



**City of Mountain Home Drinking Water Project
\$2,500,000**

Business Case GPR Documentation

- INSTALLS 14,300 FEET OF NEW HDPE WATER TRANSMISSION PIPING (Energy Efficiency). Business Case GPR per 3.5-1: *Energy efficient....upgrades*; and, per 3.5-5: *Projects that achieve the remaining increments of energy efficiency* (\$2,139,000).

New Water Transmission Line

Summary

- Installs a total of 14,300 feet of new HDPE transmission piping will be installed; the new line consists of 2,600 feet of 24" diameter pipe; 10,100 feet of 16" diameter pipe and 1,600 feet of 12" diameter pipe.
- New transmission line to increase system reliability, mitigate high pressure events, and to reduce energy requirements.
- Loan amount = \$2,500,000
- Energy saving (green) portion of loan = 86% (\$2,139,000)

Background

- The water system is experiencing fluctuating high pressure events due to a lack of transmission capacity; a 19% water loss has also been documented, some of which may be attributable to transient high pressure hot spots.
- As part of a water loss management plan, various distribution alternatives were evaluated to identify potential pipeline rehabilitation/replacement projects.
- A priority alternative selected was the provision of a new transmission line. This project will install 14,300 feet of 24-inch, 16-inch, and 12-inch pipe.

Results

- Actual anticipated savings attributable to the new transmission line will depend to a large extent on well operation; for example, more fully utilizing wells with higher groundwater levels (i.e. Wells 9, 12, and 14) will result in energy savings above and beyond calculated savings.
- The largest cost savings due to the new transmission line is anticipated during the summer periods when water demand is high and multiple wells are operating.
- A review of the energy costs of several wells showed that transmission line cost savings are anticipated for Wells 6, 11 and 13. The decline in system pressures due to the new transmission line observed near these wells results in higher production capacities for the wells.
- Due to the new transmission line, an average estimated savings of approximately 5% is anticipated for these wells during the months of June through September. During low demand periods, multiple wells are not likely to operate, and the cost savings would be less.

Calculated Energy Savings

- The WaterCAD model was used to calculate the cost per MG for a well based on discharge pressures, suction pressures, and flow. Because modified pump curves (to reflect both the drawdown and pump curve) are used, only the difference in cost per MG for the wells is compared. Costs were calculated assuming \$0.07/KW*Hr.
- For the period of June through September an estimated annual combined cost savings for these wells of at least \$4660 would be realized (refer to spreadsheet for date and table below for calculations). Over a 40 year period, this savings would amount to approximately \$186,400.

Potential Annual Energy Savings:	Well	Savings per MG*	MG/Summer	\$Savings/Summer
	6	\$ 3.92	318	\$ 1,248
	11	\$ 7.95	351	\$ 2,788
	13	\$ 4.59	136	\$ 623
	Total/Yr.		805	\$ 4,660

*Based on computer model output. Assumes \$0.07/KW*Hr.

Conclusion

- By installing 14,300 feet of new transmission line, the City anticipates conserving water while saving energy.
- The Drinking Water Facility Plan specifies approximately 19% of water production that is unaccounted for, some of which may be recovered by reduced line pressure when the new transmission line is commissioned.
- In addition, energy cost savings of at least \$186,400 can be realized over the 40-year life of the new transmission line, with additional cost savings possible depending on well operation.
- Additional benefits include reductions in unnecessary pumping and operation and maintenance expenditures, and

eliminating potential health hazards associated with waterborne pathogens entering the water distribution system.

Mountain Home Well Data

Well 6

Day	Jun-10	Jul-10	Aug-10	Sep-10
1	Repairs	Repairs	2,853,000	2,158,000
2	Repairs	Repairs	2,841,000	1,946,000
3	Repairs	Repairs	2,931,000	2,079,000
4	Repairs	Repairs	3,050,000	2,082,000
5	Repairs	Repairs	2,830,000	1,725,000
6	Repairs	Repairs	2,989,000	1,636,000
7	Repairs	Repairs	2,752,000	2,214,000
8	Repairs	Repairs	2,988,000	1,621,000
9	Repairs	Repairs	3,229,000	1,958,000
10	Repairs	Repairs	2,866,000	1,329,000
11	Repairs	Repairs	3,501,000	1,512,000
12	Repairs	Repairs	2,128,000	1,605,000
13	Repairs	Repairs	2,929,000	1,909,000
14	Repairs	Repairs	2,953,000	1,858,000
15	Repairs	2,630,000	1,961,000	1,820,000
16	Repairs	3,165,000	2,993,000	1,746,000
17	Repairs	2,407,000	2,752,000	1,580,000
18	Repairs	3,400,000	1,646,000	2,057,000
19	Repairs	2,929,000	3,097,000	1,387,000
20	Repairs	2,700,000	2,698,000	1,659,000
21	Repairs	3,339,000	3,088,000	1,551,000
22	Repairs	2,122,000	2,678,000	1,562,000
23	Repairs	3,140,000	3,004,000	1,518,000
24	Repairs	2,879,000	2,773,000	1,622,000
25	Repairs	2,992,000	2,940,000	1,635,000
26	Repairs	3,287,000	2,773,000	1,517,000
27	Repairs	2,610,000	2,811,000	1,310,000
28	Repairs	2,979,000	1,610,000	1,690,000
29	Repairs	2,929,000	1,788,000	1,489,000
30	Repairs	3,010,000	1,630,000	1,632,000
31	Repairs	3,024,000	1,940,000	

Well 11

Jun-10	Jul-10	Aug-10	Sep-10
2,906,000	3,299,000	2,831,000	2,712,000
2,565,000	3,391,000	2,929,000	3,028,000
2,474,000	3,341,000	3,347,000	3,323,000
2,448,000	2,417,000	3,042,000	3,108,000
2,286,000	2,788,000	3,893,000	3,180,000
2,261,000	2,807,000	2,767,000	3,024,000
2,377,000	1,346,000	3,196,000	3,545,000
2,691,500	905,000	3,401,000	2,972,000
2,691,500	1,591,000	3,646,000	3,368,000
2,888,000	2,035,000	2,812,000	2,521,000
2,439,000	1,949,000	3,303,000	3,024,000
2,995,000	3,100,000	2,205,000	2,920,000
3,463,000	3,199,000	2,346,000	3,747,000
3,441,000	3,409,000	2,874,000	2,894,000
3,403,000	3,174,000	3,148,000	3,249,000
3,236,000	3,344,000	3,354,000	2,906,000
2,982,000	3,015,000	2,991,000	3,155,000
3,425,000	1,883,000	3,483,000	3,063,000
3,345,000	815,000	3,176,000	2,978,000
3,547,000	1,607,000	2,354,000	3,255,000
3,269,000	1,697,000	3,556,000	3,145,000
5,444,000	489,000	3,003,000	2,930,000
1,393,000	1,706,000	2,947,000	2,885,000
3,044,000	882,000	3,052,000	2,990,000
3,138,000	964,000	3,364,000	3,272,000
3,016,000	1,236,000	3,201,000	3,283,000
3,545,000	2,840,000	3,474,000	3,115,000
2,238,000	2,892,000	3,760,000	3,354,000
2,871,000	3,462,000	2,897,000	3,094,000
3,406,000	3,203,000	2,843,000	3,209,000
	3,238,000	3,050,000	

Well 13

Jun-10	Jul-10	Aug-10	Sep-10
222,000	1,902,000	327,000	1,025,000
500,000	1,825,000	525,000	666,000
0	1,972,000	1,229,000	47,000
240,000	1,168,000	637,000	851,000
0	1,390,000	1,265,000	729,000
0	173,000	1,223,000	876,000
0	4,538,000	1,150,000	900,000
0	2,378,000	1,060,000	476,000
250,000	3,000,000	1,139,000	105,000
0	2,695,000	506,000	322,000
375,000	2,929,000	1,361,000	585,000
0	1,315,000	925,000	350,000
234,000	1,703,000	1,160,000	679,000
1,270,000	2,407,000	1,105,000	634,000
1,293,000	1,836,000	1,024,000	216,000
838,000	1,786,000	1,374,000	764,000
859,000	1,128,000	1,551,000	509,000
1,306,000	2,747,000	1,398,000	464,000
1,590,000	2,584,000	1,178,000	321,000
1,964,000	2,116,000	473,000	556,000
1,170,000	2,969,000	1,233,000	223,000
1,748,000	1,678,000	958,000	490,000
1,496,000	2,671,000	1,102,000	259,000
1,682,000	1,953,000	1,268,000	523,000
1,731,000	2,273,000	758,000	211,000
1,694,000	2,577,000	1,384,000	292,000
2,336,000	1,707,000	541,000	449,000
2,463,000	610,000	619,000	218,000
2,534,000	964,000	544,000	452,000
1,922,000	1,122,000	1,191,000	223,000
	271,000	1,045,000	

Total Est. w/o Repairs 49.542 83.022 51.407

89.228 72.024 96.245 93.249

29.717 60.387 31.253 14.415