



VMU

VMU (Versailles Municipal Utilities) operates a 10 MGD WTP built in 2014. The plant is (see Figure 4-14) located on US 62 West in Woodford County, and it draws raw water from Pool 5 of the Kentucky River. Current plant production is on the order of 3-4 MGD. VMU serves approximately 6,800 customers, including the South Woodford and Northeast Woodford Water Districts. The VMU demand is augmented by connections to KAW (up to 1 MGD as needed) and the FPB system.



Figure 4-14
VMU WTP Site

The availability of a sufficient quantity of water in Pool 5 of the Kentucky River is of concern to GMWSS. Pool 5 has a smaller drainage basin than that of Pools 3 or 4, resulting in a less reliable source compared to other suppliers considered in this Assessment.

Since VMU is dependent on KAW and FPB to Meet its own customers' demands, and due to the higher anticipated construction and operating costs of supplying water to GMWSS from VMU as compared to FPB for example, VMU is not further evaluated as a viable supplier of water to GMWSS.

Viable Water Supplier Alternatives

The following chapter includes monetary and non-monetary evaluations of the following viable alternatives for the future water supply of GMWSS:

1. **Alternative A:** GMWSS will build and operate a new raw water intake on Pool 3 of the Kentucky River, install a new transmission line to Scott County and construct a new WTP to serve the WSSA. All new facilities will be paid for by GMWSS.
2. **Alternative B:** The GMWSS water demand will be met by purchasing all water from the FPB, via a new potable water transmission main through Franklin and Scott Counties to the Lancaster water storage tank in the GMWSS system. FPB will pay for the construction of all new facilities outside of Scott County and GMWSS will pay for all new facilities within Scott County.
3. **Alternative C1:** GMWSS will purchase all water from KAW, supplied from the company's Owenton WTP and conveyed via an existing KAW transmission

4. main to Scott County, and thereafter in Scott County via a new GMWSS transmission main to the GMWSS Lancaster water storage tank. KAW will pay for the construction of all new facilities built outside of Scott County and GMWSS will pay for all new facilities built within Scott County.
5. **Alternative C2:** GMWSS will purchase all water from KAW, supplied from the Owenton WTP via a new KAW transmission line to Scott County, and thereafter in Scott County via a new GMWSS transmission line to the Lancaster water storage tank. If it is confirmed that the existing KAW 42" transmission main from the Owenton WTP and the plant itself lack sufficient capacity to supply GMWSS's demands, then this alternative calls for GMWSS to pay for all new facilities outside of Scott County as well as within Scott County.
6. **Alternative D:** GMWSS will purchase all water from LWC, supplied from LWC Clark Station Road water tank and conveyed via new transmission mains in Franklin and Scott Counties to a new water storage tank at Paynes Depot and to the GMWSS Lancaster water storage tank. LWC will pay for the construction all new facilities outside of Scott County and GMWSS will pay for all new facilities within Scott County.

In Chapter 5, each alternative is evaluated for the "Low Range" and the "High Range" water demand projections described in Chapter 3.

Chapter 5

Analysis of Water Source and Supply Alternatives

This chapter provides an analysis comparing the five viable alternatives developed in Chapter 4, based on monetary and non-monetary factors, for the “Low Range” and “High Range” water demand projections for each alternative. For example, Alternative A/L is the alternative in which GMWSS will build a new raw water intake and pump station, transmission line and WTP capable of providing a design year ADD of 7.5 MGD and 11.25 MGD MDD. Alternative A/H is similar except the WTP will be capable of producing an ADD in 2045 of 10 MGD and 15 MGD MDD.

The first comparison accounts for the Total Present Worth Cost (TPWC) of each alternative, including capital costs, annual costs, component replacement costs, and the salvage value of facilities at the end of the planning period.

The capital costs were estimated at the time this Assessment was prepared (2022) and then projected forward, to account for the current inflation-driven costs of construction, to 2025 (year 0 of the 20-year planning period for this Assessment, 2025-2045). The annual costs were developed for each year, the replacement costs were estimated for 2040 (year 15) and the salvage value was estimated for 2045 (year 20). These costs allow for engineering, land acquisition and construction to begin in 2025 (year 0) and finish in 2027 (year 2), with the new facilities in operation from 2028 to 2045 (years 3 to 20).

The second comparison includes a series of non-monetary factors, such as the reliability of the water source, history of wholesale water rate escalation, risk of infrastructure failure and ownership of the utility providing water to GMWSS. These factors will be further defined in this chapter.

At the end of this chapter each alternative is scored to rank them against each other. Opinions of cost for each alternative are provided in Appendix B.

Monetary Comparison of Alternatives

The opinions of cost in this Assessment use an analysis of TPWC for each alternative. This analysis accounts for the capital cost of facilities as well as the annual water production or purchase cost over the planning period. The cost for replacing equipment and the value of facilities at the end of the planning period are also included in this analysis. In this manner, alternatives with a high capital cost and low annual cost can be fairly compared on the same basis to those with a low capital cost and high annual cost.

The TPWC analysis in this Assessment is based on a discount rate of 3% for 20 years, expressed in 2025 dollars at the beginning of the planning period (2025). The financial term “discount rate” accounts for the time value of money at a rate of return used to express future cash flows back to their present value. This helps determine if the future

cash flows from a project or investment will be worth more than the capital outlay needed to fund the project or investment in the present. The discount rate is not the same rate as that of a state or federal loan for public works facility construction.

This equation summarizes the Total Present Worth Cost (TPWC):

$$\text{TPWC} = (\text{PW of Capital Costs} + \text{PW of Annual Costs} + \text{PW of Replacement Costs}) \\ \text{minus (PW of Salvage Value)}$$

The following paragraphs describe the basis for the opinion of cost for each Alternative:

Water Treatment Plants, Water Intakes and Raw Water Pump Stations

The capital cost for a WTP varies greatly with the plant capacity (usually expressed as the plant's production capacity to meet the MDD), treatment process used, land cost, site conditions, whether the plant is a new facility or an expansion of an existing facility and local economic factors at the time of plant construction. A review of recently published information provided recent construction costs for several plants. The capacity indicated for these plants is expressed as their MDD.

- Knoxville, TN (2014): \$17.2 million, new 8 MGD plant (equates to \$2.15/gal in 2014, or \$3.17*/gal in 2022)
- Parkville, MO (2018): \$20.7 million, new 4 MGD plant (\$5.20/gal, or \$6.56*/gal in 2022)
- Noblesville, IN (2020): \$17.0 million, 4 MGD plant expansion (\$4.30/gal, or \$5.02*/gal in 2022)
- Roswell, GA (2016): \$10.6 million, new 3 MGD plant (\$3.53/gal, or \$4.82*/gal in 2022)
- Lake Worth, FL (2011): \$17.2 million, 4.5 MGD expansion (\$3.80/gal, or \$6.31*/gal in 2022)
- Livingston, TX (2017): \$16.1 million, 2.5 MGD expansion (\$6.44/gal, or \$8.45*/gal in 2022)
- Elkins, WV (2015): ** \$20.9 million, 4 MGD new plant (\$5.23/gal. in 2015, or \$7.40*/gal in 2022)
- Lewisburg, WV (2022): ** \$29.5 million, 3.8 MGD plant expansion (\$7.76/gal in 2022).

*Based on 4% annual construction cost inflation to 2020, 8% annual inflation to 2022

** GRW Projects. Others are design and build or design/build by other firms.

The capital cost for some of the plants listed above (e.g., Roswell, Livingston, Elkins) included new water intake structures and/or raw water pump stations because they were co-located with the plant site. The costs for plant expansions usually included modifications to existing plant treatment systems as well as additional treatment capacity, but not new administration facilities or site improvements.

None of these costs included land purchase. New plant costs included flood protection, administration/maintenance buildings, on-site treated water storage and pumping to the distribution system. Transmission mains are not included in these costs.

After adjusting the above WTP initial capital costs from their date of construction, adding land costs for new plants, and accounting for the construction economy in 2022, this Assessment is based on a new WTP capital cost of \$8 per gallon of design year MDD. For a plant expansion, a capital cost of \$6 per gallon of design year MDD is applied in this Assessment.

Transmission Mains

Transmission mains are sized to supply the MDD of a water system. Capital costs for new water transmission mains are based on unit prices of material, easements and land, engineering fees and related costs. They also include road, highway, railroad, creek, and river crossings, and the restoration of property and roadways after construction. Appendix B includes construction cost estimates for the transmission mains for each alternative evaluated in this Assessment. These estimates use historic GRW project construction bid tabulations submitted by contractors for similar projects, updated to reflect 2022 costs.

Creeks, small rivers, heavily travelled roads, and highways are traditionally crossed by boring and jacking beneath them to minimize disruption of flow or traffic. A steel pipe, larger in diameter than the transmission main, is installed at the crossing, then the transmission main is inserted inside the steel pipe. Costs for such crossings in this Assessment are based on historic GRW projects of similar scope.

For a large river crossing, such as the Kentucky River crossing in Alternative D, GRW researched the construction cost of recent similar projects. One such project was completed in Jefferson City, MO, in 2014. Eric Seaman, P.E. (Director of the Jefferson City Wastewater Department), provided details to GRW for this project in which a 38", 3,000-foot long horizontal directionally drilled bore was extended in sandy, clay soil 30 feet under the Missouri River to carry a 24" wastewater force main at a cost of \$500 per linear foot. The force main was made of fusible polyvinyl chloride pipe in order that its length could be pulled through a steel casing pipe from one side of the river to the other. The bore was gently sloped down from a starting point on the west side of the river, then horizontally beneath the riverbed, and then gently sloped upward to the end point on the east side of the river. This method is the same as that anticipated for the Kentucky River crossing except that the bore will likely be through rock for an estimated length of 2,500 feet (for a horizontal distance of approximately 1,500 feet) at a 2022 cost of \$800 per linear foot, for a total cost of \$2 million. This cost is based on a 42" diameter bore and 30" water transmission main, plus set up, clean up and debris disposal.

Booster Pump Stations

Booster Pump Stations are designed to meet the MDD. These facilities maintain water system pressure in addition to refilling water storage tanks. These stations

are normally equipped with a series of pumps of various capacities to match the demand of the water system, so that when the largest pump is not in service, the remaining pumps can supply the MDD. Based on a recent GRW project, a booster pump station capable of delivering a 15 MGD MDD, or approximately 10,400 gallons per minute, will have a capital cost on the order of \$2,000,000 in today's construction marketplace. This cost equates to \$0.133 per gallon of design year MDD. For this Assessment, until a design is prepared for a selected facility, a capital cost of \$0.133 per gallon of design year MDD is used. This cost includes structural, pumping equipment and electrical/control equipment costs for similar-sized facilities as needed for the alternatives evaluated in this Assessment. For meeting the pumping needs of a system with a lower MDD, the cost of the structure will not significantly change; the most significant difference will be the cost of the pumping and associated electrical/control equipment. Therefore, a smaller capacity booster pump station will only decrease in cost in proportion to the size of this equipment: i.e., it will still cost an equivalent of \$0.133 per gallon times the design year MDD.

Water Storage Tanks

Water Storage Tanks are sized based on the MDD of a water system. Capital costs for elevated water storage tanks are based on the size of the tank, tank height, site conditions, engineering fees, contingencies, and related initial costs. The size of the tank is also based on storage within the water system. Without a complete analysis of the existing system, it is not yet possible to finalize the size of the tank needed. For this Assessment, a 500,000-gallon tank has been included where required.

GRW recently obtained budgetary pricing from Caldwell Tanks for a 500,000-gallon, multi-leg tank with a overflow elevation 180-feet above grade. Assuming no unforeseen site conditions, the budgetary price was approximately \$2 million in August 2022.

Annual Water Production, Purchase and Distribution Costs

Until a new water rate study is completed to assess the impact of the new debt service and operating costs, accurate water production and purchase costs cannot yet be applied in this Assessment. Historic cost data, however, may be used to provide a basis for estimating these future costs for each alternative. The following paragraphs summarize the approach taken for these costs.

Several sources of information were used for estimating these costs. For an understanding of the GMWSS water system annual costs, the 2019 Water and Sewer Rate Study (completed by GRW and Environmental Rate Consultants, Inc.) was referenced to determine the anticipated fiscal year 2020 to 2024 operating and maintenance (O & M) costs for the entire water system. Each annual O&M cost included the costs for treatment, distribution, administration, and management of the entire water system. For fiscal year 2020, as an example, the total O&M cost of the water system was \$4,244,118.

A second source of information was the fiscal year 2020 WTP water production and O&M costs, which indicated that it cost \$1,522,453 to produce a total of 1,110,026,919 gallons that fiscal year, or approximately \$1.37/1000 gallons for the period of July 1, 2019, to June 30, 2020. By dividing the 2020 Rate Study O&M cost of \$4,244,118 for the entire water system by the 2020 water production volume of 1,110,206,919 gallons, it can be calculated that the total O&M cost for the water system equated to \$3.82/1000 gallons in fiscal year 2020. Then, by deducting the 2020 WTP production and O&M cost (\$1.37/1000 gallons) from the 2020 total water system O&M cost (\$3.82/1000 gallons), the rest of the water system was \$2.45/1000 gallons.

These costs provide a historic basis for the costs to GMWSS for treating water (\$1.37/1000 gallons in 2020), and for distribution, administration, and management of the GMWSS water system (\$2.45/1000 gallons in 2020). By adjusting these costs to 2022 for this Assessment, the following costs have been used in evaluating each alternative:

The 2022 cost for producing water from the existing WTP is estimated at \$1.50/1000 gallons. This cost includes an increase over 2020 costs due to increased costs of WTP labor, power, chemicals, repair, and associated treatment costs. This cost applies to all alternatives until the existing WTP is either replaced by a new plant (Alternative A) or until GMWSS begins purchasing all water from another utility (Alternatives B, C1, C2, and D).

The 2022 cost for producing water from a new GMWSS WTP is estimated at \$2.00/1000 gallons. This cost is more than for the existing WTP due to increased power and O&M costs for raw water pumping from the water intake on the Kentucky River to the WTP. This cost only applies to Alternative A after the existing plant is taken out of service.

The 2022 costs for distributing water within the existing water system and for system administration and management are estimated at \$2.50/1000 gallons. This cost applies to all alternatives during the planning period.

The 2022 costs for purchasing water from another utility at their wholesale rate - FPB at \$2.55/1000 gallons (for Alternative B), KAW at \$4.21/1000 gallons (for Alternatives C1 and C2), and LWC at \$2.46/1000 gallons (for Alternative D) – are applied until the existing WTP is taken out of service. These rates represent the current purchase rates charged to their utility customers and include the payment needed to retire the debt service they will incur for supplying water to GMWSS. GMWSS may need to pay a surcharge rate or an additional capital cost, if required, if the total water purchase cost over the planning period is insufficient to cover the supplier's cost of expanding a WTP and/or building a transmission main to the Scott County line. These rates may increase once a new water rate study is completed, and a final water purchase agreement is negotiated with the selected utility. To evaluate the impact of the production, purchase and distribution costs on each alternative, this Assessment provides for increases in these costs at regular intervals. The 2022 costs have been used for the period of 2022 to 2027, such that these costs stay constant during the planning, design, and construction period for the capital projects of each alternative. Thereafter, at five-year intervals, these costs are increased by ten percent to account for higher operating and maintenance costs. The following Table 5-1 summarizes these cost increases.

Table 5-1
Costs for Water Production, Purchase and Distribution, per 1000 Gallons,
For GMWSS Alternatives A-D

Alternative	2022-2027	2028-2033	2034-2039	2040-2045
Alternative A				
Production	\$1.50	\$2.00	\$2.20	\$2.42
Purchase	\$2.55	-	-	-
Distribution	\$2.50	\$2.75	\$3.03	\$3.33
Alternative B				
Production	\$1.50	-	-	-
Purchase	\$2.55	\$2.81	\$3.09	\$3.40
Distribution	\$2.50	\$2.75	\$3.03	\$3.33
Alternative C1				
Production	\$1.50	-	-	-
Purchase	\$4.21	\$4.63	\$5.09	\$5.60
Distribution	\$2.50	\$2.75	\$3.03	\$3.33
Alternative C2				
Production	\$1.50	-	-	-
Purchase	\$4.21	\$4.63	\$5.09	\$5.60
Distribution	\$2.50	\$2.75	\$3.03	\$3.33
Alternative D				
Production	\$1.50	-	-	-
Purchase	\$2.46	\$2.71	\$2.98	\$3.28
Distribution	\$2.50	\$2.75	\$3.03	\$3.33

Water System Improvements and Expansion Costs

The 2019 Rate Study included estimated capital costs for several projects planned over the fiscal year 2020-2024 period for improvements to and expansion of the existing water system, as well as for bond payments for projects that had been previously built within the water system. These costs, when added to the projected water system O&M costs, were used to develop the total annual expenses for each year of the Rate Study. These expenses, in turn, formed the basis of the recommended water system rate structure, which was funded by a combination of connection fees, revenue bond debt financing, and new water rates for all customers.

The Rate Study recommended, for example, that the residential customer water rate increase by fiscal year 2022 to \$14.33 for the first 2000 gallons of water use, and to \$7.70 for each additional 1000 gallons of water use. To compare the recommended rates with current rates, the current GMWSS Portal indicates that the actual fiscal year 2022 residential customer water rate was \$14.36 for the first 2000 gallons and \$7.72 for each additional 1000 gallons. Since the rates recommended in the Rate Study are essentially

equal to those published in the GMWSS Portal, it may be concluded that the recommended water system projects have been undertaken or completed to date, and the remaining recommended projects will likely be undertaken or completed by fiscal year 2024.

This discussion is significant for this Assessment in that it recognizes that GMWSS will likely continue to improve and expand its water system during the planning period of 2025 to 2045 to meet customer needs and that the Water Rate Schedule will be regularly updated to pay for the required projects and other costs. A separate water system distribution study, updated at regular intervals, will be needed to identify such projects and their costs. This information may then be used in developing future water rates.

The costs for future improvements to and expansion of the existing water system will occur equally regardless of whether GMWSS produces its own water or purchases its water from another utility. Therefore, these costs are not incorporated in the comparison of the alternatives in this Assessment.

Replacement Costs

Replacement costs are estimated every 15 years during the planning period to pay for the replacement of original pumping, electrical/control and treatment equipment, and similar components that have reached the end of their useful life. These items represent a small fraction of the capital cost of these facilities, which are primarily structures, transmission mains and similar facilities with high durability. Therefore, a replacement cost equivalent to 5% of their construction cost is applied in year 15 (2040).

Salvage Values

Salvage values are based on the worth of facilities at the end of the planning period (year 20, 2045). Transmission systems and treatment plants generally last 50 years or more, therefore their salvage value at the end of this 20-year planning period will be high. For transmission system piping, pumping stations and water storage facilities, a salvage value of 90% of their construction cost is used. A salvage value of 75% of their construction cost is used for treatment plants.

Summary of Total Present Worth Costs for Alternatives

Tables 5-1 and 5-2 summarize the TPWC of each alternative presented in this Assessment. Detailed opinions of TPWC for each alternative are presented in Appendix B.

Table 5-2**Summary of 2025 Total Present Worth Costs, in \$Millions, for GMWSS Alternatives A-D**

Alternative (ADD, in MGD)	Construction Cost	PW of Annual Cost	PW of Equip. Repl. Cost	PW of Salvage Value	Total PW Cost
A/L (7.5)	\$217.7	\$158.4	\$3.5	\$75.6	\$304.0
A/H (10.0)	\$263.1	\$193.8	\$0.10	\$90.9	\$366.1
B/L (7.5)	\$26.3	\$180.4	\$0.10	\$10.3	\$196.6
B/H (10.0)	\$27.0	\$221.3	\$0.10	\$10.3	\$238.0
C1/L (7.5)	\$15.9	\$246.0	\$0.1	\$5.9	\$256.1
C1/H (10.0)	\$16.7	\$297.4	\$0.1	\$6.2	\$308.0
C2/L (7.5)	\$204.8	\$243.0	\$2.7	\$34.5	\$416.0
C2/H (10.0)	\$239.9	\$297.4	\$3.5	\$84.6	\$456.2
D/L (7.5)	\$40.9	\$180.7	\$0.1	\$10.2	\$211.5
D/H (10.0)	\$44.2	\$220.9	\$0.1	\$10.3	\$254.9

Note: Alternatives D/L and D/H include cost for shortfall of water purchase payments

Table 5-3**Summary of Water Sources, Suppliers and 2025 Total Present Worth Costs, in \$Millions, for GMWSS Alternatives A-D**

Alternative	ADD/MDD, MGD	Water Source	Water Supplier	TPWC
A/L	7.50/11.25	KY River, Pool 3	GMWSS	\$304.0
A/H	10.00/15.00	KY River, Pool 3	GMWSS	\$366.1
B/L	7.50/11.25	KY River, Pool 4	FPB	\$196.6
B/H	10.00/15.00	KY River, Pool 4	FPB	\$238.0
C1/L	7.50/11.25	KY River, Pool 3	KAW	\$256.1
C1/H	10.00/15.00	KY River, Pool 3	KAW	\$309.0
C2/L	7.50/11.25	KY River, Pool 3	KAW	\$416.0
C2/H	10.00/15.00	KY River, Pool 3	KAW	\$456.2
D/L	7.50/11.25	OH River, L'ville	LWC	\$211.5
D/H	10.00/15.00	OH River, L'ville	LWC	\$254.9

Construction Costs for FPB, KAW and LWC to Supply GMWSS

In addition to developing opinions of GMWSS cost for these alternatives, capital costs were developed for plant expansions, transmission mains, booster pump stations, and storage tanks needed, respectively, by FPB, KAW and LWC to supply water to the Scott County line. Although these capital costs will be borne by these utilities (except for Alternative C2), they will be reflected in the water purchase rates charged to GMWSS to pay off their construction costs over time. Opinions of construction costs for these facilities are provided in Appendix B and Appendix C. Table 5-3 summarizes the capital costs for FPB, KAW and LWC to meet GMWSS's 7.5 MGD ADD "Low Range" water demand as well as the 10 MGD ADD "High Range" demand. These costs have been increased to 2025 to include inflation, engineering, contingencies, land and related costs.

Table 5-4
Summary of 2025 Capital Costs, in \$Millions, for FPB, KAW and LWC
to Supply Water to GMWSS for Alternatives A-D

Alternative	Water Supplier to GMWSS	WTP Expansion Construction Cost	Transmission Main Construction Cost	Supplier Total Capital Cost
B/L	FPB	\$33.6	\$70.8	\$104.4
B/H	FPB	\$33.6	\$70.8	\$104.4
C1/L	KAW	\$68.0	\$0.0	\$68.0
C1/H	KAW	\$90.7	\$0.0	\$90.7
C2/L	KAW	\$68.0	\$88.6	\$156.6*
C2/H	KAW	\$90.7	\$88.6	\$179.3*
D/L	LWC	\$0.0	\$135.6	\$135.6
D/H	LWC	\$0.0	\$168.0	\$168.0

Note: FPB costs are based on 2022 FPB water supply offer. KAW costs are based on 2022 GRW estimate. LWC costs are based on 2022 LWC water supply offer. * All costs for Alt C2 are to be paid by GMWSS.

The costs in Table 5-3 allow that FBP, KAW and LWC already meet the water supply demands of their existing customers and their facilities are committed to the future needs of those customers. The required additional WTP capacity costs shown in Table 5-3 for each utility are based on the additional treatment capacity needed to supply GMWSS beyond that needed for their own customers. For example:

- The current capacity of the FPB WTP is 18 MGD. FPB has indicated (Appendix C) it will cost, in 2022 dollars, \$28 million to expand their WTP and \$59 million to construct a transmission main to the Scott County line to meet the GMWSS 2045 “Low Range” and “High Range” water demands, for a total of \$87 million. Increasing these costs by 20 percent for 2025 to account for construction cost inflation, indicates these costs will be a total of \$104.4 million by 2025.

It is the intent of the water purchase rates negotiated between GMWSS and FPB that the total purchase cost paid by GMWSS over the planning period be sufficient to compensate FPB for their capital expenditures to meet the GMWSS water demands. If the FPB capital costs were to be more than the total water purchase payment over the planning period, GMWSS would need to add the cost difference to its construction budget or increase the payment amount per 1000 gallons as a surcharge cost.

Based on the water purchase rates listed in Table 5-1, GMWSS will pay FPB \$125 million over the period of 2028 to 2045 for its water under the “Low Range” scenario and \$156 million under the “High Range” scenario. On that basis, GMWSS’s annual water purchase payment to FPB will exceed the capital costs paid by FPB to supply GMWSS; therefore, there will be no need for GMWSS to adjust its construction budget or pay a surcharge under Alternative B.

- The capacity of the KAW Owenton WTP is 20 MGD. KAW did not provide a formal offer to supply water to GMWSS; however, KAW has been considered a viable water supplier. Cost estimates for supplying water to GMWSS were developed by GRW. In 2022 dollars, it will

cost an estimated \$45 million to expand this plant to supply the 2045 GMWSS “Low Range” demands and \$60 million to meet the 2045 GMWSS “High Range” demands. These costs, expressed in 2025 dollars are \$68 million and \$91 million, respectively.

Under Alternative C1, KAW will supply water to GMWSS via its existing 42” transmission main. Therefore, there will be no KAW capital costs for the construction of a new transmission main to the Scott County line, and the total KAW cost for meeting GMWSS’s water demands will be limited to the costs for expanding the Owenton WTP. Based on the water purchase rates listed in Table 5-1, GMWSS will pay KAW \$206 million over the period of 2028 to 2045 for its water under the “Low Range” scenario and \$258 million under the “High Range” scenario. On that basis, GMWSS’s annual water purchase payment to KAW will exceed the capital costs paid by KAW to supply GMWSS; therefore, there will be no need for GMWSS to add to its construction budget or pay a surcharge under Alternative C1.

Under Alternative C2, in addition to expanding the Owenton WTP, KAW will provide a new 30” water transmission main to the Scott County line to supply water to GMWSS. This transmission main is estimated to cost \$89 million in 2025. When this cost is added to the WTP expansion costs, the total capital cost will be \$157 million for the “Low Range” scenario and \$179 million under the “High Range” scenario. In this alternative, GMWSS will be paying for these WTP expansion and transmission main costs, so there is no need for GMWSS to pay a surcharge.

- In Louisville, according to LWC (Appendix C), the treatment facilities have sufficient capacity to meet the GMWSS water demands without the need for expansion. The only LWC capital costs will be for the water transmission main to the Scott County line, for which LWC estimated in 2022 dollars will cost \$113 million under the “Low Range” scenario and \$140 million under the “High Range” scenario. In 2025 dollars, it is estimated this main will cost \$136 million and \$168 million for these two scenarios, respectively.

Based on the water purchase rates listed in Table 5-1, GMWSS will pay LWC \$121 million over the period of 2028 to 2045 for its water under the “Low Range” scenario and \$151 million under the “High Range” scenario. This translates to a shortfall between the LWC capital cost for constructing the transmission main and the total water purchase cost over the planning period. The estimated costs for this shortfall are estimated at \$15 million for the “Low Range” scenario and \$17 million for the “High Range” scenario, respectfully. To compensate for these shortfalls, these construction costs are included in Table 5-2 and Appendix B for Alternatives D/L and D/H.

GRW independently estimated the construction cost for the LWC transmission main as \$154 million (2022 dollars) and \$184 million (2035 dollars). The GRW estimate included three water storage tanks and three booster pump stations along the main’s route, as well as the Kentucky River crossing. It is not clear if these items are included in LWC’s cost estimate (see Appendix C); however, the LWC estimate has been used in this Assessment.

Non-Monetary Comparison of Alternatives

The following paragraphs provide a comparison of the alternatives based on their relative cost, purchase rate, reliability, and relationship to GMWSS. Also included is a comparison of the potential environmental impact of each alternative and their respective

construction complexity. Using these criteria, each alternative is ranked on a scale of 1 to 5, with a rank of 1 for the worst weighting and a score of 5 for the best weighting.

Relative Cost

As described in Table 5-2, Alternative C2 has the highest present worth cost of all alternatives. This is primarily due to GMWSS paying for all construction within as well as outside of Scott County. The second highest present worth cost is Alternative A, primarily due to the inclusion of a new GMWSS WTP in this alternative. At current water purchase rates, Alternatives B and D have the lowest purchase costs of the alternatives. Alternative C1, which has the lowest construction cost but one of the highest water purchase costs, indicates that C1 is not as cost-effective over time as are Alternates B and D. Without the need for a additional funds payable to LWC, Alternatives B and D would be considered as equal choices. However, the additional funds to repay LWC for the shortfall of construction cost for their transmission main to the Scott County line, results in a less favorable relative cost for Alternative D compared to Alternative B.

Production or Purchase Rate

Under Alternative A, the debt incurred by building a new WTP and its operating costs, will significantly increase the water rate that will be charged to GMWSS customers. The analysis of annual operating costs in Appendix B, however, indicates that purchasing water from another utility may be more costly than producing water in-house as under Alternative A. Under Alternatives C1 and C2, in which water will be purchased from KAW, the current rate (\$4.21 per 1000 gallons) is the highest of the alternatives. Alternative C2 also calls for GMWSS to pay the cost of KAW's WTP expansion and the transmission main to Scott County. In addition, KAW is a stockholder-owned, NYSE-traded, Public Service Commission-regulated utility, with a history of increasing rates to existing customers to pay for facilities built for new customers. Purchasing water from a municipally owned and operated utility that is not subject to Public Service Commission rate hike negotiations is advantageous to GMWSS.

Water Source

As discussed in Chapter 3, the Ohio River is an excellent water source, with a drainage area over 16 times that of the other alternatives and is the source for Alternative D. The Kentucky River, the water source for Alternatives A, B, C1 and C2, is also a viable source for GMWSS, even though its drainage area is smaller. Both rivers are considered by KDOW to be drought-proof and the quality of the water in both rivers is not of concern as a public water supply. Both rivers provide an adequate volume of water, even during extended dry weather periods, to meet GMWSS's water demands well beyond the end of the planning period of this Assessment.

Reliability

The risk of infrastructure failure is always a concern to a water utility. Under each alternative, long, large-diameter transmission mains, booster pump stations and elevated water storage tanks will be required. Risks of leaks and line breakage are going to be greater with longer mains, resulting in temporary disruptions in supply. For Alternative D, from Louisville, the main is significantly longer than for the other alternatives and has a Kentucky River crossing. Failure of this crossing would likely result in several months of disruption to GMWSS's water supply. A redundant parallel crossing would be prudent to consider; however, its cost has not been included in this Assessment. None of the other alternatives have crossings on the scale of Alternative D, which therefore has the lowest reliability.

Relationship to GMWSS

GMWSS already has a long-standing relationship with FPB, which is currently supplying water to meet current peak demands of GMWSS customers. The relationship with KAW is also based on purchasing water, but KAW does not provide the volume that FPB does. GMWSS has no existing water purchase relationship with LWC. FPB and LWC have provided proposals to GMWSS that will meet the demands of GMWSS customers throughout the planning period. Their proposals provide rate structures that are competitive with the rate structure that GMWSS will require under Alternative A. FPB and LWC are similar in organizational structure to GMWSS in that they are also municipally owned and operated utilities; KAW is a for-profit utility. Preference should be given to FPB and LWC as they are "like-minded" to GMWSS in operations and management style.

Environmental Concerns

Each alternative will disturb the land during construction along the route of new transmission mains. To the greatest extent possible, the final routes for these mains will be selected in the right-of-way of roads where the area was already disturbed during the road construction. Some routes will traverse private property where easements will be required; provisions to safeguard the environment such as the use of silt fences and proper materials storage will be needed in these areas. Construction noise, dust and traffic control are similar for each alternative.

A review of threatened and endangered species habitats and areas of cultural and historic significance will be needed prior to design of the mains; a more extensive habitat and cultural resource survey will be required for Alternative A which requires new sites for a raw water intake, raw water pump station and WTP. On that basis, there is the potential for a higher degree of environmental impact for Alternative A (and Alternative D with a Kentucky River crossing). There is not expected to be a significant difference between the other alternatives regarding environmental impact.

Implementation Complexity

Construction of each alternative will require GMWSS to use contractors that specialize in water mains, pump stations, water storage tanks, and in the case of Alternative A, water treatment plants. It is reasonable to conclude that as many as three or four contractors will be undertaking each type of construction at various locations at the same time. This will require multiple construction contracts, which will need to be simultaneously overseen by GMWSS staff as well as the design engineers. From this standpoint, an alternative needing fewer contracts will be more easily implemented.

Weighting Factors

Of the above-listed criteria, the following weighting factors have been assigned:

- Relative Cost 50%
- Production or Purchase Cost 15%
- Water Source 15%
- Reliability 5%
- Relationship to GMWSS 5%
- Environmental Concerns 5%
- Implementation Complexity 5%

Alternative Scoring

Tables 5-5 and 5-6 present the weighted score of each alternative, using the ranks and weighting factors described in the preceding paragraphs.

Tables 5-5 and 5-6
Scoring of Alternatives
“Low Range” and “High Range” Water Demands

Table 5-5

Alternative	Criteria	Rank	Weight	Score
A/L	Relative Cost	3	0.50	1.50
	Production/Purchase Cost	5	0.15	0.75
	Water Source	4	0.15	0.60
	Reliability	4	0.05	0.20
	Relationship to GMWSS	5	0.05	0.25
	Environmental Concerns	3	0.05	0.15
	Implementation Complexity	2	0.05	0.10
	Total			3.55
B/L	Relative Cost	5	0.50	2.50
	Production/Purchase Cost	4	0.15	0.60
	Water Source	4	0.15	0.60
	Reliability	3	0.05	0.15
	Relationship to GMWSS	5	0.05	0.25
	Environmental Concerns			
	Implementation Complexity			
	Total			

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	Environmental Concerns	3	0.05	0.15
	Implementation Complexity	4	0.05	0.20
	Total			4.45
Alternative				
C1/L	Relative Cost	4	0.50	2.00
	Production/Purchase Cost	2	0.15	0.30
	Water Source	4	0.15	0.60
	Reliability	3	0.05	0.15
	Relationship to GMWSS	3	0.05	0.15
	Environmental Concerns	4	0.05	0.20
	Implementation Complexity	3	0.05	0.15
	Total			3.55
Alternative				
C2/L	Relative Cost	1	0.50	0.50
	Production/Purchase Cost	1	0.15	0.15
	Water Source	4	0.15	0.60
	Reliability	4	0.05	0.20
	Relationship to GMWSS	3	0.05	0.15
	Environmental Concerns	4	0.05	0.20
	Implementation Complexity	3	0.05	0.15
	Total			1.95
Alternative				
D/L	Relative Cost	4	0.50	2.00
	Production/Purchase Cost	4	0.15	0.60
	Water Source	5	0.15	0.75
	Reliability	2	0.05	0.10
	Relationship to GMWSS	2	0.05	0.10
	Environmental Concerns	3	0.05	0.15
	Implementation Complexity	4	0.05	0.20
	Total			3.90

Table 5-6

Alternative	Criteria	Rank	Weight	Score
A/H	Relative Cost	3	0.50	1.50
	Production/Purchase Cost	5	0.15	0.75
	Water Source	4	0.15	0.60
	Reliability	4	0.05	0.20
	Relationship to GMWSS	5	0.05	0.25
	Environmental Concerns	3	0.05	0.15
	Implementation Complexity	2	0.05	0.10
	Total			3.55
Alternative				
B/H	Relative Cost	5	0.50	2.50
	Production/Purchase Cost	4	0.15	0.60
	Water Source	4	0.15	0.60
	Reliability	3	0.05	0.15
	Relationship to GMWSS	5	0.05	0.25
	Environmental Concerns	3	0.05	0.15
	Implementation Complexity	4	0.05	0.20
	Total			4.45
Alternative				

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C1/H	Relative Cost	4	0.50	2.00
	Production/Purchase Cost	3	0.15	0.15
	Water Source	4	0.15	0.60
	Reliability	3	0.05	0.15
	Relationship to GMWSS	3	0.05	0.15
	Environmental Concerns	4	0.05	0.20
	Implementation Complexity	3	0.05	0.15
	Total			3.40
Alternative				
C2/H	Relative Cost	1	0.50	0.50
	Production/Purchase Cost	1	0.15	0.15
	Water Source	4	0.15	0.60
	Reliability	4	0.05	0.20
	Relationship to GMWSS	3	0.05	0.15
	Environmental Concerns	4	0.05	0.20
	Implementation Complexity	3	0.05	0.15
	Total			1.95
Alternative				
D/H	Relative Cost	4	0.50	2.00
	Production/Purchase Cost	4	0.15	0.60
	Water Source	5	0.15	0.75
	Reliability	2	0.05	0.10
	Relationship to GMWSS	2	0.05	0.10
	Environmental Concerns	2	0.05	0.10
	Implementation Complexity	4	0.05	0.20
	Total			3.85

Tables 5-5 and 5-6 indicate Alternative B has the highest score, Alternatives A, C1 and D are ranked lower, and Alternative C2 has the lowest score. There are other indicators that should also be considered, such as the benefits and disadvantages of each alternative. For example:

- **Alternative A** ensures a more reliable water supply (the Kentucky River) than the current water source, retains the production, management, and financial control of the entire water system, while also allowing better control over future water rates. It also requires the acquisition of land for the WTP site. On the other hand, this alternative calls for retaining and perhaps re-training the current WTP operational staff and acquiring additional energy for raw water pumping, as well as additional operational and maintenance of the new facilities in Scott County.
- **Alternative B** provides GMWSS with no responsibility for raw water supply quantity or quality, water treatment or transmission to the WSSA. GMWSS will rely on purchasing water from a current supplier that they have a good relationship with. The water source (the Kentucky River) is also more reliable than the current water source. On the other hand, the

disadvantages of this alternative include not having GMWSS control of production and fiscal management of the water supply and treatment as well as having minimal control over future water rates.

- **Alternative C1** affords GMWSS with the smallest amount of construction in Scott County, while also purchasing water from an existing supplier. The Kentucky River is a viable source, which allows GMWSS to eliminate the need for its own source and WTP. On the other hand, the disadvantages of this alternative include not having GMWSS control of production and fiscal management of the water supply and treatment facilities. Neither will GMWSS have any control over future water rates, which are subject to negotiation with the Public Service Commission, not KAW's customers. Additionally, as KAW acquires other water systems in the future, GMWSS water rates will increase beyond the control of GMWSS.
- **Alternative C2** calls for GMWSS to pay for the construction of facilities owned and built by KAW outside of Scott County in addition to paying wholesale rates for purchasing water from KAW. The wholesale rates will not be under the control of GMWSS nor will the control of production, transmission, and management of the water supply to GMWSS.
- **Alternative D** allows the Ohio River to be the water source, a river with more reliability for water quantity and quality than the Kentucky River. This alternative also eliminates the water treatment responsibility from GMWSS, while affording GMWSS minimal control over future water rates. There is no need to expand the LWC WTP under this alternative, which allows the water purchase rate to be a function only of the cost of the treated water transmission main. The transmission main, which crosses the Kentucky River on its route to Scott County, presents a reliability risk in the event of line leakage or failure. The estimated capital cost for the transmission main exceeds the total funds that GMWSS will pay at the current water purchase rate, requiring GMWSS to also pay a surcharge rate to repay the funding shortfall in LWC's capital cost.

Conclusion of Alternative Evaluations

Alternative B, purchasing water from FPB, is the best long-term alternative for GMWSS. The TPWC of Alternatives B/L and B/H are approximately \$40 million apart, primarily due to the higher annual cost for purchasing as much as 10.0 MGD ADD for Alternative B/H compared to 7.5 MGD ADD for Alternative B/L. If a water-consuming industry were to locate to the WSSA late in the planning period, instead of as soon as 2030 as projected for the "High Range" scenario, then the annual costs for purchasing water for Alternative B/H would be closer to that of Alternative B/L. The resale of water to the industry will more than make up the added

cost for purchasing water from FPB. The GMWSS construction costs for Alternatives B/L and B/H are almost the same except that a larger water storage tank is provided under Alternative B/H.

It should also be recognized that the ability of GMWSS to supply enough water for a water-consuming industry early in the planning period provides an excellent marketing tool as opposed to having to wait to increase water supply capacity until after the industry commits to moving into the WSSA.

Based on all the monetary analyses completed and the non-monetary factors considered, it is the conclusion of this Assessment that GMWSS should select Alternative B/H for the future water demand of its customers. This alternative best meets all the GMWSS criteria desired for the future needs of the WSSA.

The continued operation of the existing WTP at nearly full capacity has also been considered in this Assessment. To ensure that the plant staff have sufficient time to complete needed maintenance and other activities until the plant can be taken out of service (2028), it is recommended that the plant operate at a reduced capacity of 2.5 MGD for the next 6 years. This will allow the plant to produce at the same hourly rate of approximately 158,000 gallons per hour as it does now, but for 16 hours a day instead of its current operation for 24 hours a day. This recommendation will allow the plant to increase production to meet peak demands, if needed, during the remaining 8 hours of the day, which it cannot do at this time. This recommendation also calls for an increase in the daily purchase of water from FPB, requiring a revision to the current purchase agreement.

Each alternative in this chapter has been evaluated based on the construction of all required facilities during the years 2025, 2026 and 2027 so that these facilities can be available by 2028 when the existing GMWSS WTP is to be taken out of operation. Phased construction was not considered in this Assessment so that the alternatives could be evaluated against each other on the same basis. To consider phasing would have unbalanced the TPWC analysis toward alternatives (e.g., Alternative A) that may not have needed to provide WTP capacity at the same time as other alternatives. Although the required transmission mains, pump stations and storage tanks need to be provided by 2028, it is not vital that the full capacity of the associated treatment plant be completed by 2028. For example, under Alternative B/H, which calls for FPB to provide 15 MGD MDD in 2045, it is very likely that expansion of their plant in two phases – a 10 MGD MDD first phase by 2028 and a second 5 MGD MDD phase several years later – will be of interest to them. This would lower FPB's initial capital costs. During water purchase agreement negotiations, GMWSS and FPB should discuss the idea of phasing the expansion of the FPB plant.

Chapter 6

Recommended Water Source and Supply Alternative

Based on the evaluations discussed in Chapter 5, **the recommended alternative for the water source and supply for GMWSS is Alternative B/H**. This alternative calls for FPB to provide a 2045 supply of 10 MGD on an average daily basis and 15 MGD on a maximum daily basis.

It is also recommended that the existing GMWSS/FPB water purchase agreement be amended to ensure the provision of a sufficient supply of water to meet the GMWSS demands until the new infrastructure is in place, even while the existing WTP will remain in operation. This agreement should again be amended at regular intervals (suggested every 5 years) so that customer water rates are in balance with water purchase, distribution, and other operating costs.

This recommendation includes the operation of the existing GMWSS WTP at a lower production rate (2.5 MGD) than it currently operates (3.8 MGD, or 95% of full capacity), to ensure that time is available to allow the plant to increase production to match higher daily demands. The plant will produce at the same rate as it does now (approximately 158,350 gallons per hour), but for 16 hours a day instead of today's operation at 24 hours per day. While this will require an increase in the annual cost of purchased water from FPB until the new facilities are available, it will also provide needed time during the day for maintenance of the WTP and will reduce the plant operating and pumping costs. This "down time" is vital so that the WTP may continue to produce high quality drinking water until it is permanently taken out of operation.

To implement this alternative, the following schedule is recommended.

- 2022 to 2023:
 - Approve this Water Source Assessment.
 - Continue purchasing water from FPB to match GMWSS demands through 2023 in addition to operating the existing GMWSS WTP at a reduced level (2.5 MGD).
 - Finalize new Water Purchase Agreement with FPB.
 - Hire Consulting Engineer for design of GMWSS system improvements.
- 2023 to 2025:
 - Continue purchasing water from FPB to match GMWSS demands through 2025 (year 0 of the planning period) in addition to operating the existing GMWSS WTP at a reduced level (2.5 MGD).
 - Complete final route selection for water transmission main in Scott County.
 - Complete topographic surveys, geotechnical investigations, environmental and cultural resources surveys.

- Complete design of new transmission main, water storage tank and booster pump station.
- Secure financing for construction of new facilities.
- Prepare construction bid package (s) and advertise for bids.
- Select construction contractor(s) and award construction contract(s).
- Complete a water rate study to determine revised customer water rates after construction bids are taken and FPB wholesale water rates are negotiated.
- 2025 to 2027:
 - Continue purchasing water from FPB to match GMWSS demands through 2027 (year 2 of the planning period) in addition to operating the existing GMWSS WTP at a reduced level (2.5 MGD).
 - Expand FPB WTP.
 - Build new FPB transmission main from FPB WTP to Scott County line.
 - Build new transmission main from Scott County line to Lancaster tank.
 - Build new booster pump station in Scott County.
- 2028:
 - Begin operation of new GMWSS and expanded FPB WTP facilities (year 3 of the planning period).
 - Begin purchasing water from FPB at newly negotiated purchase agreement rate.
 - Take existing GMWSS WTP out of operation.
- 2029 to 2045:
 - Continue purchasing water from FPB to match GMWSS projected demands until 2045 (years 4 to 20).
 - Re-assess customer water service rates on a regular basis (every 5 years is recommended).

Appendix A

Water Source Evaluation



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Technical Memorandum

To:	Alan Bryan, GMWSS	Date:	March 1, 2021
		GRW Project No.:	4909
From:	Mary Beth Robson		
	GRW Engineers, Inc.		
Subject:	Georgetown Water Supply Investigation		

Background

Georgetown Municipal Water and Sewer Service serves over 12,000 customers in Georgetown, Sadieville, and Stamping Ground, KY. The forecasted water supply need for 2045 is 10 million gallons per day (MGD). Currently, GMWSS relies on Royal Spring as their only raw water source. This source is supplemented with purchased water from the Frankfort Electric and Water Plant Board and Kentucky American Water Company. GMWSS is seeking to identify other raw water sources to supplement Royal Spring.

Royal Spring yield varies with season and rainfall. In addition, the Royal Spring is the outlet of a karst basin that underlies portions of both Scott and Fayette County, and tens of miles of Interstate 75. A catastrophic spill in the watershed could render the spring water unusable. For these reasons, a secondary raw source would provide GMWSS with greater flexibility and reliability than the current situation.

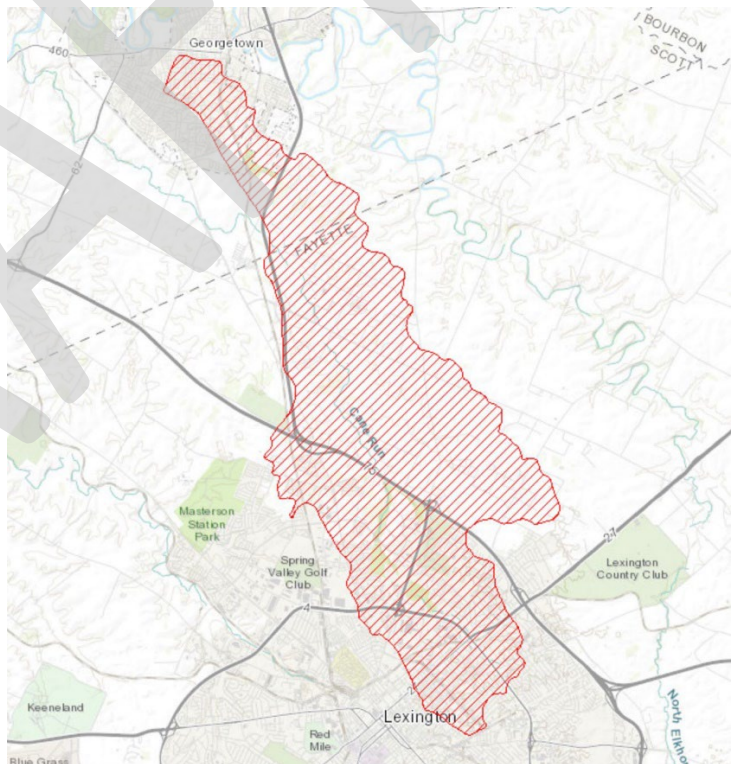
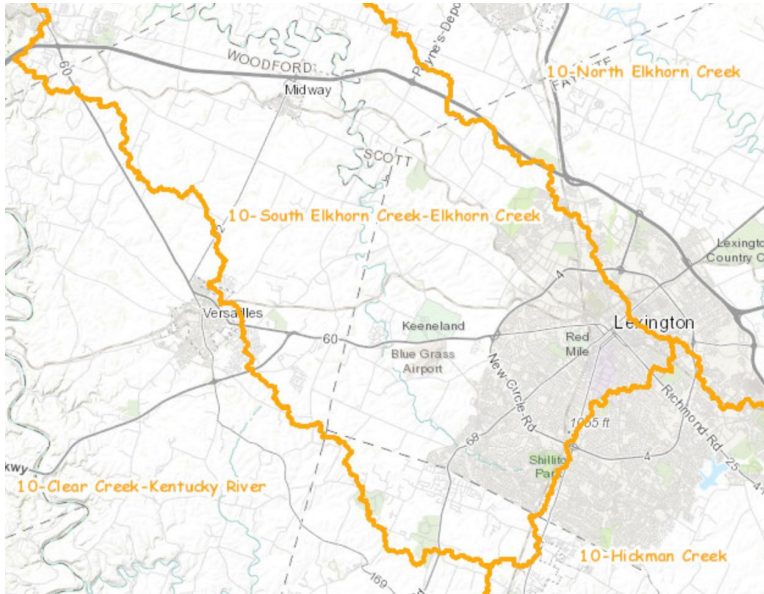


Figure 1 Royal Spring Karst Basin from KY Watershed Viewer

New Water Supply Source: South Elkhorn

One potential water supply source is the South Elkhorn Creek, which forms the southwestern boundary of Scott County. At its closest point, South Elkhorn Creek is 5.3 miles from downtown Georgetown. South Elkhorn Creek is a fourth order stream, with major tributaries including Shannons Run, Town Branch Creek, and Lees Branch.



South Elkhorn originates in south eastern Fayette County and northwestern Jessamine County. It travels generally north by northwest to its confluence with North Elkhorn Creek (near Frankfort). Most of the contributing watershed is rural residential and agricultural, with the exception of Town Branch Creek, which drains the urban center of Lexington. At the Leestown Road (US 421) crossing in Fayette County, the drainage area is 105 square miles. There is a USGS stream flow gage station at this site.

Water Quantity

Natural stream flow, other water withdrawals, aquatic life, and recreational uses combine to dictate the amount of water available for a new withdrawal. Two locations have been suggested by GMWSS: near Weisenberger Mill or near the I 64 crossing, off Moores Lane. These locations are just below and just above the USGS gage at US 421. The gage is a reasonable representation of stream flow at either of the two suggested sites.

The stream gage at US 421 has 38 years of continuous recorded stream flow. The 7-day 10-year flow (7Q10) is used in Kentucky in setting wastewater discharge pollutant limits; it represents the lowest 7- day average expected once in 10 years (or a 10% annual chance low flow). The US 421 gage data has a 7Q10 of 15 cubic feet per second (cfs) as calculated by the EPA tool DFLOW, accessed through the USGS/EPA Surface Water Toolbox. [SWToolbox Software Information \(usgs.gov\)](https://www.usgs.gov/centers/erdc/surface-water-toolbox). The 7Q10 flow of 15 cfs is approximately 10 MGD.

The only permitted water withdrawal on the South Elkhorn downstream of the gage is the Frankfort Country Club. There are two additional permitted withdrawals on the main stem of Elkhorn Creek: Old Grand Distillery (Frankfort) and the Pfeiffer fish hatchery.

There is no public recreation access to the creek except at the Forks of Elkhorn, where the South fork and the North fork meet to form the main stem near Frankfort. The Elkhorn Campground is on the banks of the South Elkhorn at the Forks. There is also a kayak/canoe access location at the Forks.

The land use between the gage at US 421 and the Forks is almost entirely agricultural. There are a few scattered residences along the creek. Any recreational use of the creek is private. Agricultural operations may withdraw water for irrigation. No permit is needed for domestic or agriculture irrigation withdrawals. (KRS 151.990)

Water Quality

South Elkhorn was studied in 2013 for a bacteria Total Maximum Daily Load (TMDL) evaluation by Lindell Ormsbee, et al. Most of the mainstem and several of its tributaries are polluted with fecal coliform. Suspected sources of pollutants include agriculture (including livestock manure), urban stormwater runoff, and municipal point source discharges. Other water quality parameters of concern detected in citizen-volunteer water quality sampling include nitrogen (measured as Total Nitrogen) and conductivity. Potential sources of the elevated nitrogen are municipal waste, fertilizers and agricultural activities. High conductivity can be the result of general urban runoff pollutants. Recent testing indicates no issues with metals or other nutrients. No testing results are available for pesticides, pharmaceuticals, or other pollutants. Citizen-volunteer monitoring is coordinated by Kentucky River Watershed Watch and data can be accessed at [Watershed Watch in Kentucky Data Portal \(uky.edu\)](https://watershedwatch.uky.edu/).

Infrastructure Needed

A water intake structure on South Elkhorn would be required. Property or an easement would also be needed to construct the structure.

Additionally, a raw water transmission line would be necessary along with easements for this line and possibly pump stations. Treatment of the raw water would require a new plant or an upgrade of the existing water treatment plant. The existing plant has capacity to treat up to 4 MGD.

Summary of South Elkhorn as a Source

A new intake on South Elkhorn may provide a partial solution for GMWSS. The allowable withdrawal amount is at the discretion of KY Division of Water permit writer and will consider other users and the natural environment. Based on a conversation with Bill Caldwell of the Kentucky Division of Water, water withdrawal permits are not based on the maximum amount that can be withdrawn from a stream

without damaging other uses, but rather on how much water is needed. After discussing South Elkhorn Creek with him, a withdrawal permit designating no more than 5 MGD may be reasonable.

The dry weather flow of South Elkhorn is likely dominated by the wastewater discharge of the Town Branch Wastewater Treatment Plant in Lexington. The dry weather flow of this plant is approximately 15 MGD. Water quality issues observed in South Elkhorn may also be related to wastewater and urban stormwater discharges.

In conclusion, South Elkhorn Creek as a viable water supply source is limited due to its low flow characteristics, documented nutrient pollutions, and potential for other human-origin pollutants from the upstream wastewater treatment plant.

New Water Supply Source: Kentucky River

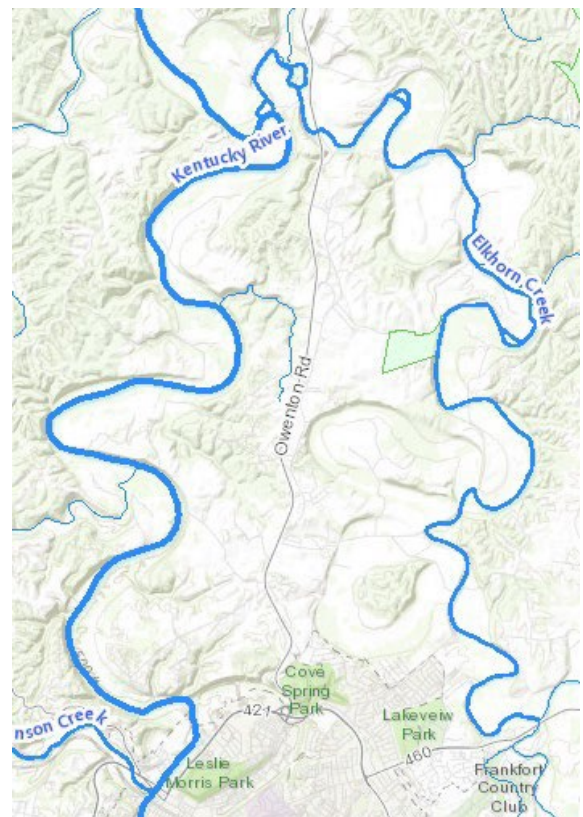
Another potential raw water source is the Kentucky River. The Kentucky River is a major river, traversing 255 miles from eastern Kentucky to the Ohio River. Originally impounded into slackwater pools for commercial navigation, it now serves as the primary water supply for Lexington and many other communities in central Kentucky. The Kentucky River Authority operates and maintains the locks and dams on the river and is funded by water use fees.

A potential withdrawal location in Pool 3 of the Kentucky River near the mouth of Elkhorn Creek (river mile 52.7) has been suggested by GMWSS. Pool 3 extends from the lock at Frankfort downstream to Monterrey in Owen County. Kentucky American Water withdrawals water from Pool 3 at river mile 48.3.

Based on conversations with Bill Caldwell, KY Division of Water, an additional withdrawal of 5 MGD may be reasonable from Pool 3. No specific information about the safe yield of Pool 3 was available; Bill Caldwell said a statistic such as a 7Q10 flow is meaningless for an impounded stream like the Kentucky River. Water quality characteristics of the Kentucky River were not investigated.

Infrastructure Needed

A water intake structure on the Kentucky River would be required. Property or an easement would also be needed to construct the structure.



Additionally, a raw water transmission line would be necessary along with easements for this line and possibly pump stations. Treatment of the raw water would require a new plant or an upgrade of the existing water treatment plant. The existing plant has capacity to treat up to 4 MGD.

Summary of Kentucky River Pool 3 as a Source

A new intake on the Kentucky River at Pool 3 may provide a full or partial solution for GMWSS. The allowable withdrawal amount is at the discretion of KY Division of Water permit writer and will consider other users and the natural environment. The amount of water available in Pool 3 greatly exceeds the amount available from the South Elkhorn. A withdrawal permit of more than 5 MGD may be possible.

It is important to note that pipeline construction for Kentucky American Water's facilities from the treatment plant at Pool 3 generated local opposition. Similar opposition may occur for a GMWSS transmission line

Appendix B

Total Present Worth Cost of Alternatives and Construction Costs for Water Transmission Mains

Alternative A/L - For 7.5 MGD ADD in 2045 (11.25 MGD MDD)

Opinion of Present Worth Cost

Water from KY River to new GMWSS WTP

		Probable Construction Cost (CC), 2022	
ADD	Item	Description of Item	CC
7.5			
	1	Raw Water Intake	\$0 Included w/ WTP Cost
	2	Raw Water Pump Station	\$0 Included w/ WTP Cost
	3	Raw Water Transmission Main	\$46,800,000 Length = 22.5 miles
	4	Booster Pump Station	\$1,496,250 \$0.133/gallon x 11.25 MGD MDD
	5	Water Storage Tank (per Caldwell Tank)	\$2,200,000 500,000 Gallon
	6	Water Treatment Plant	\$90,000,000 \$8/gallon x 11.25 MGD MDD
	7	Treated Water Transmission Main	<u>\$1,000,000</u> Length = 0.5 miles
		Sub-Total	\$141,496,250
		Construction Contingency (20%)	<u>\$28,299,250</u>
		Sub-Total	\$169,795,500
		Engineering (6%)	\$10,187,730
		Land, Easements, Legal, Administration	<u>\$1,451,280</u>
		Total Probable CC, 2022	\$181,434,510

Page A/L 2
20% CC Increase to 2025 Probable Construction Cost (CC), 2025-2027

Item	Description of Item	CC	
1	Raw Water Intake	\$0	
2	Raw Water Pump Station	\$0	
3	Raw Water Transmission Main	\$56,160,000	
4	Booster Pump Station	\$1,795,500	
5	Water Storage Tank	\$2,640,000	
6	Water Treatment Plant	\$108,000,000	
7	Treated Water Transmission Main	<u>\$1,200,000</u>	
	Sub-Total	\$169,795,500	
	Construction Contingency (20%)	<u>\$33,959,100</u>	
	Sub-Total	\$203,754,600	
	Engineering (6%)	\$12,225,276	
	Land, Easements, Legal, Administration	<u>\$1,741,536</u>	
Total Probable CC, 2025		\$217,721,412	\$217,721,41

Page A/L 3

Probable Annual Cost (AC)				
Year	ADD	Description of Cost	AC	PW of AC
1 (2026)		Current WTP and Distribution Cost	\$3,650,000 2.5 MGD from exist WTP	
	4.60	Additional Water Purchase Cost	<u>\$1,954,575</u> 2.1 MGD from FPB	
		Sub-Total	\$5,604,575	
		PW of Annual Cost, 2025	\$5,441,482	0.9709
				PW Factor
2 (2027)				
	4.70	Current WTP and Distribution Cost	\$3,650,000 2.5 MGD from exist WTP	
		Additional Water Purchase Cost	<u>\$2,047,650</u> 2.2 MGD from FPB	
		Sub-Total	\$5,697,650	
		PW of Annual Cost, 2025	\$5,370,605	0.9426
3 (2028)		Distribution Cost	\$4,818,000	
	4.80	New WTP Operating Cost	<u>\$3,504,000</u> All water from new GMWSS WTP	
		Sub-Total	\$8,322,000	
		PW of Annual Cost, 2025	\$7,615,462	0.9151
				PW Factor
4 (2029)		Distribution Cost	\$4,918,375	
	4.90	New WTP Operating Cost	<u>\$3,577,000</u>	
		Sub-Total	\$8,495,375	0.8885
		PW of Annual Cost, 2025	\$7,548,141	
5 (2030)		Distribution Cost	\$5,119,125	
	5.10	New WTP Operating Cost	<u>\$3,723,000</u>	
		Sub-Total	\$8,842,125	0.8626
		PW of Annual Cost, 2025	\$7,627,217	
6 (2031)		Distribution Cost	\$5,269,688	
	5.25	New WTP Operating Cost	<u>\$3,832,500</u>	
		Sub-Total	\$9,102,188	0.8375
		PW of Annual Cost, 2025	\$7,623,082	

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7 (2032)	Distribution Cost	\$5,370,063		
5.35	New WTP Operating Cost	<u>\$3,905,500</u>		
	Sub-Total	\$9,275,563	0.8131	
	PW of Annual Cost, 2025	\$7,541,960		\$7,541,960
8 (2033)	Distribution Cost	\$5,520,625		
5.50	New WTP Operating Cost	<u>\$4,015,000</u>		
	Sub-Total	\$9,535,625	0.7894	
	PW of Annual Cost, 2025	\$7,527,422		\$7,527,422
9 (2034)	Distribution Cost	\$6,303,915		
5.70	New WTP Operating Cost	<u>\$4,577,100</u>		
	Sub-Total	\$10,881,015	0.7664	
	PW of Annual Cost, 2025	\$8,339,210		\$8,339,210
10 (2035)	Distribution Cost	\$6,414,510		
5.80	New WTP Operating Cost	<u>\$4,657,400</u>		
	Sub-Total	\$11,071,910	0.7441	
	PW of Annual Cost, 2025	\$8,238,608		\$8,238,608
11 (2036)	Distribution Cost	\$6,690,998		
6.05	New WTP Operating Cost	<u>\$4,858,150</u>		
	Sub-Total	\$11,549,148	0.7224	
	PW of Annual Cost, 2025	\$8,343,104		\$8,343,104
12 (2037)	Distribution Cost	\$6,801,593		
6.15	New WTP Operating Cost	<u>\$4,489,500</u>		
	Sub-Total	\$11,291,093	0.7014	
	PW of Annual Cost, 2025	\$7,919,572		\$7,919,572

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13 (2038)	Distribution Cost	\$6,967,485		
6.30	New WTP Operating Cost	<u>\$5,058,900</u>		
	Sub-Total	\$12,026,385	0.6810	
	PW of Annual Cost, 2025	\$8,189,968		\$8,189,968
14 (2039)	Distribution Cost	\$7,133,378		
6.45	New WTP Operating Cost	<u>\$5,179,350</u>		
	Sub-Total	\$12,312,728	0.6611	
	PW of Annual Cost, 2025	\$8,139,944		\$8,139,944
15 (2040)	Distribution Cost	\$8,021,970		
6.60	New WTP Operating Cost	<u>\$5,829,780</u>		
	Sub-Total	\$13,851,750	0.6419	
	PW of Annual Cost, 2025	\$8,891,438		\$8,891,438
16 (2041)	Distribution Cost	\$8,265,060		
6.80	New WTP Operating Cost	<u>\$6,006,440</u>		
	Sub-Total	\$14,271,500	0.6232	
	PW of Annual Cost, 2025	\$8,893,999		\$8,893,999
17 (2042)	Distribution Cost	\$8,447,378		
6.95	New WTP Operating Cost	<u>\$6,138,935</u>		
	Sub-Total	\$14,586,313	0.6050	
	PW of Annual Cost, 2025	\$8,824,719		\$8,824,719
18 (2043)	Distribution Cost	\$8,690,468		
7.15	New WTP Operating Cost	<u>\$6,315,595</u>		
	Sub-Total	\$15,006,063	0.5874	
	PW of Annual Cost, 2025	\$8,814,561		\$8,814,561

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19 (2044)	Distribution Cost	\$8,933,558		
7.35	New WTP Operating Cost	<u>\$6,492,255</u>		
	Sub-Total	\$15,425,813	0.5703	
	PW of Annual Cost, 2025	\$8,797,341		\$8,797,341
20 (2045)	Distribution Cost	\$9,115,875		
7.50	New WTP Operating Cost	<u>\$6,624,750</u>		
	Sub-Total	\$15,740,625	0.5537	
	PW of Annual Cost, 2025	\$8,715,584		\$8,715,584
Total PW of Annual Cost (AC),2025				\$158,403,42

Replacement Costs (Year 15, 2040)

Item	Description of Item	RC		
1	Raw Water Intake	\$0	Included w/ WTP	
2	Raw Water Pump Station	\$0	Included w/ WTP	
3	Booster PS Equipment	\$89,775		
4	Water Treatment Plant Equipment	<u>\$5,400,000</u>		
	Sub-Total	\$5,489,775	0.6419	
			PW Factor	
Total PW of Replacement Costs (RC),2025		\$3,523,887		\$3,523,887

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Salvage Value (Year 20, 2045)		SV	
1	Raw Water Intake	\$0 Included w/ WTP	
2	Raw Water Pump Station	\$0 Included w/ WTP	
3	Raw Water Transmission Main	\$50,544,000	
4	Booster Pump Station	\$1,615,950	
5	Water Storage Tank	\$2,376,000	
6	Water Treatment Plant	\$81,000,000	
7	Treated Water Transmission Main	<u>\$1,080,000</u>	
	Sub-Total	\$136,615,950	0.5537
Total PW of Salvage Value (SV), 2025		\$75,644,252	\$75,644,25
Alternative A/L: Total PW Cost , 2025 (PW of CC+PW of AC+PW of RC)-PW of SV For 7.5 MGD ADD, 11.25 MGD MDD			\$304,004,46

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Alternative A/H - For 10.0 MGD ADD in 2045 (15.0 MGD MDD)

Opinion of Present Worth Cost

Water from KY River to new GMWSS WTP

		Probable Construction Cost (CC), 2022	
ADD	Item	Description of Item	CC
10			
	1	Raw Water Intake	\$0 Incl w/ WTP
	2	Raw Water Pump Station	\$0 Incl w/ WTP
	3	Raw Water Transmission Main	\$46,800,000 Length = 22.5 miles
	4	Booster Pump Station	\$1,995,000 \$0.133/gallon x 15.0 MGD
	5	Water Storage Tank (per Caldwell Tank)	\$2,200,000 500,000 gallon tank
	6	Water Treatment Plant	\$120,000,000 \$8/gallon x 15.0 MGD
	7	Treated Water Transmission Main	<u>\$1,000,000</u> Length = 0.5 miles
		Sub-Total	\$171,995,000
		Construction Contingency (20%)	<u>\$18,710,000</u>
		Sub-Total	\$190,705,000
		Engineering (6%)	\$11,442,300
		Land, Easements, Legal, Administration	<u>\$1,451,280</u>
		Total Probable CCc, 2022	\$203,598,580

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Probable Construction Cost (CC), 2025-2027 20% CC Increase to 2025

Item	Description of Item	CC	
1	Raw Water Intake	\$0	
2	Raw Water Pump Station	\$0	
3	Raw Water Transmission Main	\$56,160,000	
4	Booster Pump Station	\$2,394,000	
5	Water Storage Tank	\$2,640,000	
6	Water Treatment Plant	\$144,000,000	
7	Treated Water Transmission Main	<u>\$1,200,000</u>	
	Sub-Total	\$206,394,000	
	Construction Contingency (20%)	<u>\$41,278,800</u>	
	Sub-Total	\$247,672,800	
	Engineering (6%)	\$13,730,760	
	Land, Easements, Legal, Administration	<u>\$1,741,536</u>	
Total Probable CC, 2025		\$263,145,096	\$263,145,09

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Probable Annual Cost (AC)				
Year	ADD	Description of Cost	AC	PW of AC
1 (2026)		Current WTP and Distribution Cost	\$3,650,000 2.5 MGD from exist WTP	
	4.60	Additional Water Purchase Cost	<u>\$1,954,575</u> 2.1 MGD from FPB	
		Sub-Total	\$5,604,575	
		PW of Annual Cost, 2025	\$5,441,482	0.9709
				PW Factor
2 (2027)				
	4.70	Current WTP and Distribution Cost	\$3,650,000 2.5 MGD from exist WTP	
		Additional Water Purchase Cost	<u>\$2,047,650</u> 2.2 MGD from FPB	
		Sub-Total	\$5,697,650	
		PW of Annual Cost, 2025	\$5,370,605	0.9426
3 (2028)		Distribution Cost	\$4,818,000	
	4.80	New WTP Operating Cost	<u>\$3,504,000</u> All Water from new GMWSS WTP	
		Sub-Total	\$8,322,000	
		PW of Annual Cost, 2025	\$7,615,462	0.9151
				PW Factor
4 (2029)		Distribution Cost	\$4,918,375	
	4.90	New WTP Operating Cost	<u>\$3,577,000</u>	
		Sub-Total	\$8,495,375	0.8885
		PW of Annual Cost, 2025	\$7,548,141	
5 (2030)		Distribution Cost	\$6,122,875	
	6.10	New WTP Operating Cost	<u>\$4,453,000</u>	
		Sub-Total	\$10,575,875	0.8626
		PW of Annual Cost, 2025	\$9,122,750	
6 (2031)		Distribution Cost	\$6,323,625	
	6.30	New WTP Operating Cost	<u>\$4,599,000</u>	
		Sub-Total	\$10,922,625	0.8375
		PW of Annual Cost, 2025	\$9,147,698	

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7 (2032)	Distribution Cost	\$6,624,750		
6.60	New WTP Operating Cost	<u>\$4,818,000</u>		
	Sub-Total	\$11,442,750	0.8131	
	PW of Annual Cost, 2025	\$9,304,100		\$9,304,100
8 (2033)	Distribution Cost	\$6,825,500		
6.80	New WTP Operating Cost	<u>\$4,964,000</u>		
	Sub-Total	\$11,789,500	0.7894	
	PW of Annual Cost, 2025	\$9,306,631		\$9,306,631
9 (2034)	Distribution Cost	\$7,741,650		
7.00	New WTP Operating Cost	<u>\$5,621,000</u>		
	Sub-Total	\$13,362,650	0.7664	
	PW of Annual Cost, 2025	\$10,241,135		\$10,241,135
10 (2035)	Distribution Cost	\$8,018,138		
7.25	New WTP Operating Cost	<u>\$5,821,750</u>		
	Sub-Total	\$13,839,888	0.7441	
	PW of Annual Cost, 2025	\$10,298,260		\$10,298,260
11 (2036)	Distribution Cost	\$8,294,625		
7.5	New WTP Operating Cost	<u>\$6,022,500</u>		
	Sub-Total	\$14,317,125	0.7224	
	PW of Annual Cost, 2025	\$10,342,691		\$10,342,691
12 (2037)	Distribution Cost	\$8,515,815		
7.7	New WTP Operating Cost	<u>\$6,183,100</u>		
	Sub-Total	\$14,698,915	0.7014	
	PW of Annual Cost, 2025	\$10,309,819		\$10,309,819

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13 (2038)	Distribution Cost	\$8,847,600		
8.00	New WTP Operating Cost	<u>\$6,424,000</u>		
	Sub-Total	\$15,271,600	0.6810	
	PW of Annual Cost, 2025	\$10,399,960		\$10,399,960
14 (2039)	Distribution Cost	\$9,090,909		
8.22	New WTP Operating Cost	<u>\$6,600,660</u>		
	Sub-Total	\$15,691,569	0.6611	
	PW of Annual Cost, 2025	\$10,373,696		\$10,373,696
15 (2040)	Distribution Cost	\$10,209,780		
8.40	New WTP Operating Cost	<u>\$7,419,720</u>		
	Sub-Total	\$17,629,500	0.6419	
	PW of Annual Cost, 2025	\$11,316,376		\$11,316,376
16 (2041)	Distribution Cost	\$10,574,415		
8.70	New WTP Operating Cost	<u>\$7,684,710</u>		
	Sub-Total	\$18,259,125	0.6232	
	PW of Annual Cost, 2025	\$11,379,087		\$11,379,087
17 (2042)	Distribution Cost	\$10,939,050		
9	New WTP Operating Cost	<u>\$7,949,700</u>		
	Sub-Total	\$18,888,750	0.6050	
	PW of Annual Cost, 2025	\$11,427,694		\$11,427,694
18 (2043)	Distribution Cost	\$11,425,230		
9.4	New WTP Operating Cost	<u>\$8,303,020</u>		
	Sub-Total	\$19,728,250	0.5874	
	PW of Annual Cost, 2025	\$11,588,374		\$11,588,374

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19 (2044)	Distribution Cost	\$11,789,865		
9.7	New WTP Operating Cost	<u>\$8,568,010</u>		
	Sub-Total	\$20,357,875	0.5703	
	PW of Annual Cost, 2025	\$11,610,096		\$11,610,096
20 (2045)	Distribution Cost	\$12,154,500		
10.00	New WTP Operating Cost	<u>\$8,833,000</u>		
	Sub-Total	\$20,987,500	0.5537	
	PW of Annual Cost, 2025	\$11,620,779		\$11,620,779
Total PW of Annual Cost (AC),2025				\$193,764,83

Replacement Costs (Year 15, 2040)

Item	Description of Item			
1	Raw Water Intake	\$0 Incl w/ WTP		
2	Raw Water Pump Station	\$0 Incl w/ WTP		
3	Booster PS Equipment	\$132,000		
4	Water Treatment Plant Equipment	<u>\$60,000</u>		
	Sub-Total	\$192,000	0.6419	
			PW Factor	
Total PW of Replacement Costs (RC),2025		\$123,245		\$123,245

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Salvage Value (Year 20, 2045)

SV

1	Raw Water Intake	\$0
2	Raw Water Pump Station	\$0
3	Raw Water Transmission Main	\$50,544,000
4	Booster Pump Station	\$2,154,600
5	Water Storage Tank	\$2,376,000
6	Water Treatment Plant	\$108,000,000
7	Treated Water Transmission Main	<u>\$1,080,000</u>
	Sub-Total	\$164,154,600

0.5537

Total PW of Salvage Value (SV), 2025

\$90,892,402

\$90,892,40

Alternative A/H: Total PW Cost , 2025
(PW of CC+PW of AC+PW of RC)-PW of SV
For 10.0 MGD ADD, 15.0 MGD MDD

\$366,140,77

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Alternative B/L - For 7.5 MGD ADD in 2045 (11.25 MGD MDD)

Opinion of Present Worth Cost

Water Purchased from FPB

		Probable Construction Cost (CC), 2022	
ADD			
7.5	Item	Description of Item	CC
			Calculation:
	1	Raw Water Intake	\$0 Not Req'd by GMWSS
	2	Raw Water Pump Station	\$0 Not Req'd by GMWSS
	3	Raw Water Transmission Main	\$0 Not Req'd by GMWSS
	4	Booster Pump Station	\$1,496,250 \$0.133/gallon x 11.25 MGD MDD
	5	Water Storage Tank (per Caldwell Tank)	\$2,200,000 New Paynes Depot Tank
	6	Water Treatment Plant	\$0 Not Req'd By GMWSS
	7	Treated Water Transmission Main	<u>\$13,249,000</u> Length = 6.2 miles
		Sub-Total	\$16,945,250
		Construction Contingency (20%)	<u>\$3,389,050</u>
		Sub-Total	\$20,334,300
		Engineering (6%)	\$1,220,058
		Land, Easements, Legal, Administration	<u>\$325,720</u>
		Total Probable CC, 2022	\$21,880,078

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		Probable Construction Cost (CC), 2025-2027	20% CC Increase to 2025
CC	Item	Description of Item	
	1	Raw Water Intake	\$0 Not Req'd by GMWSS
	2	Raw Water Pump Station	\$0 Not Req'd by GMWSS
	3	Raw Water Transmission Main	\$0 Not Req'd by GMWSS
	4	Booster Pump Station	\$1,795,500 New Pump Station
	5	Water Storage Tank	\$2,640,000 New Paynes Depot Tank
	6	Water Treatment Plant	\$0 Not Req'd by GMWSS
	7	Treated Water Transmission Main	<u>\$15,898,800</u> Length = 6.2 miles
		Sub-Total	\$20,334,300
		Construction Contingency (20%)	<u>\$4,066,860</u>
		Sub-Total	\$24,401,160
		Engineering (6%)	\$1,464,070
		Land, Easements, Legal, Administration	<u>\$390,864</u>
Total Probable CC, 2025		\$26,256,094	\$26,256,094

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Probable Annual Cost (AC)				
Year	ADD	Description of Cost	AC	PW of AC
1 (2026)		Current WTP and Distribution Cost	\$3,650,000	2.5 MGD from exist WTP
4.60		Purchased Water Cost	<u>\$1,954,575</u>	2.1 MGD from FPB
		Sub-Total	\$1,954,575	PW Factor
		PW of Annual Cost, 2025	\$1,897,697	0.9709 \$1,897,697
2 (2027)		Current WTP and Distribution Cost	\$3,650,000	2.5 MGD from exist WTP
4.70		Purchased Water Cost	<u>\$2,047,650</u>	2.2 MGD from FPB
		Sub-Total	\$5,697,650	
		PW of Annual Cost, 2025	\$5,370,605	0.9426 \$5,370,605
3 (2028)		Distribution Cost	\$4,818,000	
4.80		Purchased Water Cost	<u>\$4,923,120</u>	All Water from FPB
		Sub-Total	\$9,741,120	
		PW of Annual Cost, 2025	\$8,914,099	0.9151 \$8,914,099
4 (2029)		Distribution Cost	\$4,918,375	
4.90		Purchased Water Cost	<u>\$5,025,685</u>	
		Sub-Total	\$9,944,060	0.8885
		PW of Annual Cost, 2025	\$8,835,297	\$8,835,297
5 (2030)		Distribution Cost	\$5,119,125	
5.10		Purchased Water Cost	<u>\$5,230,815</u>	
		Sub-Total	\$10,349,940	0.8626
		PW of Annual Cost, 2025	\$8,927,858	\$8,927,858
6 (2031)		Distribution Cost	\$5,269,688	
5.25		Purchased Water Cost	<u>\$5,384,663</u>	
		Sub-Total	\$10,654,350	0.8375
		PW of Annual Cost, 2025	\$8,923,018	\$8,923,018

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7 (2032)	Distribution Cost	\$5,370,063		
5.35	Purchased Water Cost	<u>\$5,487,228</u>		
	Sub-Total	\$10,857,290	0.8131	
	PW of Annual Cost, 2025	\$8,828,062		\$8,828,062
8 (2033)	Distribution Cost	\$5,520,625		
5.5	Purchased Water Cost	<u>\$5,641,075</u>		
	Sub-Total	\$11,161,700	0.7894	
	PW of Annual Cost, 2025	\$8,811,046		\$8,811,046
9 (2034)	Distribution Cost	\$6,303,915		
5.7	Purchased Water Cost	<u>\$6,428,745</u>		
	Sub-Total	\$12,732,660	0.7664	
	PW of Annual Cost, 2025	\$9,758,311		\$9,758,311
10 (2035)	Distribution Cost	\$6,414,510		
5.8	Purchased Water Cost	<u>\$6,541,530</u>		
	Sub-Total	\$12,956,040	0.7441	
	PW of Annual Cost, 2025	\$9,640,589		\$9,640,589
11 (2036)	Distribution Cost	\$6,690,998		
6.05	Purchased Water Cost	<u>\$6,823,493</u>		
	Sub-Total	\$13,514,490	0.7224	
	PW of Annual Cost, 2025	\$9,762,868		\$9,762,868
12 (2037)	Distribution Cost	\$6,801,593		
6.15	Purchased Water Cost	<u>\$6,936,278</u>		
	Sub-Total	\$13,737,870	0.7014	
	PW of Annual Cost, 2025	\$9,635,742		\$9,635,742

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13 (2038)	Distribution Cost	\$6,967,485		
6.30	Purchased Water Cost	<u>\$7,105,455</u>		
	Sub-Total	\$14,072,940	0.681	
	PW of Annual Cost, 2025	\$9,583,672		\$9,583,672
14 (2039)	Distribution Cost	\$7,133,378		
6.45	Purchased Water Cost	<u>\$7,274,633</u>		
	Sub-Total	\$14,408,010	0.6611	
	PW of Annual Cost, 2025	\$9,525,135		\$9,525,135
15 (2040)	Distribution Cost	\$8,021,970		
6.60	Purchased Water Cost	<u>\$8,190,600</u>		
	Sub-Total	\$16,212,570	0.6419	
	PW of Annual Cost, 2025	\$10,406,849		\$10,406,849
16 (2041)	Distribution Cost	\$8,265,060		
6.80	Purchased Water Cost	<u>\$8,438,800</u>		
	Sub-Total	\$16,703,860	0.6232	
	PW of Annual Cost, 2025	\$10,409,846		\$10,409,846
17 (2042)	Distribution Cost	\$8,447,378		
6.95	Purchased Water Cost	<u>\$8,624,950</u>		
	Sub-Total	\$17,072,328	0.605	
	PW of Annual Cost, 2025	\$10,328,758		\$10,328,758
18 (2043)	Distribution Cost	\$8,690,468		
7.15	Purchased Water Cost	<u>\$8,873,150</u>		
	Sub-Total	\$17,563,618	0.5874	
	PW of Annual Cost, 2025	\$10,316,869		\$10,316,869

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19 (2044)	Distribution Cost	\$8,933,558		
7.35	Purchased Water Cost	<u>\$9,121,350</u>		
	Sub-Total	\$18,054,908	0.5703	
	PW of Annual Cost, 2025	\$10,296,714		\$10,296,714
20 (2045)	Distribution Cost	\$9,115,875		
7.50	Purchased Water Cost	<u>\$9,307,500</u>		
	Sub-Total	\$18,423,375	0.5537	
	PW of Annual Cost, 2025	\$10,201,023		\$10,201,023
Total PW of Annual Cost (AC),2025				\$180,374,058
2028-2045 Total Purchased Water Cost				\$125,359,068
2025 FPB Transmission Main Cost*				\$33,600,000
*FPB 2022 estimate + 20%				\$0
Shortfall Capital Cost to be Paid by GMWSS				

Replacement Costs (Year 15, 2040)

RC	Item	Description of Item		
	1	Raw Water Intake Equipment	\$0	Included w/ WTP
	2	Raw Water PS Pumps	\$0	Included w/ WTP
	3	Booster PS Equipment	\$89,775	
	4	Water Treatment Plant Equipment	<u>\$0</u>	Not Req'd by GMWSS
		Sub-Total	\$89,775	0.6419
Total PW of Replacement Costs (RC),2025			\$57,627	\$57,627

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Salvage Value (Year 20, 2045)

SV

1	Raw Water Intake	\$0	Included w/ WTP
2	Raw Water Pump Station	\$0	Included w/ WTP
3	Raw Water Transmission Main	\$0	Not Req'd by GMWSS
4	Booster Pump Station	\$1,615,950	
5	Water Storage Tank	\$2,376,000	New Paynes Depot Tank
6	Water Treatment Plant	\$0	Not Req'd by GMWSS
7	Treated Water Transmission Main	<u>\$14,308,920</u>	
	Sub-Total	\$18,300,870	0.5537

Total PW of Salvage Value (SV), 2025

\$10,133,192

\$10,133,192

**Alternative B/L: Total PW Cost , 2025
(PW of CC+PW of AC+PW of RC)-PW of SV
For 7.5 MGD ADD, 11.25 MGD MDD**

\$196,554,586

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Alternative B/H - For 10.0 MGD ADD in 2045 (15.0 MGD MDD)

Opinion of Present Worth Cost

Water Purchased from FPB

		Probable Construction Cost (CC), 2022	
ADD			
10	Item	Description of Item	CC
			Calculation:
	1	Raw Water Intake	\$0 Not Req'd by GMWSS
	2	Raw Water Pump Station	\$0 Not Req'd by GMWSS
	3	Raw Water Transmission Main	\$0 Not Req'd by GMWSS
	4	Booster Pump Station	\$1,995,000 \$0.133/gallon x 15 MGD
	5	Water Storage Tank (per Caldwell Tank)	\$2,200,000 New Paynes Depot Tank
	6	Water Treatment Plant	\$0 Not Req'd By GMWSS
	7	Treated Water Transmission Main	<u>\$13,249,000</u> Length = 6.2 miles
		Sub-Total	\$17,444,000
		Construction Contingency (20%)	<u>\$3,488,800</u>
		Sub-Total	\$20,932,800
		Engineering (6%)	\$1,255,968
		Land, Easements, Legal, Administration	<u>\$325,720</u>
		Total Probable CC, 2022	\$22,514,488

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Probable Construction Cost (CC), 2025-2027		20% CC Increase to 2025	
Item	Description of Item	CC	
1	Raw Water Intake	\$0	Not Req'd by GMWSS
2	Raw Water Pump Station	\$0	Not Req'd by GMWSS
3	Raw Water Transmission Main	\$0	Not Req'd by GMWSS
4	Booster Pump Station	\$2,394,000	
5	Water Storage Tank	\$2,640,000	New Payne Depot Tank
6	Water Treatment Plant	\$0	Not Req'd by GMWSS
7	Treated Water Transmission Main	<u>\$15,898,800</u>	Length = 6.2 miles
	Sub-Total	\$20,932,800	
	Construction Contingency (20%)	<u>\$4,186,560</u>	
	Sub-Total	\$25,119,360	
	Engineering (6%)	\$1,507,162	
	Land, Easements, Legal, Administration	<u>\$390,864</u>	
Total Probable CC, 2025		\$27,017,386	\$27,017,386

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Probable Annual Cost (AC)					
Year					
1 (2026)	Current WTP and Distribution Cost	\$3,650,000	2.5 MGD from exist WTP		
4.60	Purchased Water Cost	<u>\$1,954,575</u>	2.1 MGD from FPB		
	Sub-Total	\$1,954,575		PW Factor	
	PW of Annual Cost, 2025	\$1,897,697		0.9709	\$1,897,697
2 (2027)	Current WTP and Distribution Cost	\$3,650,000	2.5 MGD from exist WTP		
4.70	Purchased Water Cost	<u>\$2,047,650</u>	2.2 MGD from FPB		
	Sub-Total	\$5,697,650			
	PW of Annual Cost, 2025	\$5,370,605		0.9426	\$5,370,605
3 (2028)	Distribution Cost	\$4,818,000			
4.80	Purchased Water Cost	<u>\$4,923,120</u>	All Water from FPB		
	Sub-Total	\$9,741,120			
	PW of Annual Cost, 2025	\$8,914,099		0.9151	\$8,914,099
4 (2029)	Distribution Cost	\$4,918,375			
4.90	Purchased Water Cost	<u>\$5,025,685</u>			
	Sub-Total	\$9,944,060		0.8885	
	PW of Annual Cost, 2025	\$8,835,297			\$8,835,297
5 (2030)	Distribution Cost	\$6,122,875			
6.10	Purchased Water Cost	<u>\$6,256,465</u>			
	Sub-Total	\$12,379,340		0.8626	
	PW of Annual Cost, 2025	\$10,678,419			\$10,678,419
6 (2031)	Distribution Cost	\$6,323,625			
6.3	Purchased Water Cost	<u>\$6,461,595</u>			
	Sub-Total	\$12,785,220		0.8375	
	PW of Annual Cost, 2025	\$10,707,622			\$10,707,622

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7 (2032)	Distribution Cost	\$6,624,750		
6.6	Purchased Water Cost	<u>\$6,769,290</u>		
	Sub-Total	\$13,394,040	0.8131	
	PW of Annual Cost, 2025	\$10,890,694		\$10,890,694
8 (2033)	Distribution Cost	\$6,825,500		
6.8	Purchased Water Cost	<u>\$6,974,420</u>		
	Sub-Total	\$13,799,920	0.7894	
	PW of Annual Cost, 2025	\$10,893,657		\$10,893,657
9 (2034)	Distribution Cost	\$7,741,650		
7	Purchased Water Cost	<u>\$7,894,950</u>		
	Sub-Total	\$15,636,600	0.7664	
	PW of Annual Cost, 2025	\$11,983,890		\$11,983,890
10 (2035)	Distribution Cost	\$8,018,138		
7.25	Purchased Water Cost	<u>\$8,176,913</u>		
	Sub-Total	\$16,195,050	0.7441	
	PW of Annual Cost, 2025	\$12,050,737		\$12,050,737
11 (2036)	Distribution Cost	\$8,294,625		
7.5	Purchased Water Cost	<u>\$8,458,875</u>		
	Sub-Total	\$16,753,500	0.7224	
	PW of Annual Cost, 2025	\$12,102,728		\$12,102,728
12 (2037)	Distribution Cost	\$8,515,815		
7.7	Purchased Water Cost	<u>\$8,684,445</u>		
	Sub-Total	\$17,200,260	0.7014	
	PW of Annual Cost, 2025	\$12,064,262		\$12,064,262

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13 (2038)	Distribution Cost	\$8,847,600		
8.00	Purchased Water Cost	<u>\$9,022,800</u>		
	Sub-Total	\$17,870,400	0.681	
	PW of Annual Cost, 2025	\$12,169,742		\$12,169,742
14 (2039)	Distribution Cost	\$9,068,790		
8.2	Purchased Water Cost	<u>\$9,248,370</u>		
	Sub-Total	\$18,317,160	0.6611	
	PW of Annual Cost, 2025	\$12,109,474		\$12,109,474
15 (2040)	Distribution Cost	\$10,209,780		
8.40	Purchased Water Cost	<u>\$10,424,400</u>		
	Sub-Total	\$20,634,180	0.6419	
	PW of Annual Cost, 2025	\$13,245,080		\$13,245,080
16 (2041)	Distribution Cost	\$10,574,415		
8.70	Purchased Water Cost	<u>\$10,796,700</u>		
	Sub-Total	\$21,371,115	0.6232	
	PW of Annual Cost, 2025	\$13,318,479		\$13,318,479
17 (2042)	Distribution Cost	\$10,939,050		
9	Purchased Water Cost	<u>\$11,169,000</u>		
	Sub-Total	\$22,108,050	0.605	
	PW of Annual Cost, 2025	\$13,375,370		\$13,375,370
18 (2043)	Distribution Cost	\$11,425,230		
9.4	Purchased Water Cost	<u>\$11,665,400</u>		
	Sub-Total	\$23,090,630	0.5874	
	PW of Annual Cost, 2025	\$13,563,436		\$13,563,436

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19 (2044)	Distribution Cost	\$11,789,865		
9.7	Purchased Water Cost	<u>\$12,037,700</u>		
	Sub-Total	\$23,827,565	0.5703	
	PW of Annual Cost, 2025	\$13,588,860		\$13,588,860
20 (2045)	Distribution Cost	\$12,154,500		
10.00	Purchased Water Cost	<u>\$12,410,000</u>		
	Sub-Total	\$24,564,500	0.5537	
	PW of Annual Cost, 2025	\$13,601,364		\$13,601,364
Total PW of Annual Cost (AC),2025				\$221,361,513

2028-2045 Total Purchased Water Cost \$156,400,128
2025 FPB Transmission Main Cost* \$33,600,000
\$0

Shortfall Capital Costs to be Paid by GMWSS

*FPB 2022 estimate + 20%

Replacement Costs (Year 15, 2040)

RC	Item	Description of Item		
	1	Raw Water Intake Equipment	\$0	Not Req'd by GMWSS
	2	Raw Water PS Pumps	\$0	Not Req'd by GMWSS
	3	Booster PS Equipment	\$119,700	
	4	Water Treatment Plant Equipment	<u>\$0</u>	Not Req'd by GMWSS
		Sub-Total	\$119,700	0.6419
Total PW of Replacement Costs (RC),2025			\$76,835	\$76,835

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Salvage Value (Year 20, 2045)

1	Raw Water Intake	\$0	Not Req'd by GMWSS
2	Raw Water Pump Station	\$0	Not Req'd by GMWSS
3	Raw Water Transmission Main	\$0	Not Req'd by GMWSS
4	Booster Pump Station	\$2,154,600	
5	Water Storage Tank	\$2,376,000	Use Existing Lancaster Tank
6	Water Treatment Plant	\$0	Not Req'd by GMWSS
7	Treated Water Transmission Main	<u>\$14,308,920</u>	
	Sub-Total	\$18,839,520	0.5537
Total PW of Salvage Value (SV), 2025		\$10,431,442	\$10,431,442

Alternative B/H: Total PW Cost , 2025
(PW of CC+PW of AC+PW of RC)-PW of SV
For 10.0 MGD ADD, 15.0 MGD MDD

\$238,024,292

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Alternative C1/L - For 7.5 MGD ADD in 2045 (11.25 MGD MDD)

Opinion of Present Worth Cost

Water Purchased from KAW

		Probable Construction Cost (CC), 2022			
ADD		Item	Description of Item	CC	
7.5					
					Calculation:
	1		Raw Water Intake	\$0	Not Req'd By GMWSS
	2		Raw Water Pump Station	\$0	Not Req'd By GMWSS
	3		Raw Water Transmission Main	\$0	Not Req'd By GMWSS
	4		Booster Pump Station	\$1,496,250	\$0.133/gallon x 11.25 MGD
	5		Water Storage Tank	\$0	Existing Lancaster Tank
	6		Water Treatment Plant	\$0	Not Req'd By GMWSS
	7		Treated Water Transmission Main	\$8,359,000	Length = 4.1 miles
			Sub-Total	\$9,855,250	
			Construction Contingency (20%)	\$1,971,050	
			Sub-Total	\$11,826,300	
			Engineering (6%)	\$709,578	
			Land, Easements, Legal, Administration	\$745,870	
			Total Probable CC, 2022	\$13,281,748	

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Probable Construction Cost (CC), 2025-2027		20% CC Increase to 2025	
Item	Description of Item	CC	
1	Raw Water Intake	\$0	Not Req'd by GMWSS
2	Raw Water Pump Station	\$0	Not Req'd by GMWSS
3	Raw Water Transmission Main	\$0	Not Req'd by GMWSS
4	Booster Pump Station	\$1,795,500	
5	Water Storage Tank	\$0	Existing Lancaster Tank
6	Water Treatment Plant	\$0	Not Req'd by GMWSS
7	Treated Water Transmission Main	<u>\$10,030,800</u>	Length = 4.1 miles
	Sub-Total	\$11,826,300	
	Construction Contingency (20%)	<u>\$2,365,260</u>	
	Sub-Total	\$14,191,560	
	Engineering (6%)	\$851,494	
	Land, Easements, Legal, Administration	<u>\$895,044</u>	
Total Probable CC, 2025		\$15,938,098	\$15,938,098

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		Probable Annual Cost (AC)			
Year ADD		Description of Cost	AC	PW of AC	
1 (2026)		Current WTP and Distribution Cost	\$3,650,000	2.5 MGD from exist WTP	
4.6		Purchased Water Service Cost	<u>\$3,226,965</u>	2.1 MGD from FPB	
		Sub-Total	\$6,876,965	PW Factor	
		PW of Annual Cost, 2025	6,676,845	0.9709	\$6,676,845
2 (2027)		Current WTP and Distribution Cost	\$6,862,000	2.5 MGD from exist WTP	
4.7		Purchased Water Service Cost	<u>\$3,380,630</u>	2.2 MGD from FPB	
		Sub-Total	\$10,242,630		
		PW of Annual Cost, 2025	\$9,654,703	0.9426	\$9,654,703
3 (2028)		Distribution Cost	\$4,818,000		
4.8		Purchased Water Cost	<u>\$8,111,760</u>	All Water from KAW	
		Sub-Total	\$12,929,760		
		PW of Annual Cost, 2025	\$11,832,023	0.9151	\$11,832,023
4 (2029)		Distribution Cost	\$4,918,375		
4.9		Purchased Water Cost	<u>\$8,280,755</u>		
		Sub-Total	\$13,199,130		
		PW of Annual Cost, 2025	\$11,727,427	0.8885	\$11,727,427
5 (2030)		Distribution Cost	\$5,119,125		
5.1		Purchased Water Cost	<u>\$8,618,745</u>		
		Sub-Total	\$13,737,870		
		PW of Annual Cost, 2025	\$11,850,287	0.8626	\$11,850,287
6 (2031)		Distribution Cost	\$5,269,688		
5.25		Purchased Water Cost	<u>\$8,872,238</u>		
		Sub-Total	\$14,141,925		
		PW of Annual Cost, 2025	\$11,843,862	0.8375	\$11,843,862

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7 (2032)	Distribution Cost	\$5,370,063		
5.35	Purchased Water Cost	<u>\$9,041,233</u>		
	Sub-Total	\$14,411,295	0.8131	
	PW of Annual Cost, 2025	\$11,717,824		\$11,717,824
8 (2033)	Distribution Cost	\$5,520,625		
5.5	Purchased Water Cost	<u>\$9,294,725</u>		
	Sub-Total	\$14,815,350	0.7894	
	PW of Annual Cost, 2025	\$11,695,237		\$11,695,237
9 (2034)	Distribution Cost	\$6,303,915		
5.7	Purchased Water Cost	<u>\$10,589,745</u>		
	Sub-Total	\$16,893,660	0.7664	
	PW of Annual Cost, 2025	\$12,947,301		\$12,947,301
10 (2035)	Distribution Cost	\$6,414,510		
5.8	Purchased Water Cost	<u>\$10,775,530</u>		
	Sub-Total	\$17,190,040	0.7441	
	PW of Annual Cost, 2025	\$12,791,109		\$12,791,109
11 (2036)	Distribution Cost	\$6,690,998		
6.05	Purchased Water Cost	<u>\$11,239,993</u>		
	Sub-Total	\$17,930,990	0.7224	
	PW of Annual Cost, 2025	\$12,953,347		\$12,953,347
12 (2037)	Distribution Cost	\$6,801,593		
6.15	Purchased Water Cost	<u>\$11,425,778</u>		
	Sub-Total	\$18,227,370	0.7014	
	PW of Annual Cost, 2025	\$12,784,677		\$12,784,677

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13 (2038)	Distribution Cost	\$6,967,485		
6.3	Purchased Water Cost	<u>\$11,704,455</u>		
	Sub-Total	\$18,671,940	0.681	
	PW of Annual Cost, 2025	\$12,715,591		\$12,715,591
14 (2039)	Distribution Cost	\$7,133,378		
6.45	Purchased Water Cost	<u>\$11,983,133</u>		
	Sub-Total	\$19,116,510	0.6611	
	PW of Annual Cost, 2025	\$12,637,925		\$12,637,925
15 (2040)	Distribution Cost	\$8,021,970		
6.6	Purchased Water Cost	<u>\$13,490,400</u>		
	Sub-Total	\$21,512,370	0.6419	
	PW of Annual Cost, 2025	\$13,808,790		\$13,808,790
16 (2041)	Distribution Cost	\$8,265,060		
6.8	Purchased Water Cost	<u>\$13,899,200</u>		
	Sub-Total	\$22,164,260	0.6232	
	PW of Annual Cost, 2025	\$13,812,767		\$13,812,767
17 (2042)	Distribution Cost	\$8,447,378		
6.95	Purchased Water Cost	<u>\$14,205,800</u>		
	Sub-Total	\$22,653,178	0.605	
	PW of Annual Cost, 2025	\$13,705,172		\$13,705,172
18 (2043)	Distribution Cost	\$8,690,468		
7.15	Purchased Water Cost	<u>\$14,614,600</u>		
	Sub-Total	\$23,305,068	0.5874	
	PW of Annual Cost, 2025	\$13,689,397		\$13,689,397

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19 (2044)	Distribution Cost	\$8,933,558		
7.35	Purchased Water Cost	<u>\$15,023,400</u>		
	Sub-Total	\$23,956,958	0.5703	
	PW of Annual Cost, 2025	\$13,662,653		\$13,662,653
20 (2045)	Distribution Cost	\$9,115,875		
7.5	Purchased Water Cost	<u>\$15,330,000</u>		
	Sub-Total	\$24,445,875	0.5537	
	PW of Annual Cost, 2025	\$13,535,681		\$13,535,681
Total PW of Annual Cost (AC),2025				\$246,042,619
		2028-2045 Total Purchased Water Cost		\$206,501,488
		KAW Trans. Main Cost		\$0
		(use Exist 42" KAW Main)		
Shortfall Capital Cost to be Paid by GMWSS				\$0
Replacement Costs (Year 15, 2040)				
Item	Description of Item RC			
1	Raw Water Intake Equipment	\$0	Not Req'd by GMWSS	
2	Raw Water PS Pumps	\$0	Not Req'd by GMWSS	
3	Booster PS Equipment	\$89,775		
4	Water Treatment Plant Equipment	<u>\$0</u>	Not Req'd by GMWSS	
	Sub-Total	\$89,775	0.6419	
			PW Factor	
Total PW of Replacement Costs (RC),2025		\$57,627		\$57,627

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Salvage Value (Year 20, 2045)

SV

1	Raw Water Intake	\$0	Not Req'd by GMWSS
2	Raw Water Pump Station	\$0	Not Req'd by GMWSS
3	Raw Water Transmission Main	\$0	Not Req'd by GMWSS
4	Booster Pump Station	\$1,615,950	
5	Water Storage Tank	\$0	Existing Lancaster Tank
6	Water Treatment Plant	\$0	Not Req'd by GMWSS
7	Treated Water Transmission Main	<u>\$9,027,720</u>	
	Sub-Total	\$10,643,670	0.5537

Total PW of Salvage Value (SV), 2025

\$5,893,400

\$5,893,400

**Alternative C1/L: Total PW Cost , 2025
(PW of CC+PW of AC+PW of RC)-PW of SV
For 7.5 MGD ADD, 11.25 MGD MDD**

\$256,144,943

Alternative C1/H - For 10.0 MGD ADD in 2045 (15.0 MGD MDD)
Opinion of Present Worth Cost

		Probable Construction Cost (CC), 2022		
ADD	Item	Description of Item	CC	
10				Calculation:
	1	Raw Water Intake	\$0	Not Req'd By GMWSS
	2	Raw Water Pump Station	\$0	Not Req'd By GMWSS
	3	Raw Water Transmission Main	\$0	Not Req'd By GMWSS
	4	Booster Pump Station	\$1,995,000	\$0.133/gallon x 15 MGD
	5	Water Storage Tank	\$0	Existing Lancaster Tank
	6	Water Treatment Plant	\$0	Not Req'd By GMWSS
	7	Treated Water Transmission Main	<u>\$8,359,999</u>	Length = 4.1 miles
		Sub-Total	\$10,354,999	
		Construction Contingency (20%)	<u>\$2,071,000</u>	
		Sub-Total	\$12,425,999	
		Engineering (6%)	\$745,560	
		Land, Easements, Legal, Administration	<u>\$745,870</u>	
		Total Probable CC, 2022	\$13,917,429	

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Probable Construction Cost (CC), 2025-2027

20% CC Increase to 2025

Item	Description of Item	CC	
1	Raw Water Intake	\$0	Not Req'd by GMWSS
2	Raw Water Pump Station	\$0	Not Req'd by GMWSS
3	Raw Water Transmission Main	\$0	Not Req'd by GMWSS
4	Booster Pump Station	\$2,394,000	
5	Water Storage Tank	\$0	Existing Lancaster Tank
6	Water Treatment Plant	\$0	Not Req'd by GMWSS
7	Treated Water Transmission Main	<u>\$10,031,999</u>	Length = 6.2 miles
	Sub-Total	\$12,425,999	
	Construction Contingency (20%)	<u>\$2,485,200</u>	
	Sub-Total	\$14,911,199	
	Engineering (6%)	\$894,672	
	Land, Easements, Legal, Administration	<u>\$895,044</u>	
Total Probable CC, 2025		\$16,700,914	\$16,700,914

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Probable Annual Cost (AC)				
Year	ADD	Description of Cost	AC	PW of AC
1 (2026)		Current WTP and Distribution Cost	\$3,650,000 2.5 MGD from exist WTP	
	4.6	Purchased Water Service Cost	<u>\$3,226,965</u> 2.1 MGD from FPB	
		Sub-Total	\$6,876,965	PW Factor
		PW of Annual Cost, 2025	6,676,845	0.9709 \$6,676,845
2 (2027)		Current WTP and Distribution Cost	\$3,650,000 2.5 MGD from exist WTP	
	4.7	Purchased Water Service Cost	<u>\$3,380,630</u> 2.2 MGD from FPB	
		Sub-Total	\$7,030,630	
		PW of Annual Cost, 2025	\$6,627,072	0.9426 \$6,627,072
3 (2028)		Distribution Cost	\$4,818,000	
	4.8	Purchased Water Cost	<u>\$8,111,760</u> All Water from KAW	
		Sub-Total	\$12,929,760	
		PW of Annual Cost, 2025	\$11,832,023	0.9151 \$11,832,023
4 (2029)		Distribution Cost	\$4,918,375	
	4.9	Purchased Water Cost	<u>\$8,280,755</u>	
		Sub-Total	\$13,199,130	
		PW of Annual Cost, 2025	\$11,727,427	0.8885 \$11,727,427
5 (2030)		Distribution Cost	\$6,122,875	
	6.1	Purchased Water Cost	<u>\$10,308,695</u>	
		Sub-Total	\$16,431,570	
		PW of Annual Cost, 2025	\$14,173,872	0.8626 \$14,173,872
6 (2031)		Distribution Cost	\$6,323,625	
	6.3	Purchased Water Cost	<u>\$10,646,685</u>	
		Sub-Total	\$16,970,310	
		PW of Annual Cost, 2025	\$14,212,635	0.8375 \$14,212,635

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7 (2032)	Distribution Cost	\$6,624,750		
6.6	Purchased Water Cost	<u>\$11,153,670</u>		
	Sub-Total	\$17,778,420	0.8131	
	PW of Annual Cost, 2025	\$14,455,633		\$14,455,633
8 (2033)	Distribution Cost	\$6,825,500		
6.8	Purchased Water Cost	<u>\$11,491,660</u>		
	Sub-Total	\$18,317,160	0.7894	
	PW of Annual Cost, 2025	\$14,459,566		\$14,459,566
9 (2034)	Distribution Cost	\$7,741,650		
7	Purchased Water Cost	<u>\$13,004,950</u>		
	Sub-Total	\$20,746,600	0.7664	
	PW of Annual Cost, 2025	\$15,900,194		\$15,900,194
10 (2035)	Distribution Cost	\$8,018,138		
7.25	Purchased Water Cost	<u>\$13,469,413</u>		
	Sub-Total	\$21,487,550	0.7441	
	PW of Annual Cost, 2025	\$15,988,886		\$15,988,886
11 (2036)	Distribution Cost	\$8,294,625		
7.5	Purchased Water Cost	<u>\$13,933,875</u>		
	Sub-Total	\$22,228,500	0.7224	
	PW of Annual Cost, 2025	\$16,057,868		\$16,057,868
12 (2037)	Distribution Cost	\$8,515,815		
7.7	Purchased Water Cost	<u>\$14,305,445</u>		
	Sub-Total	\$22,821,260	0.7014	
	PW of Annual Cost, 2025	\$16,006,832		\$16,006,832

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13 (2038)	Distribution Cost	\$8,847,600		
8	Purchased Water Cost	<u>\$14,862,800</u>		
	Sub-Total	\$23,710,400	0.681	
	PW of Annual Cost, 2025	\$16,146,782		\$16,146,782
14 (2039)	Distribution Cost	\$9,068,790		
8.2	Purchased Water Cost	<u>\$15,234,370</u>		
	Sub-Total	\$24,303,160	0.6611	
	PW of Annual Cost, 2025	\$16,066,819		\$16,066,819
15 (2040)	Distribution Cost	\$10,209,780		
8.4	Purchased Water Cost	<u>\$17,169,600</u>		
	Sub-Total	\$27,379,380	0.6419	
	PW of Annual Cost, 2025	\$17,574,824		\$17,574,824
16 (2041)	Distribution Cost	\$10,574,415		
8.7	Purchased Water Cost	<u>\$17,782,800</u>		
	Sub-Total	\$28,357,215	0.6232	
	PW of Annual Cost, 2025	\$17,672,216		\$17,672,216
17 (2042)	Distribution Cost	\$10,939,050		
9	Purchased Water Cost	<u>\$18,396,000</u>		
	Sub-Total	\$29,335,050	0.605	
	PW of Annual Cost, 2025	\$17,747,705		\$17,747,705
18 (2043)	Distribution Cost	\$11,425,230		
9.4	Purchased Water Cost	<u>\$19,213,600</u>		
	Sub-Total	\$30,638,830	0.5874	
	PW of Annual Cost, 2025	\$17,997,249		\$17,997,249

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19 (2044)	Distribution Cost	\$11,789,865		
9.7	Purchased Water Cost	<u>\$19,826,800</u>		
	Sub-Total	\$31,616,665	0.5703	
	PW of Annual Cost, 2025	\$18,030,984		\$18,030,984
20 (2045)	Distribution Cost	\$12,154,500		
10	Purchased Water Cost	<u>\$20,440,000</u>		
	Sub-Total	\$32,594,500	0.5537	
	PW of Annual Cost, 2025	\$18,047,575		\$18,047,575
Total PW of Annual Cost (AC),2025				\$297,403,009
2028-2045 Total Purchased Water Cost				\$257,632,878
KAW Transmission Main Cost				\$0
(use exist 42" KAW main)				
Shortfall Capital Cost to be Paid by GMWSS				\$0

Replacement Costs (Year 15, 2040)

Item	Description of Item	RC		
1	Raw Water Intake Equipment	\$0	Not Req'd by GMWSS	
2	Raw Water PS Pumps	\$0	Not Req'd by GMWSS	
3	Booster PS Equipment	\$119,700		
4	Water Treatment Plant Equipment	<u>\$0</u>	Not Req'd by GMWSS	
	Sub-Total	\$119,700	0.6419	
				PW Factor
Total PW of Replacement Costs (RC),2025		\$76,835		\$76,835

Salvage Value (Year 20, 2045)

SV

1	Raw Water Intake	\$0	Not Req'd by GMWSS
2	Raw Water Pump Station	\$0	Not Req'd by GMWSS
3	Raw Water Transmission Main	\$0	Not Req'd by GMWSS
4	Booster Pump Station	\$2,154,600	
5	Water Storage Tank	\$0	Existing Lancaster Tank
6	Water Treatment Plant	\$0	Not Req'd by GMWSS
7	Treated Water Transmission Main	<u>\$9,028,799</u>	
	Sub-Total	\$11,183,399	0.5537

Total PW of Salvage Value (SV), 2025

\$6,192,248

\$6,192,248

**Alternative C1/H: Total PW Cost , 2025
(PW of CC+PW of AC+PW of RC)-PW of SV
For 10.0 MGD ADD, 15.0 MGD MDD**

\$307,988,511

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Alternative C2/L - For 7.5 MGD ADD in 2045 (11.25 MGD MDD)

Opinion of Present Worth Cost

Water Purchased from KAW

		Probable Construction Cost (CC), 2022	
ADD	Item	Description of Item	CC
7.5			
	1	Raw Water Intake	\$0 Included w/ WTP
	2	Raw Water Pump Station	\$0 Included w/ WTP
	3	Raw Water Transmission Main	\$0 Not Req'd
	4	Booster Pump Station	\$1,496,250 \$0.133/gallon x 11.25 MGD
	5	Water Storage Tank	\$0 Existing Lancaster Tank
	6	Water Treatment Plant	\$67,500,000 \$6/gallon x 11.25 MGD
	7	Treated Water Transmission Main to Scott County	\$56,250,000 Length = 24.4 miles
	8	Treated Water Transmission Main in Scott County	<u>\$8,359,000</u> Length = 4.1 miles
		Sub-Total	\$133,605,250
		Construction Contingency (20%)	<u>\$26,721,050</u>
		Sub-Total	\$160,326,300
		Engineering (6%)	\$9,619,578
		Land, Easements, Legal, Administration	<u>\$745,870</u>
		Total Probable CC, 2022	\$170,691,748

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Probable Construction Cost (CC), 2025-2027		20% CC Increase to 2025	
Item	Description of Item	CC	
1	Raw Water Intake	\$0	Not Req'd by GMWSS
2	Raw Water Pump Station	\$0	Not Req'd by GMWSS
3	Raw Water Transmission Main	\$0	Not Req'd by GMWSS
4	Booster Pump Station	\$1,795,500	
5	Water Storage Tank	\$0	Existing Lancaster Tank
6	Water Treatment Plant	\$81,000,000	
7	Treated Water Transmission Main to Scott County	\$67,500,000	Length = 24.4 miles
8	Treated Water Transmission Main in Scott County	<u>\$10,030,800</u>	Length = 4.1 miles
	Sub-Total	\$160,326,300	
	Construction Contingency (20%)	<u>\$32,065,260</u>	
	Sub-Total	\$192,391,560	
	Engineering (6%)	\$11,543,494	
	Land, Easements, Legal, Administration	<u>\$895,044</u>	
Total Probable CC, 2025		\$204,830,098	\$204,830,098

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		Probable Annual Cost (AC)			
Year					
ADD	Description of Cost	AC			PW of AC
1 (2026)	Current WTP and Distribution Cost	\$3,650,000	2.5 MGD from exist WTP		
4.6	Purchased Water Cost	<u>\$3,226,965</u>	2.1 MGD from FPB		
	Sub-Total	\$6,876,965		PW Factor	
	PW of Annual Cost, 2025	6,676,845		0.9709	\$6,676,845
2 (2027)	Current WTP and Distribution Cost	\$3,650,000	2.5 MGD from exist WTP		
4.7	Purchased Water Cost	<u>\$3,380,630</u>	2.2 MGD from FPB		
	Sub-Total	\$7,030,630			
	PW of Annual Cost, 2025	\$6,627,072		0.9426	\$6,627,072
3 (2028)	Distribution Cost	\$4,818,000			
4.8	Purchased Water Cost	<u>\$8,111,760</u>	All Water from KAW		
	Sub-Total	\$12,929,760			
	PW of Annual Cost, 2025	\$11,832,023		0.9151	\$11,832,023
4 (2029)	Distribution Cost	\$4,918,375			
4.9	Purchased Water Cost	<u>\$8,280,755</u>			
	Sub-Total	\$13,199,130			
	PW of Annual Cost, 2025	\$11,727,427		0.8885	\$11,727,427
5 (2030)	Distribution Cost	\$5,119,125			
5.1	Purchased Water Cost	<u>\$8,618,745</u>			
	Sub-Total	\$13,737,870			
	PW of Annual Cost, 2025	\$11,850,287		0.8626	\$11,850,287
6 (2031)	Distribution Cost	\$5,269,688			
5.25	Purchased Water Cost	<u>\$8,872,238</u>			
	Sub-Total	\$14,141,925			
	PW of Annual Cost, 2025	\$11,843,862		0.8375	\$11,843,862

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7 (2032)	Distribution Cost	\$5,370,063		
5.35	Purchased Water Cost	<u>\$9,041,233</u>		
	Sub-Total	\$14,411,295	0.8131	
	PW of Annual Cost, 2025	\$11,717,824		\$11,717,824
8 (2033)	Distribution Cost	\$5,520,625		
5.5	Purchased Water Cost	<u>\$9,294,725</u>		
	Sub-Total	\$14,815,350	0.7894	
	PW of Annual Cost, 2025	\$11,695,237		\$11,695,237
9 (2034)	Distribution Cost	\$6,303,915		
5.7	Purchased Water Cost	<u>\$10,589,745</u>		
	Sub-Total	\$16,893,660	0.7664	
	PW of Annual Cost, 2025	\$12,947,301		\$12,947,301
10 (2035)	Distribution Cost	\$6,414,510		
5.8	Purchased Water Cost	<u>\$10,775,530</u>		
	Sub-Total	\$17,190,040	0.7441	
	PW of Annual Cost, 2025	\$12,791,109		\$12,791,109
11 (2036)	Distribution Cost	\$6,690,998		
6.05	Purchased Water Cost	<u>\$11,239,993</u>		
	Sub-Total	\$17,930,990	0.7224	
	PW of Annual Cost, 2025	\$12,953,347		\$12,953,347
12 (2037)	Distribution Cost	\$6,801,593		
6.15	Purchased Water Cost	<u>\$11,425,778</u>		
	Sub-Total	\$18,227,370	0.7014	
	PW of Annual Cost, 2025	\$12,784,677		\$12,784,677

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13 (2038)	Distribution Cost	\$6,967,485		
6.3	Purchased Water Cost	<u>\$11,704,455</u>		
	Sub-Total	\$18,671,940	0.681	
	PW of Annual Cost, 2025	\$12,715,591		\$12,715,591
14 (2039)	Distribution Cost	\$7,133,378		
6.45	Purchased Water Cost	<u>\$11,983,133</u>		
	Sub-Total	\$19,116,510	0.6611	
	PW of Annual Cost, 2025	\$12,637,925		\$12,637,925
15 (2040)	Distribution Cost	\$8,021,970		
6.6	Purchased Water Cost	<u>\$13,490,400</u>		
	Sub-Total	\$21,512,370	0.6419	
	PW of Annual Cost, 2025	\$13,808,790		\$13,808,790
16 (2041)	Distribution Cost	\$8,265,060		
6.8	Purchased Water Cost	<u>\$13,899,200</u>		
	Sub-Total	\$22,164,260	0.6232	
	PW of Annual Cost, 2025	\$13,812,767		\$13,812,767
17 (2042)	Distribution Cost	\$8,447,378		
6.95	Purchased Water Cost	<u>\$14,205,800</u>		
	Sub-Total	\$22,653,178	0.605	
	PW of Annual Cost, 2025	\$13,705,172		\$13,705,172
18 (2043)	Distribution Cost	\$8,690,468		
7.15	Purchased Water Cost	<u>\$14,614,600</u>		
	Sub-Total	\$23,305,068	0.5874	
	PW of Annual Cost, 2025	\$13,689,397		\$13,689,397

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19 (2044)	Distribution Cost	\$8,933,558		
7.35	Purchased Water Cost	<u>\$15,023,400</u>		
	Sub-Total	\$23,956,958	0.5703	
	PW of Annual Cost, 2025	\$13,662,653		\$13,662,653
20 (2045)	Distribution Cost	\$9,115,875		
7.5	Purchased Water Cost	<u>\$15,330,000</u>		
	Sub-Total	\$24,445,875	0.5537	
	PW of Annual Cost, 2025	\$13,535,681		\$13,535,681
Total PW of Annual Cost (AC),2025				\$243,014,988
		2028-2045 Total Purchased Water Cost	\$206,501,488	
		2025 KAW Transmission Main Cost	\$88,628,815	
			\$0	

Shortfall Capital Cost to be Paid by GMWSS

Replacement Costs (Year 15, 2040)

Item	Description of Item	RC		
1	Raw Water Intake Equipment	\$0	Included w/ WTP	
2	Raw Water PS Pumps	\$0	Included w/ WTP	
3	Booster PS Equipment	\$89,775		
4	Water Treatment Plant Equipment	<u>\$4,050,000</u>		
	Sub-Total	\$4,139,775	0.6419	
			PW Factor	
Total PW of Replacement Costs (RC),2025		\$2,657,322		\$2,657,322

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Salvage Value (Year 20, 2045)

SV

1	Raw Water Intake	\$0	Not Req'd by GMWSS
2	Raw Water Pump Station	\$0	Not Req'd by GMWSS
3	Raw Water Transmission Main	\$0	Not Req'd by GMWSS
4	Booster Pump Station	\$1,615,950	
5	Water Storage Tank	\$0	Existing Lancaster Tank
6	Water Treatment Plant	\$0	Not Req'd by GMWSS
7	Treated Water Transmission Main	<u>\$60,750,000</u>	
	Sub-Total	\$62,365,950	0.5537

Total PW of Salvage Value (SV), 2025

\$34,532,027

\$34,532,027

Alternative C2/L: Total PW Cost , 2025
(PW of CC+PW of AC+PW of RC)-PW of SV
For 7.5 MGD ADD, 11.25 MGD MDD

\$415,970,381

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Alternative C2/H - For 10.0 MGD ADD in 2045 (15.0 MGD MDD)
Opinion of Present Worth Cost

		Probable Construction Cost (CC), 2022	
ADD			
10	Item	Description of Item	CC
			Calculation:
	1	Raw Water Intake	\$0 Included w/ WTP
	2	Raw Water Pump Station	\$0 Included w/ WTP
	3	Raw Water Transmission Main	\$0 Not Req'd
	4	Booster Pump Station	\$1,995,000 \$0.133/gallon x 15 MGD
	5	Water Storage Tank	\$0 Existing Lancaster Tank
	6	Water Treatment Plant	\$90,000,000 \$6 x 15 MGD
	7	Water Transmission Main to Scott County	\$56,250,000 Length = 24.4 miles
	8	Water Transmission Main in Scott County	<u>\$8,359,999</u> Length = 4.1 miles
		Sub-Total	\$156,604,999
		Construction Contingency (20%)	<u>\$31,321,000</u>
		Sub-Total	\$187,925,999
		Engineering (6%)	\$11,275,560
		Land, Easements, Legal, Administration	<u>\$745,870</u>
		Total Probable CC, 2022	\$199,947,429

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Probable Construction Cost (CC), 2025-2027		20% CC Increase to 2025	
Item	Description of Item	CC	
1	Raw Water Intake	\$0	Included w/ WTP
2	Raw Water Pump Station	\$0	Included w/ WTP
3	Raw Water Transmission Main	\$0	Not Req'd
4	Booster Pump Station	\$2,394,000	
5	Water Storage Tank	\$0	Existing Lancaster Tank
6	Water Treatment Plant	\$108,000,000	
7	Treated Water Transmission Main to Scott County	\$67,500,000	Length = 24.4 miles
8	Treated Water Transmission Main in Scott County	<u>\$10,031,999</u>	Length = 6.2 miles
	Sub-Total	\$187,925,999	
	Construction Contingency (20%)	<u>\$37,585,200</u>	
	Sub-Total	\$225,511,199	
	Engineering (6%)	\$13,530,672	
	Land, Easements, Legal, Administration	<u>\$895,044</u>	
Total Probable CC, 2025		\$239,936,914	\$239,936,914

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Probable Annual Cost (AC)		AC	PW of AC
Year	Description of Cost		
ADD		\$3,650,000 2.5 MGD from exist WTP	
1 (2026)	Current WTP and Distribution Cost	2.1 MGD from FPB	
4.6	Purchased Water Service Cost	<u>\$3,226,965</u>	
	Sub-Total	\$6,876,965	PW Factor
	PW of Annual Cost, 2025	6,676,845	0.9709 \$6,676,845
2 (2027)	Current WTP and Distribution Cost	\$3,650,000 2.5 MGD from exist WTP	
4.7	Purchased Water Service Cost	2.2 MGD from FPB	
	Sub-Total	<u>\$3,380,630</u>	
	Sub-Total	\$7,030,630	
	PW of Annual Cost, 2025	\$6,627,072	0.9426 \$6,627,072
3 (2028)	Distribution Cost	\$4,818,000	
4.8	Purchased Water Cost		All Water from KAW
	Sub-Total	<u>\$8,111,760</u>	
	PW of Annual Cost, 2025	\$12,929,760	
4 (2029)	Distribution Cost	\$11,832,023	0.9151 \$11,832,023
4.9	Purchased Water Cost	\$4,918,375	
	Sub-Total	<u>\$8,280,755</u>	
	PW of Annual Cost, 2025	\$13,199,130	
		\$11,727,427	0.8885 \$11,727,427
5 (2030)	Distribution Cost		
6.1	Purchased Water Cost	\$6,122,875	
	Sub-Total	<u>\$10,308,695</u>	
	PW of Annual Cost, 2025	\$16,431,570	
		\$14,173,872	0.8626 \$14,173,872
6 (2031)	Distribution Cost		
6.3	Purchased Water Cost	\$6,323,625	
	Sub-Total	<u>\$10,646,685</u>	
	PW of Annual Cost, 2025	\$16,970,310	
		\$14,212,635	0.8375 \$14,212,635

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7 (2032)	Distribution Cost	\$6,624,750		
	6.6 Purchased Water Cost	<u>\$11,153,670</u>		
	Sub-Total	\$17,778,420	0.8131	
	PW of Annual Cost, 2025	\$14,455,633		\$14,455,633
		\$6,825,500		
8 (2033)	Distribution Cost	\$6,825,500		
	6.8 Purchased Water Cost	<u>\$11,491,660</u>		
	Sub-Total	\$18,317,160	0.7894	
	PW of Annual Cost, 2025	\$14,459,566		\$14,459,566
9 (2034)	Distribution Cost	\$7,741,650		
	7 Purchased Water Cost	<u>\$13,004,950</u>		
	Sub-Total	\$20,746,600	0.7664	
	PW of Annual Cost, 2025	\$15,900,194		\$15,900,194
10 (2035)	Distribution Cost	\$8,018,138		
	7.25 Purchased Water Cost	<u>\$13,469,413</u>		
	Sub-Total	\$21,487,550	0.7441	
	PW of Annual Cost, 2025	\$15,988,886		\$15,988,886
11 (2036)	Distribution Cost	\$8,294,625		
	7.5 Purchased Water Cost	<u>\$13,933,875</u>		
	Sub-Total	\$22,228,500	0.7224	
	PW of Annual Cost, 2025	\$16,057,868		\$16,057,868
12 (2037)	Distribution Cost	\$8,515,815		
	7.7 Purchased Water Cost	<u>\$14,305,445</u>		
	Sub-Total	\$22,821,260	0.7014	
	PW of Annual Cost, 2025	\$16,006,832		\$16,006,832

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13 (2038)	Distribution Cost	\$8,847,600		
8	Purchased Water Cost	<u>\$14,862,800</u>		
	Sub-Total	\$23,710,400	0.681	
	PW of Annual Cost, 2025	\$16,146,782		\$16,146,782
14 (2039)	Distribution Cost	\$9,068,790		
8.2	Purchased Water Cost	<u>\$15,234,370</u>		
	Sub-Total	\$24,303,160	0.6611	
	PW of Annual Cost, 2025	\$16,066,819		\$16,066,819
15 (2040)	Distribution Cost	\$10,209,780		
8.4	Purchased Water Cost	<u>\$17,169,600</u>		
	Sub-Total	\$27,379,380	0.6419	
	PW of Annual Cost, 2025	\$17,574,824		\$17,574,824
16 (2041)	Distribution Cost	\$10,574,415		
8.7	Purchased Water Cost	<u>\$17,782,800</u>		
	Sub-Total	\$28,357,215	0.6232	
	PW of Annual Cost, 2025	\$17,672,216		\$17,672,216
17 (2042)	Distribution Cost	\$10,939,050		
9	Purchased Water Cost	<u>\$18,396,000</u>		
	Sub-Total	\$29,335,050	0.605	
	PW of Annual Cost, 2025	\$17,747,705		\$17,747,705
18 (2043)	Distribution Cost	\$11,425,230		
9.4	Purchased Water Cost	<u>\$19,213,600</u>		
	Sub-Total	\$30,638,830	0.5874	
	PW of Annual Cost, 2025	\$17,997,249		\$17,997,249

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19 (2044)	Distribution Cost	\$11,789,865		
9.7	Purchased Water Cost	<u>\$19,826,800</u>		
	Sub-Total	\$31,616,665	0.5703	
	PW of Annual Cost, 2025	\$18,030,984		\$18,030,984
20 (2045)	Distribution Cost	\$12,154,500		
10	Purchased Water Cost	<u>\$20,440,000</u>		
	Sub-Total	\$32,594,500	0.5537	
	PW of Annual Cost, 2025	\$18,047,575		\$18,047,575

Total PW of Annual Cost (AC),2025

\$297,403,009

2028-2045 Total Purchased Water Cost	\$257,632,878
2025 KAW Transmission Main Cost	\$88,628,815
	\$0

Shortfall Capital Cost to be Paid by GMWSS

Replacement Costs (Year 15, 2040)

Item	Description of Item	RC		
1	Raw Water Intake Equipment	\$0	Included w/ WTP	
2	Raw Water PS Pumps	\$0	Included w/ WTP	
3	Booster PS Equipment	\$119,700		
4	Water Treatment Plant Equipment	<u>\$5,400,000</u>		
	Sub-Total	\$5,519,700	0.6419	
			PW Factor	
	Total PW of Replacement Costs (RC),2025	\$3,543,095		\$3,543,095

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Salvage Value (Year 20, 2045)

SV

1	Raw Water Intake	\$0	Included w/ WTP
2	Raw Water Pump Station	\$0	Included w/ WTP
3	Raw Water Transmission Main	\$0	Not Req'd
4	Booster Pump Station	\$2,154,600	
5	Water Storage Tank	\$0	
6	Water Treatment Plant	\$81,000,000	
7	Treated Water Transmission Main to Scott County	\$60,750,000	
8	Treated Water Transmission Main in Scott County	<u>\$9,028,795</u>	
	Sub-Total	\$152,933,399	0.5537

Total PW of Salvage Value (SV), 2025 \$84,679,223

\$84,679,223

**Alternative C2/H: Total PW Cost , 2025
(PW of CC+PW of AC+PW of RC)-PW of SV
For 10.0 MGD ADD, 15.0 MGD MDD**

\$456,203,796

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Alternative D/L - For 7.5 MGD ADD in 2045 (11.25 MGD MDD)

Opinion of Present Worth Cost

Water Purchased from LWC

		Probable Construction Cost (CC), 2022	
ADD	Item	Description of Item	CC
7.5			
			Calculation:
	1	Raw Water Intake	\$0 Included w/ WTP
	2	Raw Water Pump Station	\$0 Included w/WTP
	3	Raw Water Transmission Main	\$0 Not Req'd By GMWSS
	4	Booster Pump Station	\$1,496,250 \$0.133/gallon x 11.25 MGD
	5	Water Storage Tank (per Caldwell Tank)	\$2,200,000 New Paynes Depot Tank
	6	Water Treatment Plant	\$0 Not Req'd By GMWSS
	7	Treated Water Transmission Main	\$13,248,000 Length =6.2 miles
		Sub-Total	\$16,944,250
		Construction Contingency (20%)	\$3,388,850
		Sub-Total	\$20,333,100
		Engineering (6%)	\$1,219,986
		Land, Easements, Legal, Administration	\$325,720
		Total Probable CC, 2022	\$21,878,806

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Probable Construction Cost (CC), 2025-202720		% CC Increase to 202520% cc Increase to 2025	
Item	Description of Item	CC	
1	Raw Water Intake	\$0	Included w/ WTP
2	Raw Water Pump Station	\$0	Included w/ WTP
3	Raw Water Transmission Main	\$0	Not Req'd by GMWSS
4	Booster Pump Station	\$1,795,500	
5	Water Storage Tank	\$2,640,000	New Paynes Depot Tank
6	Water Treatment Plant	\$0	Not Req'd by GMWSS
7	Treated Water Transmission Main	<u>\$15,897,600</u>	Length = 6.2 miles
	Sub-Total	\$20,333,100	
	Construction Contingency (20%)	<u>\$4,066,620</u>	
	Sub-Total	\$24,399,720	
	Engineering (6%)	\$1,463,983	
	Land, Easements, Legal, Administration	<u>\$390,864</u>	
Total Probable CC, 2025		\$26,254,567	\$26,254,567

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		Probable Annual Cost (AC)			
Year					
ADD	Description of Cost	AC		PW of AC	
1 (2026)	WTP and Distribution Cost	\$3,650,000	2.5 MGD from exist WTP		
4.6	Purchased Water Cost	<u>\$1,885,590</u>	2.1 MGD from FPB		
	Sub-Total	\$5,535,590		PW Factor	
	PW of Annual Cost, 2025	\$5,374,504		0.9709	\$5,374,504
2 (2027)	Current Water Service Cost	\$3,650,000	2.5 MGD from exist WTP		
4.7	Purchased Water Cost	<u>\$1,975,380</u>	2.2 MGD from FPB		
	Sub-Total	\$5,625,380		0.9426	
	PW of Annual Cost, 2025	\$5,302,483			\$5,302,483
3 (2028)	Distribution Cost	\$4,818,000			
4.8	Purchased Water Cost	<u>\$4,747,920</u>	All Water from LWC		
	Sub-Total	\$9,565,920			
	PW of Annual Cost, 2025	\$8,753,773		0.9151	\$8,753,773
4 (2029)	Distribution Cost	\$4,918,375			
4.9	Purchased Water Cost	<u>\$4,846,835</u>			
	Sub-Total	\$9,765,210			
	PW of Annual Cost, 2025	\$8,676,389		0.8885	\$8,676,389
5 (2030)	Distribution Cost	\$5,119,125			
5.1	Purchased Water Cost	<u>\$5,044,665</u>			
	Sub-Total	\$10,163,790			
	PW of Annual Cost, 2025	\$8,767,285		0.8626	\$8,767,285
6 (2031)	Distribution Cost	\$5,269,688			
5.25	Purchased Water Cost	<u>\$5,193,038</u>			
	Sub-Total	\$10,462,725			
	PW of Annual Cost, 2025	\$8,762,532		0.8375	\$8,762,532

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7 (2032)	Distribution Cost	\$5,370,063		
5.35	Purchased Water Cost	<u>\$5,291,953</u>		
	Sub-Total	\$10,662,015		
	PW of Annual Cost, 2025	\$8,669,284	0.8131	\$8,669,284
8 (2033)	Distribution Cost	\$5,520,625		
5.5	Purchased Water Cost	<u>\$5,440,325</u>		
	Sub-Total	\$10,960,950		
	PW of Annual Cost, 2025	\$8,652,574	0.7894	\$8,652,574
9 (2034)	Distribution Cost	\$6,303,915		
5.7	Purchased Water Cost	<u>\$6,199,890</u>		
	Sub-Total	\$12,503,805		
	PW of Annual Cost, 2025	\$9,582,916	0.7664	\$9,582,916
10 (2035)	Distribution Cost	\$6,414,510		
5.8	Purchased Water Cost	<u>\$6,308,660</u>		
	Sub-Total	\$12,723,170		
	PW of Annual Cost, 2025	\$9,467,311	0.7441	\$9,467,311
11 (2036)	Distribution Cost	\$6,690,998		
6.05	Purchased Water Cost	<u>\$6,580,585</u>		
	Sub-Total	\$13,271,583		
	PW of Annual Cost, 2025	\$9,587,391	0.7224	\$9,587,391
12 (2037)	Distribution Cost	\$6,801,593		
6.15	Purchased Water Cost	<u>\$6,689,355</u>		
	Sub-Total	\$13,490,948		
	PW of Annual Cost, 2025	\$9,462,551	0.7014	\$9,462,551

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13 (2038)	Distribution Cost	\$6,967,485		
8	Purchase Water Cost	<u>\$6,852,510</u>		
	Sub-Total	\$13,819,995		
	PW of Annual Cost,	\$9,411,417	0.681	\$9,411,417
14 (2039)	Distribution Cost	\$7,133,378		
6.45	Purchased Water Cost	<u>\$7,015,665</u>		
	Sub-Total	\$14,149,043		
	PW of Annual Cost, 2025	\$9,353,932	0.6611	\$9,353,932
15 (2040)	Distribution Cost	\$8,021,970		
6.6	Purchased Water Cost	<u>\$7,901,520</u>		
	Sub-Total	\$15,923,490		
	PW of Annual Cost, 2025	\$10,221,288	0.6419	\$10,221,288
16 (2041)	Distribution Cost	\$8,265,060		
6.8	Purchased Water Cost	<u>\$8,140,960</u>		
	Sub-Total	\$16,406,020		
	PW of Annual Cost, 2025	\$10,224,232	0.6232	\$10,224,232
17 (2042)	Distribution Cost	\$8,447,378		
6.95	Purchased Water Cost	<u>\$8,320,540</u>		
	Sub-Total	\$16,767,918		
	PW of Annual Cost, 2025	\$10,144,590	0.605	\$10,144,590
18 (2043)	Distribution Cost	\$8,690,468		
7.15	Purchased Water Cost	<u>\$8,559,980</u>		
	Sub-Total	\$17,250,448		
	PW of Annual Cost, 2025	\$10,132,913	0.5874	\$10,132,913

20 (2045)	Distribution Cost	\$9,115,875		
7.5	Purchased Water Cost	<u>\$8,979,000</u>		
	Sub-Total	\$18,094,875	0.5537	
	PW of Annual Cost, 2025	\$10,019,132		\$10,019,132

Total PW of Annual Cost (AC),2025

\$180,679,615

2028-2045 Total Purchased Water Cost	\$120,912,820
2025 LWC Transmission Main Cost*	\$135,600,000
*LWC 2022 estimate + 20%	
Shortfall Capital Cost to be Paid by GMWSS	\$14,687,180

Replacement Costs (Year 15, 2040)

Item	Description of Item	RC		
1	Raw Water Intake Equipment	\$0	Included w/ WTP	
2	Raw Water PS Pumps	\$0	Included w/ WTP	
3	Booster PS Equipment	\$89,775		
4	Water Treatment Plant Equipment	<u>\$0</u>	Not Req'd by GMWSS	
	Sub-Total	\$89,775		0.6419
			PW Factor	
	Total PW of Replacement Costs (RC),2025	\$57,627		\$57,627

Salvage Value (Year 20, 2045)		SV	
1	Raw Water Intake	\$0	Included w/ WTP
2	Raw Water Pump Station	\$0	Included w/ WTP
3	Raw Water Transmission Main	\$0	Not Req'd by GMWSS
4	Booster Pump Station	\$1,615,950	
5	Water Storage Tank	\$2,376,000	New Paynes Depot Tank
6	Water Treatment Plant	\$0	Not Req'd by GMWSS
7	Treated Water Transmission Main	<u>\$14,307,840</u>	
	Sub-Total	\$18,299,790	0.5537
Total PW of Salvage Value (SV), 2025		\$10,132,594	\$10,132,594
Alternative D/L: Total PW Cost , 2025			\$196,859,215
(PW of CC+PW of AC+PW of RC)-PW of SV			
For 7.5 MGD ADD, 11.25 MGD MDD			
Includes shortfall capital cost			
			Add Purch. Water Shortfall Cost _ \$14,687,180
TPWC, including Shortfall			\$211,546,395

Alternative D/H - For 10.0 MGD ADD in 2045 (15.0 MGD MDD)

Opinion of Present Worth Cost

Water Purchased from LWC

		Probable Construction Cost (CC), 2022	
ADD			
10	Item	Description of Item	CC
			Calculation:
	1	Raw Water Intake	\$0 Included w/ WTP
	2	Raw Water Pump Station	\$0 Included w/ WTP
	3	Raw Water Transmission Main	\$0 Not Req'd By GMWSS
	4	Booster Pump Station	\$1,995,000 \$0.133/gallon x 15 MGD
	5	Water Storage Tank (per Caldwell Tank)	\$2,200,000 New Paynes Depot Tank
	6	Water Treatment Plant	\$0 Not Req'd By GMWSS
	7	Treated Water Transmission Main	<u>\$13,249,000</u> Length = 6.2 miles
		Sub-Total	\$17,444,000
		Construction Contingency (20%)	<u>\$3,488,800</u>
		Sub-Total	\$20,932,800
		Engineering (6%)	\$1,255,968
		Land, Easements, Legal, Administration	<u>\$325,720</u>
		Total Probable CC, 2022	\$22,514,488

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Probable Construction Cost (CC), 2025-2027		20% CC Increase to 2025	
Item	Description of Item	CC	
1	Raw Water Intake	\$0	Not Req'd by GMWSS
2	Raw Water Pump Station	\$0	Not Req'd by GMWSS
3	Raw Water Transmission Main	\$0	Not Req'd by GMWSS
4	Booster Pump Station	\$2,394,000	
5	Water Storage Tank	\$2,640,000	New Paynes Depot Tank
6	Water Treatment Plant	\$0	Not Req'd by GMWSS
7	Treated Water Transmission Main	<u>\$15,898,800</u>	Length = 6.2 miles
	Sub-Total	\$20,932,800	
	Construction Contingency (20%)	<u>\$4,186,560</u>	
	Sub-Total	\$25,119,360	
	Engineering (6%)	\$1,507,162	
	Land, Easements, Legal, Administration	<u>\$390,864</u>	
Total Probable CC, 2025		\$27,017,386	\$27,017,386

		Probable Annual Cost (AC)			
Year					
ADD	Description of Cost	AC		PW of AC	
1 (2026)	WTP and Distribution Cost	\$3,650,000	2.5 MGD from exist WTP		
4.6	Purchased Water Service Cost	<u>\$1,885,590</u>	2.1 MGD from FPB		
	Sub-Total	\$5,535,590		PW Factor	
	PW of Annual Cost, 2025	\$5,374,504		0.9709	\$5,374,504
2 (2027)	WTP and Distribution Cost	\$3,650,000	2.5 MGD from exist WTP		
4.7	Purchased Water Service Cost	<u>\$1,975,380</u>	2.2 MGD from FPB		
	Sub-Total	\$5,625,380		0.9426	
	PW of Annual Cost, 2025	\$5,302,483			\$5,302,483
3 (2028)	Distribution Cost	\$4,818,000			
4.8	Purchase Water Cost	<u>\$4,747,920</u>	All Water from LWC		
	Sub-Total	\$9,565,920			
	PW of Annual Cost, 2025	\$8,753,773		0.9151	\$8,753,773
4 (2029)	Distribution Cost	\$4,918,375			
4.9	Purchase Water Cost	<u>\$4,846,835</u>			
	Sub-Total	\$9,765,210			
	PW of Annual Cost, 2025	\$8,676,389		0.8885	\$8,676,389
5 (2030)	Distribution Cost	\$6,122,875			
6.1	Purchase Water Cost	<u>\$6,033,815</u>			
	Sub-Total	\$12,156,690			
	PW of Annual Cost, 2025	\$10,486,361		0.8626	\$10,486,361
6 (2031)	Distribution Cost	\$6,323,625			
6.3	Purchase Water Cost	<u>\$6,231,645</u>			
	Sub-Total	\$12,555,270			
	PW of Annual Cost, 2025	\$10,515,039		0.8375	\$10,515,039

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7 (2032)	Distribution Cost	\$6,624,750		
6.6	Purchase Water Cost	<u>\$6,528,390</u>		
	Sub-Total	\$13,153,140		
	PW of Annual Cost, 2025	\$10,694,818	0.8131	\$10,694,818
8 (2033)	Distribution Cost	\$6,825,500		
6.8	Purchase Water Cost	<u>\$6,726,220</u>		
	Sub-Total	\$13,551,720		
	PW of Annual Cost, 2025	\$10,697,728	0.7894	\$10,697,728
9 (2034)	Distribution Cost	\$7,741,650		
7	Purchase Water Cost	<u>\$7,613,900</u>		
	Sub-Total	\$15,355,550		
	PW of Annual Cost, 2025	\$11,768,494	0.7664	\$11,768,494
10 (2035)	Distribution Cost	\$8,018,138		
7.25	Purchase Water Cost	<u>\$7,885,825</u>		
	Sub-Total	\$15,903,963		
	PW of Annual Cost, 2025	\$11,834,138	0.7441	\$11,834,138
11 (2036)	Distribution Cost	\$8,294,625		
7.5	Purchase Water Cost	<u>\$8,157,750</u>		
	Sub-Total	\$16,452,375		
	PW of Annual Cost, 2025	\$11,885,196	0.7224	\$11,885,196
12 (2037)	Distribution Cost	\$8,515,815		
7.7	Purchase Water Cost	<u>\$8,375,290</u>		
	Sub-Total	\$16,891,105		
	PW of Annual Cost, 2025	\$11,847,421	0.7014	\$11,847,421

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13 (2038)	Distribution Cost	\$8,847,600		
8	Purchase Water Cost	<u>\$8,701,600</u>		
	Sub-Total	\$17,549,200		
	PW of Annual Cost, 2025	\$11,951,005	0.681	\$11,951,005
14 (2039)	Distribution Cost	\$9,068,790		
8.2	Purchase Water Cost	<u>\$8,919,140</u>		
	Sub-Total	\$17,987,930		
	PW of Annual Cost, 2025	\$11,891,821	0.6611	\$11,891,821
15 (2040)	Distribution Cost	\$10,209,780		
8.4	Purchase Water Cost	<u>\$10,056,480</u>		
	Sub-Total	\$20,266,260		
	PW of Annual Cost, 2025	\$13,008,912	0.6419	\$13,008,912
16 (2041)	Distribution Cost	\$10,574,415		
8.7	Purchase Water Cost	<u>\$10,415,640</u>		
	Sub-Total	\$20,990,055		
	PW of Annual Cost, 2025	\$13,081,002	0.6232	\$13,081,002
17 (2042)	Distribution Cost	\$10,939,050		
9	Purchase Water Cost	<u>\$10,774,800</u>		
	Sub-Total	\$21,713,850		
	PW of Annual Cost, 2025	\$13,136,879	0.605	\$13,136,879
18 (2043)	Distribution Cost	\$11,425,230		
9.4	Purchase Water Cost	<u>\$11,253,680</u>		
	Sub-Total	\$22,678,910		
	PW of Annual Cost, 2025	\$13,321,592	0.5874	\$13,321,592

19 (2044)	Distribution Cost	\$11,789,865		
9.7	Purchase Water Cost	<u>\$11,612,840</u>		
	Sub-Total	\$23,402,705		
	PW of Annual Cost, 2025	\$13,346,563	0.5703	\$13,346,563
20 (2045)	Distribution Cost	\$12,154,500		
10	Purchase Water Cost	<u>\$11,972,000</u>		
	Sub-Total	\$24,126,500		
	PW of Annual Cost, 2025	\$13,358,843	0.5537	\$13,358,843

Total PW of Annual Cost (AC),2025 **\$220,932,961**

Construction Cost of LWC Transmission Main	Total Purchased Water Cost	\$150,853,770
Total Purchased Water Cost, 2028-2045	LWC Transmission Main Cost*	\$168,000,000
	*LWC 2022 estimate + 20%	

Shortfall Capital Cost to be Paid by GMWSS **\$17,146,230**

Replacement Costs (Year 15, 2040)

Item	Description of Item	RC		
1	Raw Water Intake Equipment	\$0	Included w/ WTP	
2	Raw Water PS Pumps	\$0	Included w/ WTP	
3	Booster PS Equipment	\$119,700		
4	Water Treatment Plant Equipment	<u>\$0</u>	Not Req'd by GMWSS	
	Sub-Total	\$119,700		0.6419
			PW Factor	
	Total PW of Replacement Costs (RC),2025	\$76,835		\$76,835

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Salvage Value (Year 20, 2045)

SV

1	Raw Water Intake	\$0	Included w/ WTP
2	Raw Water Pump Station	\$0	Included w/ WTP
3	Raw Water Transmission Main	\$0	Not Req'd
4	Booster Pump Station	\$2,154,600	
5	Water Storage Tank	\$1,980,000	New Paynes Depot Tank
6	Water Treatment Plant	\$0	Not Req'd by GMWSS
7	Treated Water Transmission Main	<u>\$14,308,920</u>	
	Sub-Total	\$18,443,520	0.5537

Total PW of Salvage Value (SV), 2025

\$10,212,177

\$10,212,177

**Alternative D/H: Total PW Cost , 2025
(PW of CC+PW of AC+PW of RC)-PW of SV
For 10.0 MGD ADD, 15.0 MGD MDD
Includes shortfall capital cost**

\$210,797,619

Add Purch. Water Shortfall Cost _ **\$17,146,230**

TPWC, including Shortfall

\$227,943,849

Construction Costs for Water Transmission Mains in Scott County

Alternative A - 30" Water Transmission Main
KY River Raw Water Pump Station to Lancaster Water Tank
Opinion of Probable Construction Cost (CC), 2022

		22.9 Mi Long			
Item	Description of Item	Unit Price	Unit	Quantity	Total
1	Rock Trenching	\$120	CY	120,940	\$14,512,800
2	Back Fill	\$6	CY	89,496	\$536,976
3	Haul	\$8	CY	62,889	\$503,112
4	30" Ductile Iron Pipe (Class 250)	\$170	LF	120,940	\$20,511,424
5	Crush Stone Fill	\$30	Ton	8,675	\$260,250
6	Labor & Equipment (200 LF/day)	\$45	LF	120,940	\$5,442,300
7	30" DI Fittings (10 Fittings/mile)	\$10,000	Ton	148	\$1,480,000
8	30" DIP, Bored and Jacked in 48" Casing	\$1,200	LF	800	\$960,000
9	Creek Crossing	\$410	LF	440	\$180,400
10	Rip Rap Replacement	\$15	LF	100	\$1,500
11	Aggregate Surface Replacement	\$15	LF	1,000	\$15,000
12	Surface Restoration (Seed, Straw, Grade)	\$4	LF	93,000	\$372,000
13	Concrete (Cradle, Anchors, Encasement)	\$250	CY	200	\$50,000
14	Pavement Replacement	\$70	LF	27,000	\$1,890,000
15	Clearing	\$4	LF	16,000	\$64,000
Sub-Total					\$46,779,762
20% Contingency					\$9,355,952
Permitting, Land Acquisition, Legal and Easements					\$1,451,280
6% Engineering					<u>\$3,368,143</u>
Total Probable Construction Cost (2022)					\$60,955,137
Total Probable Construction Cost (2025)					\$77,187,963
(20% cost increase from 2022)					

**Alternative B - 30" Water Transmission Main
Scott County Line to Lancaster Water Tank**

Opinion of Probable Construction Cost (CC), 2022

6.2 Mi Long

Item	Description of Item	Unit Price	Unit	Quantity	Total
1	Rock Trenching	\$120	CY	24,000	\$2,880,000
2	Back Fill	\$6	CY	28,000	\$168,000
3	Haul	\$8	CY	14,115	\$112,920
4	30" Ductile Iron Pipe (Class 250)	\$170	LF	32,572	\$5,524,211
5	Crush Stone Fill	\$30	Ton	2,330	\$69,900
6	Labor & Equipment (200 LF/day)	\$45	LF	32,572	\$1,465,740
7	30" DI Fittings (10 Fittings/mile)	\$10,000	Ton	40	\$400,000
8	Connections to Existing Mains	\$5,000	EA	2	\$10,000
9	30" DIP, Bored and Jacked in 48" Casing	\$1,200	LF	710	\$852,000
10	Creek Crossing	\$410	LF	130	\$53,300
11	Rip Rap Replacement	\$15	LF	80	\$1,200
12	Aggregate Surface Replacement	\$15	LF	600	\$9,000
13	Surface Restoration (Seed, Straw, Grade)	\$4	LF	32,572	\$130,288
14	Concrete (Cradle, Anchors, Encasement)	\$250	CY	50	\$12,500
15	Pavement Replacement	\$70	LF	22,175	\$1,552,250
16	Clearing	\$4	LF	2,000	\$8,000
	Sub-Total				\$13,249,309
	20% Contingency				\$2,649,862
	Permitting, Land Acquisition, Legal and Easements				\$325,720
	6% Engineering				\$953,950
	Total Probable Construction Cost (2022)				\$17,178,841
	Total Probable Construction Cost (2025)				\$20,614,609
	(20% cost increase from 2022)				

**Alternatives C1 and C2 - 30" Water Transmission Main
Scott County Line to Lancaster Water Tank**
Opinion of Probable Construction Cost (CC), 2022

		4.1 Mi Long			
Item	Description of Item	Unit Price	Unit	Quantity	Total
1	Rock Trenching	\$120	CY	21,400	\$2,568,000
2	Back Fill	\$6	CY	14,600	\$87,600
3	Haul	\$8	CY	11,128	\$89,024
4	30" Ductile Iron Pipe (Class 250)	\$170	LF	21,400	\$3,629,440
5	Crush Stone Fill	\$30	Ton	1,400	\$42,000
6	Labor & Equipment (200 LF/day)	\$45	LF	21,400	\$963,000
7	30" DI Fittings (10 Fittings/mile)	\$10,000	Ton	26	\$260,000
8	30" DIP, Bored and Jacked in 48" Casing	\$1,200	LF	400	\$480,000
9	Creek Crossing	\$410	LF	200	\$82,000
10	Rip Rap Replacement	\$15	LF	100	\$1,500
11	Aggregate Surface Replacement	\$15	LF	361	\$5,415
12	Surface Restoration (Seed, Straw, Grade)	\$4	LF	21,400	\$85,600
13	Concrete (Cradle, Anchors, Encasement)	\$250	CY	40	\$10,000
14	Pavement Replacement	\$70	LF	680	\$47,600
15	Clearing	\$4	LF	2,000	\$8,000
	Sub-Total				\$8,359,179
	20% Contingency				\$1,671,836
	Permitting, Land Acquisition, Legal and Easements				\$745,870
	6% Engineering				<u>\$601,861</u>
	Total Probable Construction Cost (2022)				\$11,378,746
	Total Probable Construction Cost (2025) (20% cost increase from 2022)				\$13,654,330

Alternative D - 30" Water Transmission Main
Scott County Line to New Paynes Depot Water Tank
Opinion of Probable Construction Cost (CC), 2022

6.2 Mi Long

Item	Description of Item	Unit Price	Unit	Quantity	Total
1	Rock Trenching	\$120	CY	24,000	\$2,880,000
2	Back Fill	\$6	CY	28,000	\$168,000
3	Haul	\$8	CY	14,115	\$112,920
4	30" Ductile Iron Pipe (Class 250)	\$170	LF	32,572	\$5,524,211
5	Crush Stone Fill	\$30	Ton	2,330	\$69,900
6	Labor & Equipment (200 LF/day)	\$45	LF	32,572	\$1,465,740
7	30" DI Fittings (10 Fittings/mile)	\$10,000	Ton	40	\$400,000
8	Connections to Existing Water Mains	\$5,000	EA	2	\$10,000
9	30" DIP, Bored and Jacked in 48" Casing	\$1,200	LF	710	\$852,000
10	Creek Crossing	\$410	LF	130	\$53,300
11	Rip Rap Replacement	\$15	LF	80	\$1,200
12	Aggregate Surface Replacement	\$15	LF	600	\$9,000
13	Surface Restoration (Seed, Straw, Grade)	\$4	LF	32,572	\$130,288
14	Concrete (Cradle, Anchors, Encasement)	\$250	CY	50	\$12,500
15	Pavement Replacement	\$70	LF	22,175	\$1,552,250
16	Clearing	\$4	LF	2,000	\$8,000
	Sub-Total				\$13,249,309
	20% Contingency				\$2,649,862
	Permitting, Land Acquisition, Legal and Easements				\$325,720
	6% Engineering				\$953,950
	Total Probable Construction Cost (2022)				\$17,178,841
	Total Probable Construction Cost (2025) (20% cost increase from 2022)				\$20,614,609

Construction Costs for Water Transmission Mains to Scott County

Alternative B - FPB Portion of 24" Water Transmission Main

From FPB WTP to US 421

Opinion of Probable Construction Cost (CC), 2022

10.2 Mi Long

Item	Description of Item	Unit Price	Unit	Quantity	Total
1	Rock Trenching	\$120	CY	31,974	\$3,836,880
2	Back Fill	\$6	CY	38,369	\$230,214
3	Haul	\$8	CY	19,184	\$153,472
4	24" Ductile Iron Pipe	\$123	LF	53,956	\$6,636,588
5	Crush Stone Fill	\$30	Ton	5,724	\$171,720
6	Labor & Equipment (200 LF/day)	\$36	LF	53,956	\$1,942,416
7	24" DI Fittings (10 Fittings/mile)	\$8,000	Ton	39	\$312,000
8	Connections to Existing Water Mains	\$5,000	EA	2	\$10,000
9	24" DIP, Bored and Jacked in 48" Casing	\$765	LF	392	\$299,880
10	Creek Crossing	\$244	LF	20	\$4,880
11	Rip Rap Replacement	\$15	LF	0	\$0
12	Aggregate Surface Replacement	\$15	LF	345	\$5,175
13	Surface Restoration (Seed, Straw, Grade)	\$4	LF	53,326	\$213,304
14	Concrete (Cradle, Anchors, Encasement)	\$250	CY	30	\$7,500
15	Pavement Replacement	\$70	LF	275	\$19,250
16	Clearing	\$4	LF	4,000	\$16,000
	Sub-Total				\$13,859,279
	20% Contingency				\$2,771,856
	Permitting, Land Acquisition, Legal and Easements				\$647,472
	6% Engineering				<u>\$647,472</u>
	Total Probable Construction Cost (2022), FPB 24" Main to US 421				\$17,926,079
	Total Probable Construction Cost (2025)				\$21,511,294
	(20% cost increase from 2022)				

**Alternative B - FPB Portion of 30" Water Transmission Main
From US 421 to Scott County Line**

Opinion of Probable Construction Cost (CC), 2022

7.5 Mi Long

Item	Description of Item	Unit Price	Unit	Quantity	Total
1					
2	Rock Trenching	\$120	CY	29,625	\$3,555,000
3	Back Fill	\$6	CY	34,130	\$204,780
4	Haul	\$8	CY	17,117	\$136,936
5	30" Ductile Iron Pipe	\$160	LF	39,490	\$6,318,400
6	Crush Stone Fill	\$30	Ton	2,833	\$84,990
7	Labor & Equipment (200 LF/day)	\$45	LF	39,450	\$1,775,250
8	30" DI Fittings (10 Fittings/mile)	\$10,000	Ton	38	\$380,000
9	Connections to Existing Mains	\$5,000	EA	2	\$10,000
10	30" DIP, Bored and Jacked in 48" Casing	\$1,200	LF	150	\$180,000
11	Creek Crossing	\$410	LF	80	\$32,800
12	Rip Rap Replacement	\$15	LF	60	\$900
13	Aggregate Surface Replacement	\$15	LF	80	\$1,200
14	Surface Restoration (Seed, Straw, Grade)	\$4	LF	39,400	\$157,600
15	Concrete (Cradle, Anchors, Encasement)	\$250	CY	20	\$5,000
16	Pavement Replacement	\$70	LF	1,000	\$70,000
17	Clearing	\$4	LF	800	\$3,200
18	Booster Pump Stations	\$2,000,000	EA	1	\$2,000,000
	Water Storage Tanks (per Caldwell Tanks)	\$2,200,000	EA	1	\$2,200,000
	Sub-Total				\$17,116,056
	20% Contingency				\$3,423,211
	Permitting, Land Acquisition, Legal and Easements				\$474,000
	6% Engineering				\$1,232,356
	Total Probable Construction Cost (2022), FPB 30" Main to Scott County				\$22,245,623
	Total Probable Construction Cost (2025)				\$26,694,747

Total for 24" and 30" FPB Transmission Mains to Scott County (2025)

\$48,206,041

Alternative C2 - KAW Portion of 30" Water Transmission Main
From KAW Owenton WTP to Scott County Line

Opinion of Probable Construction Cost (CC), 2022

24.4 Mi Long

Item	Description of Item	Unit Price	Unit	Quantity	Total
1	Rock Trenching	\$120	CY	129,000	\$15,480,000
2	Back Fill	\$6	CY	95,460	\$572,760
3	Haul	\$8	CY	67,080	\$536,640
4	30" Ductile Iron Pipe (Class 250)	\$170	LF	129,000	\$21,878,400
5	Crush Stone Fill	\$30	Ton	9,200	\$276,000
6	Labor & Equipment (200 LF/day)	\$45	LF	129,000	\$5,805,000
7	30" DI Fittings (10 Fittings/mile)	\$10,000	Ton	158	\$1,580,000
8	30" DIP, Bored and Jacked in 48" Casing	\$1,200	LF	2040	\$2,448,000
9	Creek Crossing	\$410	LF	200	\$82,000
10	Rip Rap Replacement	\$15	LF	100	\$1,500
11	Aggregate Surface Replacement	\$15	LF	2,100	\$31,500
12	Surface Restoration (Seed, Straw, Grade)	\$4	LF	129,000	\$516,000
13	Concrete (Cradle, Anchors, Encasement)	\$250	CY	200	\$50,000
14	Pavement Replacement	\$70	LF	22,400	\$1,568,000
15	Clearing	\$4	LF	6,000	\$24,000
16	Booster Pump Stations	\$2,000,000	EA	2	\$4,000,000
17	Water Storage Tanks (per Caldwell Tanks)	\$2,200,000	EA	1	<u>\$2,200,000</u>
	Sub-Total				\$57,049,800
	20% Contingency				\$11,409,960
	Permitting, Land Acquisition, Legal and Easements				\$1,290,000
	6% Engineering				<u>\$4,107,586</u>
	Total Probable Construction Cost (2022), KAW Main to Scott County				\$73,857,346
	Total Probable Construction Cost (2025)				\$88,628,815
	(20% cost increase from 2022)				

**Alternative D - LWC Portion of 30" Water Transmission Main
From LWC Clark Station Road Water Tank to Scott County Line**
Opinion of Probable Construction Cost (CC), 2022

51.4 Mi Long

Item	Description of Item	Unit Price	Unit	Quantity	Total
1	Rock Trenching	\$120	CY	271,180	\$32,541,600
2	Back Fill	\$6	CY	200,673	\$1,204,038
3	Haul	\$8	CY	141,014	\$1,128,112
4	30" Ductile Iron Pipe (Class 250)	\$170	LF	271,180	\$46,100,600
5	Crush Stone Fill	\$30	Ton	19,451	\$583,530
6	Labor & Equipment (200 LF/day)	\$45	LF	271,180	\$12,203,100
7	30" DI Fittings (10 Fittings/mile)	\$10,000	Ton	331	\$3,310,000
8	Connections to Existing Mains	\$7,500	EA	2	\$15,000
9	30" DIP, Bored and Jacked in 48" Casing	\$1,200	LF	3720	\$4,464,000
10	Creek Crossing	\$488	LF	440	\$214,720
11	Kentucky River Crossing	\$2,000,000	EA	1	\$2,000,000
12	Rip Rap Replacement	\$15	LF	750	\$11,250
13	30", Plug Valves for Railroad, if necessary	\$20,000	EA	6	\$120,000
14	Aggregate Surface Replacement	\$15	LF	80	\$1,200
15	Surface Restoration (Seed, Straw, Grade)	\$4	LF	271,180	\$1,084,720
16	Concrete (Cradle, Anchors, Encasement)	\$250	CY	200	\$50,000
17	Pavement Replacement	\$70	LF	135	\$9,450
18	Clearing	\$4	LF	135,590	\$542,360
19	Booster Pump Stations	\$2,000,000	EA	3	\$6,000,000
20	Water Storage Tanks (per Caldwell Tanks)	\$2,200,000	EA	3	<u>\$6,600,000</u>
	Sub-Total				\$118,183,680
	20% Contingency				\$23,636,736
	Permitting, Land Acquisition, Legal and Easements				\$3,254,160
	6% Engineering				<u>\$8,509,225</u>
	Total Probable Construction Cost (2022), LWC Main to Scott County				\$153,583,801
	Total Probable Construction Cost (2025)				\$184,300,560
	(20% cost increase from 2022)				

Appendix C

Offers from Other Utilities

Comparison of Purchasing Water from Other Utilities

During the preparation of this Assessment, requests were made of FPB and LWC to provide information regarding their capability to provide water to GMWSS and what they will charge if GMWSS were to purchase water from them. In addition to responding to these requests, they also provided information on their costs for conveying treated water to GMWSS. The FPB and LWC proposals are provided in this Appendix and summarized below; each assured they could supply GMWSS's water needs for the next 50 years. KAW was not contacted for this information, but two alternatives (C1 and C2) for providing water from KAW are included in this Assessment. The following summarizes the offers for purchasing water from these utilities. All capital costs are expressed in 2022 Dollars, unless otherwise noted as 2025 Dollars. Chapter 5 of this Assessment provides a discussion of cost increases over time for purchasing water from FPB, KAW and LWC.

Alternative B – FPB Offer

FPB provided an offer for supplying water to GMWSS. Three levels of demand were presented:

- A Low Demand Scenario of 5.5 MGD ADD (8 MGD MDD) by 2045. This scenario was not included in the GMWSS demand projections in Chapter 3, since it does not meet the WSSA growth expectations anticipated by 2045.
- An Intermediate Demand Scenario of 7.5 MGD ADD (11.25 MGD MDD) by 2045. This scenario matches the GMWSS "Low Range" demand projections discussed in Chapter 3. Under this scenario, FPB will initially enlarge the clear well at its WTP and construct a new 24-inch transmission main to Scott County at an estimated cost of \$28 million. The plant's clear well is the treated water storage basin from which water is pumped into the distribution system. In this scenario, water to GMWSS will be provided from FPB's existing WTP until 2032, when the plant will be expanded at a cost of \$59 million. FPB will pay the total cost of \$87 million for their facilities provided that GMWSS purchases a minimum of 4 to 5 MGD for the first few years of this agreement and an increasing volume to a minimum of minimum of 7.0 MGD by 2045. In turn, GMWSS will initially pay \$2.55/1000 gallons to FPB for purchasing treated water.
- A High Demand Scenario of 10.0 MGD ADD (15 MGD MDD) by 2045. This scenario matches the GMWSS "High Range" demand projections in Chapter 3. Under this scenario, FPB will initially enlarge the clear well at its WTP and construct a new 24-inch transmission main to Scott County at an estimated cost of \$28 million. Water to GMWSS will be provided from FPB's existing WTP until 2028, when the plant will be expanded at a cost of \$59 million. FPB will pay the total cost of \$87 million provided that GMWSS purchases a minimum of 4 to 6 MGD for the first few years of this agreement and an increasing volume to a minimum of 9 MGD by 2045. In turn, GMWSS will initially pay \$2.55/1000 gallons to FPB for purchasing treated water.

For this Assessment, it has been projected that by 2028 GMWSS will require that its existing WTP be replaced and GMWSS either produce water from its own plant or purchase water from another utility. Accordingly, under this Alternative B the FPB WTP will need to be expanded by 2028 under the "Low Range" and the "High Range" demand projections of

GMWSS. Therefore, the 2022 costs for expanding the FPB WTP and providing the transmission main to Scott County are estimated at \$87 million under either demand scenario.

FPB will require water cost of service studies so that their initial wholesale rate of \$2.55/1000 gallons can increase incrementally over time as needed to protect FPB from rising construction costs, O&M costs, and inflation.

To evaluate the FPB offer, GRW completed a separate opinion of the construction cost for the FPB capital improvements. The GRW estimate indicated a cost of \$45 million for the WTP expansion and \$40 million for the transmission main, or \$85 million total under the “Low Range” option in which GMWSS will purchase an ADD of 7.5 MGD in 2045 (Alternative B/L). For the “High Range” option for purchasing an ADD of 10.0 MGD in 2045 (Alternative B/H), GRW estimated the FPB costs will be \$60 million for the WTP expansion and \$40 million for the transmission main, for \$100 million total. Since FPB’s estimate of \$87 million was included in their offer, it has been used in lieu of the GRW estimate in this Assessment. This equates to \$104.4 million in 2025.

Alternatives C1 and C2 - No Formal Offer from KAW

KAW was not contacted during the preparation of this Assessment; subsequently, no formal offers were received from KAW. Historically, all KAW system acquisition costs are distributed to their entire customer base and KAW has been aggressive with their rate increase requests. Even though this acquisition practice may initially benefit GMWSS, it will be detrimental to GMWSS if KAW makes future acquisitions of other utilities. Purchase water rates charged by KAW are also subject to negotiations between KAW and the Public Service Commission, without input or discussion with KAW’s wholesale water customers, which will lead to GMWSS having no say in future rates.

Although no detailed offers were received from KAW, nevertheless two alternatives are included in this Assessment for GMWSS purchasing water from KAW. The first alternative, Alternative C1, provides for GMWSS to draw water from the existing 42-inch KAW transmission main located along Ironworks Pike, at an existing tee and valve at the intersection of Ironworks Pike and US 62, thus not requiring KAW to construct a dedicated transmission main to Scott County. The existing KAW WTP in Owenton will require expansion under the 7.5 MGD ADD and the 10.0 MGD ADD scenarios, possibly in two phases. Under Alternative C1, the capital cost for the KAW plant expansion will be paid for by KAW, then GMWSS will purchase water from KAW initially at the current wholesale rate of \$4.21 per 1000 gallons. The plant expansion is estimated to cost \$45 million under the “Low Range” demand scenario of Alternative C1/L and \$60 million under the “High Range” demand scenario of Alternative C1/H. In 2025 Dollars, Alternative C1/L is estimated to cost \$68.0 million and Alternative C1/H is estimated to cost \$90.7 million.

In Alternative C2, all construction costs will be paid by GMWSS as a capital expense, including the KAW WTP expansion and a new transmission main from the WTP built parallel to the existing KAW 42-inch main to Ironworks Pike at US 62. The capital cost for this main is estimated at \$74 million. On that basis, GMWSS will pay KAW an estimated total capital cost, in 2022 Dollars, of \$119 million under Alternative C2/L and \$134 million under Alternative C2/H, for the WTP expansion and transmission main to the Scott County line, or \$156.6 million and \$179.3 million, respectively, in 2025 Dollars. GMWSS will also pay KAW for treated water initially at the wholesale rate of \$4.21 per 1000 gallons. This rate is expected to increase over time.

Alternative D – LWC Offer

Like FPB, LWC also offered three levels (5.5 MGD ADD, 7.5 MGD ADD and 10.0 MGD ADD) to supply water by 2045 to GMWSS under the same purchase assumptions as FPB. For all three demand levels, LWC indicated it will not need to expand its WTP. The only capital costs required by LWC will be for construction of a transmission main from their water storage tank at I-64 and Clark Station Road to the Scott County line. For the same reason as described above for the FPB offer, the 5.5 MGD ADD scenario was not considered for this Assessment. The other two scenarios, which aligned with the “Low Range” demand of Alternative D/L and the “High Range” demand of Alternative D/H, were considered in this Assessment.

LWC proposed two route options for construction of the transmission main to Scott County. The first option will route the main via the Frankfort Reservoir and part of the Frankfort water distribution system before continuing to Scott County. The second option will route the transmission main through Frankfort to the Scott County line without connecting to the Frankfort water system. While the first option was less expensive (by using some of the Frankfort water system), it did not provide the same level of reliability as the second option because it could allow Frankfort to divert water from their system for their own uses. Accordingly, the second option was selected to ensure that GMWSS would always receive its required water demand.

Under the 7.5 MGD ADD (Alternative D/L) and 10.0 MGD ADD (Alternative D/H) scenarios, LWC estimated their capital costs for the transmission main at \$113 million and \$140 million, respectively. These estimates equate to \$135.6 million and \$168.0 million, respectively, in 2025 Dollars.

GRW’s 2022 estimate for LWC’s transmission main was \$153.5 million for both scenarios (\$184.3 million in 2025 Dollars). The GRW estimate included construction of the Kentucky River crossing, three booster pump stations, and three elevated water storage tanks along the route of the LWC transmission main; it is not clear how many of these facilities were included in the LWC proposal. The LWC estimates, however, since they were included in the LWC offer have been used in this Assessment.

The basis of the LWC offer calls for LWC to pay the capital costs for the transmission main to the Scott County line. GMWSS will reimburse this cost to LWC at the initial water purchase rate of \$2.46 per 1000 gallons, which is expected to increase over time.



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April 18, 2022

Mr. Joseph Henry, PE
GRW
801 Corporate Drive
Lexington, KY 40503

Re: FPB response to GMWSS Water Source Assessment

Dear Mr. Henry,

Thank you for the letter dated February 3, 2022 discussing Georgetown's future plans for drinking water improvements. We appreciate the request for information and look forward to working with you and Mr. Azevedo to develop a plan that will meet the future needs of Georgetown and the Scott County community.

This is an exciting opportunity for FPB to build upon the 30-year relationship we have with GMWSS. Because we are both municipal systems, we have the shared mission of providing our customers high quality services at low rates. We also understand the associated challenges that are inherent to that mission.

As a non-profit municipal utility, we do not focus on profits for shareholders. We focus on re-investing back into the system to improve services for our customer-owners. This means that we are uniquely able to respond to our customer's needs, and this is just one of the factors that puts FPB in the ideal position to expand our partnership with GMWSS.

We commit to maintaining an open line of communication and to being available as needed, as we are now. This direct line of communication between GMWSS operators and both the FPB Water Treatment Plant and Water Distribution teams is vital to the distribution of a safe and clean product. For example, we recently replaced the strainer in the pump station and we respond to calls as needed when GMWSS operators have questions about chlorine residuals. The existing relationship allows for GMWSS personnel to easily contact FPB as needed to inform us about plant work and shutdowns that will require additional water from FPB, along with any other issues that may arise.

FPB has been a proven partner with GMWSS, and because we share a border, there is no question about FPB's statutory authority to provide water service to Georgetown. With the existing line currently serving GMWSS along with the proposed line to come, FPB will be able to provide two points of delivery for redundancy. Due to the systems being adjacent, the length of the new line will allow for an obtainable turnover rate, which is critical in order to maintain water quality.



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At FPB, we pride ourselves on the quality of water we produce. We have confirmed with the Division of Water that FPB can increase withdrawal from the Kentucky River. As you know, the Kentucky River is less susceptible to industrial contamination and has been an excellent source of supply.

FPB has served Georgetown's neighbors in the Frankfort and the Franklin County community for nearly 80 years. We can ensure GMWSS that we have a strong financial position, sound financial reserves, and a long history of clean audits.

Enclosed is the form that takes into consideration the three demand scenarios defined as low, intermediate, and high. Please note that a number of assumptions were taken into consideration when developing the proposed costs, as described in the attachment.

We will be happy to meet with you to discuss the numbers and explain how they can be revised as the assumptions are revised, based on additional information from you.

We want to reiterate that we value FPB's existing relationship with GMWSS. In addition, the FPB Board of Directors fully supports this proposal and would like the opportunity to make an oral presentation to discuss actions we could explore to strengthen this proposal. Our board looks forward to enhancing our partnership and developing an agreement that is beneficial for both parties, both of our customer bases, and both of our communities. We understand this will be a phased process and the numbers as outlined in the attachment are a starting point.

Thank you for considering FPB for this monumental project. We understand how important this decision is and we look forward to further discussions about how we can be a part of this process.

Sincerely,

Gary Zheng, PE, Ph.D.
FPB General Manager

Cc: John Cubine, FPB Board Chairman
John Snyder, FPB Board Vice-Chairman
Stephen Mason, FPB Board Secretary-Treasurer
Kathryn Dutton-Mitchell, FPB Board Member
Jason Delambre, FPB Board Member

FPB Water System Improvements for GMWSS - Revised by GRW 4/1/22

All transmission improvements constructed to the Scott County line on US 421 by FPB

FPB will construct WTP Improvements to meet the GMWSS need.

GMWSS desires to decommission their existing WTP from service in 2027.

	2021 Wholesale Rate ¹	FPB Contribution ² (\$)	Minimum Purchase Assumption ³ (MGD)	
Scenario 1 - Low Demand	\$2.55	100% calculated as \$28M constructed by year 1, 2027 - Figures preliminary with further discussion requested	Year 1 - 5	4.00
5.5 Average Day Demand - 2045	\$2.55	100% calculated as \$28M constructed by year 1, 2027 - Figures preliminary with further discussion requested	Year 6 - 10	4.50
8 MGD Peak Day Demand - 2045	\$2.55	100% calculated as \$28M constructed by year 1, 2027 - Figures preliminary with further discussion requested	Year 11-15	5.00
	\$2.55	100% calculated as \$28M constructed by year 1 and additional \$59M constructed in year 16 for \$87M total - Figures preliminary with further discussion requested	Year 16-50	5.50

	2021 Wholesale Rate ¹	FPB Contribution ² (\$)	Minimum Purchase Assumption ³ (MGD)	
Scenario 2 - Intermediate Demand	\$2.55	100% calculated as \$28M constructed by year 1 and additional \$59M constructed in year 6 for \$87M total - Figures preliminary with further discussion requested	Year 1	4.00
	\$2.55	100% calculated as \$28M constructed by year 1 and additional \$59M constructed in year 6 for \$87M total - Figures preliminary with further discussion requested	Year 2	4.50
	\$2.55	100% calculated as \$28M constructed by year 1 and additional \$59M constructed in year 6 for \$87M total - Figures preliminary with further discussion requested	Year 3	5.00
	\$2.55	100% calculated as \$28M constructed by year 1 and additional \$59M constructed in year 6 for \$87M total - Figures preliminary with further discussion requested	Year 4	5.00
	\$2.55	100% calculated as \$28M constructed by year 1 and additional \$59M constructed in year 6 for \$87M total - Figures preliminary with further discussion requested	Year 5	5.00
7.5 Average Day Demand - 2045	\$2.55	100% calculated as \$28M constructed by year 1 and additional \$59M constructed in year 6 for \$87M total - Figures preliminary with further discussion requested	Year 6 - 10	6.00
11.5 MGD Peak Day Demand - 2045	\$2.55	100% calculated as \$28M constructed by year 1 and additional \$59M constructed in year 6 for \$87M total - Figures preliminary with further discussion requested	Year 11-15	6.50
	\$2.55	100% calculated as \$28M constructed by year 1 and additional \$59M constructed in year 6 for \$87M total - Figures preliminary with further discussion requested	Year 16-20	7.00
	\$2.55	100% calculated as \$28M constructed by year 1 and additional \$59M constructed in year 6 for \$87M total - Figures preliminary with further discussion requested	Year 21-25	7.00
	\$2.55	100% calculated as \$28M constructed by year 1 and additional \$59M constructed in year 6 for \$87M total - Figures preliminary with further discussion requested	Year 26-50	7.50

	2021 Wholesale Rate ¹	FPB Contribution ² (\$)	Minimum Purchase Assumption ³ (MGD)	
Scenario 3 - High Demand	\$2.55	100% calculated as \$87M by FPB constructed by year 2 - Figures preliminary with further discussion requested	Year 1	5.00
	\$2.55	100% calculated as \$87M by FPB constructed by year 2 - Figures preliminary with further discussion requested	Year 2	5.50
	\$2.55	100% calculated as \$87M by FPB constructed by year 2 - Figures preliminary with further discussion requested	Year 3	5.50
	\$2.55	100% calculated as \$87M by FPB constructed by year 2 - Figures preliminary with further discussion requested	Year 4	6.00
	\$2.55	100% calculated as \$87M by FPB constructed by year 2 - Figures preliminary with further discussion requested	Year 5	6.00
10.0 Average Day Demand - 2045	\$2.55	100% calculated as \$87M by FPB constructed by year 2 - Figures preliminary with further discussion requested	Year 6 - 10	7.00
15 MGD Peak Day Demand - 2045	\$2.55	100% calculated as \$87M by FPB constructed by year 2 - Figures preliminary with further discussion requested	Year 11-15	8.00
	\$2.55	100% calculated as \$87M by FPB constructed by year 2 - Figures preliminary with further discussion requested	Year 16-20	9.00
	\$2.55	100% calculated as \$87M by FPB constructed by year 2 - Figures preliminary with further discussion requested	Year 21-50	10.00

Footnotes:

1 - GMWSS will decommission their water treatment plant in +/- Year 2027 and reduce to the the wholesale rate. GMWSS desires some type of cost control, such as cost of living adjustments or cost of service study to determine fair wholesale rates.

2 - The FPB contribution is capital improvement monies that are provided from the wholesale rate revenue. The remaining monies required for capital improvements would be financed by GMWSS or FPB reimbursed via an additional surcharge.

3 - A minimum purchase has been assumed for calculation of FPB contribution purposes.

4 - Year 1 is 2027.



FPB Assumptions for GMWSS Water Source Assessment Quotes:

If one or more of the assumptions below changes, FPB's wholesale rate quote could require revision. Quotes provided are preliminary until further discussions can be had with GMWSS and their representatives regarding this enhanced partnership.

Scenario 1 Rate Assumptions used by FPB

- **Capital improvements required and timing of improvements:**
 - A new 24" line extension and water treatment plant clearwell addition would be required by Year 1 to meet minimum purchase assumptions for Year 1 through 15 at FPB estimated cost of \$28 million. FPB would begin construction of the line extension and clearwell addition in 2024 with three years of construction complete by Year 1 of partnership. FPB currently has a 24" line from the plant to US 60 (Versailles Road). Assumption has been made that the new 24" line can be extended from that point, therefore, shortening the length to ~ 56,000 feet to the Scott County line (dependent upon final route).
 - A water treatment plant expansion would be required in Year 16 to meet minimum purchase assumptions for the remaining 50 year term at FPB's estimated cost of an additional \$59 million.
 - The total capital improvements needed by FPB for the "Scenario 1 – Low Demand" minimum purchase assumptions would be \$87 million in the two phases detailed above.
 - FPB is offering to contribute 100% of the estimated \$87 million in capital improvements needed under "Scenario 1 – Low Demand" from the volumetric rate of \$2.55 per 1,000 gallons.
- **Capital improvement financing:**
 - FPB would take out a Bond Anticipation Note (BAN) in 2024 to fund the initial line extension and clearwell addition. The BAN would have a three year term and 3% interest rate. The lender would allow interest to be capitalized during construction period. If FPB were to be required to service debt or pay interest only during construction period prior to increased water sales from Georgetown, FPB would need financial assistance agreement with Georgetown to help fund the debt service payments.
 - The BAN would be paid-off at end of year 2026 with funds from a 30 year electric and water revenue bond issuance at 3% interest over the term. FPB would fund the required debt service reserve fund required by bond covenant by adding it to the bond issuance.
 - FPB would finance the plant expansion in Year 16 with another 30 year electric and water revenue bond issuance at 3% interest over the term.
 - If one or more of the financing assumptions above were to change FPB could require a revision to the quoted volumetric rate.



- Rate Structure:
 - FPB's rate structure to Georgetown would remain as it is today with a volumetric rate per 1,000 gallons (quoted), fixed customer charge based on meter size, and Kentucky River Authority withdraw fee.
- Construction cost risk:
 - Final rates would be dependent upon capital improvement costs at the time of construction to protect FPB from rising construction costs.
- Inflation risk:
 - FPB would perform frequent water cost of service studies and adjust rates to Georgetown in accordance with study results to protect company from rising operating costs over partnership. FPB would work to phase in any rate changes equally over time between cost of service studies. FPB prefers incremental rate increase implementation to avoid customer rate shock.

Scenario 2 Rate Assumptions used by FPB

- Capital improvements required and timing of improvements:
 - A new 24" line extension and water treatment plant clearwell addition would be required by Year 1 to meet minimum purchase assumptions for Years 1 through 5 at FPB estimated cost of \$28 million. FPB would begin construction of the line extension and clearwell addition in 2024 with three years of construction complete by Year 1 of partnership. FPB currently has a 24" line from the plant to US 60 (Versailles Road). Assumption has been made that the new 24" line can be extended from that point, therefore, shortening the length to ~ 56,000 feet to the Scott County line (dependent upon final route).
 - A water treatment plant expansion would be required in Year 6 to meet minimum purchase assumptions for years going forward at FPB's estimated cost of an additional \$59 million.
 - The total capital improvements needed by FPB for the "Scenario 2 – Intermediate Demand" minimum purchase assumptions would be \$87 million in the two phases detailed above.
 - FPB is offering to contribute 100% of the estimated \$87 million in capital improvements needed under "Scenario 2 – Intermediate Demand" from the volumetric rate of \$2.55 per 1,000 gallons.



Scenario 2 Rate Assumptions used by FPB (continued)

- **Capital improvement financing:**
 - FPB would take out a Bond Anticipation Note (BAN) in 2024 to fund the initial line extension and clearwell addition. The BAN would have a three year term and 3% interest rate. The lender would allow interest to be capitalized during construction period. If FPB were to be required to service debt or pay interest only during construction period prior to increased water sales from Georgetown, FPB would need financial assistance agreement with Georgetown to help fund the debt service payments.
 - The BAN would be paid-off at end of year 2026 with funds from a 30 year electric and water revenue bond issuance at 3% interest over the term. FPB would fund the required debt service reserve fund required by bond covenant by adding it to the bond issuance.
 - FPB would finance the plant expansion in Year 6 with another 30 year electric and water revenue bond issuance at 3% interest over the term.
 - If one or more of the financing assumptions above were to change FPB could require a revision to the quoted volumetric rate.
- **Rate Structure:**
 - FPB's rate structure to Georgetown would remain as it is today with a volumetric rate per 1,000 gallons (quoted), fixed customer charge based on meter size, and Kentucky River Authority withdraw fee.
- **Construction cost risk:**
 - Final rates would be dependent upon capital improvement costs at the time of construction to protect FPB from rising construction costs.
- **Inflation risk:**
 - FPB would perform frequent water cost of service studies and adjust rates to Georgetown in accordance with study results to protect company from rising operating costs over partnership. FPB would work to phase in any rate changes equally over time between cost of service studies. FPB prefers incremental rate increase implementation to avoid customer rate shock.

Scenario 3 Rate Assumptions used by FPB

- **Capital improvements required and timing of improvements:**
 - A new 24" line extension and water treatment plant clearwell addition would be required by Year 1 at FPB estimated cost of \$28 million. FPB would begin construction of the line extension and clearwell addition in 2024 with three years of construction complete by Year 1 of partnership.



Scenario 3 Rate Assumptions used by FPB (continued)

- A water treatment plant expansion would be required in Year 2 to meet minimum purchase assumptions for remaining 50 year term at FPB's estimated cost of an additional \$59 million.
- The total capital improvements needed by FPB for the "Scenario 3 – High Demand" minimum purchase assumptions would be \$87 million in the two phases detailed above.
- FPB is offering to contribute 100% of the estimated \$87 million in capital improvements needed under "Scenario 3 – High Demand" from the volumetric rate of \$2.55 per 1,000 gallons. The waterline extension may need to begin at the plant depending upon growth pattern. Capital costs for a waterline extension starting at plant in Year 1 and capital costs for a plant expansion in Year 2 could result in the need for a surcharge to be determined and dependent upon capital improvement costs at the time of construction.
- **Capital improvement financing:**
 - FPB would take out a Bond Anticipation Note (BAN) in 2024 to fund initial line extension, clearwell addition, and plant expansion. The BAN would have a three year term and 3% interest rate. The lender would allow interest to be capitalized during construction period. If FPB were to be required to service debt or pay interest only during construction period prior to increased water sales from Georgetown, FPB would need financial assistance agreement with Georgetown to help fund the debt service payments.
 - The BAN would be paid-off at end of term with funds from a 30 year electric and water revenue bond issuance at 3% interest over the term. FPB would fund the required debt service reserve fund required by bond covenant by adding it to the bond issuance.
 - If one or more of the financing assumptions above were to change FPB could require a revision to the quoted volumetric rate and/or possible additional surcharge needed due to capital cost starting at beginning of partnership term.
- **Rate Structure:**
 - FPB's rate structure to Georgetown would remain as it is today with a volumetric rate per 1,000 gallons (quoted), fixed customer charge based on meter size, and Kentucky River Authority withdraw fee.
- **Construction cost risk:**
 - Final rates would be dependent upon capital improvement costs at the time of construction to protect FPB from rising construction costs.
- **Inflation risk:**
 - FPB would perform frequent water cost of service studies and adjust rates to Georgetown in accordance with study results to protect company from rising operating costs over partnership. FPB would work to phase in any rate changes equally over time between cost of service studies. FPB prefers incremental rate increase implementation to avoid customer rate shock.

30" Transmission System - 5.5 MGD Demand (2045)



Alternative	ID	Alignment Start	Alignment Stop	Total Cost	LW Contribution	Funding Gap	Notes
Georgetown	1	I-64 Tank	I-64/Elkhorn Creek	\$ 145,000,000	\$ 89,000,000	\$ 56,000,000	
Frankfort	2			\$ 109,000,000	\$ 89,000,000	\$ 20,000,000	This alignment results in a total project net savings of approximately \$36 million dollars by leveraging existing Frankfort Plant Board transmission infrastructure.
	2a	I-64 Tank	Frankfort Reservoir	\$ 91,000,000			
	2b	Leestown/Duckers Station	I-64 & Elkhorn Creek	\$ 18,000,000			

High Side Estimate

Alternative	ID	Alignment Start	Alignment Stop	Total Cost	LW Contribution	Funding Gap	Notes
Georgetown	1	I-64 Tank	I-64/Elkhorn Creek	\$ 174,000,000	\$ 89,000,000	\$ 85,000,000	
Frankfort	2			\$ 131,000,000	\$ 89,000,000	\$ 42,000,000	This alignment results in a total project net savings of approximately \$43 million dollars by leveraging existing Frankfort Plant Board transmission infrastructure.
	2a	I-64 Tank	Frankfort Reservoir	\$ 109,000,000			
	2b	Leestown/Duckers Station	I-64 & Elkhorn Creek	\$ 22,000,000			

Minimum Purchase Assumption

Year	Demand (MGD)
Year 1	4.0
Year 2	4.0
Year 3	4.0
Year 4	4.0
Year 5	4.0
Year 6-10	4.5
Year 11-15	5.0
Year 16-50	5.5

30" Transmission System - 7.5 MGD Demand (2045)

Mid-Point Estimate

Alternative	ID	Alignment Start	Alignment Stop	Total Cost	LW Contribution	Funding Gap	Notes
Georgetown	1	I-64 Tank	I-64/Elkhorn Creek	\$ 145,000,000	\$ 113,000,000	\$ 32,000,000	
Frankfort	2			\$ 109,000,000	\$ 109,000,000	\$ -	This alignment results in a total project net savings of approximately \$36 million dollars by leveraging existing Frankfort Plant Board transmission infrastructure.
	2a	I-64 Tank	Frankfort Reservoir	\$ 91,000,000			
	2b	Leestown/Duckers Station	I-64 & Elkhorn Creek	\$ 18,000,000			

High Side Estimate

Alternative	ID	Alignment Start	Alignment Stop	Total Cost	LW Contribution	Funding Gap	Notes
Georgetown	1	I-64 Tank	I-64/Elkhorn Creek	\$ 174,000,000	\$ 113,000,000	\$ 61,000,000	
Frankfort	2			\$ 131,000,000	\$ 113,000,000	\$ 18,000,000	This alignment results in a total project net savings of approximately \$43 million dollars by leveraging existing Frankfort Plant Board transmission infrastructure.
	2a	I-64 Tank	Frankfort Reservoir	\$ 109,000,000			
	2b	Leestown/Duckers Station	I-64 & Elkhorn Creek	\$ 22,000,000			

Minimum Purchase Assumption

Year	Demand (MGD)
Year 1	4.0
Year 2	4.5
Year 3	5.0
Year 4	5.0
Year 5	5.0
Year 6-10	6.0
Year 11-15	6.5
Year 16-20	7.0
Year 21-25	7.0
Year 26-50	7.5

30" Transmission System - 10 MGD Demand (2045)

Mid-Point Estimate

Alternative	ID	Alignment Start	Alignment Stop	Total Cost	LW Contribution	Funding Gap	Notes
Georgetown	1	I-64 Tank	I-64/Elkhorn Creek	\$ 145,000,000	\$ 140,000,000	\$ 5,000,000	
Frankfort	2			\$ 109,000,000	\$ 109,000,000	\$ -	This alignment results in a total project net savings of approximately \$36 million dollars by leveraging existing Frankfort Plant Board transmission infrastructure.
	2a	I-64 Tank	Frankfort Reservoir	\$ 91,000,000			
	2b	Leestown/Duckers Station	I-64 & Elkhorn Creek	\$ 18,000,000			

High Side Estimate

Alternative	ID	Alignment Start	Alignment Stop	Total Cost	LW Contribution	Funding Gap	Notes
Georgetown	1	I-64 Tank	I-64/Elkhorn Creek	\$ 174,000,000	\$ 140,000,000	\$ 34,000,000	
Frankfort	2			\$ 131,000,000	\$ 131,000,000	\$ -	This alignment results in a total project net savings of approximately \$43 million dollars by leveraging existing Frankfort Plant Board transmission infrastructure.
	2a	I-64 Tank	Frankfort Reservoir	\$ 109,000,000			
	2b	Leestown/Duckers Station	I-64 & Elkhorn Creek	\$ 22,000,000			

Minimum Purchase Assumption

Year	Demand (MGD)
Year 1	5.0
Year 2	5.5
Year 3	5.5
Year 4	6.0
Year 5	6.0
Year 6-10	7.0
Year 11-15	8.0
Year 16-20	9.0
Year 21-50	10.0