

## CHAPTER 11

### RECOMMENDED ALTERNATIVES

#### 11.1 SHORT-TERM RECOMMENDATIONS

There are four short-term alternatives available to the City of Gillette in the interim to meet anticipated water demands until the long-term supply is established:

- Conservation
- Utilize CBM Water
- Expand the Fort Union Source
- Treat the Fox Hills Source

Of these four alternatives, conservation is the proverbial “low hanging fruit.” The City of Gillette’s conservation program is already showing positive results. This alternative represents a minimal monetary investment compared to the other short-term alternatives. There is little downside to pursuing this alternative beyond the fact that in some cases it tends to diminish with time. A strong sense of the community pulling together in a time of need should mitigate this effect for the duration required for the long-term supply to be developed. It is recommended that this alternative continue to be pursued by the City of Gillette as the first line of action in their short-term supply campaign.

The second recommendation is a two-path activity. The City of Gillette should continue pursuing CBM water as a source, including negotiating with CBM operators while concurrently pursuing expansion of the Fort Union wellfield by redrilling their pre-1980 wells. This concurrent approach ensures that Gillette can effectively and efficiently explore CBM water as a source while not losing any time with the Fort Union redrilling undertaking. These should be pursued concurrently up to a “point of no return” – presumably the funding date of the Fort Union wells. If the CBM water is to be a viable option, negotiations must be finalized and it must be a committed, firm source by this date to prevent loss of critical time to develop alternate sources.

In addition to the Fort Union recommendation above, it is also recommended that the City of Gillette setup and maintain a detailed groundwater monitoring program for the Fort Union aquifer in the Gillette area. The results of this plan will steer the policy of usage from the Fort

Union as the system transitions into the new long-term water supply. The Fort Union usage could conceivably vary between an emergency peaking resource and being run at maximum capacity 365 days a year. The modeling efforts presented in this report indicate the latter would be highly imprudent, but it is outside the scope of this report to determine an actual usage level.

The third recommendation is to explore a rental contract or other contractual understanding with suppliers to provide a skid-mounted reverse osmosis unit to treat Fox Hills water. Due to its cost, this alternative should be pursued as the last course of action. It is anticipated that this alternative may need to be utilized until the Fort Union redrilling is finished and possibly as a peaking resource toward the end of the short-term planning period.

## **11.2 REGIONALIZATION**

In the event that the Sleepy Hollow, Crestview, and Antelope Valley subdivisions petitions for annexation, or the City of Gillette pursues annexation of the same, it is recommended that the Phase 1 improvements discussed in Chapter 6 be implemented. If annexation does not occur, these improvements may still be prudent, but they are no longer directly connected to the City of Gillette, and as such are outside the scope of this report. If annexation is pursued and the City of Gillette undertakes the recommended Phase 1 improvements, it is recommended that subsequent planning begin to undertake Phase 2 improvements once the long-term supply is in place. The exact timing of the execution of Phase 2 should be coordinated to the extent possible with other planning and extension efforts in the area.

## **11.3 LONG-TERM RECOMMENDATIONS**

There are a number of factors to consider when selecting a preferred alternative for the long-term supply. These factor have been discussed at much more length elsewhere in this report, and are summarized here for ease of comparison.

**Table 11-1  
Comparative Summary**

	Madison Wellfield and Pipeline	Surface Impoundment with Treatment
Initial Capital Cost		X
O & M Cost	X	
Present Worth	-- (Tie – Each within margin of error)	-- (Tie – Each within margin of error)
EDU Cost – Scenario #1	X	
EDU Cost – Scenario #2	X	
Non-Economic Analysis	X	
Time to Implementation	X	

X – Preferred Alternative

This summary in Table 11-1 shows that the Madison wellfield and pipeline is the preferred alternative in all categories except capital cost and a tie in present worth. While this appears overwhelming, the issue of capital cost is significant. The difference in initial capital outlay is approximately \$58,290,000. This difference is cut substantially when the 15 year 9 MGD plant upgrade is constructed at a cost in today's dollars of \$13,731,000, but not completely overcome.

However, this additional capital for the Madison pipeline alternative buys a number of important benefits that justify its expenditure. First, O & M costs are approximately \$500,000 less per year. Second, the residual life in the pipeline at the end of the 30-year planning period is assumed to be 30 years, while the first phase of the treatment plant is assumed to be consumed by year 30 of the planning period. The effects of these circumstances are seen in the present worth analysis. From this analysis, it can be seen that on a present worth basis, within a reasonable margin of interest rates, that the alternatives are substantially the same. In simple terms, this demonstrates that the money spent upfront in additional capital on the pipeline and wellfield option is equaled by the additional expenditures that will need to be made of the life of the project on the surface water alternative. From a cost per EDU standpoint, the pipeline and wells are the preferred alternative. This analysis indicates that even though they are still making a significant contribution to finance the project in the form of almost doubled rates, that the ratepayers of Gillette are paying a less burdensome share of the cost.

These economic benefits must be weighed in conjunction with non-economic issues to reach a fully considered decision. The pipeline and wellfield option offers non-economic benefits such as increased redundancy, increased water quality, an increased life of facilities, and a reduced operational logistics challenge. The surface water reservoir offers the non-economic benefits of easily accepting CBM water if delivered to the reservoir, and a slightly higher synergy for incorporating softening.

It is the conclusion of this study and report that both of these long-term options are technically viable solutions. However, when all factors are considered, the parallel Madison pipeline and wellfield is the preferred alternative. The increased capital costs of this alternative are offset by the other economic and non-economic considerations that this alternative clearly outperforms the surface water impoundment and treatment plant alternative.