7.0 COMPARISON OF ALTERNATIVES

7.1 Financial Analysis Methodology

Previous sections of this report presented a detailed description of the alternatives considered in this study effort and the associated opinions of probable project costs. This section summarizes the assumptions used in the financial analysis, provides background information on potential financial strategies, and compares the alternatives based on the financial impacts to the City of Sioux Falls and its residents. In accordance with concerns regarding the implementation of the LCRWS project, two variations were developed for the LCRWS Alternative in an attempt to quantify the relative financial implications of the potential for inadequate Federal funding to meet the City's 2012 deadline and the inability for the City of Sioux Falls to acquire additional capacity available through expansion of the LCRWS in the magnitude and by the required timeline to meet the projected water supply demands under drought conditions from year 2017 through year 2037. As a result, five alternatives are discussed in this section:

1. LCRWS Alternative;
2. LCRWS Alternative with Limited Federal Funding;
3. LCRWS Alternative with Limited Expansion Capacity;
4. Missouri River Pipeline Alternative; and
5. Missouri River Pipeline Alternative with Consecutive Users.

In terms of methodology, the financial evaluation for the LCRWS project was based on estimated capital and O&M costs as provided by Banner. As noted in Section 5, all capital and O&M costs prepared by AE2S for the Missouri River Pipeline Alternative were estimated in November 2004 dollars as part of this evaluation effort based on engineering judgment and experience, projects of similar scope, input from contractors and suppliers, estimates previously prepared by other engineering firms under contract with the City of Sioux Falls, and recent bid tabulations for the LCRWS project. All capital costs prepared previous to this study effort, such as that for the LCRWS project, have been adjusted to reflect November 2004 costs using construction cost index tables published by Engineering News Record. Provisions for construction interest were excluded from this analysis due to the likelihood that interest from the bond proceeds prior to expenditures would likely offset a large portion of the construction interest costs.

7.1.1 Funding Discussion

There are various financing options potentially available to the City of Sioux Falls pursuant to its Home Rule Charter. The City currently has not provided in its Charter for financing alternatives beyond the existing provisions of State law; therefore, the options and related information provided in this section are limited to current State laws.

Since State loans (i.e. Drinking Water Revolving Fund) are generally below market interest rates, the City will want to determine what dollar amounts, interest rates, and terms would be available to the City through programs administered by the State of South Dakota before moving forward with a project. Because the funding available through the current State programs is very limited, however, this report does not discuss the State programs but instead focuses on the City's other traditional financing options.

One factor that will need to be considered is the City's debt limit. Under the State constitution, the City has a general debt limit equal to five percent of its assessed value. There is an additional 10 percent available for water and sewer provided that at least a majority of the voters have approved the issuance of the bonds. As of December 31, 2003, the City had $95,741,655 of debt outstanding. All of it was applicable to the five percent limitation. The City had no debt applicable to the 10 percent limitation. Based on an assessed value of $7,629,701,378 for 2004, the five percent limitation would be $381,485,068, and the 10 percent limitation would be $762,970,137. Because of the potential significant debt needs for this project, it would appear to be in the City's overall best financial interest not to have debt for this project applicable to the five percent limitation, requiring voter approval of the project. The following are some of the financing options that have been explored with the assistance of Dougherty & Company, LLC, and should be revisited prior to any actual issuance of bonds.

General Obligation Bonds

The lowest interest rates in the traditional market would be obtained by the City's issuance of General Obligation (GO) Bonds. The City of Sioux Falls may want to consider this financing option even if it intends to pay for the project(s) from water system revenues or other City revenues. This financing option would require the City to submit the issuance of the GO Bonds to an election, which would require a 60 percent approval. Regardless of whether the City represented to the voters that the City would or would not pay debt service solely from water system revenues, the GO Bonds would qualify for the additional 10 percent constitutional debt limitation. All fees, including but not limited to Bond Insurance and Rating Agency, relating to the issuance of the bonds would also be the lowest under this financing option. In fact, if the City obtains an Aa2/AA or better rating, it probably would not benefit from the purchase of bond insurance on GO Bonds.

Water System Revenue Bonds

Bonds that are secured by revenues from the existing water facilities as well as the financed facilities would probably carry interest rates that are estimated to be 10 basis points higher than GO Bonds. The issuance of Water System Revenue Bonds would have to be submitted to an election and would require a 60 percent approval. In addition to having higher issuance costs, Bond Insurers and/or Rating Agencies would require the

City of Sioux Falls to covenant that the water rates would produce net operating revenues available for debt service equal to 1.20 to 1.35 times annual debt service. As with GO Bonds, this type of bond would qualify for the additional 10 percent debt limitation.

Water Surcharge Revenue Bonds

If the City of Sioux Falls prefers to issue bonds without the need for an election, it could establish a surcharge within the water rate structure to provide for payment of the financed facilities. However, the ordinance authorizing the issuance would be subject to a majority referendum election if petitioned by five percent of the registered voters. If referred, it would require only a majority voter approval instead of 60 percent approval under GO and Water System Revenue Bond options. The City would segregate the funds monthly as the water bill payments are received and use the revenues to pay the operating expenses related to the improvements and net operating revenue to pay debt service on the bonds.

It is estimated that Water Surcharge Revenue Bonds would carry interest rates at least five basis points higher than Water System Revenue Bonds and 15 basis points higher than GO Bonds. Water Surcharge Revenue Bonds also would have higher issuance costs, and Bond Insurers and/or Rating Agencies would require the City to covenant that the revenues from the surcharge would produce net operating revenues available for debt service equal to 1.20 to 1.35 times annual debt service coverage. One issue that should be noted is that, for Water Surcharge Revenue Bonds, the net debt service coverage would have to be collected entirely from the surcharge, not in the overall water rates. Although a Bond Insurer probably would allow the City to transfer surplus revenues generated from the surcharge to the general water fund after the annual operating expenses and payment on the bonds have been satisfied, the overall water rates necessary to satisfy the requirements for Water Surcharge Revenue Bonds may drive the water rates higher than those established under the Water System Revenue Bond option. Since Water Surcharge Revenue Bonds would be payable from the surcharge established to finance the improvements, the bonds would not be classified as debt. Therefore, Water Surcharge Revenue Bonds would not count against the City's five or 10 percent debt limitation.

Improvement Revenue Bonds

The use of Improvement Revenue Bonds is another bonding option available to the City of Sioux Falls, whereby the City would issue bonds payable solely from the revenues generated by the improvements financed by the bonds. Since the improvements associated with implementing additional water supply and treatment capacity are intended to supplement existing infrastructure, it would be very difficult to identify revenues being produced solely by this project. Also, the amount of water that would be conveyed through the new pipelines associated with this project would vary depending on operational decisions and strategies. Physical components of the project such as pumping

facilities and piping may be difficult to get rated and insured and would likely require higher interest rates. Although improvement revenue bonds would not be considered debt and would not count against either of the two debt limitations, this financing option does not appear to be feasible for this type of project because of the issues identified above.

Sale and Lease-Back

In a Sale and Lease-Back financing scenario, the City of Sioux Falls would enter into a ground lease with a Bank Trustee (Trustee). The City would issue Certificates of Participation (COPs) in the lease, and the Trustee would use the funds from the sale of the COPs to construct the improvements. The Trustee, however, would appoint the City as its agent for construction of the improvements. Upon payment of the lease, the improvements would be transferred to the City, and the ground lease would terminate. Generally, with the City pledging to pay from any funds available and with a rate covenant like Water System Revenue Bonds (although they probably could have a lesser debt service coverage), the COPs could be sold as Limited Tax GO Certificates and would carry interest rates not any greater than Water System Revenue Bonds (10 basis points higher than GO Bonds). The costs, including Bond Insurers and Rating Agency fees, would be similar to those for Water System Revenue Bonds. No voting would be required, but referendum provisions would apply. If petitions were filed, a majority election would be required. However, unless the repayment was not subject to non-appropriation on an annual basis, the COPs would count against the five percent general debt limitation. If they were made subject to non-appropriation on an annual basis, the interest rates would probably be 15 basis points higher than GO Bonds, and the costs, particularly for bond insurance premiums, would be higher than for Water System Revenue Bonds and Surcharge Revenue Bonds.

Summary

If the City can obtain 60 percent voter approval, it should give consideration to the issuance of GO Bonds. In addition to the above discussion, the issuance of GO Bonds would allow more opportunity for the City to explore creative financing alternatives as the project moves forward. Some of the alternatives may not only end up with lower interest expense than traditional serial maturities, but also allow a better matching of debt repayment to receipt of revenues, given the relatively steep projected demand curve for the City of Sioux Falls. The economic benefit to be obtained by alternative financing is often enhanced with a general obligation pledge as the ultimate credit.

For comparison purposes in this evaluation, it was assumed that the City would issue GO Bonds with a 25-year final maturity. The 25-year maturity matches the periods into which the planning horizon for this project has been set. Although interest rates for Aa2/AA rated general obligation bonds with a 25-year maturity in late 2004 reflect an average interest rate slightly above 4.5 percent, an average interest rate of 6 percent was used in

the amortization schedules, as this value is more reflective of historical average interest rates.

7.1.2 Funding Assumptions

To compare the alternatives presented in this report, an analysis of the projected annual debt obligations and O&M expenses based on a list of project-specific assumptions was conducted. The analysis considered only the incremental estimated debt service and O&M costs associated with the implementation of each of the alternatives in accordance with the assumption that any debt obligations and O&M expenses for the City of Sioux Falls associated with use of the existing infrastructure would be consistent across each of the alternatives. The estimated capital costs were indexed to the estimated year of completion of construction and were amortized to estimate annual costs through 2062. The estimated O&M costs were also indexed to the associated year of operation. The costs of each alternative were then adjusted to present worth (November 2004 dollars) for comparison purposes. The following discussion presents an analysis of the estimated annual debt, O&M, and total costs for each alternative, as well as the annual costs per meter using the population projections from Section 2. The assumptions used in the analysis include:

- All costs were rounded to the nearest $10,000;
- Issuance of GO Bonds with a 25-year final maturity and six percent interest rate;
- Annual index factor (inflation) of four percent for future capital expenditures based on recent trends in which construction costs have increased above the current rate of inflation;
- Annual index factor (inflation) of 2.5 percent for future O&M expenditures, based on the consumer price index trends over the past 15-year period;
- Bond issue occurs one year prior to the completion of construction (simplified for the purpose of this analysis);
- Bond repayment begins in the year each improvement becomes operational (simplified for the purpose of this analysis);
- Future debt calculations were brought back to present worth using a rate of four percent;
- Population estimates consistent with Section 2.2 of this document with approximately 3.34 residents per meter based on 2003 data; and
- The estimated local share is $25.98 million (November 2004 dollars), of which $3.4 million has been spent on the project to date, leaving a remaining local cost share of $22.58 million (November 2004 dollars).

7.2 LCRWS Alternatives

Due to uncertainties associated with the LCRWS project, three funding scenarios were evaluated for the LCRWS Alternative. In addition to the LCRWS Alternative described in previous sections, scenarios were developed based on the two major concerns from the City's perspective regarding participation in the LCRWS project: 1) the availability of Federal funding and its impact on the implementation schedule; and 2) the willingness of LCRWS users to support and commit to expansion of the LCRWS that meets the capacity objectives and implementation timeline of the City of Sioux Falls.

7.2.1 LCRWS Alternative

This alternative assumes that the City of Sioux Falls benefits from its share of program funding for the LCRWS project at a level of at least $24 million (November 2004 dollars) annually for the period of 2006 through 2011, for a total of $144 million (November 2004 dollars) over six years, which would provide treated water service to the City by the year 2012 deadline according to Banner. Program funding for the LCRWS project is comprised of 76.18 percent Federal funds and 9.72 percent State funds for a total of approximately 85.9 percent grant funding. The LCRWS Alternative also assumes that additional capacity is available to the City of Sioux Falls as described in Section 4. The opinion of total probable project cost for the City of Sioux Falls under this alternative is $457,580,000 (November 2004 dollars). The breakdown and timeline for these expenditures is shown in Table 7.1.

Table 7.1: Estimated Expenditures – LCRWS Alternative

Itemized Capital Expenditures	Opinion of Cost (November 2004 Dollars)	Indexed Opinion of Cost (Year of Bond Issue)	Annual Incremental O&M Costs (November 2004 Dollars)
Current Funding (1)	$25,980,000	$-	$-
2011 Bond Series	$31,220,000	$42,730,000	$2,368,000
2016 Bond Series	$83,550,000	$139,120,000	$2,368,000
2036 Bond Series	$316,830,000	$1,155,920,000	$5,515,000
Total – City of Sioux Falls	**$457,580,000**		

(1) As discussed in Section 7.1.2.

To illustrate the total annual cost, including estimated debt service and incremental O&M costs associated with implementation of the LCRWS Alternative, amortization schedules for each bond series were developed with the support of Dougherty & Company, LLC and are included as Exhibit F. Estimated incremental annual O&M costs presented in Table 7.1 were indexed to future values. Figures 7.1 and 7.2 present the total annual costs and total annual costs per meter, respectively. Analysis of the present worth of the LCRWS Alternative shows that through the year 2062, the total estimated present worth (November 2004 dollars), including estimated debt, financing, and incremental O&M costs, is approximately $751,140,000.

Figures 7.1 and 7.2 show major user cost increases in years 2012, 2017, and 2037, due to the implementation of capital improvement events as outlined in Section 4. Because of the lack of Federal funding, the impacts in years 2017 and 2037 are relatively significant. It should be noted that these are the incremental cost increases associated with the implementation of the LCRWS Alternative and are independent of the costs associated with the operation of the existing City of Sioux Falls water system.

Annual cost decreases included in the estimated costs shown on Figures 7.1 and 7.2 are associated with a decrease in variable costs due to reduced operation of the existing City of Sioux Falls WPP. For instance, when the City receives treated water service from LCRWS, operation of the existing WPP will be decreased by approximately 10 mgd. This will result in a decrease in variable costs and a potential increase in fixed costs per meter, depending upon the allocation of fixed and variable costs within the existing rate structure. An evaluation of the effects of the variable and fixed costs associated with the existing WPP is beyond the scope of this study effort, but an estimated reduction in variable chemical and power costs has been taken into account.

In accordance with the implementation timeline of the capital improvements, Figure 7.2 shows major increases of approximately $125 per meter in year 2012, $190 per meter in year 2017, and $1,100 per meter in year 2037, and $116 and $678 decreases in 2042 and 2062, respectively, to implement the LCRWS Alternative. As debt service is retired in 2042 and 2062, the estimated annual cost per meter decreases substantially. The estimated present worth of the annual cost per meter of the LCRWS Alternative for the 50-year planning period is $8,502 (November 2004 dollars).

Overall, with the exception of years in which new debt service payments begin, Figure 7.2 shows that the annual costs per meter generally decrease despite annual increases in estimated O&M costs. This is attributable to the increasing population projections used in the analysis, as discussed in Section 2 of this report. The potential for major estimated increases in annual user costs, however, indicates that prudent rate planning decisions and the exploration of creative financial options leading up to capital improvements will be required to minimize the impact of sudden and substantial rate increases (rate shock).

Figure 7.1: Estimated Annual Debt and Incremental O&M Costs – LCRWS Alternative

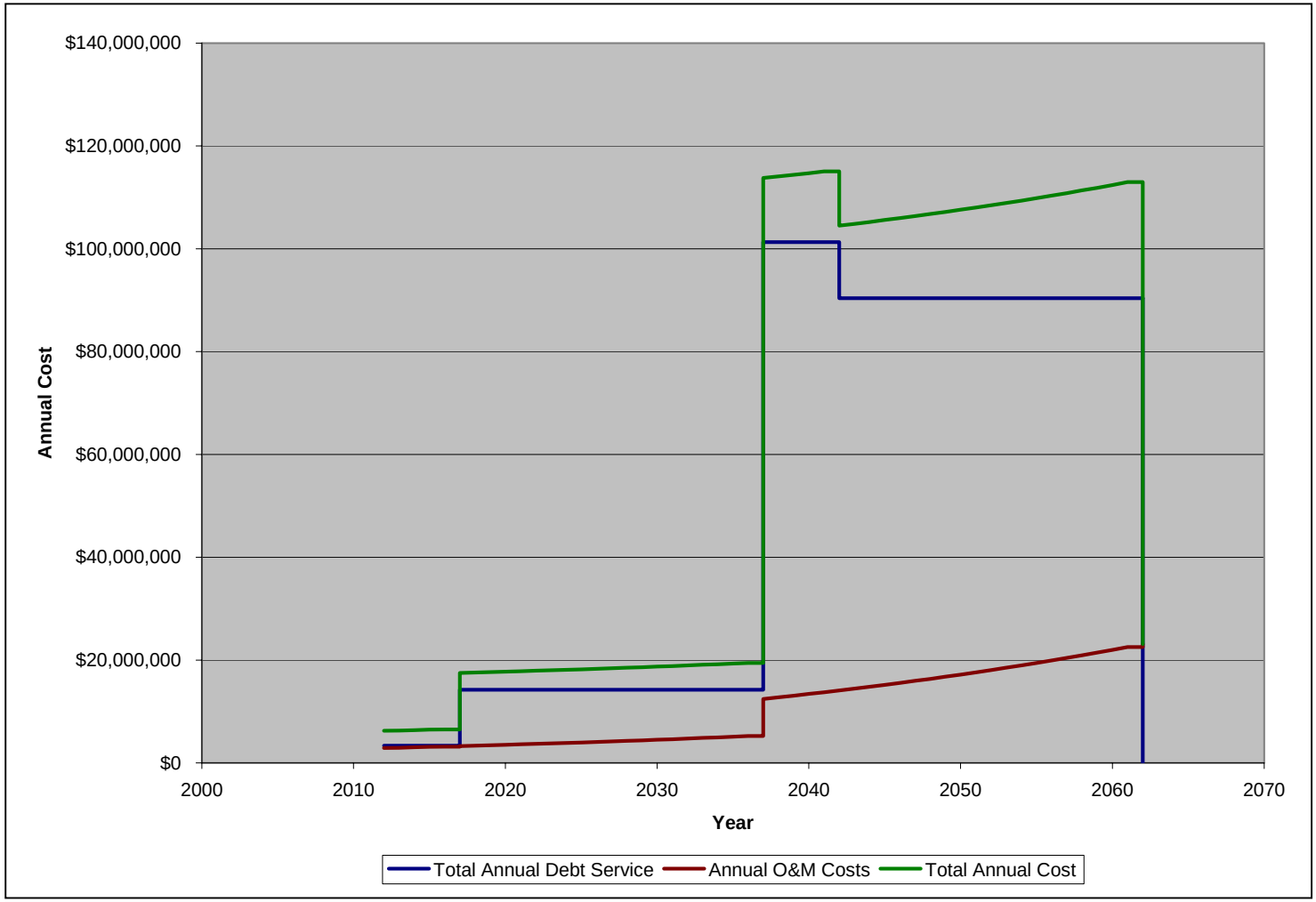
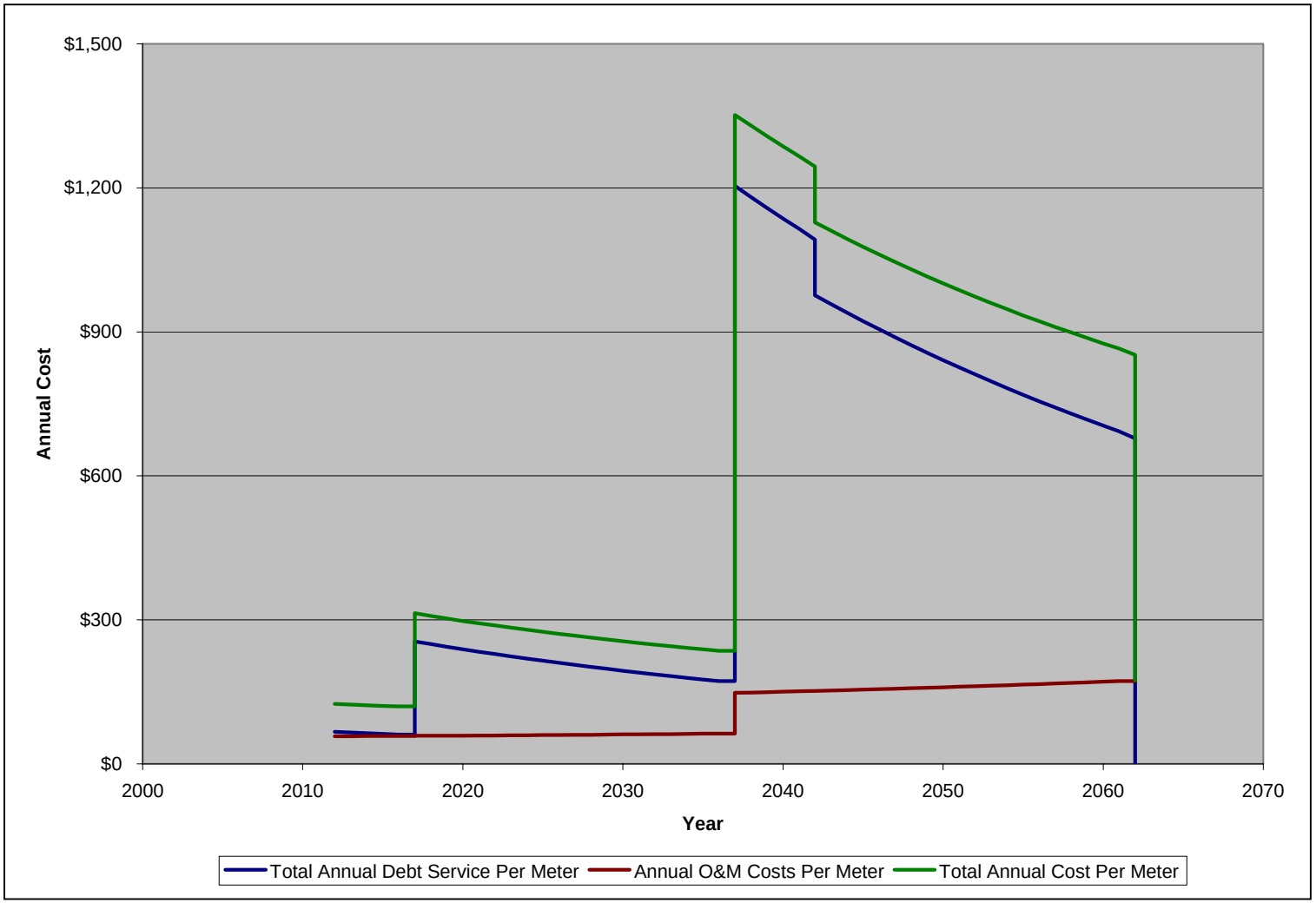


Figure 7.2: Estimated Annual Debt and Incremental O&M Costs per Meter – LCRWS Alternative



According to information provided by the City of Sioux Falls' Public Works Department, Sioux Falls users currently pay an estimated $323 per meter per year for water service. Table 7.2 illustrates the present worth (November 2004 dollars) of the estimated annual cost increases (and decreases in years in which debt is retired) associated with the implementation of the LCRWS Alternative.

7.2.2 LCRWS Alternative with Limited Federal Funding

At a rate of $24 million in program funding per year, it is anticipated that the LCRWS will be on schedule to meet the estimated cost of $182,580,000 (2003 dollars) for infrastructure required to provide treated water service to the City of Sioux Falls by year 2011. To reflect the potential circumstance in which annual program funding falls short of $24 million, the LCRWS Alternative with Limited Federal Funding was evaluated. This alternative assumed that the Federal funding levels result in a $6 million (November 2004 dollars) shortfall annually from year 2006 through year 2011. To address the Federal funding shortfall, the City would bond an additional $36 million (November 2004 dollars) in year 2011. Although LCRWS has indicated that it would attempt to repay the City of Sioux Falls with operating revenue prior to the completion of the project, it was assumed that repayment by LCRWS to the City of Sioux Falls would be made upon completion of construction of the entire LCRWS project.

For the purpose of this analysis, it was assumed that repayment awards of approximately $7.5 million, $15 million, and $13.5 million, each expressed as November 2004 dollars, will be received in years 2027, 2028, and 2029, respectively. These values were calculated based on the assumption that at $18 million (November 2004 dollars) per year in program funding, construction of the entire LCRWS project will be completed in mid-2027.

Table 7.2: Present Worth of Estimated Annual User Costs – LCRWS Alternative

Year	Estimated Annual Incremental Increase/(Decrease) Per Meter (November 2004 Dollars)	Estimated Total Annual Cost Per Meter (November 2004 Dollars)
Baseline (2004)	$-	$323
2012	$97	$420
2017	$114	$534
2037	$318	$852
2042	$(42)	$810
2062	$(75)	$735

Program funding for the LCRWS project is comprised of 76.18 percent Federal funds and 9.72 percent State funds for a total of approximately 85.9 percent. To make up for the $36 million shortfall in program funding, another two years of program funding would be required beyond mid-2027. It is assumed that the City of Sioux Falls would be reimbursed for half of the annual program funding in year 2027 (approximately $9 million in November 2004 dollars), a full year of State and Federal program funding in year 2028 (approximately $18 million in November 2004 dollars), and the remainder of the $36 million ($9 million in November 2004 dollars) in year 2029. To be consistent with estimated increases in capital costs, the funding repayment values were indexed to the estimated year of repayment ($22.2 million in year 2027, $46.1 million in year 2028, and $24 million in year 2029).

The breakdown and timeline for the expenditures for the LCRWS Alternative with Limited Federal Funding is shown in Table 7.3. The opinion of total probable project cost for the City of Sioux Falls' share of this alternative is $493,580,000 (November 2004 dollars). To illustrate the total annual cost, including estimated debt, financing, and incremental O&M costs associated with implementation of this alternative, amortization schedules for each bond series were developed with the support of Dougherty & Company, LLC and are included as Exhibit F. Figures 7.3 and 7.4 present the total annual projected costs and total annual projected costs per meter, respectively.

Analysis of the present worth of this alternative shows that through the year 2062, the total estimated present worth (November 2004 dollars) of this alternative, including estimated debt and incremental O&M costs, is $760,890,000, which is about $16,290,000 more than the LCRWS Alternative. The difference is attributable to the interest on the $36 million shortfall financed from year 2012 through 2029.

Table 7.3: Estimated Expenditures – LCRWS Alternative with Limited Federal Funding

Itemized Capital Expenditures	Opinion of Cost (November 2004 Dollars)	Indexed Opinion of Cost (Year of Bond Issue)	Annual Incremental O&M Costs (November 2004 Dollars)
Current Funding (1)	$25,980,000	$-	$-
2011 Bond Series	$67,220,000	$92,000,000	$2,368,000
2016 Bond Series	$83,550,000	$139,120,000	$2,368,000
2036 Bond Series	$316,830,000	$1,155,920,000	$5,515,000
Total – City of Sioux Falls	**$493,580,000**		

(1) As discussed in Section 7.1.2.

Figure 7.3: Estimated Annual Debt and Incremental O&M Costs – LCRWS Alternative with Limited Federal Funding

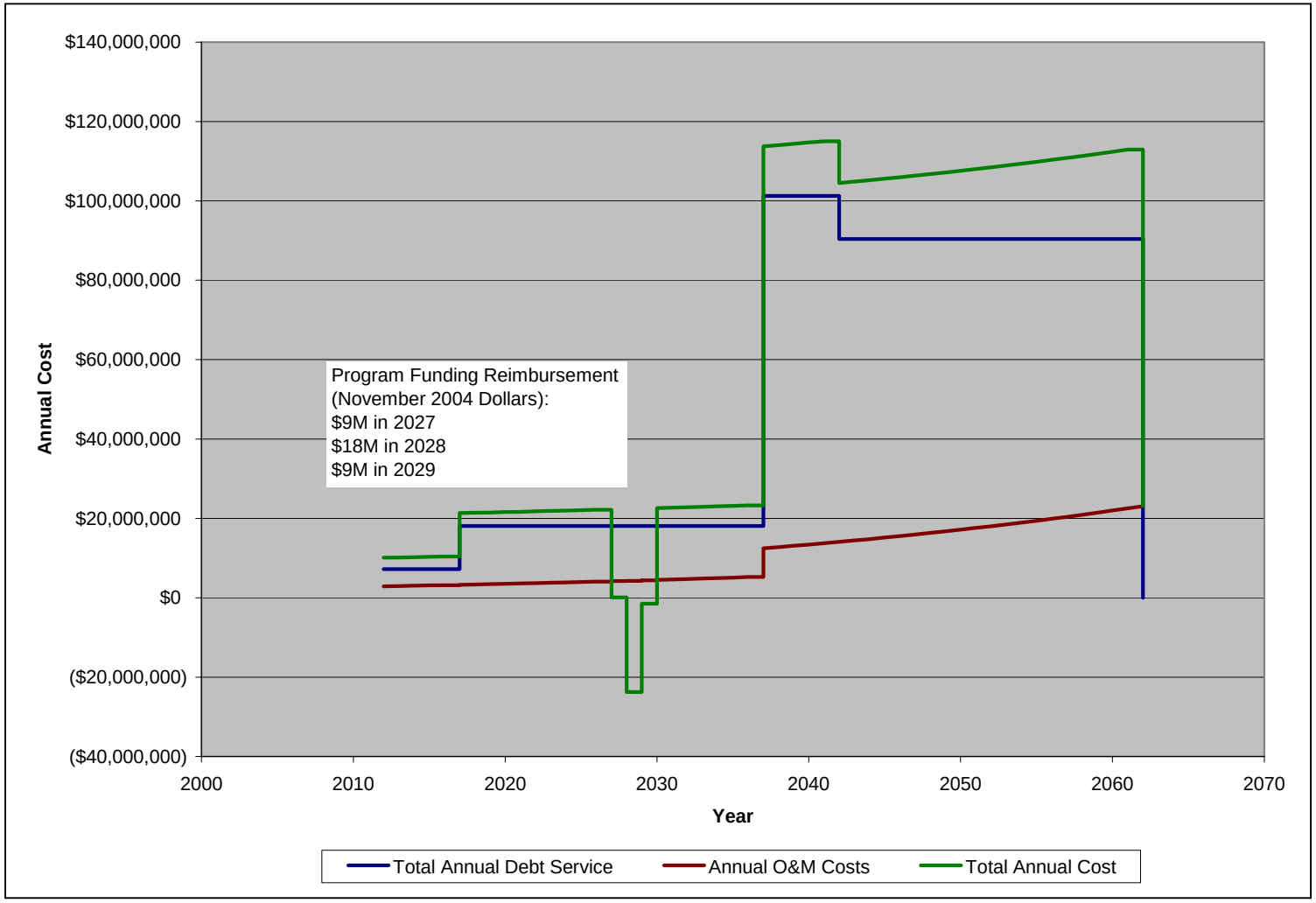
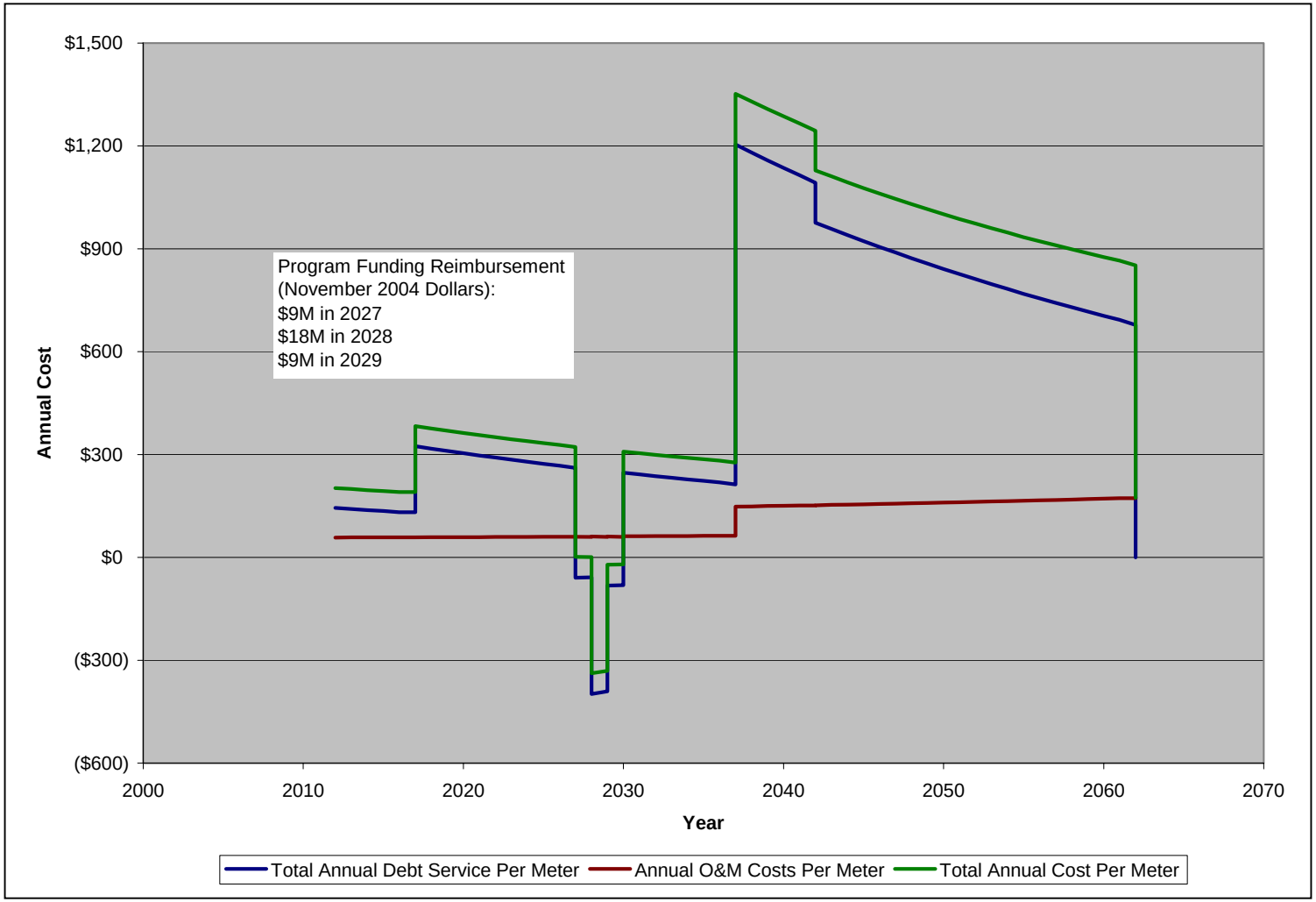


Figure 7.4: Estimated Annual Debt and Incremental O&M Costs per Meter – LCRWS Alternative with Limited Federal Funding



The estimated present worth of the annual cost per meter of the LCRWS Alternative with Limited Federal Funding for the 50-year planning period is $9,250 (November 2004 dollars). Figures 7.3 and 7.4 show major user cost increases in years 2012, 2017, and 2037, due to the implementation of capital improvement events as outlined in Section 4. Because of the reduced level of Federal funding, the impacts in year 2012, 2017, and 2037 are more significant than for the LCRWS Alternative. It should be emphasized that these are the incremental cost increases associated with the implementation of the LCRWS Alternative with Limited Federal Funding, and are independent of the costs associated with the operation of the existing City of Sioux Falls water system.

Annual cost decreases included in the estimated costs shown on Figures 7.3 and 7.4 are associated with a decrease in variable costs due to reduced operation of the existing City of Sioux Falls WPP. For instance, when the City receives treated water service from LCRWS, operation of the existing WPP will be decreased by approximately 10 mgd. This will result in a decrease in variable costs and a potential increase in fixed costs per meter, depending upon the allocation of fixed and variable costs within the existing rate structure. An evaluation of the effects of the variable and fixed costs associated with the existing WPP is beyond the scope of this study effort, but an estimated reduction in variable chemical and power costs has been taken into account.

In accordance with implementation of the timeline of capital improvements, Figure 7.4 shows an estimated increase of $200 per meter in year 2012, an approximate $190 per meter increase in year 2017, and an estimated $1,100 per meter increase in year 2037 due to the implementation of capital improvement events as outlined in Section 4. In addition, repayment of the additional $36 million funding results in a short-term cost reductions in years 2027 through 2029. As debt service is retired and/or repayment of program funding is made, the estimated annual cost per meter decreases substantially at approximately $116 and $678 per meter in 2042 and 2062, respectively.

Overall, with the exception of years in which new debt service payments begin, Figure 7.4 shows that the annual costs per meter generally decrease, despite annual increases in estimated incremental O&M costs. This is attributable to the increasing population projections used in the analysis, as discussed in Section 2 of this report. The potential for major estimated increases in annual user costs, however, indicates that prudent rate planning decisions and the exploration of creative financial options leading up to capital improvements will be required to minimize the impact of sudden and substantial rate increases (rate shock).

According to information provided by the City of Sioux Falls' Public Works Department, Sioux Falls users currently pay an estimated $323 per meter per year for water service. Table 7.4 illustrates the present worth (November 2004 dollars) of the estimated annual cost increases (and decreases in years in which debt is retired) associated with the implementation of the LCRWS Alternative with Limited Federal Funding.

Table 7.4: Present Worth of Estimated Annual User Costs – LCRWS Alternative with Limited Federal Funding

Year	Estimated Annual Incremental Increase/(Decrease) Per Meter (November 2004 Dollars)	Estimated Total Annual Cost Per Meter (November 2004 Dollars)
Baseline (2004)	$-	$323
2012	$153	$476
2017	$111	$587
2027	$(7)	$580
2028	$(7)	$573
2029	$(7)	$566
2030	$(6)	$560
2037	$304	$864
2042	$(42)	$822
2062	$(75)	$747

7.2.3 LCRWS Alternative with Limited Expansion Capacity

The LCRWS Alternative with Limited Expansion Capacity assumes that, after the initial treated water service of 10 mgd is provided to the City of Sioux Falls by LCRWS (with adequate Federal funding), the following two situations are true:

- Other LCRWS users are not willing to relinquish rights to additional capacity through expansion of the LCRWS to the City of Sioux Falls, resulting in the future availability of approximately 6 mgd for the City of Sioux Falls, which is its apportioned share in accordance with the capacity of the proposed LCRWS; and
- Other LCRWS users are not prepared to participate in an expansion of the LCRWS in year 2017 to meet the City's projected peak day demands under drought conditions.

Under the LCRWS Alternative, a maximum capacity of 30 mgd was deemed available from LCRWS through expansion of the system, the presence of unclaimed existing capacity, and the expressed intent for LCRWS to operate in a manner to meet peak day demands regardless of the allocated capacity. In the absence of additional capacity as noted in the considerations above, the LCRWS Alternative with Limited Expansion Capacity scenario assumes that the additional 6 mgd allocated to the City of Sioux Falls through future expansion does not become available until year 2047. To meet the projected 2017 water supply shortages, the timeline for construction of a raw water intake at Gavin's Point Dam is accelerated from year 2037 to year 2017 to meet peak day demands under drought conditions. Subsequent expansion of the Gavin's Point Dam intake and transmission pipeline systems would also be required in year 2047.

The opinion of total probable project cost for the City of Sioux Falls' share of this alternative is $475,060,000 in 2004 dollars. Table 7.5 shows the breakdown and timeline for the expenditures for the LCRWS Alternative with Limited Expansion Capacity.

To illustrate the total annual cost, including estimated debt, financing, and incremental O&M costs associated with the implementation of this alternative, amortization schedules for each bond series were developed with the support of Dougherty & Company, LLC and are included as Exhibit F.

Figures 7.5 and 7.6 show the total estimated annual project costs and total estimated annual costs per meter, respectively. Analysis of the present worth of this alternative shows that through the year 2062, the total estimated present worth (November 2004 dollars) of this alternative, including debt and incremental O&M costs, is $815,360,000. Although a portion of the debt service repayment schedule for this alternative lies beyond the year 2062, the future debt payments beyond 2062 were included in the present worth analysis because the improvements associated with this long-term debt is needed to meet capacity requirements through 2062.

The estimated present worth of the annual cost per meter of the LCRWS Alternative with Limited Expansion Capacity for the 50-year planning period is $10,204 (November 2004 dollars). Figure 7.6 shows major user cost increases in years 2012, 2017, 2035, and 2047, due to the implementation of capital improvement events as outlined in Section 4. Whereas the previous LCRWS alternatives showed a large increase in estimated annual cost in year 2037, this alternative, due to the accelerated schedule for construction of the intake at Gavin's Point Dam and associated transmission pipeline system, has rather abrupt increases in annual cost in years 2017 and 2035 corresponding to construction of

Table 7.5: Estimated Expenditures – LCRWS Alternative with Limited Expansion Capacity

Itemized Capital Expenditures	Opinion of Cost (November 2004 Dollars)	Indexed Opinion of Cost (Year of Bond Issue)	Annual Incremental O&M Costs (November 2004 Dollars)
Current Funding (1)	$25,980,000	$-	$-
2011 Bond Series	$31,220,000	$42,730,000	$2,368,000
2016 Bond Series	$248,370,000	$413,550,000	$3,293,000
2034 Bond Series	$122,900,000	$414,560,000	$6,196,000
2046Bond Series	$46,590,000	$251,610,000	$6,196,000
Total – City of Sioux Falls	**$475,060,000**		

(1) As discussed in Section 7.1.2.

Figure 7.5: Estimated Annual Debt and Incremental O&M Costs – LCRWS Alternative with Limited Expansion Capacity

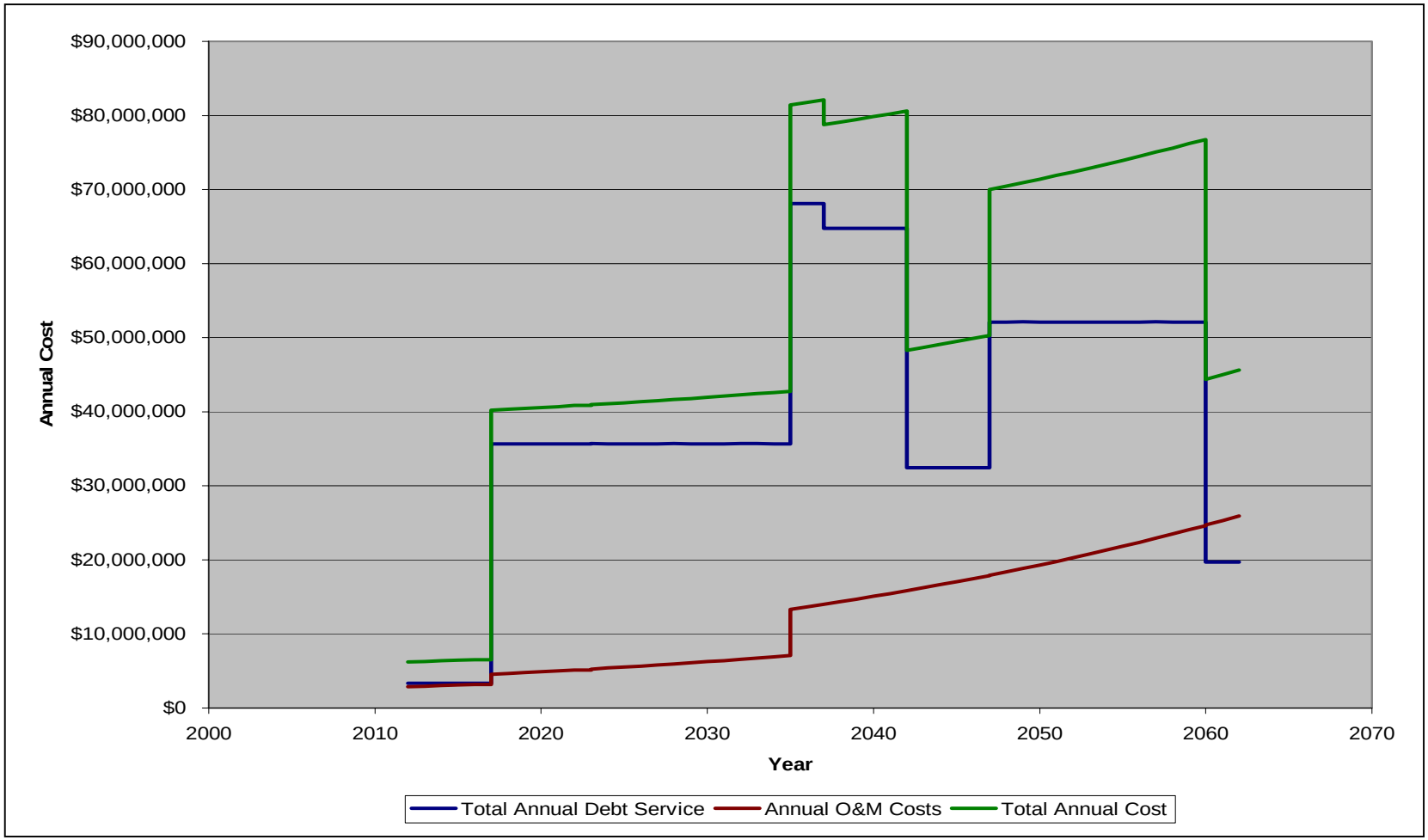
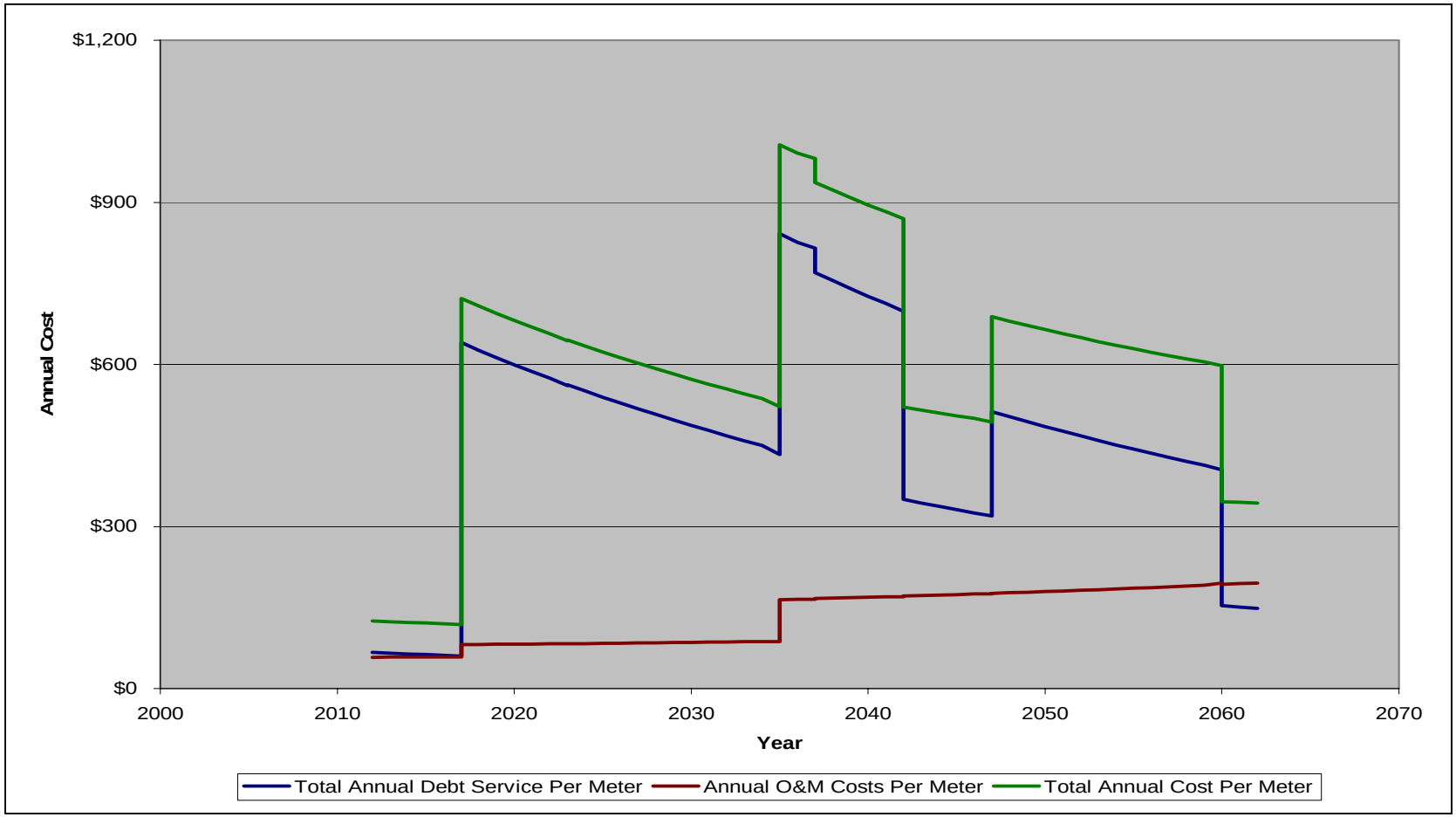


Figure 7.6: Estimated Annual Debt and Incremental O&M Costs per Meter – LCRWS Alternative with Limited Expansion Capacity



the Gavin's Point Dam with associated raw water delivery infrastructure and the future water treatment facility at Sioux Falls, respectively. Although some debt service is retired in 2042, a third notable increase occurs in year 2047, corresponding to the expansion of the LCRWS and Gavin's Point Dam supply and transmission systems. Although the City of Sioux Falls is growing at a rapid pace, the accelerated timeline for construction of the water supply, transmission, and treatment infrastructure under the this alternative means that the costs are distributed over a smaller population, which in turn results in larger increases in user costs.

As noted previously, the costs presented in this section are the incremental cost increases associated with the implementation of the LCRWS Alternative with Limited Expansion Capacity and are independent of the costs associated with the operation of the existing City of Sioux Falls water system.

Annual cost decreases are included in the estimated costs shown on Figures 7.5 and 7.6. For instance, when the City receives treated water service from LCRWS, operation of the existing WPP will be decreased by approximately 10 mgd. This will result in a decrease in variable costs and a potential increase in fixed costs per meter, depending upon the allocation of fixed and variable costs within the existing rate structure. As noted previously, an evaluation of the effects of the variable and fixed costs associated with the existing WPP is beyond the scope of this study effort, but an estimated reduction in variable chemical and power costs has been taken into account.

This scenario differs from the two previous LCRWS scenarios by implementing portions of the project on an accelerated timeline, which results in more capital improvement events at less cost per event. Figure 7.6 shows the estimated effects of the LCRWS Alternative with Limited Expansion Capacity on annual user charges by meter. Significant adjustments to the estimated annual user rates consist of approximately $125 per meter increase in year 2012, an approximate $603 per meter increase in year 2017, an estimated $485 per meter increase in year 2035, approximate $45 and $348 per meter decreases in years 2037 and 2042, respectively, an approximate $195 per meter increase in year 2047, and an estimated $252 per meter decrease in year 2060. These anticipated adjustments are due to the implementation of capital improvement events as outlined in Section 4 and the retirement of debt service associated with these improvements. As debt service is retired, the estimated annual cost per meter decreases substantially. Overall, with the exception of years in which new debt service payments begin, Figure 7.6 shows that the annual costs per meter generally decrease despite annual increases in estimated incremental O&M costs. This is attributable to the increasing population projections used in the analysis, as discussed in Section 2 of this report. The potential for major estimated increases in annual user costs, however, indicates that prudent rate planning decisions and the exploration of creative financial options leading up to capital improvements will be required to minimize the impact of sudden and substantial rate increases (rate shock).

According to information provided by the City of Sioux Falls' Public Works Department, Sioux Falls users currently pay an estimated $323 per meter per year for water service. Table 7.6 illustrates the present worth (November 2004 dollars) of the estimated annual cost increases (and decreases in years in which debt is retired) associated with the implementation of the LCRWS Alternative with Limited Expansion Capacity.

7.3 Missouri River Pipeline Alternatives

Consideration was given to the development and implementation of the Missouri River Pipeline Alternative due to the issues regarding Federal funding and expanded capacity for the LCRWS project. This section presents financial information for the Missouri River Pipeline Alternative and discusses an additional Missouri River Pipeline Alternative in which service is provided to consecutive users.

7.3.1 Missouri River Pipeline Alternative

Under the Missouri River Pipeline Alternative, the City of Sioux Falls would utilize the remaining $22.58 million of local funding available as cash intended for the LCRWS project, but the $3.4 million already invested in the LCRWS project would not be recouped. The breakdown and timeline for the expenditures associated with the Missouri River Pipeline Alternative shown in Table 7.7. The opinion of total probable project cost for the City of Sioux Falls for this alternative is $627,970,000 (November 2004 dollars). It should be noted that the water supply capacity under this alternative exceeds the projected water supply demands under drought conditions due to the strategic manner in which the infrastructure was developed. As a result, a portion of the capital costs for this alterative provides benefit beyond year 2062. For the purposes of estimating present

Table 7.6: Present Worth of Estimated Annual User Costs – LCRWS Alternative with Limited Expansion Capacity

Year	Estimated Annual Incremental Increase/(Decrease) Per Meter (November 2004 Dollars)	Estimated Total Annual Cost Per Meter (November 2004 Dollars)
Baseline (2004)	$-	$323
2012	$97	$420
2017	$362	$782
2035	$146	$928
2037	$(26)	$902
2042	$(89)	$813
2047	$31	$844
2060	$(32)	$812

Table 7.7: Estimated Timeline for Expenditures – Missouri River Pipeline Alternative

Itemized Capital Expenditures	Opinion of Cost (November 2004 Dollars)	Indexed Opinion of Cost (Year of Bond Issue)	Annual Incremental O&M Costs (November 2004 Dollars)
Current Funding (1)	$22,580,000	$-	$-
2011 Bond Series	$240,120,000	$328,620,000	$748,000
2027 Bond Series	$102,050,000	$261,590,000	$3,259,000
2036 Bond Series	$28,600,000	$104,340,000	$3,259,000
2047 Bond Series	$234,620,000	$1,317,750,000	$5,085,000
Total – City of Sioux Falls	**$627,970,000**		

(1) As discussed in Section 7.1.2.

worth, only the portion of the costs that are required to meet capacity requirements for the City of Sioux Falls through 2062 are included in the present worth analysis.

To illustrate the total annual cost, including estimated debt service, financing, and incremental O&M costs associated with implementation of this alternative, amortization schedules for each bond series were developed with the support of Dougherty & Company, LLC and are included as Exhibit F. Figures 7.7 and 7.8 present the estimated total annual costs and estimated total annual costs per meter, respectively.

Analysis of the present worth of this alternative shows that through the year 2062, the total estimated present worth (November 2004 dollars) of the Missouri River Pipeline Alternative, including estimated debt and incremental O&M costs, is $853,300,000. It should be noted that the present worth was calculated by excluding the debt service costs beyond year 2062 that are related to infrastructure that exceed the capacity requirements through year 2062.

Figures 7.7 and 7.8 show significant user cost increases in years 2012, 2028, and 2047, which represent the implementation of the capital improvement events as outlined in Section 4. Particularly in year 2047 when expansion of the future water treatment facility is anticipated, annual user costs by meter rise sharply by an estimated $1,000 per meter. In other years, Figure 7.8 shows that the annual cost per user decreases. Sharp decreases are shown in years when debt is retired, and more gradual decreases are seen in years when new debt payments are not added, due to increasing population.

Figure 7.7: Estimated Annual Debt and Incremental O&M Costs – Missouri River Pipeline Alternative

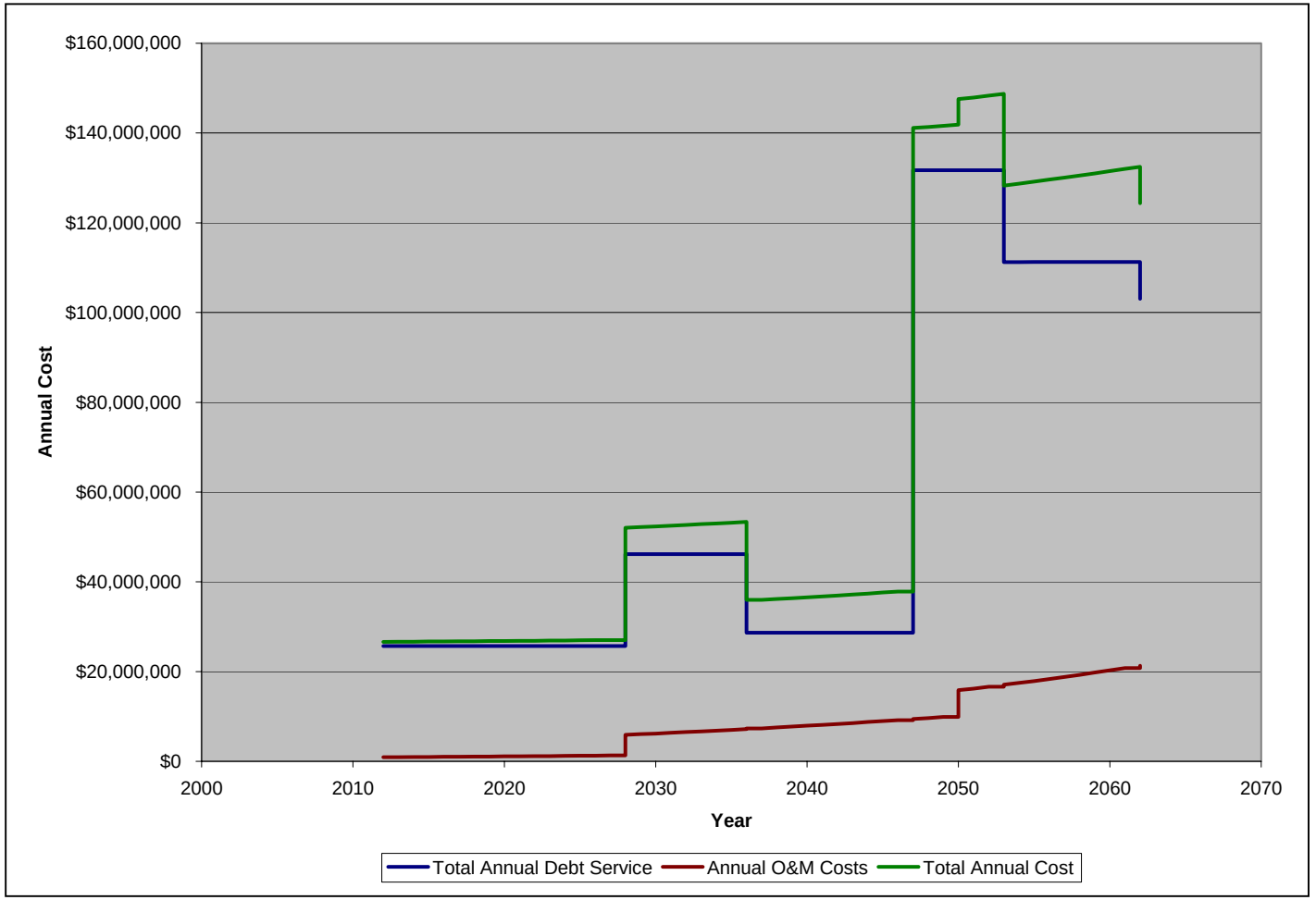


Figure 7.8: Estimated Annual Debt and Incremental O&M Costs per Meter – Missouri River Pipeline Alternative

It should be noted that the costs discussed in this section are the incremental cost increases associated with the implementation of the Missouri River Pipeline Alternative, and are independent of the costs associated with the operation of the existing City of Sioux Falls water system. Included in the estimated costs shown on Figures 7.7 and 7.8 are annual cost decreases associated with a decrease in variable costs due to reduced operation of the existing City of Sioux Falls WPP. An evaluation of the effects of the variable and fixed costs associated with the existing WPP is beyond the scope of this study effort, but an estimated reduction in variable chemical and power costs has been taken into account.

The estimated present worth of the annual cost per meter of the Missouri River Pipeline Alternative for the 50-year planning period is $10,444 (November 2004 dollars). Upon implementation of the project in year 2012, Figure 7.8 shows major estimated increases of approximately $530 per meter in year 2012, $370 per meter in year 2028 and $1,000 per meter in year 2047 due to capital improvement events as outlined in Section 4. In addition, estimated decreases of $213 per meter, $54 per meter, and $180 per meter were projected for years 2036, 2050, and 2053, respectively. The potential for major estimated increases in annual user costs, however, indicates that prudent rate planning decisions and the exploration of creative financial options leading up to capital improvements will be required to minimize the impact of sudden and substantial rate increases (rate shock).

According to information provided by the City of Sioux Falls' Public Works Department, Sioux Falls users currently pay an estimated $323 per meter per year for water service. Table 7.8 illustrates the present worth (November 2004 dollars) of the estimated annual cost increases (and decreases in years in which debt is retired) associated with the implementation of the LCRWS Alternative with Limited Expansion Capacity.

Table 7.8: Present Worth of Estimated Annual User Costs – Missouri River Pipeline Alternative

Year	Estimated Annual Incremental Increase/(Decrease) Per Meter (November 2004 Dollars)	Estimated Total Annual Cost Per Meter (November 2004 Dollars)
Baseline (2004)	$-	$323
2012	$392	$715
2028	$140	$855
2037	$(67)	$788
2048	$174	$962
2050	$5	$967
2053	$(37)	$930

7.3.2 Missouri River Pipeline Alternative with Consecutive Users

An additional Missouri River Pipeline Alternative evaluated as part of this study effort consisted of the construction of the Missouri River Pipeline Alternative and subsequent service to consecutive users associated with the LCRWS. Under this alternative, as in the previous alternative, the City of Sioux Falls would utilize the remaining $22.58 million in local funding available as cash for the LCRWS project. The breakdown and timeline for the expenditures for the Missouri River Pipeline Alternative with Consecutive Users is shown in Table 7.9. The opinion of total probable project cost for the City of Sioux Falls for the Missouri River Alternative with Consecutive Users is $577,880,000 (November 2004 dollars).

To illustrate the total annual cost, including estimated debt service, financing, and incremental O&M costs associated with implementation of this alternative, amortization schedules for each bond series were developed with the support of Dougherty & Company, LLC and are included as Exhibit F. Analysis of the estimated present worth of this alternative shows that through the year 2062, the total estimated present worth (November 2004 dollars) of this alternative, including debt and incremental O&M costs, is $764,240,000.

It should be noted that the water supply capacity under the Missouri River Pipeline Alternative with Consecutive Users exceeds the projected peak day demand under drought conditions through 2062 due to the most cost-effective strategy of expanding and implementing various components. Therefore, a portion of the capital investment provides benefit to the City of Sioux Falls beyond the 50-year planning period, and as a result, the debt associated with these improvements was not included in the estimate of present worth of the project through 2062.

Table 7.9: Estimated Timeline for Expenditures – Missouri River Pipeline Alternative with Consecutive Users

Itemized Capital Expenditures	Opinion of Cost (November 2004 Dollars)	Indexed Opinion of Cost (Year of Bond Issue)	Annual Incremental O&M Costs (November 2004 Dollars)
Current Funding (1)	$22,580,000	$-	$-
2011 Bond Series	$256,830,000	$351,490,000	$2,342,000
2036 Bond Series	$104,350,000	$380,710,000	$2,342,000
2050 Bond Series	$194,120,000	$1,179,240,000	$4,500,000
Total – City of Sioux Falls	**$577,880,000**		

(1) As discussed in Section 7.1.2.

It should also be noted that this alternative is highly dependent upon the willingness of consecutive users to participate in this project, which would not have a component of grant funding. Although the costs of this alternative appear to be less from the City of Sioux Falls' perspective due to economy of scale provided by the assumed participation of consecutive users, the likelihood of this project moving forward is low due to a lack of Federal funding and the anticipated increase in user costs. As a result, the estimated costs of this alternative are not discussed in further detail herein.

7.4 Cost Comparisons

Table 7.10 summarizes the present worth (November 2004 dollars) of the alternatives involving the LCRWS project and the Missouri River Pipeline Alternative. As shown in Table 7.10, the LCRWS Alternative (with adequate Federal funding and adequate future expansion capacity) is the least cost alternative for the City of Sioux Falls. In the absence of the adequate funding or expansion capacity, it is still more economical to participate in the LCRWS instead of constructing the completely independent Missouri River Pipeline Alternative, based on the estimated present worth of the alternatives discussed. There are considerations, however, other than cost that must also be considered by the City. A discussion of these considerations is presented in Section 7.5.

Table 7.10: Present Worth of LCRWS and Missouri River Pipeline Alternatives

Alternative	Present Worth of Annual Debt Payment	Present Worth of Annual Incremental O&M Costs (2012-2037)	Present Worth of Annual Incremental O&M Costs (2012-2062)	Present Worth of Total Annual Debt and Incremental O&M Costs (2012-2062)
LCRWS Alternative	$548,550,000	$64,720,000	$202,590,000	**$751,140,000**
LCRWS Alternative with Limited Federal Funding	$558,300,000	$64,720,000	$202,590,000	**$760,890,000**
LCRWS Alternative with Limited Expansion Capacity	$570,760,000	$89,710,000	$244,600,000	**$815,360,000**
Missouri River Pipeline	$703,240,000	$44,560,000	$149,780,000	**$853,020,000**

(1) All values in November 2004 dollars.
(2) Includes debt service and incremental O&M associated with existing supply and treatment operations at Sioux Falls.
(3) The last column equals the sum of the first and third columns, respectively, representing total estimated present worth through 2062.

It should be noted that the City of Sioux Falls could realize the combined impacts of inadequate Federal funding and limited capacity through expansion of the LCRWS. If both the limited funding and the limited expansion capacity scenarios occurred, the result of implementing the LCRWS Alternative with Limited Funding and Limited Expansion Capacity would be a project with an estimated present worth of approximately $825,110,000 (November 2004 dollars).

Figures 7.9 and 7.10 present a comparison between the LCRWS Alternative and the Missouri River Pipeline Alternative. Figure 7.10 shows the estimated annual cost per meter for the LCRWS Alternative and the Missouri River Pipeline Alternative. The estimated present worth of the difference between the LCRWS Alternative and Missouri River Pipeline Alternative, in November 2004 dollars, is approximately $101,880,000 through 2062.

Figures 7.11 and 7.12 compare the LCRWS Alternatives with Limited Federal Funding and Limited Expansion Capacity to the Missouri River Pipeline Alternative. As shown in Table 7.10, even with limited Federal funding for the LCRWS, the present worth of LCRWS Alternative is approximately $92,130,000 less than that of the Missouri River Pipeline Alternative. In addition, the estimated present worth of the LCRWS Alternative with Limited Expansion Capacity through 2062 is less than the Missouri River Pipeline Alternative by $37,660,000 (November 2004 dollars). Compared strictly on a financial basis to the LCRWS Alternative, the Missouri River Pipeline Alternative is a less attractive option. The estimated total present worth of the Missouri River Pipeline Alternative is higher than any of the potential funding and capacity scenarios evaluated for the LCRWS Alternative.

Figure 7.13 provides a graphical comparison of the capital costs associated with the LCRWS Alternative, its variations, and the Missouri River Pipeline Alternative. Based on the financial analysis presented in this section, it appears that the LCRWS Alternative would be the most economical option for the City of Sioux Falls, both on an estimated capital cost and estimated present worth basis. Implementation of the LCRWS Alternative, however, is subject to the availability of adequate Federal Funding and the magnitude and timing of future capacity through LCRWS expansion. In addition, there are additional considerations, which are presented in the ensuing sections, that should be noted by the City of Sioux Falls during the evaluation of the alternatives.

Figure 7.9: Comparison of Total Annual Costs – LCRWS Alternative versus Missouri River Pipeline Alternative (November 2004 Dollars)

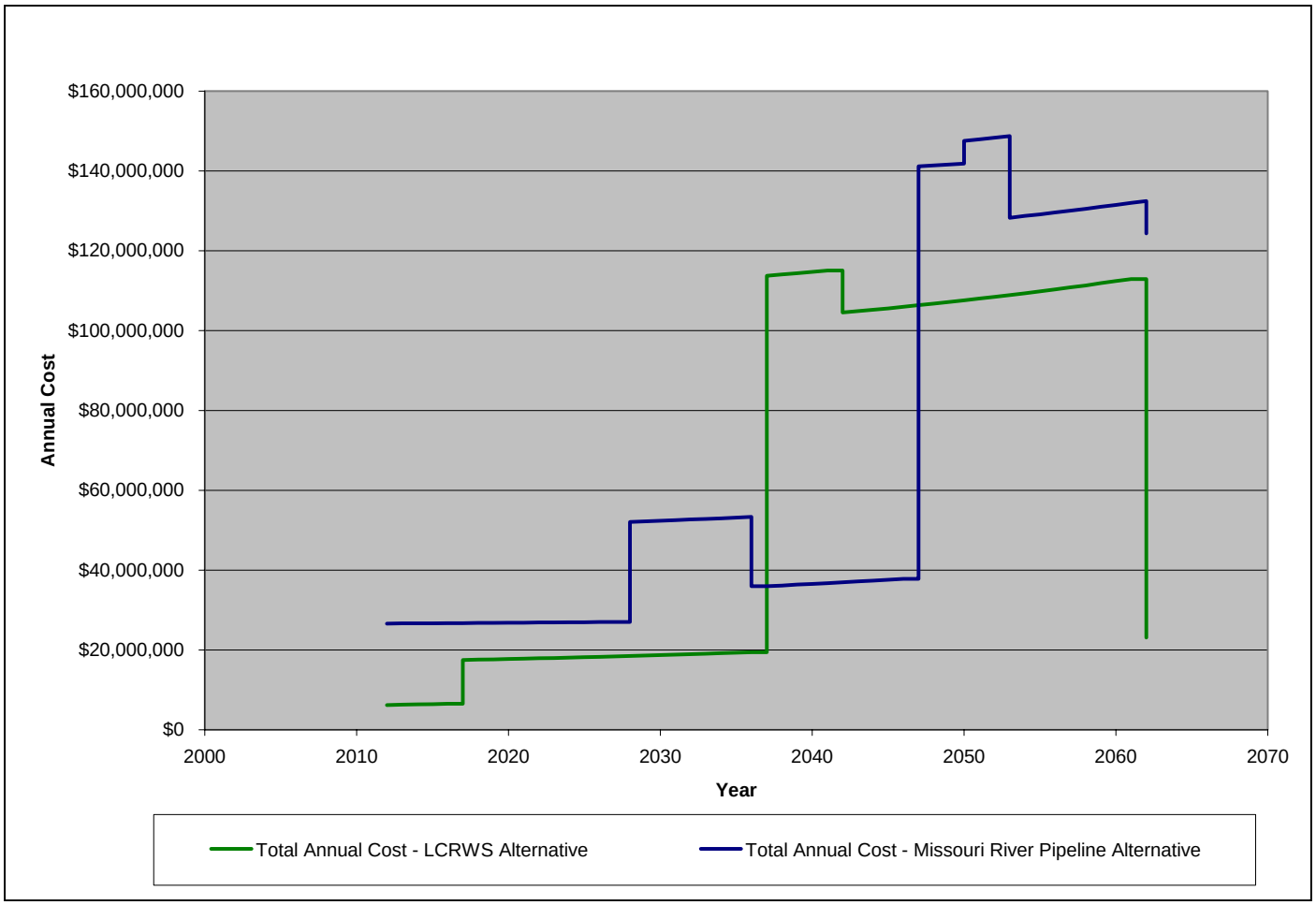


Figure 7.10: Comparison of Total Annual Costs per Meter – LCRWS Alternative versus Missouri River Pipeline Alternative (November 2004 Dollars)

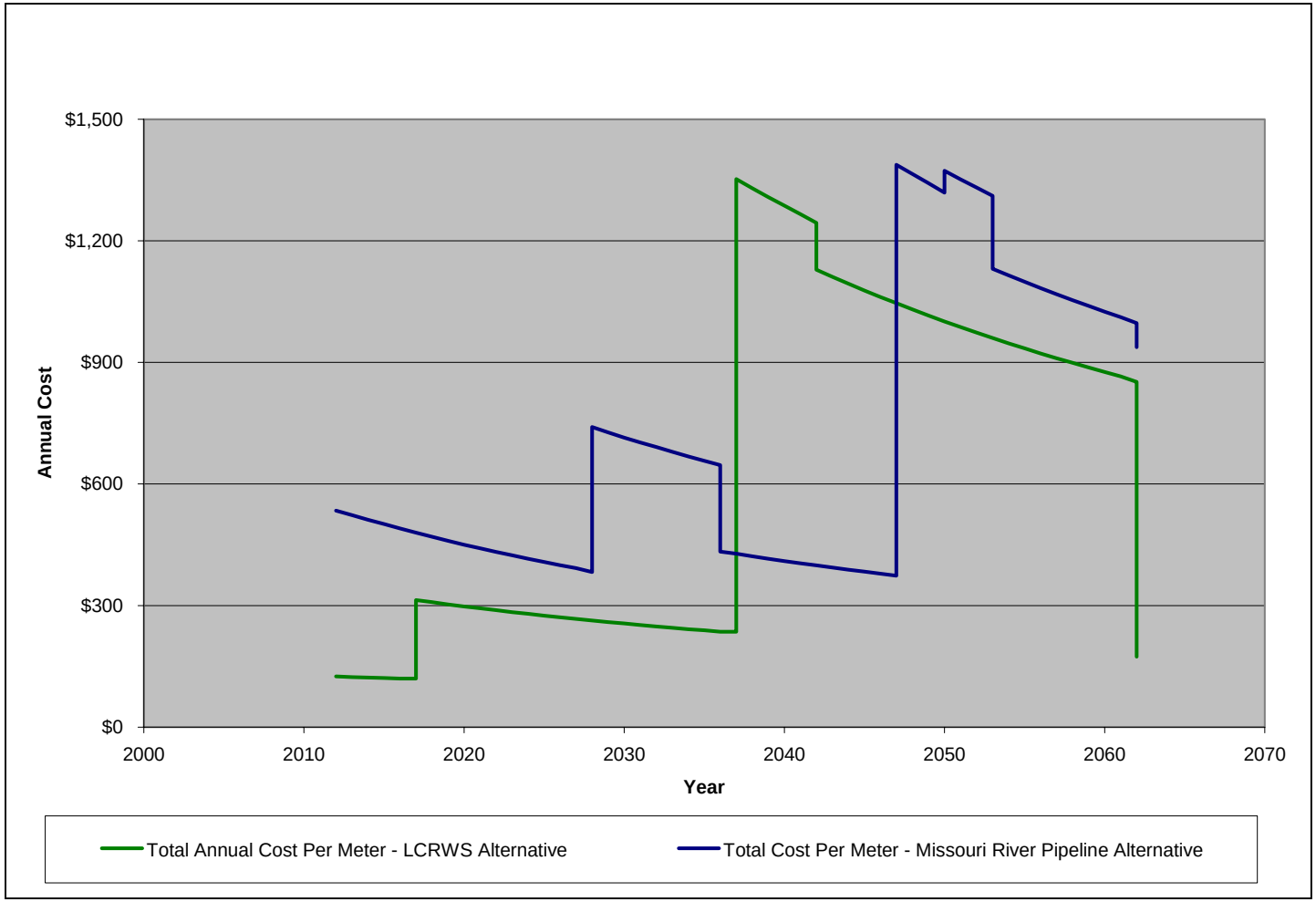


Figure 7.11: Comparison of Total Annual Costs – LCRWS Alternatives with Limited Federal Funding and Limited Expansion Capacity versus Missouri River Pipeline Alternative (November 2004 Dollars)

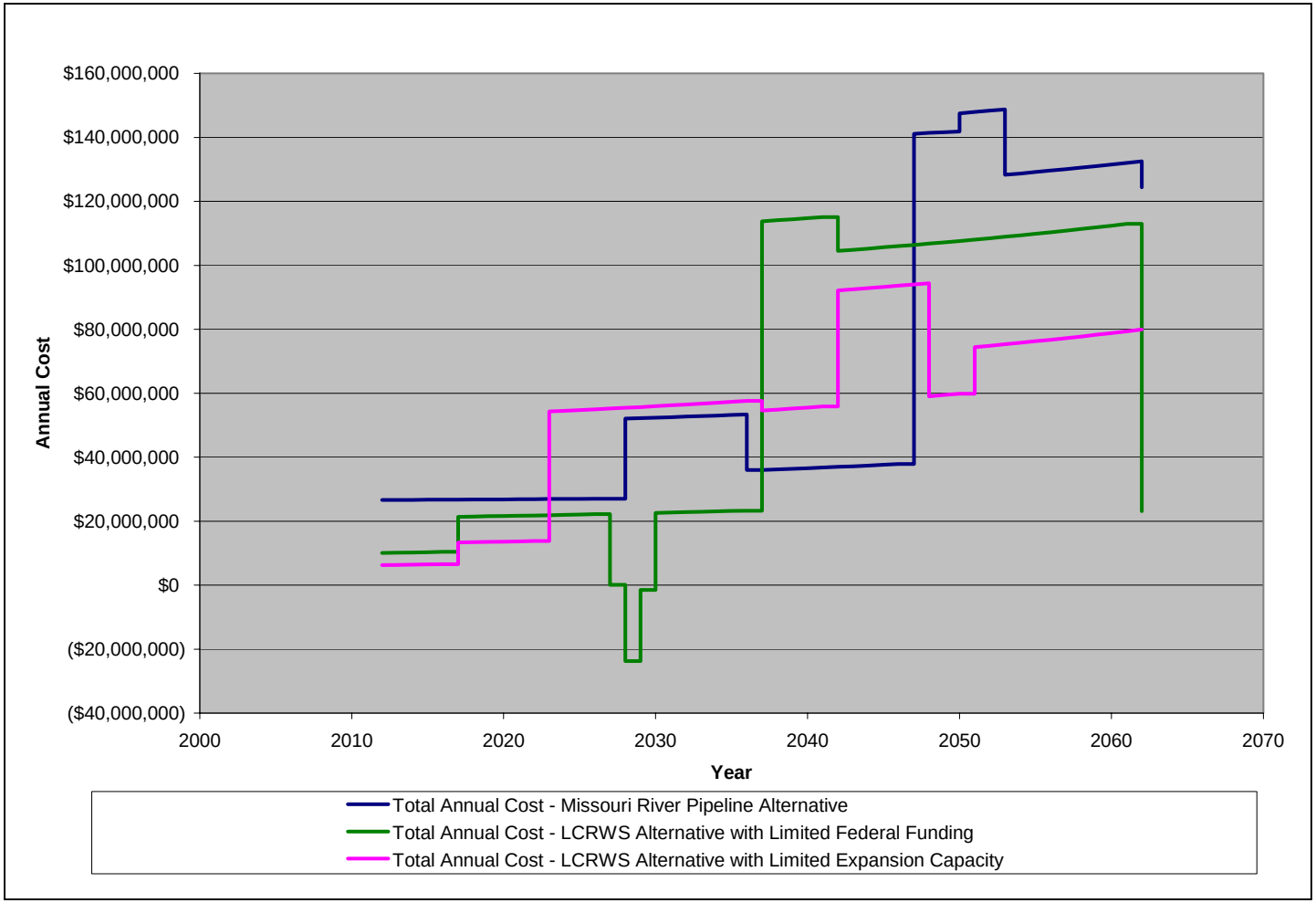


Figure 7.12: Comparison of Total Annual Costs per Meter – LCRWS Alternatives with Limited Federal Funding and Limited Expansion Capacity versus Missouri River Pipeline Alternative (November 2004 Dollars)

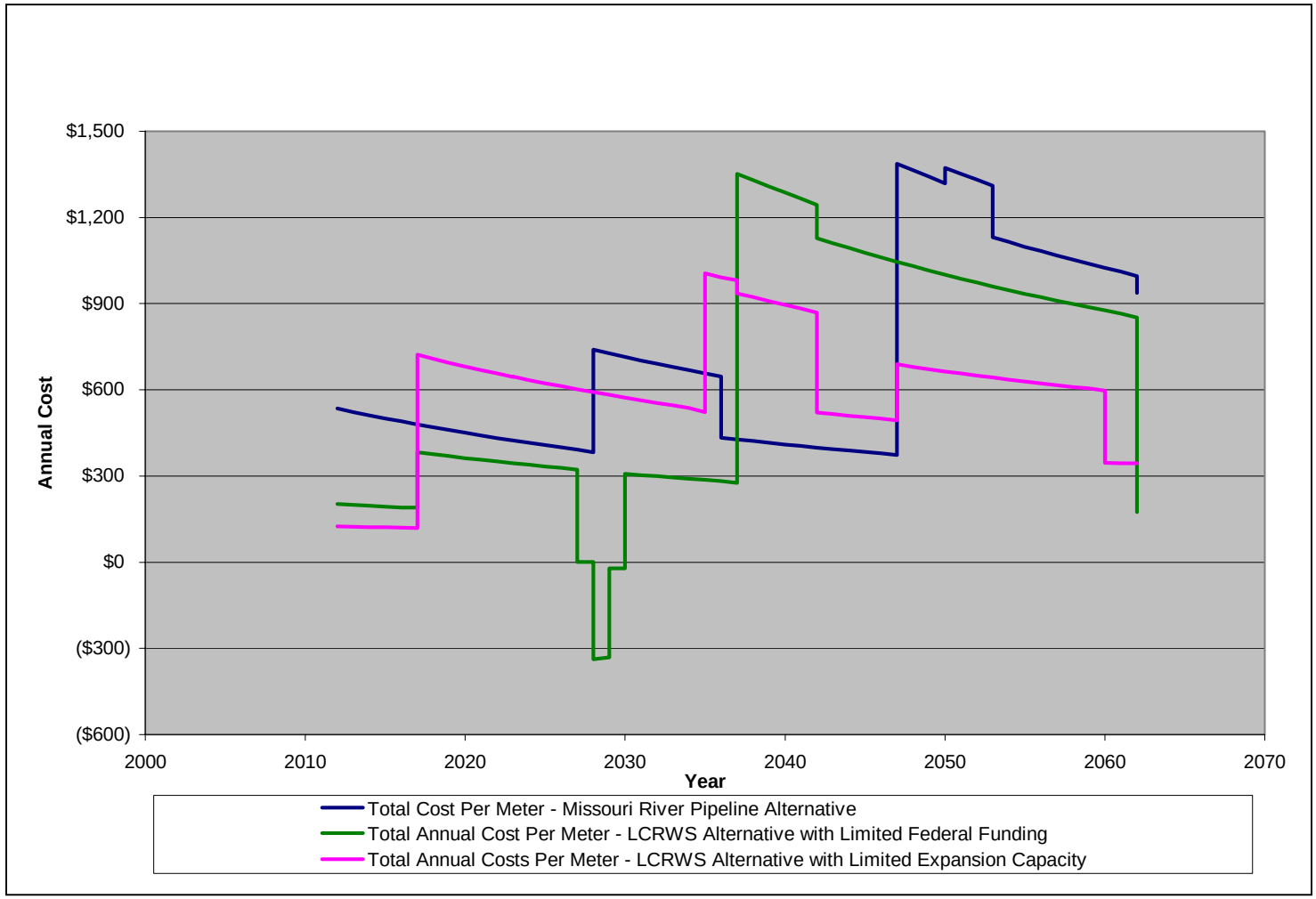
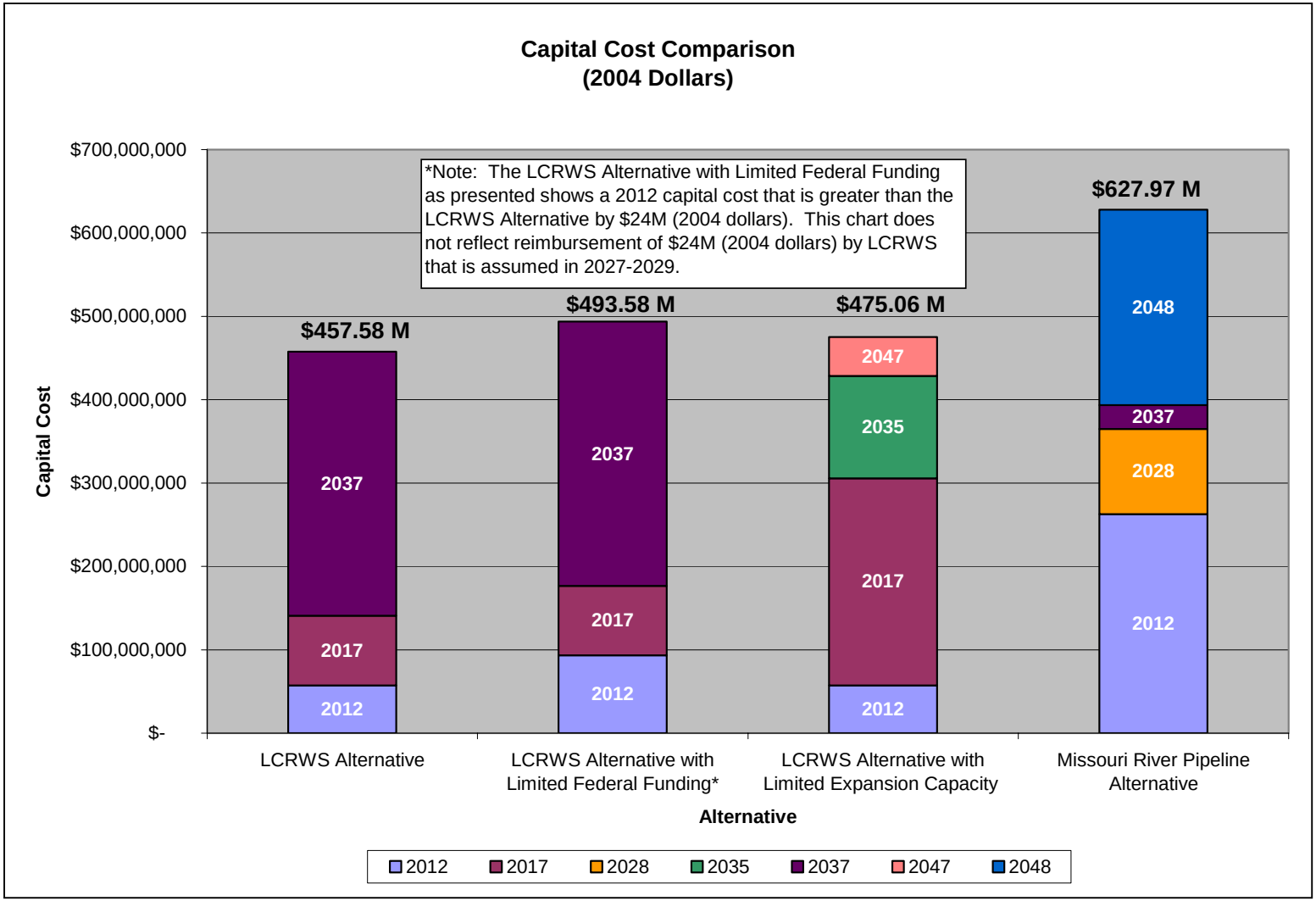


Figure 7.13: Capital Cost Comparison (November 2004 Dollars)



7.5 Additional Alternative Considerations

As noted in the previous section, there are additional considerations that should be weighed when evaluating the Alternatives. These additional considerations are listed as advantages or disadvantages to the City of Sioux Falls in this section.

7.5.1 LCRWS Alternative

Advantages for the City of Sioux Falls:

1. Access to grant funding for the proposed project.
2. Distribution of current and future project costs over a larger user base (economy of scale benefits).
3. Planning, environmental compliance, the majority of the land and easement acquisition, some design, and some of the construction of the proposed LCRWS project have been completed, decreasing the potential barriers to addressing the anticipated water supply shortages projected for Sioux Falls in 2012.
4. Lower estimated costs for the initial increment of capacity under the proposed LCRWS project.
5. Limited technical and environmental barriers to achieving a total potential project capacity of 45 mgd (30 mgd for the City of Sioux Falls), if the LCRWS Board of Directors commits to expand the system by year 2017 and provide the City of Sioux Falls with an increased capacity allocation.
6. Lower estimated costs for the increment of capacity up to the desired expansion to 30 mgd for the City of Sioux Falls, if the LCRWS Board of Directors commits to expand the system by year 2017 and provide the City of Sioux Falls with an increased capacity allocation.
7. Receiving treated water from LCRWS eliminates the responsibility by the City of Sioux Falls to treat this volume of water and delays the construction of a new Sioux Falls water treatment facility.
8. Reserves the Missouri River future use permit held by the City of Sioux Falls for the future.

Disadvantages for the City of Sioux Falls:

1. The LCRWS project as currently proposed only provides sufficient capacity for the City of Sioux Falls for a short-term planning horizon (through 2017).
2. The City of Sioux Falls has minor representation on the Board of Directors for LCRWS in comparison to its percentage of capacity.
3. The projected water demand curve for the City of Sioux Falls is likely much steeper than the projected water demand curves for the majority of the other LCRWS members, which creates a greater sense of urgency for

future expansion of the system on the part of the City of Sioux Falls than for other LCRWS systems.

4. No commitment has been made to date by LCRWS to expand the LCRWS system by year 2017 and provide an increased capacity allocation to the City of Sioux Falls as desired under the LCRWS Alternative.
5. No commitment has been made to date by LCRWS to the City of Sioux Falls regarding the terms of an expansion of the LCRWS system and associated cost of service.
6. Receiving treated water from LCRWS limits the flexibility to use water treatment infrastructure at Sioux Falls to treat multiple source waters.

7.5.2 Missouri River Pipeline Alternative

Advantages for the City of Sioux Falls:

1. The concept, capacity, and phasing for this alternative can be implemented in accordance with the projected water demand curve for the City of Sioux Falls.
2. The City of Sioux Falls would have complete and independent control over the management and operation of the infrastructure.
3. The Missouri River Pipeline Alternative is similar to the concept for expansion of the LCRWS system beyond 45 mgd (potential 30 mgd for the City of Sioux Falls) in scope and estimated costs.
4. Treatment of the water at Sioux Falls will provide the flexibility to treat multiple source waters and greater ability to optimize future operations.

Disadvantages for the City of Sioux Falls:

1. No grant funding is currently available for the Missouri River Pipeline Alternative, and the likelihood of securing grant funding for a water system that serves a single, relatively large municipal user is not high.
2. All costs for this alternative are the responsibility of the City of Sioux Falls.
3. Higher estimated costs when compared to the initial 10 mgd increment of capacity as well as the desired expansion to 30 mgd provided under to the LCRWS Alternative.
4. Significant planning, easement and land acquisition, design, and construction activities must be completed to address the implementation deadline of year 2012 and subsequent years over the 50-year planning period corresponding to major capital improvements.
5. Independent treatment of the water supply by the City maintains all of the treatment responsibilities and accelerates the timeline for a new Sioux Falls water treatment facility.
6. Eliminates the ability to resolve the appropriations provided by the future use permit from the Missouri River for the future.