake-T-Sauk Rapids-0047 - 000G98 - 001	45	$2,379.13	$52.87	$2,203.43	$48.97	0	2	4	$1.689930
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	683	$14,702.55	$21.53	$13,616.77	$19.94	0	2	4	$1.299725
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	991	$24,696.03	$24.92	$22,872.23	$23.08	0	2	4	$1.363236
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	10,927	$91,512.22	$8.37	$84,754.06	$7.76	0	2	4	$0.889862
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	8,771	$52,957.78	$6.04	$49,046.86	$5.59	0	2	4	$0.747412
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	2,787	$40,576.02	$14.56	$37,579.49	$13.48	0	2	4	$1.129690
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	3,412	$83,917.61	$24.59	$77,720.31	$22.78	0	2	4	$1.357554
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	15	Pine City-Mora-C-Mora-0332 - 000G98 - 015	4	$2,724.83	$681.21	$2,523.61	$630.90	0	2	4	$2.799961
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	350	$10,917.33	$31.19	$10,111.09	$28.89	0	2	4	$1.460748
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	31	Rosemount-New Market-C-New Prague-0721 - 000G93 - 031	35	$2,138.55	$61.10	$1,980.62	$56.59	0	2	4	$1.752740
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	8	$54.65	$6.83	$50.61	$6.33	0	2	4	$0.801404
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	6,201	$95,041.10	$15.33	$88,022.33	$14.19	0	2	4	$1.151982
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	52	Worthington-Ewington-T-Brewster-0513 - 000G99 - 052	3	$2,117.94	$705.98	$1,961.53	$653.84	0	2	4	$2.815471
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	737	$7,677.44	$10.42	$7,110.46	$9.65	0	2	4	$0.984527
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	54	Fairmont-Lakefield-C-Jackson Cty Central-2895 - 000G94 - 054	8,543	$161,930.11	$18.95	$149,971.59	$17.55	0	2	4	$1.244277
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	55	Worthington-Madison-C-Lac Qui Parle Valley-2853 - 000G99 - 055	523	$4,005.10	$7.66	$3,709.32	$7.09	0	2	4	$0.850646
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	56	Worthington-Madison-T-Lac Qui Parle Valley-2853 - 000G99 - 056	794	$4,903.73	$6.18	$4,541.59	$5.72	0	2	4	$0.757396
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	57	Worthington-Hendricks-C-Hendricks-0402 - 000G99 - 057	149	$1,861.64	$12.49	$1,724.16	$11.57	0	2	4	$1.063333
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	59	Worthington-Ivanhoe-C-Ivanhoe-0403 - 000G99 - 059	3	$5,472.09	$1,824.03	$5,067.98	$1,689.33	0	2	4	$3.227714
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	65	Worthington-Tracy-C-Tracy-0417 - 000G99 - 065	475	$4,212.46	$8.87	$3,901.37	$8.21	0	2	4	$0.914343
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	735	$18,279.21	$24.87	$16,929.29	$23.03	0	2	4	$1.362294
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	74	Fairmont-Sherburn-C-Martin Cty W-2448 - 000G94 - 074	1,252	$14,841.60	$11.85	$13,745.56	$10.98	0	2	4	$1.040602
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	3,814	$83,181.47	$21.81	$77,038.51	$20.20	0	2	4	$1.305351
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	93	Fairmont-New Richland-C-NRHEG-2168 - 000G94 - 093	16,636	$348,122.20	$20.93	$322,413.42	$19.38	0	2	4	$1.287354
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	4	($1,316.72)	($329.18)	($1,219.48)	($304.87)	0	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	3,875	$45,477.67	$11.74	$42,119.15	$10.87	0	2	4	$1.036230
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	951	$16,032.42	$16.86	$14,848.43	$15.61	0	2	4	$1.193403
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	1,309	$22,407.78	$17.12	$20,752.97	$15.85	0	2	4	$1.200029
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	3,778	$79,793.80	$21.12	$73,901.03	$19.56	0	2	4	$1.291369

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	845	$67,543.81	$79.93	$62,555.71	$74.03	0	2	4	$1.869408
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	134	Rochester-Houston-C-Houston-0294 - 000G95 - 134	140	$1,553.65	$11.10	$1,438.91	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	3	($311.48)	($103.83)	($288.48)	($96.16)	0	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	757	$5,217.77	$6.89	$4,832.44	$6.38	0	2	4	$0.804821
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	3,933	$33,357.19	$8.48	$30,893.77	$7.86	0	2	4	$0.895423
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	1,898	$12,026.62	$6.34	$11,138.46	$5.87	0	2	4	$0.768638
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	148	Rochester-Dover-C-Dover-Eyota-0533 - 000G95 - 148	16	$616.44	$38.53	$570.91	$35.68	0	2	4	$1.552425
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	1,449	$31,738.42	$21.90	$29,394.54	$20.29	0	2	4	$1.307282
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	153	Rochester-Haverhill-T-Rochester-0535 - 000G95 - 153	613	$33,198.69	$54.16	$30,746.97	$50.16	0	2	4	$1.700358
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	156	Rochester-Marion-T-Rochester-0535 - 000G95 - 156	23	$1,473.29	$64.06	$1,364.49	$59.33	0	2	4	$1.773274
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	158	Rochester-Orion-T-Chatfield-0227 - 000G95 - 158	10	$1,865.00	$186.50	$1,727.27	$172.73	0	2	4	$2.237368
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	24,127	$653,790.81	$27.10	$605,508.43	$25.10	0	2	4	$1.399674
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	1,216	$10,227.75	$8.41	$9,472.43	$7.79	0	2	4	$0.891537
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	326	$9,272.42	$28.44	$8,587.65	$26.34	0	2	4	$1.420616
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	167	Rochester-Elgin-C-Elgin-Millville-2899 - 000G95 - 167	3	$1,545.38	$515.13	$1,431.25	$477.08	0	2	4	$2.678591
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	168	Rochester-Plainview-C-Plainview-2899 - 000G95 - 168	930	$16,815.98	$18.08	$15,574.12	$16.75	0	2	4	$1.224015
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	169	Rochester-Plainview-T-Plainview-2899 - 000G95 - 169	165	$2,983.49	$18.08	$2,763.16	$16.75	0	2	4	$1.224015
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	4	$120.43	$30.11	$111.54	$27.89	0	2	4	$1.445449
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	177	Wadena-Aitkin-T-Aitkin-0001 - 000G89 - 177	110	$958.66	$8.72	$887.86	$8.07	0	2	4	$0.906874
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	180	Cloquet-Carlton-C-Carlton-0093 - 000G96 - 180	475	$5,171.76	$10.89	$4,789.83	$10.08	0	2	4	$1.003461
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	2,938	$30,621.29	$10.42	$28,359.92	$9.65	0	2	4	$0.984527
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	191	Wadena-Crosby-C-Crosby-Ironton-0182 - 000G89 - 191	203	$5,055.88	$24.91	$4,682.50	$23.07	0	2	4	$1.363048
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	193	Wadena-Ironton-C-Crosby-Ironton-0182 - 000G89 - 193	475	$11,856.67	$24.96	$10,981.06	$23.12	0	2	4	$1.363988
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	194	Wadena-Deerwood-T-Crosby-Ironton-0182 - 000G89 - 194	234	$3,421.96	$14.62	$3,169.25	$13.54	0	2	4	$1.131619
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	2,128	$37,115.34	$17.44	$34,374.38	$16.15	0	2	4	$1.208173
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	207	Cloquet-Laprairie-C-Greenway-0316 - 000G96 - 207	190	$1,565.46	$8.24	$1,449.85	$7.63	0	2	4	$0.882525
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	208	Cloquet-Marble-C-Greenway-0316 - 000G96 - 208	25	$1,469.74	$58.79	$1,361.20	$54.45	0	2	4	$1.735998
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	1,639	$39,358.76	$24.01	$36,452.12	$22.24	0	2	4	$1.347135
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	213	Cloquet-Ranier-C-International Falls-0361 - 000G96 - 213	786	$21,804.55	$27.74	$20,194.29	$25.69	0	2	4	$1.409764
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	715	$12,329.60	$17.24	$11,419.06	$15.97	0	2	4	$1.203305
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	221	Cloquet-Canosia-T-Proctor-0704 - 000G96 - 221	3,256	$49,636.52	$15.24	$45,970.86	$14.12	0	2	4	$1.149835
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	97	$3,085.59	$31.81	$2,857.72	$29.46	0	2	4	$1.469233
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	209	$2,008.31	$9.61	$1,859.99	$8.90	0	2	4	$0.949390
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	771	$6,258.35	$8.12	$5,796.17	$7.52	0	2	4	$0.876218
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	872	$220.39	$0.25	$204.12	$0.23	0	2	4	($0.638272)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	12	$2,644.62	$220.39	$2,449.32	$204.11	0	2	4	$2.309864
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	241	Bemidji-Audubon-T-Lk Park Audubon-2889 - 000G97 - 241	414	$3,135.99	$7.57	$2,904.40	$7.02	0	2	4	$0.846337
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	310	$6,213.39	$20.04	$5,754.53	$18.56	0	2	4	$1.268578
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	245	Bemidji-Frazee-C-Frazee-Vergas-0023 - 000G97 - 245	459	$3,971.83	$8.65	$3,678.51	$8.01	0	2	4	$0.903633
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	90	$1,151.59	$12.80	$1,066.55	$11.85	0	2	4	$1.073718
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	4,125	$78,446.41	$19.02	$72,653.16	$17.61	0	2	4	$1.245759
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	198	$1,366.42	$6.90	$1,265.51	$6.39	0	2	4	$0.805501
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	215	$2,363.90	$10.99	$2,189.32	$10.18	0	2	4	$1.007748
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	257	Wadena-Motley-C-Staples-Motley-2170 - 000G89 - 257	2,000	$24,688.08	$12.34	$22,864.87	$11.43	0	2	4	$1.058046
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	1,166	$13,064.84	$11.20	$12,100.00	$10.38	0	2	4	$1.016197
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	260	Bemidji-McDonaldsville-T-Ada-Borup-2854 - 000G97 - 260	660	$4,571.03	$6.93	$4,233.46	$6.41	0	2	4	$0.806858
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	262	Wadena-Compton-T-Wadena-Deer Creek-2155 - 000G89 - 262	944	$7,994.80	$8.47	$7,404.38	$7.84	0	2	4	$0.894316
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	2,051	$59,839.66	$29.18	$55,420.51	$27.02	0	2	4	$1.431685
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	272	Wadena-Lake-T-Warroad-0690 - 000G89 - 272	647	$6,100.41	$9.43	$5,649.90	$8.73	0	2	4	$0.941014
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	1,124	$20,532.91	$18.27	$19,016.56	$16.92	0	2	4	$1.228400
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	275	Wadena-Warroad-C-Warroad-0690 - 000G89 - 275	450	$4,088.10	$9.08	$3,786.19	$8.41	0	2	4	$0.924796
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	277	Wadena-Bertha-C-Bertha-Hewitt-0786 - 000G89 - 277	211	$4,360.56	$20.67	$4,038.53	$19.14	0	2	4	$1.281942
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	127	$4,515.74	$35.56	$4,182.26	$32.93	0	2	4	$1.517592
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	683	$7,723.24	$11.31	$7,152.88	$10.47	0	2	4	$1.019947
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	710	$8,869.60	$12.49	$8,214.57	$11.57	0	2	4	$1.063333
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	107	$2,171.58	$20.30	$2,011.21	$18.80	0	2	4	$1.274158
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	5,726	$46,277.03	$8.08	$42,859.47	$7.49	0	2	4	$0.874482
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	307	Pine City-Pokegama-T-Pine City-0578 - 000G98 - 307	6	$2,275.46	$379.24	$2,107.42	$351.24	0	2	4	$2.545604
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	313	Worthington-Mountain Lake-C-Mountain Lake-0173 - 000G99 - 313	12,711	$288,561.93	$22.70	$267,251.68	$21.03	0	2	4	$1.322839
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	322	Wadena-Staples-T-Staples-Motley-2170- 000G89 - 322	256	$7,138.53	$27.88	$6,611.35	$25.83	0	2	4	$1.412124
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	330	Rosemount-Lakeville-C-Rosemnt-Apple Vly-0196 - 000G93 - 330	10,515	$66,321.95	$6.31	$61,424.08	$5.84	0	2	4	$0.766413
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	376	Rochester-Mayville-T-Caledonia - 000G95 - 376	18	$2,305.61	$128.09	$2,135.34	$118.63	0	2	4	$2.074195
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	3,674	$68,892.95	$18.75	$63,805.21	$17.37	0	2	4	$1.239800
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2012	443	Rochester-Leroy-T-Leroy-Ostrander - 000G95 - 443	2	$37.50	$18.75	$34.73	$17.37	0	2	4	$1.239800
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2012	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	18	$7,572.47	$420.69	$7,013.24	$389.62	0	3	9	$2.590641
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2012	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	16	$26,504.91	$1,656.56	$24,547.53	$1,534.22	0	3	9	$3.185888
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2012	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	5	$2,538.99	$507.80	$2,351.49	$470.30	0	3	9	$2.672375

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2012	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	2	$421.52	$210.76	$390.39	$195.20	0	3	9	$2.290480
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2012	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	2	$19.41	$9.71	$17.98	$8.99	0	3	9	$0.953760
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	310	$13,060.01	$42.13	$12,095.53	$39.02	0	4	16	$1.591287
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	5,198	$154,392.27	$29.70	$142,990.42	$27.51	0	4	16	$1.439491
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	2,350	$46,194.20	$19.66	$42,782.76	$18.21	0	4	16	$1.260310
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	10	$3,127.65	$312.77	$2,896.67	$289.67	0	4	16	$2.461904
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	30	Rosemount-Elko-C-Lakeville-0194 - 000G93 - 030	4	$2,159.39	$539.85	$1,999.92	$499.98	0	4	16	$2.698953
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	32	Rosemount-New Market-T-New Prague-0721 - 000G93 - 032	4	$4,054.40	$1,013.60	$3,754.98	$938.75	0	4	16	$2.972550
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	59	$1,189.27	$20.16	$1,101.44	$18.67	0	4	16	$1.271144
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	6,655	$188,616.41	$28.34	$174,687.12	$26.25	0	4	16	$1.419129
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	62	Worthington-Cottonwood-C-Lakeview-2167 - 000G99 - 062	2,675	$21,241.57	$7.94	$19,672.88	$7.35	0	4	16	$0.866287
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	64	Worthington-Lucas-T-Lakeview-2167 - 000G99 - 064	1,807	$14,348.98	$7.94	$13,289.31	$7.35	0	4	16	$0.866287
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	2,262	$75,756.95	$33.49	$70,162.31	$31.02	0	4	16	$1.491642
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	415	$13,426.22	$32.35	$12,434.70	$29.96	0	4	16	$1.476542
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	93	Fairmont-New Richland-C-NRHEG-2168 - 000G94 - 093	19	$473.86	$24.94	$438.87	$23.10	0	4	16	$1.363612
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	101	Rochester-Hayfield-T-Hayfield-0203 - 000G95 - 101	2,443	$31,126.45	$12.74	$28,827.77	$11.80	0	4	16	$1.071882
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	238	$3,961.78	$16.65	$3,669.20	$15.42	0	4	16	$1.188084
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	5	$100.46	$20.09	$93.04	$18.61	0	4	16	$1.269746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	106	Rochester-West Concord-C-Triton-2125 - 000G95 - 106	39	$3,638.53	$93.30	$3,369.83	$86.41	0	4	16	$1.936564
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	2,413	$77,252.95	$32.02	$71,547.83	$29.65	0	4	16	$1.472025
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	2	$49.73	$24.87	$46.06	$23.03	0	4	16	$1.362294
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	653	$23,104.21	$35.38	$21,397.97	$32.77	0	4	16	$1.515476
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	381	$28,486.21	$74.77	$26,382.51	$69.25	0	4	16	$1.840420
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	315	$3,270.79	$10.38	$3,029.24	$9.62	0	4	16	$0.983175
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	1,283	$40,373.10	$31.47	$37,391.55	$29.14	0	4	16	$1.464490
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	148	Rochester-Dover-C-Dover-Eyota-0533 - 000G95 - 148	11	($43.82)	($3.98)	($40.58)	($3.69)	0	4	16	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	153	Rochester-Haverhill-T-Rochester-0535 - 000G95 - 153	1,334	$99,066.93	$74.26	$91,750.84	$68.78	0	4	16	$1.837462
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	159	Rochester-Oronoco-C-Rochester-0535 - 000G95 - 159	4	$4,992.76	$1,248.19	$4,624.05	$1,156.01	0	4	16	$3.062962
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	15,774	$493,672.71	$31.30	$457,215.07	$28.99	0	4	16	$1.462248
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	790	$10,749.73	$13.61	$9,955.86	$12.60	0	4	16	$1.100371
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	1,225	$11,565.86	$9.44	$10,711.72	$8.74	0	4	16	$0.941511
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	167	Rochester-Elgin-C-Elgin-Millville-2899 - 000G95 - 167	212	$2,050.51	$9.67	$1,899.08	$8.96	0	4	16	$0.952308
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	493	$17,691.74	$35.89	$16,385.21	$33.24	0	4	16	$1.521661
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	6	$2,950.02	$491.67	$2,732.17	$455.36	0	4	16	$2.658355
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	1,423	$15,768.70	$11.08	$14,604.18	$10.26	0	4	16	$1.011147
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	220	Cloquet-Buhl-C-Mt Iron-Buhl-0712 - 000G96 - 220	2,282	$32,925.71	$14.43	$30,494.15	$13.36	0	4	16	$1.125806
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	9	$3,591.09	$399.01	$3,325.89	$369.54	0	4	16	$2.567661
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	679	$20,756.20	$30.57	$19,223.36	$28.31	0	4	16	$1.451940
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	882	$19,746.26	$22.39	$18,288.00	$20.73	0	4	16	$1.316599
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	949	$31,539.05	$33.23	$29,209.89	$30.78	0	4	16	$1.488269
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	260	$6,305.33	$24.25	$5,839.68	$22.46	0	4	16	$1.351410
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	313	Worthington-Mountain Lake-C-Mountain Lake-0173 - 000G99 - 313	4,324	$118,095.14	$27.31	$109,373.83	$25.29	0	4	16	$1.402949
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	340	Rosemount-New Market-T-Lakeville-0194 - 000G93 - 340	15	($121.36)	($8.09)	($112.40)	($7.49)	0	4	16	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	356	Rosemount-Cedar Lk-T-Jordan - 000G93 - 356	4	$4,054.41	$1,013.60	$3,754.99	$938.75	0	4	16	$2.972550
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	418	Rochester-Adams-C-Southland - 000G95 - 418	83	$2,077.30	$25.03	$1,923.90	$23.18	0	4	16	$1.365113
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	5,690	$142,407.32	$25.03	$131,890.56	$23.18	0	4	16	$1.365113
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2012	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	316	$7,908.73	$25.03	$7,324.67	$23.18	0	4	16	$1.365113
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2012	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	1,710	$125,312.87	$73.28	$116,058.53	$67.87	0	6	36	$1.831678
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2012	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	704	$24,459.04	$34.74	$22,652.74	$32.18	0	6	36	$1.507586
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2012	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	950	$33,192.09	$34.94	$30,740.86	$32.36	0	6	36	$1.510009
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2012	167	Rochester-Elgin-C-Elgin-Millville-2899 - 000G95 - 167	7,887	$254,475.22	$32.27	$235,682.26	$29.88	0	6	36	$1.475381
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2012	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	3	$5,192.93	$1,730.98	$4,809.43	$1,603.14	0	6	36	$3.204971
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2012	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	125	$12,053.74	$96.43	$11,163.57	$89.31	0	6	36	$1.950900
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2012	340	Rosemount-New Market-T-Lakeville-0194 - 000G93 - 340	6	$10,805.07	$1,800.85	$10,007.12	$1,667.85	0	6	36	$3.222157
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2012	206	Cloquet-Keewatin-C-Nashwauk-Keewatin-0319 - 000G96 - 206	3	$6,827.26	$2,275.75	$6,323.07	$2,107.69	1	1.25	1.5625	$3.323807
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2012	209	Cloquet-Nashwauk-C-Nashwauk-Keewatin-0319 - 000G96 - 209	3	$7,298.61	$2,432.87	$6,759.61	$2,253.20	1	1.25	1.5625	$3.352800
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2012	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	3	$1,623.90	$541.30	$1,503.98	$501.33	1	1.25	1.5625	$2.700124
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	2012	179	Cloquet-Barnum-C-Barnum-0091 - 000G96 - 179	4	$2,996.61	$749.15	$2,775.31	$693.83	1	1	1	$2.841253
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	1	Pine City-Mayhew Lake-T-Sauk Rapids-0047 - 000G98 - 001	10	$5,997.00	$599.70	$5,554.12	$555.41	1	2	4	$2.744614
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	198	$28,445.15	$143.66	$26,344.48	$133.05	1	2	4	$2.124015
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	25	$7,518.78	$300.75	$6,963.52	$278.54	1	2	4	$2.444888
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	29	Rosemount-Webster-T-Northfield-0659 - 000G93 - 029	11	$6,940.69	$630.97	$6,428.12	$584.37	1	2	4	$2.766688
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	4	$159.71	$39.93	$147.92	$36.98	1	2	4	$1.567967
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	18	$11,807.12	$655.95	$10,935.17	$607.51	1	2	4	$2.783553
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	2	$2,374.79	$1,187.40	$2,199.41	$1,099.71	1	2	4	$3.041278
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	11	$19,488.50	$1,771.68	$18,049.27	$1,640.84	1	2	4	$3.215066
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	11	$10,698.55	$972.60	$9,908.46	$900.77	1	2	4	$2.954614

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	106	Rochester-West Concord-C-Triton-2125 - 000G95 - 106	41	$8,927.47	$217.74	$8,268.18	$201.66	1	2	4	$2.304620
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	2	$5,994.61	$2,997.31	$5,551.91	$2,775.96	1	2	4	$3.443413
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	23	$4,420.77	$192.21	$4,094.30	$178.01	1	2	4	$2.250444
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	124	Fairmont-Hayward-C-Albert Lea-0241 - 000G94 - 124	204	$37,253.76	$182.62	$34,502.57	$169.13	1	2	4	$2.228221
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	134	Rochester-Houston-C-Houston-0294 - 000G95 - 134	43	$15,145.10	$352.21	$14,026.64	$326.20	1	2	4	$2.513484
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	42	$14,531.23	$345.98	$13,458.10	$320.43	1	2	4	$2.505733
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	78	$12,606.98	$161.63	$11,675.96	$149.69	1	2	4	$2.175193
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	7	$1,000.36	$142.91	$926.48	$132.35	1	2	4	$2.121724
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	2,517	$137,348.76	$54.57	$127,205.55	$50.54	1	2	4	$1.703635
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	38	$10,245.02	$269.61	$9,488.43	$249.70	1	2	4	$2.397419
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	2	$5,266.85	$2,633.43	$4,877.89	$2,438.95	1	2	4	$3.387203
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	171	Rochester-Lewiston-C-Lewiston-Altura-0857 - 000G95 - 171	2	$6,254.63	$3,127.32	$5,792.73	$2,896.37	1	2	4	$3.461854
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	14	$3,601.73	$257.27	$3,335.74	$238.27	1	2	4	$2.377069
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	2	$3,584.88	$1,792.44	$3,320.14	$1,660.07	1	2	4	$3.220126
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	134	$7,265.44	$54.22	$6,728.89	$50.22	1	2	4	$1.700877
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	1	$6,000.75	$6,000.75	$5,557.60	$5,557.60	1	2	4	$3.744887
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	18	$2,444.92	$135.83	$2,264.36	$125.80	1	2	4	$2.099681
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	242	Bemidji-Burlington-T-Frazee-Vergas-0023 - 000G97 - 242	18	$16,211.77	$900.65	$15,014.53	$834.14	1	2	4	$2.921239
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	106	$8,273.92	$78.06	$7,662.89	$72.29	1	2	4	$1.859078
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	266	Wadena-Rocksbury-T-Thief River Falls-0564 - 000G89 - 266	199	$28,270.86	$142.06	$26,183.06	$131.57	1	2	4	$2.119157
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	277	Wadena-Bertha-C-Bertha-Hewitt-0786 - 000G89 - 277	1,048	$54,675.60	$52.17	$50,637.82	$48.32	1	2	4	$1.684127
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2012	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	114	$5,605.87	$49.17	$5,191.88	$45.54	1	2	4	$1.658393
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2012	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	107	$47,378.30	$442.79	$43,879.42	$410.09	1	3	9	$2.612879
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2012	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	121	$23,604.11	$195.08	$21,860.95	$180.67	1	4	16	$2.256886
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2012	15	Pine City-Mora-C-Mora-0332 - 000G98 - 015	18	$12,265.49	$681.42	$11,359.69	$631.09	1	4	16	$2.800091
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2012	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	9	$9,072.88	$1,008.10	$8,402.85	$933.65	1	4	16	$2.970184
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2012	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	2	$2,298.00	$1,149.00	$2,128.29	$1,064.15	1	4	16	$3.027003
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2012	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	6	$428.55	$71.43	$396.90	$66.15	1	4	16	$1.820530
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2012	106	Rochester-West Concord-C-Triton-2125 - 000G95 - 106	41	$20,998.49	$512.16	$19,447.75	$474.34	1	4	16	$2.676090
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2012	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	24	$7,968.07	$332.00	$7,379.63	$307.48	1	4	16	$2.487817
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2012	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	65	$12,625.09	$194.23	$11,692.73	$179.89	1	4	16	$2.255007
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2012	134	Rochester-Houston-C-Houston-0294 - 000G95 - 134	31	$14,745.57	$475.66	$13,656.61	$440.54	1	4	16	$2.643985
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2012	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	11	$2,273.38	$206.67	$2,105.49	$191.41	1	4	16	$2.281965
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2012	154	Rochester-High Forest-T-Stewartville-0534 - 000G95 - 154	26	$1,812.54	$69.71	$1,678.68	$64.56	1	4	16	$1.809964
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2012	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	246	$69,468.52	$282.39	$64,338.28	$261.54	1	4	16	$2.417538
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2012	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	59	$26,057.72	$441.66	$24,133.36	$409.04	1	4	16	$2.611766
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2012	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	417	$37,373.01	$89.62	$34,613.02	$83.00	1	4	16	$1.919078
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2012	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	76	$12,753.65	$167.81	$11,811.79	$155.42	1	4	16	$2.191507
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2012	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	305	$39,323.74	$128.93	$36,419.69	$119.41	1	4	16	$2.077041
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2012	418	Rochester-Adams-C-Southland - 000G95 - 418	160	$34,314.99	$214.47	$31,780.84	$198.63	1	4	16	$2.298045
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2012	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	19	$34,404.04	$1,810.74	$31,863.31	$1,677.02	1	6	36	$3.224538
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2012	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	268	$75,162.46	$280.46	$69,611.71	$259.75	1	6	36	$2.414556
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2012	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	1,093	$96,981.63	$88.73	$89,819.55	$82.18	1	6	36	$1.914766
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2012	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	579	$139,532.04	$240.99	$129,227.62	$223.19	1	6	36	$2.348675
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2012	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	1,444	$198,797.45	$137.67	$184,116.29	$127.50	1	6	36	$2.105510
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	2012	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	1,974	$192,589.30	$97.56	$178,366.60	$90.36	1	8	64	$1.955976
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	2012	154	Rochester-High Forest-T-Stewartville-0534 - 000G95 - 154	84	$7,998.71	$95.22	$7,408.01	$88.19	1	8	64	$1.945419
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	2012	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	2,018	$192,159.58	$95.22	$177,968.62	$88.19	1	8	64	$1.945419
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2013	33	Rosemount-Spring Lk-T-Prior Lk-Savage-0719 - 000G93 - 033	1	$2,114.00	$2,114.00	$1,984.31	$1,984.31	0	1	1	$3.297610
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2013	97	Rochester-Claremont-C-Triton-2125 - 000G95 - 097	2	$4,017.79	$2,008.90	$3,771.30	$1,885.65	0	1	1	$3.275461
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2013	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	1	$0.15	$0.15	$0.14	$0.14	0	1	1	($0.853872)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2013	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	2	$4,021.53	$2,010.77	$3,774.81	$1,887.41	0	1	1	$3.275866
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2013	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	3	$205.50	$68.50	$192.89	$64.30	0	1	1	$1.808211
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2013	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	2	$2,126.01	$1,063.01	$1,995.58	$997.79	0	1	1	$2.999039
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2013	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	2	$3,346.56	$1,673.28	$3,141.25	$1,570.63	0	1	1	$3.196074
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2013	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	4	$4,443.40	$1,110.85	$4,170.79	$1,042.70	0	1	1	$3.018159
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2013	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	2	$1,133.16	$566.58	$1,063.64	$531.82	0	1	1	$2.725765
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2013	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	2	$1,480.52	$740.26	$1,389.69	$694.85	0	1	1	$2.841891
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2013	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	2	$1,136.64	$568.32	$1,066.91	$533.46	0	1	1	$2.727102
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2013	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	1	$0.20	$0.20	$0.19	$0.19	0	1	1	($0.721246)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2013	307	Pine City-Pokegama-T-Pine City-0578 - 000G98 - 307	1	$1,367.35	$1,367.35	$1,283.47	$1,283.47	0	1	1	$3.108386
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2013	352	Rosemount-Eureka-T-Northfield SD - 000G93 - 352	2	$3,833.32	$1,916.66	$3,598.15	$1,799.08	0	1	1	$3.255050
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	5	$5,053.82	$1,010.76	$4,743.78	$948.76	0	2	4	$2.977156
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	6	Pine City-Rusheba-T-Rush City-0139 - 000G98 - 006	415	$2,633.21	$6.35	$2,471.66	$5.96	0	2	4	$0.775246
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	7,339	$58,452.21	$7.96	$54,866.18	$7.48	0	2	4	$0.873902
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	13,446	$181,558.78	$13.50	$170,420.19	$12.67	0	2	4	$1.102777
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	10,727	$182,351.58	$17.00	$171,164.37	$15.96	0	2	4	$1.203033

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	2,860	$65,926.77	$23.05	$61,882.18	$21.64	0	2	4	$1.335257
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	12	Rosemount-Cannon Falls-T-Cannon Falls-0252 - 000G93 - 012	1,025	$18,686.69	$18.23	$17,540.27	$17.11	0	2	4	$1.233250
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	6,462	$65,536.29	$10.14	$61,515.66	$9.52	0	2	4	$0.978637
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	19	Pine City-Hinckley-T-Hinckley-Finlayson - 2165 - 000G98 - 019	168	$2,072.05	$12.33	$1,944.93	$11.58	0	2	4	$1.063709
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	3	$2,580.63	$860.21	$2,422.31	$807.44	0	2	4	$2.907110
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	33	Rosemount-Spring Lk-T-Prior Lk-Savage-0719 - 000G93 - 033	311	$7,434.70	$23.91	$6,978.58	$22.44	0	2	4	$1.351023
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	37	Worthington-Great Bend-T-Windom-0177 - 000G99 - 037	1,062	$17,206.36	$16.20	$16,150.76	$15.21	0	2	4	$1.182129
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	1,841	$41,567.87	$22.58	$39,017.70	$21.19	0	2	4	$1.326131
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	63	$3,984.24	$63.24	$3,739.81	$59.36	0	2	4	$1.773494
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	4,239	$84,851.18	$20.02	$79,645.60	$18.79	0	2	4	$1.273927
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	54	Fairmont-Lakefield-C-Jackson Cty Central-2895 - 000G94 - 054	3,111	$43,720.43	$14.05	$41,038.20	$13.19	0	2	4	$1.120245
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	59	Worthington-Ivanhoe-C-Ivanhoe-0403 - 000G99 - 059	6	($8,597.37)	($1,432.90)	($8,069.92)	($1,344.99)	0	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	14,693	$319,858.17	$21.77	$300,234.96	$20.43	0	2	4	$1.310268
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	74	Fairmont-Sherburn-C-Martin Cty W-2448 - 000G94 - 074	178	$2,155.45	$12.11	$2,023.22	$11.37	0	2	4	$1.055760
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	1,374	$64,770.27	$47.14	$60,796.63	$44.25	0	2	4	$1.645913
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	97	Rochester-Claremont-C-Triton-2125 - 000G95 - 097	7	($230.51)	($32.93)	($216.36)	($30.91)	0	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	332	$7,074.32	$21.31	$6,640.32	$20.00	0	2	4	$1.301030
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	106	Rochester-West Concord-C-Triton-2125 - 000G95 - 106	679	$16,684.68	$24.57	$15,661.08	$23.06	0	2	4	$1.362859
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	114	Rochester-Lanesboro-C-Lanesboro-0229 - 000G95 - 114	59	$10,343.11	$175.31	$9,708.56	$164.55	0	2	4	$2.216298
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	115	Rochester-Mabel-C-Mabel-Canton-0238 - 000G95 - 115	134	$5,966.46	$44.53	$5,600.42	$41.79	0	2	4	$1.621072
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	5	$103.94	$20.79	$97.56	$19.51	0	2	4	$1.290257
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	123	Fairmont-Glenville-C-Glenville-Emmons-2886 - 000G94 - 123	3	$60.58	$20.19	$56.86	$18.95	0	2	4	$1.277609
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	126	Rochester-Kenyon-C-Kenyon-Wanamingo-2172 - 000G95 - 126	245	$7,949.55	$32.45	$7,461.85	$30.46	0	2	4	$1.483730
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	494	$32,256.96	$65.30	$30,278.01	$61.29	0	2	4	$1.787390
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	159	$3,856.34	$24.25	$3,619.75	$22.77	0	2	4	$1.357363
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	175	$3,963.83	$22.65	$3,720.65	$21.26	0	2	4	$1.327563
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	887	$29,066.60	$32.77	$27,283.37	$30.76	0	2	4	$1.487986
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	140	Rochester-Brownsdale-C-Hayfield-0203 - 000G95 - 140	211	$2,779.69	$13.17	$2,609.16	$12.37	0	2	4	$1.092370
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	1,499	$13,280.00	$8.86	$12,465.27	$8.32	0	2	4	$0.920123
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	450	$5,134.48	$11.41	$4,819.48	$10.71	0	2	4	$1.029789
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	148	Rochester-Dover-C-Dover-Eyota-0533 - 000G95 - 148	1,833	$49,905.80	$27.23	$46,844.09	$25.56	0	2	4	$1.407561
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	153	Rochester-Haverhill-T-Rochester-0535 - 000G95 - 153	91	$2,418.00	$26.57	$2,269.66	$24.94	0	2	4	$1.396896
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	154	Rochester-High Forest-T-Stewartville-0534 - 000G95 - 154	1,677	$8,528.42	$5.09	$8,005.20	$4.77	0	2	4	$0.678518
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	156	Rochester-Marion-T-Rochester-0535 - 000G95 - 156	3,067	$21,156.56	$6.90	$19,858.61	$6.47	0	2	4	$0.810904
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	159	Rochester-Oronoco-C-Rochester-0535 - 000G95 - 159	3,243	$39,420.67	$12.16	$37,002.21	$11.41	0	2	4	$1.057286
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	23,209	$269,440.74	$11.61	$252,910.66	$10.90	0	2	4	$1.037426
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	2,944	$61,771.43	$20.98	$57,981.78	$19.69	0	2	4	$1.294246
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	169	Rochester-Plainview-T-Plainview-2899 - 000G95 - 169	1,430	$24,231.35	$16.95	$22,744.76	$15.91	0	2	4	$1.201670
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	180	Cloquet-Carlton-C-Carlton-0093 - 000G96 - 180	206	$6,885.37	$33.42	$6,462.95	$31.37	0	2	4	$1.496515
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	2,018	$26,261.97	$13.01	$24,650.79	$12.22	0	2	4	$1.087071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	6,221	$198,992.16	$31.99	$186,784.05	$30.02	0	2	4	$1.477411
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	482	$25,805.48	$53.54	$24,222.32	$50.25	0	2	4	$1.701136
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	190	Cloquet-Twin Lakes-T-Carlton-0093 - 000G96 - 190	887	$10,279.86	$11.59	$9,649.19	$10.88	0	2	4	$1.036629
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	198	Cloquet-Bovey-C-Greenway-0316 - 000G96 - 198	292	$4,713.33	$16.14	$4,424.18	$15.15	0	2	4	$1.180413
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	201	Cloquet-Coleraine-C-Greenway-0316 - 000G96 - 201	345	$12,492.47	$36.21	$11,726.06	$33.99	0	2	4	$1.531351
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	5,462	$90,205.88	$16.52	$84,671.79	$15.50	0	2	4	$1.190332
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	206	Cloquet-Keewatin-C-Nashwauk-Keewatin-0319 - 000G96 - 206	1,336	$31,007.35	$23.21	$29,105.06	$21.79	0	2	4	$1.338257
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	207	Cloquet-Laprairie-C-Greenway-0316 - 000G96 - 207	1,066	$9,062.22	$8.50	$8,506.26	$7.98	0	2	4	$0.902003
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	18	$3,602.31	$200.13	$3,381.31	$187.85	0	2	4	$2.273811
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	213	Cloquet-Ranier-C-International Falls-0361 - 000G96 - 213	273	$9,149.31	$33.51	$8,588.00	$31.46	0	2	4	$1.497759
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	214	Cloquet-S InternationalFalls-C-Intrntnl-361 - 000G96 - 214	159	$2,696.35	$16.96	$2,530.93	$15.92	0	2	4	$1.201943
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	215	Cloquet-Silver Bau-C-Lake Superior-0381 - 000G96 - 215	3,956	$85,257.40	$21.55	$80,026.88	$20.23	0	2	4	$1.305996
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	20	$1,884.80	$94.24	$1,769.17	$88.46	0	2	4	$1.946747
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	221	Cloquet-Canosia-T-Proctor-0704 - 000G96 - 221	276	$2,261.98	$8.20	$2,123.21	$7.69	0	2	4	$0.885926
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	130	$2,853.85	$21.95	$2,678.77	$20.61	0	2	4	$1.314078
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	704	$36,445.57	$51.77	$34,209.65	$48.59	0	2	4	$1.686547
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	225	Cloquet-Fayal-T-Eveleth-Gilbert-2154 - 000G96 - 225	496	$2,867.64	$5.78	$2,691.71	$5.43	0	2	4	$0.734800
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	4,082	$59,763.11	$14.64	$56,096.66	$13.74	0	2	4	$1.137987
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	3,182	$22,724.05	$7.14	$21,329.94	$6.70	0	2	4	$0.826075
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	474	$4,114.22	$8.68	$3,861.82	$8.15	0	2	4	$0.911158
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	240	Bemidji-Audubon-C-Lk Park Audubon-2889 - 000G97 - 240	5	$5,437.80	$1,087.56	$5,104.19	$1,020.84	0	2	4	$3.008958
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	227	$1,651.47	$7.28	$1,550.15	$6.83	0	2	4	$0.834421
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	245	Bemidji-Frazee-C-Frazee-Vergas-0023 - 000G97 - 245	1,828	$13,193.55	$7.22	$12,384.13	$6.77	0	2	4	$0.830589
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	246	Bemidji-Lake View-T-Detroit Lakes-0022 - 000G97 - 246	2,314	$14,514.76	$6.27	$13,624.29	$5.89	0	2	4	$0.770115
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	541	$3,276.27	$6.06	$3,075.26	$5.68	0	2	4	$0.754348
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	4,639	$44,245.25	$9.54	$41,530.81	$8.95	0	2	4	$0.951823
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	1,027	$8,401.67	$8.18	$7,886.23	$7.68	0	2	4	$0.885361

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	255	Wadena-Baudette-C-Lake of Woods-0390 - 000G89 - 255	567	$5,426.72	$9.57	$5,093.79	$8.98	0	2	4	$0.953276
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	260	Bemidji-McDonaldsville-T-Ada-Borup-2854 - 000G97 - 260	194	$3,533.66	$18.21	$3,316.87	$17.10	0	2	4	$1.232996
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	266	Wadena-Rocksbury-T-Thief River Falls-0564 - 000G89 - 266	406	$3,702.12	$9.12	$3,475.00	$8.56	0	2	4	$0.932474
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	540	$52,802.24	$97.78	$49,562.84	$91.78	0	2	4	$1.962748
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	272	Wadena-Lake-T-Warroad-0690 - 000G89 - 272	172	$1,167.05	$6.79	$1,095.45	$6.37	0	2	4	$0.804139
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	64	$76,365.75	$1,193.21	$71,680.74	$1,120.01	0	2	4	$3.049222
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	275	Wadena-Warroad-C-Warroad-0690 - 000G89 - 275	1,852	$18,994.59	$10.26	$17,829.28	$9.63	0	2	4	$0.983626
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	277	Wadena-Bertha-C-Bertha-Hewitt-0786 - 000G89 - 277	115	$1,152.16	$10.02	$1,081.48	$9.40	0	2	4	$0.973128
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	83	$2,055.01	$24.76	$1,928.94	$23.24	0	2	4	$1.366236
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	283	Wadena-Aldrich-T-Verndale-818 - 000G89 - 283	6,494	$23,369.36	$3.60	$21,935.66	$3.38	0	2	4	$0.528917
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	285	Wadena-Menahga-C-Menahga-821 - 000G89 - 285	2,248	$41,289.26	$18.37	$38,756.18	$17.24	0	2	4	$1.236537
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	600	$4,583.63	$7.64	$4,302.43	$7.17	0	2	4	$0.855519
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	293	Rosemount-Castle Rock-T-Farmington-0192 - 000G93 - 293	1,155	$15,886.83	$13.75	$14,912.17	$12.91	0	2	4	$1.110926
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	1,470	$51,311.35	$34.91	$48,163.41	$32.76	0	2	4	$1.515344
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	3,364	$33,173.76	$9.86	$31,138.56	$9.26	0	2	4	$0.966611
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	7,379	$78,135.90	$10.59	$73,342.29	$9.94	0	2	4	$0.997386
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	2,924	$20,543.88	$7.03	$19,283.52	$6.59	0	2	4	$0.818885
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	307	Pine City-Pokegama-T-Pine City-0578 - 000G98 - 307	215	$13,938.99	$64.83	$13,083.84	$60.86	0	2	4	$1.784332
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	313	Worthington-Mountain Lake-C-Mountain Lake-0173 - 000G99 - 313	5	($1,027.28)	($205.46)	($964.26)	($192.85)	0	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	330	Rosemount-Lakeville-C-Rosemnt-Apple Vly-0196 - 000G93 - 330	3,265	$18,427.27	$5.64	$17,296.76	$5.30	0	2	4	$0.724276
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	352	Rosemount-Eureka-T-Northfield SD - 000G93 - 352	99	$2,148.89	$21.71	$2,017.06	$20.37	0	2	4	$1.308991
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	358	Rosemount-Stanton-T-Randolph - 000G93 - 358	539	$7,785.09	$14.44	$7,307.48	$13.56	0	2	4	$1.132260
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	369	Wadena-Wadena-T-Wadena-Deer Creek-2155 - 000G89 - 369	119	$1,034.80	$8.70	$971.32	$8.16	0	2	4	$0.911690
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	4,754	$96,005.92	$20.19	$90,115.99	$18.96	0	2	4	$1.277838
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	461	Rochester-Rose Creek-C-Southland - 000G95 - 461	747	$15,085.49	$20.19	$14,160.00	$18.96	0	2	4	$1.277838
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2013	468	Rochester-Lyle-C-Lyle - 000G95 - 468	294	$5,937.27	$20.19	$5,573.02	$18.96	0	2	4	$1.277838
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2013	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	11	$11,852.39	$1,077.49	$11,125.25	$1,011.39	0	3	9	$3.004919
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2013	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	4	$10,685.50	$2,671.38	$10,029.95	$2,507.49	0	3	9	$3.399239
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2013	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	3	$10,944.73	$3,648.24	$10,273.27	$3,424.42	0	3	9	$3.534587
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	14	$31,144.03	$2,224.57	$29,233.35	$2,088.10	0	4	16	$3.319751
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	2,039	$101,366.98	$49.71	$95,148.15	$46.66	0	4	16	$1.668945
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	419	$16,834.06	$40.18	$15,801.30	$37.71	0	4	16	$1.576457
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	1,940	$49,889.28	$25.72	$46,828.59	$24.14	0	4	16	$1.382737
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	45	Fairmont-Emmons-C-Glenville-Emmons-2886 - 000G94 - 045	243	$8,147.49	$33.53	$7,647.64	$31.47	0	4	16	$1.497897
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	4,554	$191,100.54	$41.96	$179,376.59	$39.39	0	4	16	$1.595386
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	754	$26,937.96	$35.73	$25,285.32	$33.53	0	4	16	$1.525434
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	269	$10,154.78	$37.75	$9,531.79	$35.43	0	4	16	$1.549371
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	655	$16,202.05	$24.74	$15,208.06	$23.22	0	4	16	$1.365862
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	137	Rochester-Spring Grove-C-Spring Grove-0297 - 000G95 - 137	70	$2,941.84	$42.03	$2,761.36	$39.45	0	4	16	$1.596047
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	1,169	$39,079.68	$33.43	$36,682.15	$31.38	0	4	16	$1.496653
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	739	$15,005.58	$20.31	$14,084.99	$19.06	0	4	16	$1.280123
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	148	Rochester-Dover-C-Dover-Eyota-0533 - 000G95 - 148	500	$16,224.54	$32.45	$15,229.16	$30.46	0	4	16	$1.483730
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	207	$6,159.43	$29.76	$5,781.55	$27.93	0	4	16	$1.446071
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	154	Rochester-High Forest-T-Stewartville-0534 - 000G95 - 154	491	$7,368.39	$15.01	$6,916.34	$14.09	0	4	16	$1.148911
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	155	Rochester-Kalmar-T-Bryron-0531 - 000G95 - 155	10	$167.01	$16.70	$156.76	$15.68	0	4	16	$1.195346
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	159	Rochester-Oronoco-C-Rochester-0535 - 000G95 - 159	1,029	$35,535.58	$34.53	$33,355.48	$32.42	0	4	16	$1.510813
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	9,489	$208,888.30	$22.01	$196,073.05	$20.66	0	4	16	$1.315130
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	545	$27,962.73	$51.31	$26,247.23	$48.16	0	4	16	$1.682686
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	13	($380.54)	($29.27)	($357.19)	($27.48)	0	4	16	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	778	$20,327.25	$26.13	$19,080.18	$24.52	0	4	16	$1.389520
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	1,405	$10,234.39	$7.28	$9,606.51	$6.84	0	4	16	$0.835056
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	246	Bemidji-Lake View-T-Detroit Lakes-0022 - 000G97 - 246	9	$166.15	$18.46	$155.96	$17.33	0	4	16	$1.238799
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	3,147	$48,537.35	$15.42	$45,559.60	$14.48	0	4	16	$1.160769
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	18	$1,254.69	$69.71	$1,177.72	$65.43	0	4	16	$1.815777
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	179	$2,005.16	$11.20	$1,882.14	$10.51	0	4	16	$1.021603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	260	Bemidji-McDonaldsville-T-Ada-Borup-2854 - 000G97 - 260	2,156	$24,151.59	$11.20	$22,669.90	$10.51	0	4	16	$1.021603
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	4,155	$94,981.93	$22.86	$89,154.82	$21.46	0	4	16	$1.331630
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	275	Wadena-Warroad-C-Warroad-0690 - 000G89 - 275	140	$292.28	$2.09	$274.35	$1.96	0	4	16	$0.292256
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	285	Wadena-Menahga-C-Menahga-821 - 000G89 - 285	235	$7,706.59	$32.79	$7,233.79	$30.78	0	4	16	$1.488269
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	394	$18,933.24	$48.05	$17,771.69	$45.11	0	4	16	$1.654273
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2013	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	34	$29,315.60	$862.22	$27,517.09	$809.33	0	4	16	$2.908126
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2013	2	Pine City-Harris-C-North Branch-0138 - 000G98 - 002	8,414	$203,594.44	$24.20	$191,103.98	$22.71	0	6	36	$1.356217
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2013	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	12	$26,385.83	$2,198.82	$24,767.07	$2,063.92	0	6	36	$3.314693
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2013	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	1,755	$99,136.17	$56.49	$93,054.20	$53.02	0	6	36	$1.724440
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2013	37	Worthington-Great Bend-T-Windom-0177 - 000G99 - 037	4,342	$160,577.82	$36.98	$150,726.42	$34.71	0	6	36	$1.540455
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2013	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	3,366	$124,482.94	$36.98	$116,845.95	$34.71	0	6	36	$1.540455
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2013	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	854	$46,743.00	$54.73	$43,875.33	$51.38	0	6	36	$1.710794

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2013	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	220	$30,924.87	$140.57	$29,027.64	$131.94	0	6	36	$2.120376
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2013	155	Rochester-Kalmar-T-Bryron-0531 - 000G95 - 155	6,561	$137,732.32	$20.99	$129,282.48	$19.70	0	6	36	$1.294466
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2013	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	7,466	$269,051.35	$36.04	$252,545.13	$33.83	0	6	36	$1.529302
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2013	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	179	$37,394.53	$208.91	$35,100.39	$196.09	0	6	36	$2.292455
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	182	Plastic 8 in	2013	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	720	($24,974.98)	($34.69)	($23,442.77)	($32.56)	0	8	64	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2013	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	1	$8,261.94	$8,261.94	$7,755.07	$7,755.07	1	1.25	1.5625	$3.889586
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2013	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	61	$10,326.46	$169.29	$9,692.94	$158.90	1	1.25	1.5625	$2.201124
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	2013	2	Pine City-Harris-C-North Branch-0138 - 000G98 - 002	2	$15,294.47	$7,647.24	$14,356.16	$7,178.08	1	1	1	$3.856008
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	186	Steel 10 in	2013	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	136	$101,268.38	$744.62	$95,055.60	$698.94	1	10	100	$2.844440
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	187	Steel 12 in	2013	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	660	$369,682.44	$560.12	$347,002.54	$525.76	1	12	144	$2.720788
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2013	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	4	($1,413.65)	($353.41)	($1,326.92)	($331.73)	1	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2013	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	2	$2,497.90	$1,248.95	$2,344.65	$1,172.33	1	2	4	$3.069050
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2013	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	5	$589.89	$117.98	$553.70	$110.74	1	2	4	$2.044305
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2013	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	107	$13,338.76	$124.66	$12,520.43	$117.01	1	2	4	$2.068223
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2013	122	Rochester-Spring Valley-T-Kingsland-2137 - 000G95 - 122	3	$0.03	$0.01	$0.03	$0.01	1	2	4	($2.000000)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2013	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	8	$883.15	$110.39	$828.97	$103.62	1	2	4	$2.015444
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2013	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	96	$9,008.10	$93.83	$8,455.46	$88.08	1	2	4	$1.944877
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2013	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	216	$49,514.93	$229.24	$46,477.20	$215.17	1	2	4	$2.332782
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2013	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	4	$585.57	$146.39	$549.65	$137.41	1	2	4	$2.138018
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2013	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	1	$1,196.40	$1,196.40	$1,123.00	$1,123.00	1	2	4	$3.050380
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2013	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	7	$3,566.45	$509.49	$3,347.65	$478.24	1	2	4	$2.679646
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2013	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	43	$14,805.02	$344.30	$13,896.74	$323.18	1	2	4	$2.509444
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2013	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	44	($2,821.55)	($64.13)	($2,648.45)	($60.19)	1	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2013	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	17	$11,819.56	$695.27	$11,094.44	$652.61	1	2	4	$2.814654
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2013	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	296	$36,430.17	$123.07	$34,195.19	$115.52	1	2	4	$2.062657
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2013	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	221	$20,520.60	$92.85	$19,261.67	$87.16	1	2	4	$1.940317
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2013	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	180	$43,773.67	$243.19	$41,088.17	$228.27	1	2	4	$2.358449
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2013	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	7	$1,532.71	$218.96	$1,438.68	$205.53	1	2	4	$2.312875
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2013	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	135	$12,837.60	$95.09	$12,050.02	$89.26	1	2	4	$1.950657
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2013	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	1	$2,452.76	$2,452.76	$2,302.28	$2,302.28	1	2	4	$3.362158
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2013	283	Wadena-Aldrich-T-Verndale-818 - 000G89 - 283	753	$16,249.33	$21.58	$15,252.44	$20.26	1	2	4	$1.306639
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2013	420	Rochester-Adams-T-Southland - 000G95 - 420	1	$0.01	$0.01	$0.01	$0.01	1	2	4	($2.000000)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2013	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	2	$2,782.18	$1,391.09	$2,611.49	$1,305.75	1	3	9	$3.115860
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2013	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	4	$2,215.11	$553.78	$2,079.21	$519.80	1	3	9	$2.715836
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	194	Steel 3/4 in	2013	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	6	$19.97	$3.33	$18.74	$3.12	1	0.75	0.5625	$0.494155
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2013	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	5	$1,042.84	$208.57	$978.86	$195.77	1	4	16	$2.291746
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2013	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	64	$12,204.00	$190.69	$11,455.29	$178.99	1	4	16	$2.252829
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2013	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	3	$799.06	$266.35	$750.04	$250.01	1	4	16	$2.397957
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2013	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	1	$5,281.28	$5,281.28	$4,957.28	$4,957.28	1	4	16	$3.695243
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2013	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	15	$11,007.98	$733.87	$10,332.64	$688.84	1	4	16	$2.838118
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2013	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	3	$7,143.11	$2,381.04	$6,704.88	$2,234.96	1	4	16	$3.349270
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2013	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	25	$17,927.08	$717.08	$16,827.25	$673.09	1	4	16	$2.828073
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2013	256	Pine City-Green Prairie-T-Little Falls-0482 - 000G98 - 256	148	$12,208.45	$82.49	$11,459.47	$77.43	1	4	16	$1.888909
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2013	283	Wadena-Aldrich-T-Verndale-818 - 000G89 - 283	11,322	$422,021.25	$37.27	$396,130.38	$34.99	1	4	16	$1.543944
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2013	366	Wadena-Stowe Prairie-T-Verndale - 000G89 - 366	692	$25,793.91	$37.27	$24,211.46	$34.99	1	4	16	$1.543944
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2013	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	26	$29,128.73	$1,120.34	$27,341.69	$1,051.60	1	6	36	$3.021851
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2013	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	1,518	$238,042.48	$156.81	$223,438.65	$147.19	1	6	36	$2.167878
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2013	200	Cloquet-Cohasset-C-Grand Rapids-0318 - 000G96 - 200	470	$29,811.56	$63.43	$27,982.64	$59.54	1	6	36	$1.774809
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2013	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	1,967	$282,995.08	$143.87	$265,633.42	$135.04	1	6	36	$2.130462
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2013	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	20	$4,945.92	$247.30	$4,642.49	$232.12	1	6	36	$2.365713
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2013	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	29	$21,768.66	$750.64	$20,433.16	$704.59	1	6	36	$2.847936
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2013	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	2	$20,085.12	$10,042.56	$18,852.90	$9,426.45	1	6	36	$3.974348
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2013	275	Wadena-Warroad-C-Warroad-0690 - 000G89 - 275	705	$132,211.56	$187.53	$124,100.42	$176.03	1	6	36	$2.245587
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	174	Plastic 1 1/4 in	2014	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	1	$20.46	$20.46	$19.09	$19.09	0	1.25	1.5625	$1.280806
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	3	Pine City-Nessel-T-Rush City-0139 - 000G98 - 003	2	$3,419.23	$1,709.62	$3,189.89	$1,594.95	0	1	1	$3.202747
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	3	$1.89	$0.63	$1.76	$0.59	0	1	1	($0.229148)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	12	Rosemount-Cannon Falls-T-Cannon Falls-0252 - 000G93 - 012	2	($0.19)	($0.10)	($0.18)	($0.09)	0	1	1	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	2	$3,766.50	$1,883.25	$3,513.87	$1,756.94	0	1	1	$3.244757
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	54	Fairmont-Lakefield-C-Jackson Cty Central-2895 - 000G94 - 054	1	$1.55	$1.55	$1.45	$1.45	0	1	1	$0.161368
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	55	Worthington-Madison-C-Lac Qui Parle Valley-2853 - 000G99 - 055	2	$1,004.43	$502.22	$937.06	$468.53	0	1	1	$2.670737
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	4	$4,421.85	$1,105.46	$4,125.26	$1,031.32	0	1	1	$3.013393
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	2	$0.49	$0.25	$0.46	$0.23	0	1	1	($0.638272)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	93	Fairmont-New Richland-C-NRHEG-2168 - 000G94 - 093	6	$2,404.60	$400.77	$2,243.31	$373.89	0	1	1	$2.572744
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	95	Worthington-Canby-C-Canby-0891 - 000G99 - 095	10	$1,704.40	$170.44	$1,590.08	$159.01	0	1	1	$2.201424
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	3	$0.70	$0.23	$0.65	$0.22	0	1	1	($0.657577)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	2	$0.45	$0.23	$0.42	$0.21	0	1	1	($0.677781)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	122	Rochester-Spring Valley-T-Kingsland-2137 - 000G95 - 122	7	$35.02	$5.00	$32.67	$4.67	0	1	1	$0.669317

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	157	Rochester-New Haven-T-Pine Island-0255 - 000G95 - 157	1	$0.06	$0.06	$0.06	$0.06	0	1	1	($1.221849)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	2	$0.90	$0.45	$0.84	$0.42	0	1	1	($0.376751)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	176	Wadena-Aitkin-C-Aitkin-0001 - 000G89 - 176	2	$2,342.62	$1,171.31	$2,185.49	$1,092.75	0	1	1	$3.038521
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	3	$2,468.13	$822.71	$2,302.58	$767.53	0	1	1	$2.885095
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	2	$1,159.90	$579.95	$1,082.10	$541.05	0	1	1	$2.733237
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	2	$2,946.86	$1,473.43	$2,749.20	$1,374.60	0	1	1	$3.138176
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	194	Wadena-Deerwood-T-Crosby-Ironton-0182 - 000G89 - 194	2	$1,531.33	$765.67	$1,428.62	$714.31	0	1	1	$2.853887
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	207	Cloquet-Laprairie-C-Greenway-0316 - 000G96 - 207	6	$0.70	$0.12	$0.65	$0.11	0	1	1	($0.958607)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	4	$2,079.05	$519.76	$1,939.60	$484.90	0	1	1	$2.685652
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	2	$2,864.68	$1,432.34	$2,672.53	$1,336.27	0	1	1	$3.125894
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	1	$0.20	$0.20	$0.19	$0.19	0	1	1	($0.721246)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	220	Cloquet-Buhl-C-Mt Iron-Buhl-0712 - 000G96 - 220	2	$2,733.85	$1,366.93	$2,550.48	$1,275.24	0	1	1	$3.105592
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	252	Wadena-Straight River-T-Park Rapids-0309 - 000G89 - 252	1	$0.05	$0.05	$0.05	$0.05	0	1	1	($1.301030)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	275	Wadena-Warroad-C-Warroad-0690 - 000G89 - 275	1	$1,085.59	$1,085.59	$1,012.78	$1,012.78	0	1	1	$3.005515
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	1	$1,504.68	$1,504.68	$1,403.76	$1,403.76	0	1	1	$3.147293
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	2	$1,793.12	$896.56	$1,672.85	$836.43	0	1	1	$2.922430
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	293	Rosemount-Castle Rock-T-Farmington-0192 - 000G93 - 293	4	$7,425.34	$1,856.34	$6,927.30	$1,731.83	0	1	1	$3.238505
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	313	Worthington-Mountain Lake-C-Mountain Lake-0173 - 000G99 - 313	1	$1,289.52	$1,289.52	$1,203.03	$1,203.03	0	1	1	$3.080276
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2014	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	193	$965.41	$5.00	$900.66	$4.67	0	1	1	$0.669317
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	3	Pine City-Nessel-T-Rush City-0139 - 000G98 - 003	4	$106.02	$26.51	$98.91	$24.73	0	2	4	$1.393224
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	1,551	$14,525.28	$9.37	$13,551.02	$8.74	0	2	4	$0.941511
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	167	$5,290.45	$31.68	$4,935.60	$29.55	0	2	4	$1.470557
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	10,193	$95,573.83	$9.38	$89,163.40	$8.75	0	2	4	$0.942008
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	23,920	$293,564.85	$12.27	$273,874.54	$11.45	0	2	4	$1.058805
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	201	$1,780.66	$8.86	$1,661.23	$8.26	0	2	4	$0.916980
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	13	$219.90	$16.92	$205.15	$15.78	0	2	4	$1.198107
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	12	Rosemount-Cannon Falls-T-Cannon Falls-0252 - 000G93 - 012	2	($24.77)	($12.39)	($23.11)	($11.56)	0	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	15	Pine City-Mora-C-Mora-0332 - 000G98 - 015	1	$456.10	$456.10	$425.51	$425.51	0	2	4	$2.628910
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	209	$1,922.26	$9.20	$1,793.33	$8.58	0	2	4	$0.933487
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	110	$1,890.51	$17.19	$1,763.71	$16.03	0	2	4	$1.204934
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	30	Rosemount-Elko-C-Lakeville-0194 - 000G93 - 030	81	$1,450.87	$17.91	$1,353.56	$16.71	0	2	4	$1.222976
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	39	Worthington-Mountain Lake-T-Mountain Lake-0173 - 000G99 - 039	6,699	$50,880.45	$7.60	$47,467.74	$7.09	0	2	4	$0.850646
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	15	$1,908.16	$127.21	$1,780.17	$118.68	0	2	4	$2.074378
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	799	$13,103.80	$16.40	$12,224.88	$15.30	0	2	4	$1.184691
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	44	Fairmont-Alden-C-Alden-Conger-0242 - 000G94 - 044	847	$13,189.95	$15.57	$12,305.26	$14.53	0	2	4	$1.162266
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	207	$5,829.96	$28.16	$5,438.93	$26.28	0	2	4	$1.419625
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	54	Fairmont-Lakefield-C-Jackson Cty Central-2895 - 000G94 - 054	716	$7,934.04	$11.08	$7,401.88	$10.34	0	2	4	$1.014521
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	55	Worthington-Madison-C-Lac Qui Parle Valley-2853 - 000G99 - 055	420	$3,407.55	$8.11	$3,178.99	$7.57	0	2	4	$0.879096
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	56	Worthington-Madison-T-Lac Qui Parle Valley-2853 - 000G99 - 056	604	$7,029.71	$11.64	$6,558.21	$10.86	0	2	4	$1.035830
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	57	Worthington-Hendricks-C-Hendricks-0402 - 000G99 - 057	934	$6,563.42	$7.03	$6,123.19	$6.56	0	2	4	$0.816904
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	59	Worthington-Ivanhoe-C-Ivanhoe-0403 - 000G99 - 059	182	$1,378.96	$7.58	$1,286.47	$7.07	0	2	4	$0.849419
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	65	Worthington-Tracy-C-Tracy-0417 - 000G99 - 065	250	$5,744.61	$22.98	$5,359.30	$21.44	0	2	4	$1.331225
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	2,862	$68,455.56	$23.92	$63,864.04	$22.31	0	2	4	$1.348500
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	13,925	$321,730.40	$23.10	$300,150.92	$21.55	0	2	4	$1.333447
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	89	Fairmont-Ellendale-C-NRHEG-2168 - 000G94 - 089	2,805	$55,616.16	$19.83	$51,885.81	$18.50	0	2	4	$1.267172
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	93	Fairmont-New Richland-C-NRHEG-2168 - 000G94 - 093	1,107	$29,926.28	$27.03	$27,919.03	$25.22	0	2	4	$1.401745
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	98	Rochester-Concord-T-Triton-2125 - 000G95 - 098	380	$5,628.23	$14.81	$5,250.73	$13.82	0	2	4	$1.140508
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	194	$3,504.31	$18.06	$3,269.27	$16.85	0	2	4	$1.226600
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	100	Rochester-Hayfield-C-Hayfield-0203 - 000G95 - 100	151	$1,794.99	$11.89	$1,674.60	$11.09	0	2	4	$1.044932
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	5	($435.01)	($87.00)	($405.83)	($81.17)	0	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	2,735	$17,414.64	$6.37	$16,246.59	$5.94	0	2	4	$0.773786
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	106	Rochester-West Concord-C-Triton-2125 - 000G95 - 106	1,433	$35,001.05	$24.43	$32,653.42	$22.79	0	2	4	$1.357744
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	108	Rochester-Carrolton-T-Fillmore Central-2198 - 000G95 - 108	2,571	$16,786.37	$6.53	$15,660.45	$6.09	0	2	4	$0.784617
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	115	Rochester-Mabel-C-Mabel-Canton-0238 - 000G95 - 115	99	$2,452.35	$24.77	$2,287.86	$23.11	0	2	4	$1.363800
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	2,098	$36,986.75	$17.63	$34,505.93	$16.45	0	2	4	$1.216166
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	638	$19,013.92	$29.80	$17,738.60	$27.80	0	2	4	$1.444045
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	121	Rochester-Spring Valley-C-Kingsland-2137 - 000G95 - 121	255	$12,030.63	$47.18	$11,223.70	$44.01	0	2	4	$1.643551
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	122	Rochester-Spring Valley-T-Kingsland-2137 - 000G95 - 122	51	$1,025.28	$20.13	$956.51	$18.78	0	2	4	$1.273696
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	123	Fairmont-Glenville-C-Glenville-Emmons-2886 - 000G94 - 123	136	$2,746.29	$20.13	$2,562.09	$18.78	0	2	4	$1.273696
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	501	$5,184.46	$10.35	$4,836.73	$9.65	0	2	4	$0.984527
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	531	$3,550.58	$6.69	$3,312.43	$6.24	0	2	4	$0.795185
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	10	$712.46	$71.25	$664.67	$66.47	0	2	4	$1.822626
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	2,600	$63,542.85	$24.44	$59,280.83	$22.80	0	2	4	$1.357935
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	156	Rochester-Marion-T-Rochester-0535 - 000G95 - 156	7,428	$49,432.73	$6.65	$46,117.12	$6.21	0	2	4	$0.793092
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	159	Rochester-Oronoco-C-Rochester-0535 - 000G95 - 159	1,138	$19,723.26	$17.33	$18,400.36	$16.17	0	2	4	$1.208710
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	29,292	$333,333.08	$11.38	$310,975.38	$10.62	0	2	4	$1.026125
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	1,440	$19,996.31	$13.89	$18,655.09	$12.95	0	2	4	$1.112270

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	440	$6,113.78	$13.89	$5,703.71	$12.96	0	2	4	$1.112605
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	517	$26,911.73	$52.05	$25,106.68	$48.56	0	2	4	$1.686279
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	176	Wadena-Aitkin-C-Aitkin-0001 - 000G89 - 176	428	$7,863.63	$18.37	$7,336.19	$17.14	0	2	4	$1.234011
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	177	Wadena-Aitkin-T-Aitkin-0001 - 000G89 - 177	7,195	$30,754.41	$4.27	$28,691.61	$3.99	0	2	4	$0.600973
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	180	Cloquet-Carlton-C-Carlton-0093 - 000G96 - 180	357	$6,581.51	$18.44	$6,140.07	$17.20	0	2	4	$1.235528
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	3,083	$36,293.20	$11.77	$33,858.90	$10.98	0	2	4	$1.040602
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	620	$5,574.63	$8.99	$5,200.72	$8.39	0	2	4	$0.923762
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	927	$17,428.15	$18.80	$16,259.19	$17.54	0	2	4	$1.244030
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	194	Wadena-Deerwood-T-Crosby-Ironton-0182 - 000G89 - 194	2,978	$7,536.71	$2.53	$7,031.20	$2.36	0	2	4	$0.372912
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	225	$3,826.82	$17.01	$3,570.14	$15.87	0	2	4	$1.200577
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	207	Cloquet-Laprairie-C-Greenway-0316 - 000G96 - 207	6,028	$94,493.39	$15.68	$88,155.42	$14.62	0	2	4	$1.164947
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	2,443	$36,843.37	$15.08	$34,372.17	$14.07	0	2	4	$1.148294
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	214	Cloquet-S InternationalFalls-C-Intrntnl-361 - 000G96 - 214	271	$3,525.02	$13.01	$3,288.59	$12.14	0	2	4	$1.084219
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	2	$46.28	$23.14	$43.18	$21.59	0	2	4	$1.334253
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	853	$22,163.75	$25.98	$20,677.16	$24.24	0	2	4	$1.384533
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	220	Cloquet-Buhl-C-Mt Iron-Buhl-0712 - 000G96 - 220	10	$220.83	$22.08	$206.02	$20.60	0	2	4	$1.313867
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	479	$10,900.25	$22.76	$10,169.13	$21.23	0	2	4	$1.326950
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	4,199	$14,093.22	$3.36	$13,147.95	$3.13	0	2	4	$0.495544
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	238	Cloquet-Proctor-C-Proctor-0704 - 000G96 - 238	192	$3,529.89	$18.38	$3,293.13	$17.15	0	2	4	$1.234264
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	5,273	$29,888.06	$5.67	$27,883.38	$5.29	0	2	4	$0.723456
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	244	Bemidji-Detroit-T-Detroit Lakes-0022 - 000G97 - 244	200	$7,244.76	$36.22	$6,758.83	$33.79	0	2	4	$1.528788
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	245	Bemidji-Frazee-C-Frazee-Vergas-0023 - 000G97 - 245	992	$21,102.77	$21.27	$19,687.34	$19.85	0	2	4	$1.297761
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	246	Bemidji-Lake View-T-Detroit Lakes-0022 - 000G97 - 246	1,814	$26,548.90	$14.64	$24,768.18	$13.65	0	2	4	$1.135133
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	285	$6,426.29	$22.55	$5,995.26	$21.04	0	2	4	$1.323046
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	2,814	$41,795.73	$14.85	$38,992.36	$13.86	0	2	4	$1.141763
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	1,700	$15,985.93	$9.40	$14,913.71	$8.77	0	2	4	$0.943000
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	252	Wadena-Straight River-T-Park Rapids-0309 - 000G89 - 252	2,883	$19,190.27	$6.66	$17,903.12	$6.21	0	2	4	$0.793092
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	253	Wadena-Todd-C-Park Rapids-0309 - 000G89 - 253	1,426	$18,803.96	$13.19	$17,542.72	$12.30	0	2	4	$1.089905
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	257	Wadena-Motley-C-Staples-Motley-2170 - 000G89 - 257	323	$14,105.04	$43.67	$13,158.97	$40.74	0	2	4	$1.610021
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	264	Wadena-North-T-Thief River Falls-0564 - 000G89 - 264	1,763	$33,363.29	$18.92	$31,125.51	$17.65	0	2	4	$1.246745
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	266	Wadena-Rocksbury-T-Thief River Falls-0564 - 000G89 - 266	239	$2,399.95	$10.04	$2,238.98	$9.37	0	2	4	$0.971740
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	2,373	$37,433.47	$15.77	$34,922.69	$14.72	0	2	4	$1.167908
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	1,368	$13,332.12	$9.75	$12,437.90	$9.09	0	2	4	$0.958564
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	275	Wadena-Warroad-C-Warroad-0690 - 000G89 - 275	811	$14,114.45	$17.40	$13,167.75	$16.24	0	2	4	$1.210586
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	207	$3,765.76	$18.19	$3,513.18	$16.97	0	2	4	$1.229682
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	287	Wadena-Rockwood-T-Sebeka-820 - 000G89 - 287	345	$2,368.91	$6.87	$2,210.02	$6.41	0	2	4	$0.806858
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	3	$41.70	$13.90	$38.90	$12.97	0	2	4	$1.112940
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	293	Rosemount-Castle Rock-T-Farmington-0192 - 000G93 - 293	202	$6,057.67	$29.99	$5,651.36	$27.98	0	2	4	$1.446848
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	2,489	$17,680.84	$7.10	$16,494.93	$6.63	0	2	4	$0.821514
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	906	$50,908.85	$56.19	$47,494.23	$52.42	0	2	4	$1.719497
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	9,964	$66,104.62	$6.63	$61,670.77	$6.19	0	2	4	$0.791691
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	1,207	$7,666.91	$6.35	$7,152.67	$5.93	0	2	4	$0.773055
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	307	Pine City-Pokegama-T-Pine City-0578 - 000G98 - 307	7	$742.44	$106.06	$692.65	$98.95	0	2	4	$1.995416
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	313	Worthington-Mountain Lake-C-Mountain Lake-0173 - 000G99 - 313	202	$4,207.99	$20.83	$3,925.75	$19.43	0	2	4	$1.288473
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	315	Pine City-Pine City-T-Pine City-0578 - 000G98 - 315	127	$1,986.87	$15.64	$1,853.60	$14.60	0	2	4	$1.164353
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	330	Rosemount-Lakeville-C-Rosemnt-Apple Vly-0196 - 000G93 - 330	2,977	$18,232.53	$6.12	$17,009.62	$5.71	0	2	4	$0.756636
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	340	Rosemount-New Market-T-Lakeville-0194 - 000G93 - 340	2,784	$36,873.67	$13.24	$34,400.44	$12.36	0	2	4	$1.092018
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	342	Bemidji-Eckels-T-Bemidji-0031 - 000G97 - 342	550	$3,980.10	$7.24	$3,713.14	$6.75	0	2	4	$0.829304
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	390	Rochester-Mantorville-C-Kassn-Mantorvlle-0204 - 000G95 - 390	405	$5,416.29	$13.37	$5,053.01	$12.48	0	2	4	$1.096215
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	1,913	$38,502.40	$20.13	$35,919.92	$18.78	0	2	4	$1.273696
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	424	Fairmont-Alden-C-Alden-Conger-0242 - 000G94 - 044	847	$13,189.95	$15.57	$12,305.26	$14.53	0	2	4	$1.162266
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	462	Fairmont-Shell Rock-T-Glenville-Emmons - 000G94 - 462	204	$4,101.13	$20.13	$3,826.05	$18.78	0	2	4	$1.273696
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	468	Rochester-Lyle-C-Lyle - 000G95 - 468	625	$12,578.00	$20.13	$11,734.35	$18.78	0	2	4	$1.273696
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2014	469	Rochester-Lodi-T-Southland - 000G95 - 469	492	$9,904.96	$20.13	$9,240.60	$18.78	0	2	4	$1.273696
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2014	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	2	$2,848.50	$1,424.25	$2,657.44	$1,328.72	0	3	9	$3.123433
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2014	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	5	$4,195.87	$839.17	$3,914.44	$782.89	0	3	9	$2.893701
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2014	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	5	$5,051.44	$1,010.29	$4,712.62	$942.52	0	3	9	$2.974291
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2014	220	Cloquet-Buhl-C-Mt Iron-Buhl-0712 - 000G96 - 220	5	$6,497.54	$1,299.51	$6,061.73	$1,212.35	0	3	9	$3.083628
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	177	Plastic 3 in	2014	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	9	$12,673.38	$1,408.15	$11,823.34	$1,313.70	0	3	9	$3.118496
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	2014	89	Fairmont-Ellendale-C-NRHEG-2168 - 000G94 - 089	2	$11.47	$5.74	$10.70	$5.35	0	0.75	0.5625	$0.728354
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	2014	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	1	$23.52	$23.52	$21.94	$21.94	0	0.75	0.5625	$1.341237
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	1,727	$66,905.59	$38.74	$62,418.02	$36.14	0	4	16	$1.557988
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	79	$12,088.63	$153.02	$11,277.81	$142.76	0	4	16	$2.154607
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	16	$491.48	$30.72	$458.51	$28.66	0	4	16	$1.457276
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	7	$515.39	$73.63	$480.82	$68.69	0	4	16	$1.836894
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	935	$29,180.22	$31.21	$27,223.01	$29.12	0	4	16	$1.464191
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	24	Pine City-Sandstone-C-E Central-2580 - 000G98 - 024	297	$12,163.50	$40.95	$11,347.66	$38.21	0	4	16	$1.582177

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	30	Rosemount-Elko-C-Lakeville-0194 - 000G93 - 030	637	$17,353.75	$27.24	$16,189.78	$25.42	0	4	16	$1.405176
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	39	Worthington-Mountain Lake-T-Mountain Lake-0173 - 000G99 - 039	2,886	$29,726.22	$10.30	$27,732.39	$9.61	0	4	16	$0.982723
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	40	Worthington-Windom-C-Windom-0177 - 000G99 - 040	470	$21,760.04	$46.30	$20,300.53	$43.19	0	4	16	$1.635383
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	1,340	$38,953.05	$29.07	$36,340.35	$27.12	0	4	16	$1.433290
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	44	Fairmont-Alden-C-Alden-Conger-0242 - 000G94 - 044	1,594	$45,075.40	$28.28	$42,052.05	$26.38	0	4	16	$1.421275
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	54	Fairmont-Lakefield-C-Jackson Cty Central-2895 - 000G94 - 054	1,036	$49,437.69	$47.72	$46,121.75	$44.52	0	4	16	$1.648555
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	4,448	$180,211.33	$40.52	$168,124.00	$37.80	0	4	16	$1.577492
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	744	$35,635.74	$47.90	$33,245.54	$44.68	0	4	16	$1.650113
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	6	$176.32	$29.39	$164.49	$27.42	0	4	16	$1.438067
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	107	Rochester-Westfield-T-Blooming Prairie-0756 - 000G95 - 107	1,150	$56,034.86	$48.73	$52,276.42	$45.46	0	4	16	$1.657629
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	1,112	$61,980.79	$55.74	$57,823.54	$52.00	0	4	16	$1.716003
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	708	$18,543.94	$26.19	$17,300.14	$24.44	0	4	16	$1.388101
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	282	$7,537.86	$26.73	$7,032.27	$24.94	0	4	16	$1.396896
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	157	Rochester-New Haven-T-Pine Island-0255 - 000G95 - 157	12,130	$185,691.89	$15.31	$173,236.95	$14.28	0	4	16	$1.154728
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	11,486	$292,208.90	$25.44	$272,609.52	$23.73	0	4	16	$1.375298
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	1,973	$23,062.30	$11.69	$21,515.44	$10.90	0	4	16	$1.037426
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	561	$26,469.66	$47.18	$24,694.26	$44.02	0	4	16	$1.643650
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	18	$3,998.68	$222.15	$3,730.48	$207.25	0	4	16	$2.316495
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	10	$4,600.37	$460.04	$4,291.81	$429.18	0	4	16	$2.632639
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	252	Wadena-Straight River-T-Park Rapids-0309 - 000G89 - 252	5,463	$66,032.65	$12.09	$61,603.63	$11.28	0	4	16	$1.052309
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	4,028	$43,422.77	$10.78	$40,510.26	$10.06	0	4	16	$1.002598
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	275	Wadena-Warroad-C-Warroad-0690 - 000G89 - 275	3,068	$82,557.80	$26.91	$77,020.39	$25.10	0	4	16	$1.399674
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	284	Wadena-Blueberry-T-Menahga-821 - 000G89 - 284	11,503	$156,087.21	$13.57	$145,617.95	$12.66	0	4	16	$1.102434
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	82	$3,292.04	$40.15	$3,071.23	$37.45	0	4	16	$1.573452
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	840	$23,004.40	$27.39	$21,461.42	$25.55	0	4	16	$1.407391
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	926	$34,352.99	$37.10	$32,048.83	$34.61	0	4	16	$1.539202
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	297	Rosemount-Empire-T-Farmington-0192 - 000G93 - 297	4	$7,538.67	$1,884.67	$7,033.03	$1,758.26	0	4	16	$3.245083
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	312	Rochester-Chatfield-T-Chatfield-0227 - 000G95 - 312	312	$8,339.75	$26.73	$7,780.38	$24.94	0	4	16	$1.396896
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	340	Rosemount-New Market-T-Lakeville-0194 - 000G93 - 340	4,897	$115,367.08	$23.56	$107,629.05	$21.98	0	4	16	$1.342028
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	351	Rosemount-Eureka-T-Lakeville-0194 - 000G93 - 351	2,328	$36,914.01	$15.86	$34,438.07	$14.79	0	4	16	$1.169968
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	371	Wadena-Straight River-T-Menahga-821 - 000G89 - 371	16,576	$224,924.08	$13.57	$209,837.71	$12.66	0	4	16	$1.102434
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	424	Fairmont-Alden-C-Alden-Conger-0242 - 000G94 - 044	1,594	$45,075.40	$28.28	$42,052.05	$26.38	0	4	16	$1.421275
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2014	467	Rochester-Wykoff-C-Kingsland - 000G95 - 467	202	$5,558.51	$27.46	$5,185.68	$25.62	0	4	16	$1.408579
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2014	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	697	$26,913.05	$38.61	$25,107.91	$36.02	0	6	36	$1.556544
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2014	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	3,529	$130,356.10	$36.94	$121,612.70	$34.46	0	6	36	$1.537315
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2014	116	Rochester-Newburg-T-Mabel-Canton-0238 - 000G95 - 116	807	($504.60)	($0.63)	($470.75)	($0.58)	0	6	36	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2014	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	733	$51,940.49	$70.86	$48,456.68	$66.11	0	6	36	$1.820267
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2014	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	3,249	$126,154.69	$38.83	$117,693.09	$36.22	0	6	36	$1.558948
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2014	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	1,417	$65,380.15	$46.14	$60,994.90	$43.05	0	6	36	$1.633973
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2014	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	6	$11,586.60	$1,931.10	$10,809.45	$1,801.58	1	1.25	1.5625	$3.255654
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2014	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	1	($1,238.58)	($1,238.58)	($1,155.50)	($1,155.50)	1	1.25	1.5625	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	2014	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	2	$3,033.48	$1,516.74	$2,830.01	$1,415.01	1	1	1	$3.150760
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	2014	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	7	$4,095.84	$585.12	$3,821.12	$545.87	1	1	1	$2.737089
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	2014	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	9	$8,044.75	$893.86	$7,505.16	$833.91	1	1	1	$2.921119
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	2014	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	1	$187.68	$187.68	$175.09	$175.09	1	1	1	$2.243261
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	186	Steel 10 in	2014	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	1,912	$11,692.05	$6.12	$10,907.83	$5.70	1	10	100	$0.755875
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	187	Steel 12 in	2014	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	1,601	$882,338.63	$551.12	$823,157.38	$514.15	1	12	144	$2.711090
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	187	Steel 12 in	2014	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	40	$60,372.06	$1,509.30	$56,322.71	$1,408.07	1	12	144	$3.148624
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	187	Steel 12 in	2014	252	Wadena-Straight River-T-Park Rapids-0309 - 000G89 - 252	440	$238,907.32	$542.97	$222,883.05	$506.55	1	12	144	$2.704622
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2014	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	2	$2,280.99	$1,140.50	$2,128.00	$1,064.00	1	2	4	$3.026942
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2014	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	580	$31,940.66	$55.07	$29,798.30	$51.38	1	2	4	$1.710794
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2014	99	Rochester-Dodge Center-C-Triton-2125 - 000G95 - 099	5	$1,952.26	$390.45	$1,821.32	$364.26	1	2	4	$2.561411
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2014	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	24	$4,467.74	$186.16	$4,168.07	$173.67	1	2	4	$2.239725
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2014	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	116	$20,730.72	$178.71	$19,340.24	$166.73	1	2	4	$2.222014
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2014	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	58	$3,998.67	$68.94	$3,730.47	$64.32	1	2	4	$1.808346
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2014	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	10	$6,189.14	$618.91	$5,774.01	$577.40	1	2	4	$2.761477
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2014	147	Rochester-Chatfield-C-Chatfield-0227 - 000G95 - 147	5	$1,924.19	$384.84	$1,795.13	$359.03	1	2	4	$2.555131
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2014	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	76	$23,043.62	$303.21	$21,498.02	$282.87	1	2	4	$2.451587
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2014	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	5	$4,620.94	$924.19	$4,311.00	$862.20	1	2	4	$2.935608
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2014	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	866	$37,013.59	$42.74	$34,530.97	$39.87	1	2	4	$1.600646
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2014	191	Wadena-Crosby-C-Crosby-Ironton-0182 - 000G89 - 191	34	$6,094.41	$179.25	$5,685.64	$167.22	1	2	4	$2.223288
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2014	192	Wadena-Deerwood-C-Crosby-Ironton-0182 - 000G89 - 192	3	$3,621.56	$1,207.19	$3,378.65	$1,126.22	1	2	4	$3.051623
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2014	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	24	$9,726.57	$405.27	$9,074.18	$378.09	1	2	4	$2.577595
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2014	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	1,519	$30,054.54	$19.79	$28,038.69	$18.46	1	2	4	$1.266232
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2014	245	Bemidji-Frazee-C-Frazee-Vergas-0023 - 000G97 - 245	8	$9,341.96	$1,167.75	$8,715.37	$1,089.42	1	2	4	$3.037195
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2014	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	4	$2,615.66	$653.92	$2,440.22	$610.06	1	2	4	$2.785373
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2014	279	Wadena-Moran-T-Staples-Motley-2170 - 000G89 - 279	2,238	$47,517.55	$21.23	$44,330.40	$19.81	1	2	4	$1.296884

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2014	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	25	$6,686.98	$267.48	$6,238.47	$249.54	1	2	4	$2.397140
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2014	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	4	$4,155.88	$1,038.97	$3,877.13	$969.28	1	2	4	$2.986449
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2014	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	12	$4,202.21	$350.18	$3,920.35	$326.70	1	3	9	$2.514149
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2014	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	12	$4,150.06	$345.84	$3,871.70	$322.64	1	3	9	$2.508718
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2014	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	38	$10,228.02	$269.16	$9,541.99	$251.11	1	3	9	$2.399864
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2014	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	13	$23,588.15	$1,814.47	$22,006.02	$1,692.77	1	4	16	$3.228598
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2014	116	Rochester-Newburg-T-Mabel-Canton-0238 - 000G95 - 116	4	($11.35)	($2.84)	($10.59)	($2.65)	1	4	16	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2014	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	25	$4,544.34	$181.77	$4,239.54	$169.58	1	4	16	$2.229375
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2014	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	1,641	$93,566.33	$57.02	$87,290.54	$53.19	1	4	16	$1.725830
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2014	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	50	$2,850.90	$57.02	$2,659.68	$53.19	1	4	16	$1.725830
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2014	420	Rochester-Adams-T-Southland - 000G95 - 420	37	$326.02	$8.81	$304.15	$8.22	1	4	16	$0.914872
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2014	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	171	$78,217.66	$457.41	$72,971.36	$426.73	1	6	36	$2.630153
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2014	200	Cloquet-Cohasset-C-Grand Rapids-0318 - 000G96 - 200	269	$106,853.29	$397.22	$99,686.30	$370.58	1	6	36	$2.568882
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	2014	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	10	$611.48	$61.15	$570.47	$57.05	1	8	64	$1.756256
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	2014	252	Wadena-Straight River-T-Park Rapids-0309 - 000G89 - 252	118	$7,109.04	$60.25	$6,632.21	$56.21	1	8	64	$1.749814
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2015	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	30	$103.53	$3.45	$99.37	$3.31	0	1	1	$0.519828
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2015	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	2	($1.17)	($0.59)	($1.12)	($0.56)	0	1	1	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2015	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	2	$9.07	$4.54	$8.71	$4.36	0	1	1	$0.639486
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2015	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	2	$2,114.22	$1,057.11	$2,029.33	$1,014.67	0	1	1	$3.006325
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2015	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	2	$931.17	$465.59	$893.78	$446.89	0	1	1	$2.650201
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2015	177	Wadena-Aitkin-T-Aitkin-0001 - 000G89 - 177	2	$3,010.60	$1,505.30	$2,889.72	$1,444.86	0	1	1	$3.159826
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2015	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	2	$0.44	$0.22	$0.42	$0.21	0	1	1	($0.677781)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2015	220	Cloquet-Buhl-C-Mt Iron-Buhl-0712 - 000G96 - 220	2	$2,594.99	$1,297.50	$2,490.80	$1,245.40	0	1	1	$3.095309
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2015	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	3	$6,844.99	$2,281.66	$6,570.16	$2,190.05	0	1	1	$3.340454
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2015	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	4	$0.83	$0.21	$0.80	$0.20	0	1	1	($0.698970)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2015	293	Rosemount-Castle Rock-T-Farmington-0192 - 000G93 - 293	2	$5,788.07	$2,894.04	$5,555.68	$2,777.84	0	1	1	$3.443707
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2015	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	4	($3.74)	($0.94)	($3.59)	($0.90)	0	1	1	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2015	314	Worthington-Ortonville-C-Ortonville-2903 - 000G99 - 314	20	$12,834.58	$641.73	$12,319.26	$615.96	0	1	1	$2.789553
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2015	340	Rosemount-New Market-T-Lakeville-0194 - 000G93 - 340	2	$1,999.82	$999.91	$1,919.53	$959.77	0	1	1	$2.982167
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2015	380	Rochester-St Charles-T-St Charles - 000G95 - 380	2	$1,638.57	$819.29	$1,572.78	$786.39	0	1	1	$2.895638
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2015	418	Rochester-Adams-C-Southland - 000G95 - 418	3	$3,270.54	$1,090.18	$3,139.23	$1,046.41	0	1	1	$3.019702
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2015	461	Rochester-Rose Creek-C-Southland - 000G95 - 461	2	$3,077.09	$1,538.55	$2,953.54	$1,476.77	0	1	1	$3.169313
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	10	$5,875.73	$587.57	$5,639.82	$563.98	0	2	4	$2.751264
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	5	Pine City-Rush-C-Rush City-0139 - 000G98 - 005	492	$8,434.72	$17.14	$8,096.06	$16.46	0	2	4	$1.216430
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	2,564	$17,082.48	$6.66	$16,396.61	$6.39	0	2	4	$0.805501
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	17,221	$123,041.24	$7.14	$118,101.06	$6.86	0	2	4	$0.836324
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	226	$11,989.23	$53.05	$11,507.86	$50.92	0	2	4	$1.706888
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	11	Rosemount-Cannon Falls-C-Cannon Falls-0252 - 000G93 - 011	6	($474.21)	($79.04)	($455.17)	($75.86)	0	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	16	Pine City-Barry-T-Hinckley-Finlayson-2165 - 000G98 - 016	30	$209.31	$6.98	$200.91	$6.70	0	2	4	$0.826075
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	18	Pine City-Hinckley-C-Hinckley-Finlayson-2165 - 000G98 - 018	3,177	$22,186.89	$6.98	$21,296.08	$6.70	0	2	4	$0.826075
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	4,048	$161,580.44	$39.92	$155,092.89	$38.31	0	2	4	$1.583312
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	24	Pine City-Sandstone-C-E Central-2580 - 000G98 - 024	193	$5,830.48	$30.21	$5,596.38	$29.00	0	2	4	$1.462398
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	37	Worthington-Great Bend-T-Windom-0177 - 000G99 - 037	457	$3,660.53	$8.01	$3,513.56	$7.69	0	2	4	$0.885926
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	2	$1,943.98	$971.99	$1,865.93	$932.97	0	2	4	$2.969868
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	46	Fairmont-Freeborn-C-United S Central-2134 - 000G94 - 046	2	$2,328.58	$1,164.29	$2,235.09	$1,117.55	0	2	4	$3.048267
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	49	Fairmont-Twin Lakes-C-Albert Lea-0241 - 000G94 - 049	130	$2,004.42	$15.42	$1,923.94	$14.80	0	2	4	$1.170262
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	51	Fairmont-DesMoines-T-Jackson Cty Centrl-2895 - 000G94 - 051	622	$3,897.50	$6.27	$3,741.01	$6.01	0	2	4	$0.778874
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	1,224	$7,669.69	$6.27	$7,361.75	$6.01	0	2	4	$0.778874
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	54	Fairmont-Lakefield-C-Jackson Cty Central-2895 - 000G94 - 054	1,261	$37,282.55	$29.57	$35,785.64	$28.38	0	2	4	$1.453012
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	62	Worthington-Cottonwood-C-Lakeview-2167 - 000G99 - 062	160	$1,145.67	$7.16	$1,099.67	$6.87	0	2	4	$0.836957
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	65	Worthington-Tracy-C-Tracy-0417 - 000G99 - 065	260	$4,635.27	$17.83	$4,449.16	$17.11	0	2	4	$1.233250
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	75	Fairmont-Trimont-C-Martin Cty W-2448 - 000G94 - 075	1,096	$8,930.12	$8.15	$8,571.57	$7.82	0	2	4	$0.893207
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	76	Fairmont-Truman-C-Truman-0458 - 000G94 - 076	3,098	$55,508.13	$17.92	$53,279.45	$17.20	0	2	4	$1.235528
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	77	Fairmont-Welcome-C-Martin Cty W-2448 - 000G94 - 077	583	$4,674.15	$8.02	$4,486.48	$7.70	0	2	4	$0.886491
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	78	Worthington-Brewster-C-Brewster-0513 - 000G99 - 078	853	$5,523.94	$6.48	$5,302.15	$6.22	0	2	4	$0.793790
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	3,134	$83,327.32	$26.59	$79,981.68	$25.52	0	2	4	$1.406881
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	89	Fairmont-Ellendale-C-NRHEG-2168 - 000G94 - 089	18	$1,605.08	$89.17	$1,540.64	$85.59	0	2	4	$1.932423
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	91	Worthington-Appleton-C-Lac Qui Parle Valley - 000G99 - 091	1,443	$11,632.73	$8.06	$11,165.67	$7.74	0	2	4	$0.888741
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	94	Worthington-Butterfield-C-Butterfield-0836 - 000G99 - 094	281	$2,416.46	$8.60	$2,319.43	$8.25	0	2	4	$0.916454
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	95	Worthington-Canby-C-Canby-0891 - 000G99 - 095	4,195	$106,310.83	$25.34	$102,042.40	$24.32	0	2	4	$1.385964
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	97	Rochester-Claremont-C-Triton-2125 - 000G95 - 097	1,022	$8,939.17	$8.75	$8,580.26	$8.40	0	2	4	$0.924279
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	102	Rochester-Kasson-C-Kasson-Mantorville-0204 - 000G95 - 102	1,759	$15,413.55	$8.76	$14,794.69	$8.41	0	2	4	$0.924796
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	103	Rochester-Mantorville-T-Kassn-Mantorvlle-0204 - 000G95 - 103	3	($335.39)	($111.80)	($321.92)	($107.31)	0	2	4	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	112	Rochester-Fountain-C-Fillmore Central-2198 - 000G95 - 112	480	$4,862.25	$10.13	$4,667.03	$9.72	0	2	4	$0.987666
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	116	Rochester-Newburg-T-Mabel-Canton-0238 - 000G95 - 116	472	$5,027.90	$10.65	$4,826.03	$10.22	0	2	4	$1.009451
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	117	Rochester-Peterson-C-Rushford-Peterson-0239 - 000G95 - 117	708	$12,432.86	$17.56	$11,933.67	$16.86	0	2	4	$1.226858
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	118	Rochester-Preston-C-Fillmore Central-2198 - 000G95 - 118	75	$4,147.72	$55.30	$3,981.19	$53.08	0	2	4	$1.724931

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	122	Rochester-Spring Valley-T-Kingsland-2137 - 000G95 - 122	5	$6.69	$1.32	$6.42	$1.27	0	2	4	$0.103804
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	123	Fairmont-Glenville-C-Glenville-Emmons-2886 - 000G94 - 123	332	$7,846.50	$23.66	$7,531.46	$22.71	0	2	4	$1.356217
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	1,056	$25,049.70	$23.72	$24,043.94	$22.77	0	2	4	$1.357363
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	131	Rochester-Wanamingo-C-Kenyon-Wanamingo-2172 - 000G95 - 131	1,004	$4,590.47	$4.57	$4,406.16	$4.39	0	2	4	$0.642465
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	1,070	$24,771.97	$23.15	$23,777.36	$22.22	0	2	4	$1.346744
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	133	Rochester-Caledonia-C-Caledonia-0299 - 000G95 - 133	55	$913.20	$16.60	$876.54	$15.94	0	2	4	$1.202488
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	135	Rochester-La Crescent-C-LaCrescent-Hokah-0300 - 000G95 - 135	267	$11,471.55	$42.96	$11,010.96	$41.24	0	2	4	$1.615319
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	4,466	$26,549.84	$5.94	$25,483.86	$5.71	0	2	4	$0.756636
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	148	Rochester-Dover-C-Dover-Eyota-0533 - 000G95 - 148	110	$3,051.78	$27.74	$2,929.25	$26.63	0	2	4	$1.425371
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	609	$9,718.59	$15.96	$9,328.38	$15.32	0	2	4	$1.185259
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	3,801	$40,668.91	$10.70	$39,036.04	$10.27	0	2	4	$1.011570
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	869	$14,493.75	$16.68	$13,911.81	$16.01	0	2	4	$1.204391
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	986	$23,514.96	$23.85	$22,570.82	$22.89	0	2	4	$1.359646
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	167	Rochester-Elgin-C-Elgin-Millville-2899 - 000G95 - 167	156	$1,918.24	$12.30	$1,841.22	$11.80	0	2	4	$1.071882
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	177	Wadena-Aitkin-T-Aitkin-0001 - 000G89 - 177	179	$3,703.95	$20.69	$3,555.23	$19.86	0	2	4	$1.297979
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	180	Cloquet-Carlton-C-Carlton-0093 - 000G96 - 180	1,273	$41,071.29	$32.26	$39,422.25	$30.97	0	2	4	$1.490941
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	3,297	$63,384.79	$19.22	$60,839.87	$18.45	0	2	4	$1.265996
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	184	Cloquet-Scanlon-C-Cloquet-0094 - 000G96 - 184	15	$23,481.00	$1,565.40	$22,538.22	$1,502.55	0	2	4	$3.176829
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	192	Wadena-Deerwood-C-Crosby-Ironton-0182 - 000G89 - 192	498	$12,060.25	$24.22	$11,576.02	$23.25	0	2	4	$1.366423
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	195	Wadena-Irondale(Riverton)-T-Crosby-Ironton-0182 - 000G89 - 195	168	$1,526.75	$9.09	$1,465.45	$8.72	0	2	4	$0.940516
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	198	Cloquet-Bovey-C-Greenway-0316 - 000G96 - 198	71	$1,683.69	$23.71	$1,616.09	$22.76	0	2	4	$1.357172
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	201	Cloquet-Coleraine-C-Greenway-0316 - 000G96 - 201	355	$3,277.59	$9.23	$3,145.99	$8.86	0	2	4	$0.947434
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	5,227	$67,282.16	$12.87	$64,580.74	$12.36	0	2	4	$1.092018
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	207	Cloquet-Laprairie-C-Greenway-0316 - 000G96 - 207	185	$1,369.90	$7.40	$1,314.90	$7.11	0	2	4	$0.851870
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	209	Cloquet-Nashwauk-C-Nashwauk-Keewatin-0319 - 000G96 - 209	86	$5,539.71	$64.42	$5,317.29	$61.83	0	2	4	$1.791199
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	621	$16,119.74	$25.96	$15,472.52	$24.92	0	2	4	$1.396548
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	1,040	$20,183.39	$19.41	$19,373.01	$18.63	0	2	4	$1.270213
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	220	Cloquet-Buhl-C-Mt Iron-Buhl-0712 - 000G96 - 220	5	$97.94	$19.59	$94.01	$18.80	0	2	4	$1.274158
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	1,035	$10,183.06	$9.84	$9,774.20	$9.44	0	2	4	$0.974972
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	224	Cloquet-Eveleth-C-Eveleth-Gilbert-2154 - 000G96 - 224	681	$16,088.58	$23.62	$15,442.61	$22.68	0	2	4	$1.355643
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	225	Cloquet-Fayal-T-Eveleth-Gilbert-2154 - 000G96 - 225	2,668	$31,194.19	$11.69	$29,941.72	$11.22	0	2	4	$1.049993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	7,504	$87,526.31	$11.66	$84,012.07	$11.20	0	2	4	$1.049218
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	2,156	$7,248.15	$3.36	$6,957.14	$3.23	0	2	4	$0.509203
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	240	Bemidji-Audubon-C-Lk Park Audubon-2889 - 000G97 - 240	313	$5,315.94	$16.98	$5,102.50	$16.30	0	2	4	$1.212188
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	506	$14,123.12	$27.91	$13,556.07	$26.79	0	2	4	$1.427973
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	2,991	$17,304.01	$5.79	$16,609.25	$5.55	0	2	4	$0.744293
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	2,556	$20,440.52	$8.00	$19,619.82	$7.68	0	2	4	$0.885361
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	250	Wadena-Henrietta-T-Park Rapids-0309 - 000G89 - 250	615	$4,686.05	$7.62	$4,497.90	$7.31	0	2	4	$0.863917
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	320	$8,945.68	$27.96	$8,586.51	$26.83	0	2	4	$1.428621
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	186	$5,055.71	$27.18	$4,852.72	$26.09	0	2	4	$1.416474
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	260	Bemidji-McDonaldsville-T-Ada-Borup-2854 - 000G97 - 260	1,064	$6,020.96	$5.66	$5,779.22	$5.43	0	2	4	$0.734800
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	264	Wadena-North-T-Thief River Falls-0564 - 000G89 - 264	601	$7,897.97	$13.14	$7,580.86	$12.61	0	2	4	$1.100715
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	3,041	$21,861.28	$7.19	$20,983.55	$6.90	0	2	4	$0.838849
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	1,519	$12,477.27	$8.21	$11,976.30	$7.88	0	2	4	$0.896526
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	275	Wadena-Warroad-C-Warroad-0690 - 000G89 - 275	796	$7,413.48	$9.31	$7,115.83	$8.94	0	2	4	$0.951338
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	285	Wadena-Menahga-C-Menahga-821 - 000G89 - 285	186	$3,845.69	$20.68	$3,691.28	$19.85	0	2	4	$1.297761
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	290	Wadena-Verndale-C-Verndale-818 - 000G89 - 290	324	$4,802.10	$14.82	$4,609.29	$14.23	0	2	4	$1.153205
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	2,402	$32,950.66	$13.72	$31,627.68	$13.17	0	2	4	$1.119586
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	302	Cloquet-White-T-Mesabi E-2711 - 000G96 - 302	1,240	$20,598.27	$16.61	$19,771.24	$15.94	0	2	4	$1.202488
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	306	Fairmont-Owatonna-T-Owatonna-0761 - 000G94 - 306	456	$10,588.91	$23.22	$10,163.76	$22.29	0	2	4	$1.348110
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	307	Pine City-Pokegama-T-Pine City-0578 - 000G98 - 307	521	$6,382.97	$12.25	$6,126.69	$11.76	0	2	4	$1.070407
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	313	Worthington-Mountain Lake-C-Mountain Lake-0173 - 000G99 - 313	777	$17,779.51	$22.88	$17,065.65	$21.96	0	2	4	$1.341632
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	314	Worthington-Ortonville-C-Ortonville-2903 - 000G99 - 314	266	$11,540.98	$43.39	$11,077.60	$41.65	0	2	4	$1.619615
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	318	Rochester-Oronoco-T-Pine Island-0255 - 000G95 - 318	900	$6,947.61	$7.72	$6,668.66	$7.41	0	2	4	$0.869818
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	328	Bemidji-Grant Valley-Bemidji-0031 - 000G97 - 328	5	$1,244.23	$248.85	$1,194.27	$238.85	0	2	4	$2.378125
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	340	Rosemount-New Market-T-Lakeville-0194 - 000G93 - 340	3,867	$24,960.85	$6.45	$23,958.66	$6.20	0	2	4	$0.792392
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	353	Rosemount-Castle Rock-T-Northfield - 000G93 - 353	278	$4,032.04	$14.50	$3,870.15	$13.92	0	2	4	$1.143639
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	380	Rochester-St Charles-T-St Charles - 000G95 - 380	161	$1,871.65	$11.63	$1,796.50	$11.16	0	2	4	$1.047664
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	398	Worthington-Butterfield-T-Butterfield-0836 - 000G99 - 398	620	$4,087.81	$6.59	$3,923.68	$6.33	0	2	4	$0.801404
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	400	Worthington-Monroe-T-Tracy - 000G99 - 400	422	$7,523.41	$17.83	$7,221.34	$17.11	0	2	4	$1.233250
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	418	Rochester-Adams-C-Southland - 000G95 - 418	74	$1,217.85	$16.46	$1,168.95	$15.80	0	2	4	$1.198657
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	228	$780.84	$3.42	$749.49	$3.28	0	2	4	$0.515874
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	422	Fairmont-Albert Lea-T-Albert Lea - 000G94 - 422	506	$3,532.58	$6.98	$3,390.74	$6.70	0	2	4	$0.826075
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	433	Fairmont-Geneva-C-N.R.H.E.G. - 000G94 - 433	125	$1,338.11	$10.70	$1,284.38	$10.28	0	2	4	$1.011993
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	442	Rochester-Leroy-C-Leroy-Ostrander - 000G95 - 442	5	$3,092.65	$618.53	$2,968.48	$593.70	0	2	4	$2.773567
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	461	Rochester-Rose Creek-C-Southland - 000G95 - 461	222	$3,009.79	$13.56	$2,888.95	$13.01	0	2	4	$1.114277
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	462	Fairmont-Shell Rock-T-Glenville-Emmons - 000G94 - 462	20	$26.78	$1.32	$25.70	$1.27	0	2	4	$0.103804

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	468	Rochester-Lyle-C-Lyle - 000G95 - 468	62	$82.12	$1.32	$78.82	$1.27	0	2	4	$0.103804
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2015	469	Rochester-Lodi-T-Southland - 000G95 - 469	49	$64.67	$1.32	$62.07	$1.27	0	2	4	$0.103804
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	178	Plastic 3/4 in	2015	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	1	$13.22	$13.22	$12.69	$12.69	0	0.75	0.5625	$1.103462
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	4	$796.98	$199.25	$764.98	$191.25	0	4	16	$2.281601
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	2,104	$24,614.82	$11.70	$23,626.52	$11.23	0	4	16	$1.050380
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	1,114	$39,936.41	$35.85	$38,332.94	$34.41	0	4	16	$1.536685
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	37	Worthington-Great Bend-T-Windom-0177 - 000G99 - 037	1,890	$30,076.59	$15.91	$28,869.00	$15.27	0	4	16	$1.183839
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	43	Fairmont-Wells-C-United S Central-2134 - 000G94 - 043	110	$11,083.50	$100.76	$10,638.49	$96.71	0	4	16	$1.985471
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	4	$4,414.86	$1,103.72	$4,237.60	$1,059.40	0	4	16	$3.025060
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	54	Fairmont-Lakefield-C-Jackson Cty Central-2895 - 000G94 - 054	12	$1,418.05	$118.17	$1,361.11	$113.43	0	4	16	$2.054728
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	76	Fairmont-Truman-C-Truman-0458 - 000G94 - 076	968	$31,202.98	$32.23	$29,950.16	$30.94	0	4	16	$1.490520
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	1,475	$133,231.75	$90.33	$127,882.42	$86.70	0	4	16	$1.938019
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	92	Fairmont-New Richland-T-NRHEG-2168 - 000G94 - 092	382	$7,206.20	$18.86	$6,916.87	$18.11	0	4	16	$1.257918
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	95	Worthington-Canby-C-Canby-0891 - 000G99 - 095	1,585	$75,289.90	$47.50	$72,266.96	$45.59	0	4	16	$1.658870
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	117	Rochester-Peterson-C-Rushford-Peterson-0239 - 000G95 - 117	537	$18,022.84	$33.56	$17,299.21	$32.21	0	4	16	$1.507991
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	141	Rochester-Lansing-T-Austin-0492 - 000G95 - 141	30	$2,122.81	$70.76	$2,037.58	$67.92	0	4	16	$1.831998
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	520	$8,613.93	$16.57	$8,268.08	$15.90	0	4	16	$1.201397
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	1,544	$47,091.67	$30.50	$45,200.91	$29.28	0	4	16	$1.466571
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	157	Rochester-New Haven-T-Pine Island-0255 - 000G95 - 157	10	$310.23	$31.02	$297.77	$29.78	0	4	16	$1.473925
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	2,620	$67,737.57	$25.85	$65,017.86	$24.82	0	4	16	$1.394802
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	161	Rochester-Rochester-T-Rochester-0535 - 000G95 - 161	159	$6,407.34	$40.30	$6,150.08	$38.68	0	4	16	$1.587486
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	4,219	$67,686.55	$16.04	$64,968.90	$15.40	0	4	16	$1.187521
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	7	$5,237.72	$748.25	$5,027.42	$718.20	0	4	16	$2.856245
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	102	$6,558.65	$64.30	$6,295.32	$61.72	0	4	16	$1.790426
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	50	$2,019.79	$40.40	$1,938.70	$38.77	0	4	16	$1.588496
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	273	Wadena-Roseau-C-Roseau-0682 - 000G89 - 273	1,003	$25,824.96	$25.75	$24,788.07	$24.71	0	4	16	$1.392873
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	293	Rosemount-Castle Rock-T-Farmington-0192 - 000G93 - 293	11	$918.13	$83.47	$881.27	$80.12	0	4	16	$1.903741
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	6	$3,641.23	$606.87	$3,495.03	$582.51	0	4	16	$2.765303
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	302	Cloquet-White-T-Mesabi E-2711 - 000G96 - 302	582	$18,477.49	$31.75	$17,735.61	$30.47	0	4	16	$1.483872
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	313	Worthington-Mountain Lake-C-Mountain Lake-0173 - 000G99 - 313	1,105	$48,307.07	$43.72	$46,367.51	$41.96	0	4	16	$1.622835
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	314	Worthington-Ortonville-C-Ortonville-2903 - 000G99 - 314	1,298	$24,023.78	$18.51	$23,059.21	$17.77	0	4	16	$1.249687
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	318	Rochester-Oronoco-T-Pine Island-0255 - 000G95 - 318	1,387	$20,455.93	$14.75	$19,634.61	$14.16	0	4	16	$1.151063
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	418	Rochester-Adams-C-Southland - 000G95 - 418	2,111	$66,399.17	$31.45	$63,733.21	$30.19	0	4	16	$1.479863
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	64	$19,470.57	$304.23	$18,688.82	$292.01	0	4	16	$2.465398
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2015	467	Rochester-Wykoff-C-Kingsland - 000G95 - 467	354	$4,266.93	$12.07	$4,095.61	$11.58	0	4	16	$1.063709
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2015	37	Worthington-Great Bend-T-Windom-0177 - 000G99 - 037	600	$12,098.72	$20.16	$11,612.95	$19.35	0	6	36	$1.286681
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2015	132	Rochester-Zumbrota-C-Zumbrota-Mazeppa-2805 - 000G95 - 132	255	$11,039.44	$43.29	$10,596.20	$41.55	0	6	36	$1.618571
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2015	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	6,353	$232,137.49	$36.54	$222,817.04	$35.07	0	6	36	$1.544936
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2015	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	5,655	$452,920.94	$80.09	$434,735.91	$76.88	0	6	36	$1.885813
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2015	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	2	($258.32)	($129.16)	($247.95)	($123.98)	1	1.25	1.5625	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2015	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	14	$7,186.89	$513.35	$6,898.33	$492.74	1	1.25	1.5625	$2.692618
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2015	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	4	$2,279.02	$569.76	$2,187.52	$546.88	1	1.25	1.5625	$2.737892
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	186	Steel 10 in	2015	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	883	$108,633.25	$123.03	$104,271.56	$118.09	1	10	100	$2.072213
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	187	Steel 12 in	2015	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	759	$212,219.13	$279.60	$203,698.41	$268.38	1	12	144	$2.428750
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	187	Steel 12 in	2015	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	603	$168,600.94	$279.60	$161,831.52	$268.38	1	12	144	$2.428750
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2015	4	Pine City-North Branch-C-North Branch-0138 - 000G98 - 004	5	$5,132.96	$1,026.59	$4,926.87	$985.37	1	2	4	$2.993599
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2015	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	15	$4,412.72	$294.18	$4,235.55	$282.37	1	2	4	$2.450819
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2015	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	65	$11,023.94	$169.60	$10,581.32	$162.79	1	2	4	$2.211628
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2015	15	Pine City-Mora-C-Mora-0332 - 000G98 - 015	110	$2,533.91	$23.04	$2,432.17	$22.11	1	2	4	$1.344589
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2015	53	Fairmont-Jackson-C-Jackson Cty Central-2895 - 000G94 - 053	8	$10,173.58	$1,271.70	$9,765.10	$1,220.64	1	2	4	$3.086588
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2015	65	Worthington-Tracy-C-Tracy-0417 - 000G99 - 065	599	$35,840.66	$59.83	$34,401.64	$57.43	1	2	4	$1.759139
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2015	76	Fairmont-Truman-C-Truman-0458 - 000G94 - 076	519	$55,507.33	$106.95	$53,278.68	$102.66	1	2	4	$2.011401
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2015	79	Worthington-Worthington-C-Worthington Admn-0518 - 000G99 - 079	5	$967.92	$193.58	$929.05	$185.81	1	2	4	$2.269069
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2015	124	Fairmont-Hayward-C-Albert Lea-0241 - 000G94 - 124	27	$15,764.16	$583.86	$15,131.22	$560.42	1	2	4	$2.748514
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2015	151	Rochester-Eyota-C-Dover-Eyota-0533 - 000G95 - 151	34	$3,742.96	$110.09	$3,592.68	$105.67	1	2	4	$2.023952
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2015	156	Rochester-Marion-T-Rochester-0535 - 000G95 - 156	3	$3,307.99	$1,102.66	$3,175.17	$1,058.39	1	2	4	$3.024646
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2015	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	134	$38,127.70	$284.54	$36,596.85	$273.11	1	2	4	$2.436338
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2015	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	8	$3,991.42	$498.93	$3,831.16	$478.90	1	2	4	$2.680245
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2015	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	200	$10,342.79	$51.71	$9,927.52	$49.64	1	2	4	$1.695832
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2015	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	2	$4,422.70	$2,211.35	$4,245.13	$2,122.57	1	2	4	$3.326862
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2015	198	Cloquet-Bovey-C-Greenway-0316 - 000G96 - 198	17	$4,869.86	$286.46	$4,674.33	$274.96	1	2	4	$2.439270
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2015	207	Cloquet-Laprairie-C-Greenway-0316 - 000G96 - 207	10	$1,101.51	$110.15	$1,057.28	$105.73	1	2	4	$2.024198
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2015	208	Cloquet-Marble-C-Greenway-0316 - 000G96 - 208	1,948	$69,791.77	$35.83	$66,989.59	$34.39	1	2	4	$1.536432
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2015	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	125	$3,915.85	$31.33	$3,758.62	$30.07	1	2	4	$1.478133
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2015	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	286	$13,900.80	$48.60	$13,342.67	$46.65	1	2	4	$1.668852
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2015	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	67	$5,265.72	$78.59	$5,054.30	$75.44	1	2	4	$1.877602
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2015	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	2	$4,106.92	$2,053.46	$3,942.02	$1,971.01	1	2	4	$3.294689

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2015	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	10	$3,417.77	$341.78	$3,280.54	$328.05	1	2	4	$2.515940
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2015	291	Wadena-Wadena-C-Wadena-Deer Creek-2155 - 000G89 - 291	186	$13,761.24	$73.99	$13,208.72	$71.01	1	2	4	$1.851320
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2015	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	34	$10,686.80	$314.32	$10,257.72	$301.70	1	3	9	$2.479575
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2015	165	Fairmont-Blooming-C-Blooming Prairie-0756 - 000G94 - 165	39	$36,581.92	$938.00	$35,113.14	$900.34	1	3	9	$2.954407
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	193	Steel 3 in	2015	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	3	$4,587.70	$1,529.23	$4,403.50	$1,467.83	1	3	9	$3.166676
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2015	24	Pine City-Sandstone-C-E Central-2580 - 000G98 - 024	877	$46,891.25	$53.47	$45,008.54	$51.32	1	4	16	$1.710287
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2015	67	Fairmont-Fairmont-C-Fairmont Area-2752 - 000G94 - 067	46	$18,243.26	$396.59	$17,510.78	$380.67	1	4	16	$2.580549
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2015	76	Fairmont-Truman-C-Truman-0458 - 000G94 - 076	194	$36,364.61	$187.45	$34,904.55	$179.92	1	4	16	$2.255079
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2015	119	Rochester-Rushford-C-Rushford-Peterson-0239 - 000G95 - 119	2	$5,315.29	$2,657.65	$5,101.88	$2,550.94	1	4	16	$3.406700
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2015	124	Fairmont-Hayward-C-Albert Lea-0241 - 000G94 - 124	22	$3,295.53	$149.80	$3,163.21	$143.78	1	4	16	$2.157698
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2015	145	Rochester-Byron-C-Bryron-0531 - 000G95 - 145	8	$2,718.70	$339.84	$2,609.54	$326.19	1	4	16	$2.513471
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2015	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	2	$24.89	$12.45	$23.89	$11.95	1	4	16	$1.077368
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2015	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	8	$1,478.48	$184.81	$1,419.12	$177.39	1	4	16	$2.248929
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2015	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	4	($3,306.00)	($826.50)	($3,173.26)	($793.32)	1	4	16	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2015	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	1,198	$73,266.63	$61.16	$70,324.93	$58.70	1	4	16	$1.768638
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2015	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	6	($540.54)	($90.09)	($518.84)	($86.47)	1	4	16	#NUM!
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2015	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	3	$4,561.14	$1,520.38	$4,378.01	$1,459.34	1	4	16	$3.164156
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2015	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	269	$15,809.32	$58.77	$15,174.58	$56.41	1	4	16	$1.751356
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2015	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	6	$5,038.03	$839.67	$4,835.75	$805.96	1	4	16	$2.906313
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2015	296	Rosemount-Eagan-C-Rosemount-Apple Valley-0196 - 000G93 - 296	4	$5,148.89	$1,287.22	$4,942.16	$1,235.54	1	4	16	$3.091857
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2015	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	438	$30,916.13	$70.58	$29,674.83	$67.75	1	6	36	$1.830909
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	2015	146	Rochester-Cascade-T-Rochester-0535 - 000G95 - 146	11	$331.22	$30.11	$317.92	$28.90	1	8	64	$1.460898
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	2015	207	Cloquet-Laprairie-C-Greenway-0316 - 000G96 - 207	1,772	$211,757.66	$119.50	$203,255.47	$114.70	1	8	64	$2.059563
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	197	Steel 8 in	2015	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	24,442	$2,648,404.62	$108.35	$2,542,069.68	$104.00	1	8	64	$2.017033
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	207	Rectifiers	2015	183	Cloquet-Moose Lake-C-Moose Lake-0097 - 000G96 - 183	1	$54,103.72	$54,103.72	$51,931.43	$51,931.43	#N/A	#N/A	#N/A	$4.715430
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	207	Rectifiers	2015	223	Cloquet-Duluth-C-Proctor-0704 - 000G96 - 223	1	$112,434.55	$112,434.55	$107,920.24	$107,920.24	#N/A	#N/A	#N/A	$5.033103
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2016	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	3	$5,395.59	$1,798.53	$5,395.59	$1,798.53	0	1	1	$3.254918
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2016	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	2	$1,242.63	$621.32	$1,242.63	$621.32	0	1	1	$2.793315
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	2016	255	Wadena-Baudette-C-Lake of Woods-0390 - 000G89 - 255	1	$1,830.67	$1,830.67	$1,830.67	$1,830.67	0	1	1	$3.262610
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	8	$1,478.91	$184.86	$1,478.91	$184.86	0	2	4	$2.266843
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	8	Rosemount-Lakeville-C-Lakeville-0194 - 000G93 - 008	4	$891.28	$222.82	$891.28	$222.82	0	2	4	$2.347954
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	15	Pine City-Mora-C-Mora-0332 - 000G98 - 015	510	$7,332.92	$14.38	$7,332.92	$14.38	0	2	4	$1.157759
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	16	Pine City-Barry-T-Hinckley-Finlayson-2165 - 000G98 - 016	8,638	$58,181.38	$6.74	$58,181.38	$6.74	0	2	4	$0.828660
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	23	Pine City-Pine-C-Pine City-0578 - 000G98 - 023	138	$7,233.48	$52.42	$7,233.48	$52.42	0	2	4	$1.719497
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	38	Worthington-Midway-T-Mountain Lake-0173 - 000G99 - 038	488	$2,172.54	$4.45	$2,172.54	$4.45	0	2	4	$0.648360
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	59	Worthington-Ivanhoe-C-Ivanhoe-0403 - 000G99 - 059	6	$2,768.80	$461.47	$2,768.80	$461.47	0	2	4	$2.664143
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	87	Worthington-WalnutGrve-C-Westbrk-WalnutGrv-2898 - 000G99 - 087	633	$11,237.69	$17.75	$11,237.69	$17.75	0	2	4	$1.249198
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	114	Rochester-Lanesboro-C-Lanesboro-0229 - 000G95 - 114	166	$6,406.32	$38.59	$6,406.32	$38.59	0	2	4	$1.586475
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	117	$8,110.28	$69.32	$8,110.28	$69.32	0	2	4	$1.840859
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	163	Rochester-Sterwartsville-C-Stewartville-0534 - 000G95 - 163	3,695	$94,920.53	$25.69	$94,920.53	$25.69	0	2	4	$1.409764
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	173	Rochester-Saint Charles-C-St Charles-0858 - 000G95 - 173	918	$27,419.85	$29.87	$27,419.85	$29.87	0	2	4	$1.475235
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	2,928	$30,499.80	$10.42	$30,499.80	$10.42	0	2	4	$1.017868
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	192	Wadena-Deerwood-C-Crosby-Ironton-0182 - 000G89 - 192	196	$5,031.60	$25.67	$5,031.60	$25.67	0	2	4	$1.409426
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	194	Wadena-Deerwood-T-Crosby-Ironton-0182 - 000G89 - 194	464	$3,639.20	$7.84	$3,639.20	$7.84	0	2	4	$0.894316
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	198	Cloquet-Bovey-C-Greenway-0316 - 000G96 - 198	111	$2,090.48	$18.83	$2,090.48	$18.83	0	2	4	$1.274850
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	203	Cloquet-Grand Rapids-C-Grand Rapids-0318 - 000G96 - 203	854	$24,602.38	$28.81	$24,602.38	$28.81	0	2	4	$1.459543
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	206	Cloquet-Keewatin-C-Nashwauk-Keewatin-0319 - 000G96 - 206	317	$6,934.03	$21.87	$6,934.03	$21.87	0	2	4	$1.339849
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	212	Cloquet-International Falls-C-Intrntnl-0361 - 000G96 - 212	120	$3,686.65	$30.72	$3,686.65	$30.72	0	2	4	$1.487421
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	217	Cloquet-Aurora-C-Mesabi E-2711 - 000G96 - 217	94	$1,182.77	$12.58	$1,182.77	$12.58	0	2	4	$1.099681
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	347	$9,755.05	$28.11	$9,755.05	$28.11	0	2	4	$1.448861
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	220	Cloquet-Buhl-C-Mt Iron-Buhl-0712 - 000G96 - 220	88	$5,472.52	$62.19	$5,472.52	$62.19	0	2	4	$1.793721
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	742	$19,673.83	$26.51	$19,673.83	$26.51	0	2	4	$1.423410
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	225	Cloquet-Fayal-T-Eveleth-Gilbert-2154 - 000G96 - 225	1,001	$16,535.11	$16.52	$16,535.11	$16.52	0	2	4	$1.218010
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	228	Cloquet-Grand Lake-T-Proctor-0704 - 000G96 - 228	4,335	$35,468.48	$8.18	$35,468.48	$8.18	0	2	4	$0.912753
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	231	Cloquet-Hermantown-T-Hermantown-0700 - 000G96 - 231	2,504	$37,348.80	$14.92	$37,348.80	$14.92	0	2	4	$1.173769
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	237	Cloquet-Mt Iron-C-Mt Iron-Buhl-0712 - 000G96 - 237	204	$4,282.85	$20.99	$4,282.85	$20.99	0	2	4	$1.322012
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	3,925	$40,140.70	$10.23	$40,140.70	$10.23	0	2	4	$1.009876
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	245	Bemidji-Frazee-C-Frazee-Vergas-0023 - 000G97 - 245	4,668	$93,692.96	$20.07	$93,692.96	$20.07	0	2	4	$1.302547
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	246	Bemidji-Lake View-T-Detroit Lakes-0022 - 000G97 - 246	3,235	$35,514.71	$10.98	$35,514.71	$10.98	0	2	4	$1.040602
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	247	Bemidji-Bemidji-T-Bemidji-0031 - 000G97 - 247	5,230	$31,834.13	$6.09	$31,834.13	$6.09	0	2	4	$0.784617
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	248	Bemidji-Bemidji-C-Bemidji-0031 - 000G97 - 248	927	$6,443.47	$6.95	$6,443.47	$6.95	0	2	4	$0.841985
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	249	Bemidji-Northern--Bemidji-0031 - 000G97 - 249	2,549	$19,874.20	$7.80	$19,874.20	$7.80	0	2	4	$0.892095
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	251	Wadena-Park Rapids-C-Park Rapids-0309 - 000G89 - 251	2,152	$17,179.76	$7.98	$17,179.76	$7.98	0	2	4	$0.902003
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	255	Wadena-Baudette-C-Lake of Woods-0390 - 000G89 - 255	308	$8,029.06	$26.07	$8,029.06	$26.07	0	2	4	$1.416141
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	259	Bemidji-Ada-C-Ada-Borup-2854 - 000G97 - 259	965	$9,755.65	$10.11	$9,755.65	$10.11	0	2	4	$1.004751
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	1,475	$21,108.06	$14.31	$21,108.06	$14.31	0	2	4	$1.155640
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	288	Wadena-Sebeka-C-Sebeka-820 - 000G89 - 288	197	$1,653.94	$8.40	$1,653.94	$8.40	0	2	4	$0.924279

Table 1
FERC Account 376 - Gas Distribution Mains
Detailed Data for Minimum System Studies
Based on Historical Year Ending December 31, 2016

Company	Product	Account	Retirement Unit Code	Retirement Unit Description	Year	Tax District Number	Asset Location Description	Quantity	Actual Total Cost	Actual Unit Cost	Escalated Total Cost	Escalated Unit Cost	Material	Size	Size^2	log(Escalated Unit Cost)
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	290	Wadena-Verndale-C-Verndale-818 - 000G89 - 290	1,725	$20,026.15	$11.61	$20,026.15	$11.61	0	2	4	$1.064832
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	207	$5,043.83	$24.37	$5,043.83	$24.37	0	2	4	$1.386856
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	313	Worthington-Mountain Lake-C-Mountain Lake-0173 - 000G99 - 313	850	$23,955.74	$28.18	$23,955.74	$28.18	0	2	4	$1.449941
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	342	Bemidji-Eckels-T-Bemidji-0031 - 000G97 - 342	2,908	$18,858.15	$6.48	$18,858.15	$6.48	0	2	4	$0.811575
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	176	Plastic 2 in	2016	421	Fairmont-Albert Lea-C-Albert Lea - 000G94 - 421	13	$2,587.14	$199.01	$2,587.14	$199.01	0	2	4	$2.298875
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2016	10	Rosemount-Farmington-C-Farmington-0192 - 000G93 - 010	217	$9,575.59	$44.13	$9,575.59	$44.13	0	4	16	$1.644734
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2016	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	3,124	$97,338.63	$31.16	$97,338.63	$31.16	0	4	16	$1.493597
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2016	243	Bemidji-Detroit Lakes-C-Detroit Lakes-0022 - 000G97 - 243	729	$12,278.76	$16.84	$12,278.76	$16.84	0	4	16	$1.226342
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	179	Plastic 4 in	2016	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	600	$28,015.49	$46.69	$28,015.49	$46.69	0	4	16	$1.669224
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2016	160	Rochester-Rochester-C-Rochester-0535 - 000G95 - 160	1,490	$87,214.46	$58.53	$87,214.46	$58.53	0	6	36	$1.767379
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	181	Plastic 6 in	2016	294	Rosemount-Eagan-C-W St Paul-Mendota Hts-0197 - 000G93 - 294	1,695	$77,808.24	$45.90	$77,808.24	$45.90	0	6	36	$1.661813
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	184	Steel 1 1/4 in	2016	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	1	$1,927.82	$1,927.82	$1,927.82	$1,927.82	1	1.25	1.5625	$3.285066
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	2016	179	Cloquet-Barnum-C-Barnum-0091 - 000G96 - 179	6	$17,530.72	$2,921.79	$17,530.72	$2,921.79	1	1	1	$3.465649
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	185	Steel 1 in	2016	181	Cloquet-Cloquet-C-Carlton-0094 - 000G96 - 181	1,135	$1,227.76	$1.08	$1,227.76	$1.08	1	1	1	$0.033424
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2016	218	Cloquet-Biwabik-C-Mesabi E-2711 - 000G96 - 218	27	$7,897.39	$292.50	$7,897.39	$292.50	1	2	4	$2.466126
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2016	222	Cloquet-Chisholm-C-Chisholm-0695 - 000G96 - 222	6	$8,533.45	$1,422.24	$8,533.45	$1,422.24	1	2	4	$3.152973
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2016	227	Cloquet-Gilbert-C-Eveleth-Gilbert-2154 - 000G96 - 227	4	$571.28	$142.82	$571.28	$142.82	1	2	4	$2.154789
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2016	268	Wadena-ThiefRiverFalls-C-ThiefRvrFlls-0564 - 000G89 - 268	38	$7,131.02	$187.66	$7,131.02	$187.66	1	2	4	$2.273372
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2016	280	Wadena-Staples-C-Staples-Motley-2170- 000G89 - 280	2	$2,510.33	$1,255.17	$2,510.33	$1,255.17	1	2	4	$3.098703
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2016	295	Rosemount-Eagan-C-Burnsville-0191 - 000G93 - 295	13	$10,903.64	$838.74	$10,903.64	$838.74	1	2	4	$2.923627
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2016	302	Cloquet-White-T-Mesabi E-2711 - 000G96 - 302	70	$4,218.03	$60.26	$4,218.03	$60.26	1	2	4	$1.780029
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	191	Steel 2 in	2016	313	Worthington-Mountain Lake-C-Mountain Lake-0173 - 000G99 - 313	44	$26,213.15	$595.75	$26,213.15	$595.75	1	2	4	$2.775064
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	195	Steel 4 in	2016	29	Rosemount-Webster-T-Northfield-0659 - 000G93 - 029	52	$14,355.10	$276.06	$14,355.10	$276.06	1	4	16	$2.441003
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	196	Steel 6 in	2016	129	Rochester-Pine Island-C-Pine Island-0255 - 000G95 - 129	1,051	$99,684.13	$94.85	$99,684.13	$94.85	1	6	36	$1.977037
Minnesota Energy Resources Corp	200 Gas	376000 GDist Mains	175	Plastic 1 in	1953	7	Rosemount-Rosemount-C-Apple Valley-0196 - 000G93 - 007	132	$42.67	$0.32	$816.06	$6.18	0	1	1	$0.790988

Translation of Distribution Operation & Maintenance Accounts 870-894 to Plant Accounts 374-385
Forecasted Test Year Ending December 31, 2018

Line No.	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[J]	[K]	[L]	[M]	[N]	[O]	[P]	[Q]	[R]	[R]	[S]	[T]
1				Alloc Method			Alloc Method			Alloc Method			YE			YE TOTAL					
2			Ave Plant	A			B			C		FERC	Total			Dist O&M					
3	Land and Land Rights	374	769,100	0.00152								870	9,526		374	11,651					
4	Structures and Improvements	375	145,076	0.00029								871	343,520		375	2,198					
5	Mains	376	229,210,314	0.45418					229,210,314	0.591038		872	-		376	6,720,963					
6	Compressor Station Equipment	377	-	-								873	-		377	-					
7	Measuring & Regulation Equipment - General	378	12,872,816	0.02551								874	3,266,824		378	1,257,263					
8	Measuring & Regulation Equipment - Gate Station	379	15,117,304	0.02996								875	338,152		379	483,721					
9	Services	380	158,599,651	0.31427					158,599,651	0.408962		876	-		380	4,700,619					
10	Meters	381.0	46,235,618	0.09162		46,235,618	0.676129					877	-		381.0	3,542,801					
11	Automated Meter Reading - Purchases	381.2	-	-		-	-					878	1,843,555		381.2	-					
12	Demand Devices - Purchases	381.3	-	-		-	-					879	365,125		381.3	-					
13	Meter Connections & Installations	382.0	-	-								880	7,185,524		382.0	-					
14	Automated Meter Installations	382.2	-	-								881	15,824		382.2	-					
15	Demand Device - Installations	382.3	-	-								885	20,089		382.3	-					
16	House Regulators	383	19,482,827	0.03861		19,482,827	0.284908					886	-		383	1,492,870					
17	Industrial Metering & Regulating Station Equip.	385	2,664,381	0.00528		2,664,381	0.038963					887	1,317,868		385	204,158					
18	Other Prop on Cust Prem	386	-	-								888	-		386	-					
19	Intangible	302	3,969,435	0.00787											302	60,132					
20	Intangible	303	15,600,454	0.03091								889	724,102		303	236,329					
21			504,666,977			68,382,826			387,809,965			890	-			18,712,706					
22												891	254,711								
23												892	962,005								
24												893	1,995,226		** These figures do not include G&C allocations or A&G allocations						
25												894	70,655								
26													18,712,706								
27																					

28 **Distribution O&M Accts are mapped to the appropriate, corresponding Plant Series of Distribution Accounts.**
29 **This helps to keep the COSS on an apples-to-apples comparison basis.**
30
31
32
33
34 **PERCENTAGES ASSIGNED/TRANSLATED:**
35
36 Plant Acct:

	FERC Acct:	374	375	376	377	378	379	380	381.0	381.2	381.3	382.0	382.2	382.3	383	385	386	302	303	Alloc Method
38	(870)Superv & Engr	0.00152	0.00029	0.45418	-	0.02551	0.02996	0.31427	0.09162	-	-	-	-	-	0.03861	0.00528	-	0.00787	0.03091	(A)
39	(871)Load Dispatch	0.00152	0.00029	0.45418	-	0.02551	0.02996	0.31427	0.09162	-	-	-	-	-	0.03861	0.00528	-	0.00787	0.03091	(A)
40	(872)Comp Labr & Ex	1.00000																		Direct
41	(873)Comp Fuel & Pw	1.00000																		Direct
42	(874)Mains&Serv Exp			0.59104				0.40896												(C)
43	(875)Ms&Reg Exp Gen					1.00000														Direct
44	(877)Ms&Reg Exp Gat						1.00000													Direct
45	(878)Mtr&Hous Regul								0.67613	-	-				0.28491	0.03896				(B)
46	(879)Cust Install								0.67613	-	-				0.28491	0.03896				(B)
47	(880)Other	0.00152	0.00029	0.45418	-	0.02551	0.02996	0.31427	0.09162	-	-	-	-	-	0.03861	0.00528	-	0.00787	0.03091	(A)
48	(881)Rents	0.00152	0.00029	0.45418	-	0.02551	0.02996	0.31427	0.09162	-	-	-	-	-	0.03861	0.00528	-	0.00787	0.03091	(A)
49	(885)Superv.& Engr.	0.00152	0.00029	0.45418	-	0.02551	0.02996	0.31427	0.09162	-	-	-	-	-	0.03861	0.00528	-	0.00787	0.03091	(A)
50	(886)Struct & Imprv		1.00000																	Direct
51	(887)Mains			1.00000																Direct
52	(888)Comp Stat Equp	1.00000																		Direct
53	(889)Ms&Reg Exp Gen					1.00000														Direct
54	(890)Ms&Reg Exp Indust					1.00000														Direct
55	(891)Ms&Reg Exp Gat						1.00000													Direct
56	(892)Services							1.00000												Direct
57	(893)Mtr&Hous Regul								0.67613	-	-				0.28491	0.03896				(B)
58	(894)Other Equipmt	0.00152	0.00029	0.45418	-	0.02551	0.02996	0.31427	0.09162	-	-	-	-	-	0.03861	0.00528	-	0.00787	0.03091	(A)

59
60
61 **DOLLARS ASSIGNED/TRANSLATED BASED ON PERCENTAGES ABOVE:**
62 Plant Acct:

	FERC Acct:	374	375	376	377	378	379	380	381.0	381.2	381.3	382.0	382.2	382.3	383	385	386	302	303	Alloc Method	
64	(870)Superv & Engr	15	3	4,327	-	243	285	2,994	873	-	-	-	-	-	368	50	-	75	294	(A)	9,526
65	(871)Load Dispatch	524	99	156,020	-	8,762	10,290	107,957	31,472	-	-	-	-	-	13,262	1,814	-	2,702	10,619	(A)	343,520
66	(872)Comp Labr & Ex	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Direct	-
67	(873)Comp Fuel & Pw	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Direct	-
68	(874)Mains&Serv Exp	-	-	1,930,816	-	-	-	1,336,008	-	-	-	-	-	-	-	-	-	-	-	(C)	3,266,824
69	(875)Ms&Reg Exp Gen	-	-	-	-	338,152	-	-	-	-	-	-	-	-	-	-	-	-	-	Direct	338,152
70	(877)Ms&Reg Exp Gat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Direct	-
71	(878)Mtr&Hous Regul	-	-	-	-	-	-	-	1,246,481	-	-	-	-	-	525,244	71,830	-	-	-	(B)	1,843,555
72	(879)Cust Install	-	-	-	-	-	-	-	246,872	-	-	-	-	-	104,027	14,226	-	-	-	(B)	365,125
73	(880)Other	10,951	2,066	3,263,531	-	183,285	215,242	2,258,166	658,310	-	-	-	-	-	277,399	37,936	-	56,517	222,122	(A)	7,185,524
74	(881)Rents	24	5	7,187	-	404	474	4,973	1,450	-	-	-	-	-	611	84	-	124	489	(A)	15,824
75	(885)Superv.& Engr.	31	6	9,124	-	512	602	6,313	1,840	-	-	-	-	-	776	106	-	158	621	(A)	20,089
76	(886)Struct & Imprv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Direct	-
77	(887)Mains	-	-	1,317,868	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Direct	1,317,868
78	(888)Comp Stat Equp	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Direct	-
79	(889)Ms&Reg Exp Gen	-	-	-	-	724,102	-	-	-	-	-	-	-	-	-	-	-	-	-	Direct	724,102
80	(890)Ms&Reg Exp Indust	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Direct	-
81	(891)Ms&Reg Exp Gat	-	-	-	-	-	254,711	-	-	-	-	-	-	-	-	-	-	-	-	Direct	254,711
82	(892)Services	-	-	-	-	-	-	962,005	-	-	-	-	-	-	-	-	-	-	-	Direct	962,005
83	(893)Mtr&Hous Regul	-	-	-	-	-	-	-	1,349,030	-	-	-	-	-	568,456	77,739	-	-	-	(B)	1,995,226
84	(894)Other Equipmt	108	20	32,090	-	1,802	2,116	22,204	6,473	-	-	-	-	-	2,728	373	-	556	2,184	(A)	70,655
85		11,651	2,198	6,720,963	-	1,257,263	483,721	4,700,619	3,542,801	-	-	-	-	-	1,492,870	204,158	-	60,132	236,329		18,712,706

Gas Transportaion Administration Costs
Historical Year Ending December 31, 2016

			Allocated Gas Transportation Costs
Gas Supply Labor Costs (Transportation Customer Load Balancing, etc)			$52,270
	Hours/Yr	Total Costs/Utility	
MERC Labor (Hours per Year)	1250	$52,270	
Tech Support System Costs			
DeMaxx and TherMaxx			$39,623
MERC		$61,600	
Pegasys (formerly Transportation Web Access)			$0
MERC		$0	
Customer Notification System			$2,779
MERC		$8,914	
Total			$94,672

Allocation Factors

% Costs to Transportation Customers (Thermaxx & Demaxx) (2016 Actual)

	mmBtu	Percentage
Transport Customer Throughput	53,312,611	64%
Total Throughput	82,883,136	

% Costs to Transportation Customers (CNS Customers) (2016 Actual)

	Customers	Percentage
Transport Customers	236	31%
Interruptible Customers	521	69%
	757	100%

Derivation of Transportation Administration Fee
Historical Year Ending December 31, 2016

Line No.	Activity	Total Cost	Loaded Cost
1	Billing & Customer Accounting Support	$ 10,350	$ 15,830
2	Gas Supply Support	$ 52,270	$ 79,944
3	Administration Support	$ 42,402	$ 64,851
4	Operational Support	$ 99,396	$ 152,020
6	Information Technology Support	$ 20,865	$ 31,912
7			
8	Total Annual Cost (Corporate-wide)	$ 225,283	$ 344,557
9			
10	Number of MERC Transportation Meters	2,244	2,244
11			
12	MERC Combined Service Territory Annual Administration Fee	$ 100.39	$ 153.55

Table 2
Uncollectible Cost Detail
Historical Year Ending December 31, 2016

Residential	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec		
Recoveries	(26,321)	(473)	(1,642)	(84,541)	(22,196)	(15,718)	(20,255)	(17,712)	(10,744)	(33,060)	(30,850)	(34,032)		
Write-Offs	10,450	145,624	49,444	66,240	148,922	90,692	25,117	210,903	308,820	96,857	234,484	129,854		
Net	(15,871)	145,151	47,802	(18,301)	126,726	74,974	4,862	193,191	298,076	63,797	203,634	95,822	101,655	68.39%

Commercial	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	
Recoveries	(709)	(33)	(5,178)	(3,794)	(1,038)	(1,697)	(10,116)	(131)	-	(1,694)	(555)	(1,548)	
Write-Offs	338,738	27,180	22,184	3,508	4,834	7,572	20,185	54,186	52,855	22,737	30,652	5,123	
Net	338,029	27,147	17,006	(286)	3,796	5,875	10,069	54,055	52,855	21,043	30,097	3,575	46,938

Large C&I	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	
Recoveries			-										
Write-Offs			622					52					
net	-	-	622	-	-	-	-	52	-	-	-	-	56

C&I - Total	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec		
Recoveries	(709)	(33)	(5,178)	(3,794)	(1,038)	(1,697)	(10,116)	(131)	-	(1,694)	(555)	(1,548)		
Write-Offs	338,738	27,180	22,806	3,508	4,834	7,572	20,185	54,238	52,855	22,737	30,652	5,123		
net	338,029	27,147	17,628	(286)	3,796	5,875	10,069	54,107	52,855	21,043	30,097	3,575	46,995	31.61%
													148,650	

Account 381 - Gas Meters Cost Information - DETAILED

Historical Year Ending December 31, 2016

MERC has over 1000 pages of workpapers detailing meter data used to construct the weighting factors that are utilized within the Meter Allocation Factor in the Class Cost of Service Study.

This data is available upon request in electronic format.

Account 381 - Gas Meters Cost Information
Historical Year Ending December 31, 2016

	[A]	[B]	[C]	[D]	[E]
LINE NO	**PGA**	**RATE CLASS**	**METERS**	**TOTAL METER+DEVICE REPLACEMENT COST**	**COST PER METER**
1	NNG	Residential	177,041	$23,791,873	$134.39
2	NNG	Class 1	6,395	$1,391,853	$217.64
3	NNG	Class 2	11,216	$9,288,762	$828.17
4	NNG	Class 3	581	$930,558	$1,601.43
5	NNG	Class 4	31	$75,559	$2,399.29
6	NNG	Class 5	21	$62,813	$2,991.10
7	NNG	Agriculture Class 1	62	$121,775	$1,960.63
8	NNG	Agriculture Class 2	87	$161,202	$1,857.88
9	NNG	Agriculture Class 3	3	$9,644	$3,160.46
10	NNG	Power Generation Class 1	14	$28,562	$1,979.72
11	NNG	Power Generation Class 2	-	$0	$0.00
12	NNG				
13					
14	Consolidated	Residential	29,731	$3,992,331	$134.28
15	Consolidated	Class 1	2,049	$414,441	$202.24
16	Consolidated	Class 2	3,391	$2,613,167	$770.65
17	Consolidated	Class 3	96	$189,564	$1,979.43
18	Consolidated	Class 4	12	$43,728	$3,611.44
19	Consolidated	Class 5	19	$25,450	$1,339.47
20	Consolidated	Agriculture Class 1	7	$6,901	$934.79
21	Consolidated	Agriculture Class 2	3	$4,935	$1,870.30
22	Consolidated	Agriculture Class 3	-	$0	$0.00
23	Consolidated	Power Generation Class 1	-	$0	$0.00
24	Consolidated	Power Generation Class 2	-	$0	$0.00
25					

NOTE: This data is based upon the historical period ending December 31, 2016