WASHINGTON CITY
CULINARY WATER MASTER PLAN UPDATE, USER RATE ANALYSIS, IMPACT FEE ANALYSIS, AND IMPACT FEE FACILITIES PLAN

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I. INTRODUCTION

Washington City is located in Washington County along Interstate 15 in southwestern Utah. The City is geographically split into three sections north-to-south by both I-15 and the Virgin River. Washington City has a long agricultural heritage that is still active in the Washington Fields area of the City. However, with rapid residential growth, much of the Washington Fields area is changing from a rural to a suburban community. Residential and commercial growth are impacting nearly every area of the City.

Washington City completed a Culinary Waster Master Plan update in 2017, which was an update to the 2012 Culinary Water Master Plan. The City has contracted with Sunrise Engineering to complete an update to the 2017 plan.

The culinary water system has been analyzed under the State of Utah Division of Drinking Water guidelines to determine the current system status and to evaluate possible system needs as the community grows during the next 20 years. As part of this plan, Sunrise Engineering, Inc. has recommended improvements to the culinary water system and has developed a potential financing plan that will help Washington City obtain the necessary funds for the recommended improvements. This report does not analyze water rights or water treatment.

This plan also serves as the City's Impact Facilities Plan and includes an Impact Fee Analysis.

II. SYSTEM USERS ANALYSIS

A. LENGTH OF PLANNING PERIOD

It is typical for a Master Plan to use a 10 or 20-year planning period. For example, the first year of a 10-year planning period would be the year 2023 with the 10th and final year being 2032. This plan will use fiscal years and will assume a 20-year (2023-2042) planning period for recommended improvements. This period will allow an adequate evaluation of the system for potential infrastructure improvements or other needs. Revenue sources should be carefully evaluated each year as budgets are set by the city council.

B. PROJECTED GROWTH RATE

An important element in the development of the water system and capacity analysis is the projection of the City's population growth rate on an annual basis. This projection gives the planner an idea of the potential future demands on the culinary water system for the length of the planning period. All planning for the future should be based on the expected population growth.

Projecting the number of future culinary water connections can be a subjective process. The most effective method of estimating the number of future connections is by analyzing historical numbers of connections, recent building permits, and census records. Figure II-1 below shows the historic population for the City.

Figure II-1: Historic Population

Calendar Year	Population	Est. Growth Rate
2016	26,099	-
2017	27,401	4.99%
2018	29,411	7.34%
2019	31,058	5.60%
2020	33,678	8.44%
2021	38,015	12.88%
2022	40,594	6.78%

In recent years, the growth rate in the community has varied widely. At the time of the previous plan, the City anticipated a moderate growth rate for the planning window. However, Washington City has experienced high growth rates during the past decade, much greater than was anticipated in the 2017 Master Plan Update. In addition, there are plans to expand the system and number of connections which will further increase the future population.

City staff looked at the upcoming developments in different stages of the approval process to determine a realistic number of anticipated new connections in future years. The number of anticipated new connections was used to determine a growth rate. In the discussions with City

staff, it was determined that the immediately foreseeable growth may not be sustainable over the 20-year planning period, and therefore a lesser growth rate was determined for the latter years of the planning period. The following growth rates were used for this study:

- 2023-2025 (first 3 years) – 6.9% per year
- 2026-2028 (second 3 years) –5.5% per year
- 2029-2032 (next 4 years) – 4.0% per year
- 2033-2042 (last 10 years) – 3.5% per year

C. PROJECTED POPULATION & NUMBER OF CONNECTIONS

Based on the forecasted growth rates referenced above, the number of connections the City will need to plan for can be calculated with the compound interest formula shown below:

$$F = P(1 + i)^N$$

F = Future Population P = Present Population
i = Projected Growth Rate N = Years

This equation was used to project the community population and number of connections for each year in the planning period. Figure II-2 shows a summary of the growth rate analysis. Appendix A shows the full analysis.

Figure II-2: Growth Rate Analysis Summary

Calendar Year	Population	Est. Growth rate	# of Conn.
2022	40,594	-	13,916
2023	43,395	6.9%	14,876
2024	46,389	6.9%	15,903
2025	49,590	6.9%	17,000
2026	52,318	5.5%	17,935
2027	55,195	5.5%	18,921
2028	58,231	5.5%	19,962
2029	60,560	4.0%	20,761
2030	62,982	4.0%	21,591
2031	65,502	4.0%	22,455
2032	68,122	4.0%	23,353
2033	70,506	3.5%	24,170
2034	72,974	3.5%	25,016
2035	75,528	3.5%	25,892
2036	78,171	3.5%	26,798
2037	80,907	3.5%	27,736
2038	83,739	3.5%	28,707
2039	86,670	3.5%	29,711
2040	89,703	3.5%	30,751
2041	92,843	3.5%	31,827
2042	96,092	3.5%	32,941

It is important to understand that projected growth rates are not the cornerstone of this plan. If the maximum number of system connections projected is reached earlier or later than anticipated, future improvements to support growth may come either earlier or later.

D. PROJECTED EQUIVALENT RESIDENTIAL UNITS (ERU)

The water system is made up of multiple connection types. Washington City reports their different connections to the state as either residential, commercial, industrial, or institutional. Figure II-3 shows a summary of the number of connections by type.

Figure II-3: Total Number of Units Per Connection Type

Calendar Year	Residential	Commercial	Industrial	Institutional	Total
2016	8,878	270	29	62	9,239
2017	9,599	291	30	100	10,020
2018	10,286	315	30	91	10,722
2019	10,919	346	28	93	11,386
2020	11,827	302	30	94	12,253
2021	12,674	394	46	99	13,213
2022	13,442	323	49	102	13,916

Each connection type uses different amounts of water at different rates. In order to properly analyze the system usage, the number of connections are converted to equivalent residential units (ERU). This is done by taking the average usage per connection of each connection type and dividing by the usage per connection of residential connections. Figure II-4 and Figure II-5 show the ERU per connection type and the total number of ERUs. This plan will use the number of ERUs instead of the number of connections to evaluate existing and future needs.

Figure II-4: ERUs Per Connection Type

Calendar Year	Residential	Commercial	Industrial	Institutional
2022	1.0	6.5	2.0	9.5

Figure II-5: Total Number of ERUs Per Connection Type

Calendar Year	Residential	Commercial	Industrial	Institutional	Total
2016	8,878	1,158	17	932	10,985
2017	9,599	1,248	18	1,502	12,368
2018	10,286	1,351	18	1,367	13,022
2019	10,919	1,484	16	1,397	13,817
2020	11,827	1,296	18	1,412	14,553
2021	12,674	1,690	27	1,487	15,879
2022	13,442	1,386	29	1,533	16,389

E. AVERAGE CULINARY WATER USAGE

The State of Utah Public Drinking Water regulations require public water systems to meet requirements based upon usage. These requirements are found in Rule R309 of the State Code.

The code provides a minimum standard usage based upon the types of connections serviced in a system. The code says to use a minimum average day usage of 400 gallons per day (gpd) per ERU for indoor use and an additional 13.6 gpd per irrigated acre in the system area. However, if available, systems can use actual usage date to calculate and project usage demands. The City has flow meters that are able to provide real time flow data. This study looked at both the state's minimum standard and the historical usage to determine the appropriate usage to use for this study.

The historical usage from the City was based on meter data over the past 4 years (2019-2022). The average usage per ERU was calculated from the historical usage. The total average usage over the past 4 years was divided by the average number of ERUs and then converted to gpd/ERU as shown in the calculations below.

2,647,998,000 gallons / 15,159 ERU = 174,677 gallon/ERU/year
174,677 gallon/ERU/year / 365 days/year = 478.9 gpd/ERU

Figure II-6 shows a summary of the average usage and historical data gathered by the City through water metering.

Figure II-6: Washington City Historical Usage Summary

Calendar Year	Total Usage (Thousand gallons)	Number of ERUs	Usage Per ERU (gpd/ERU)
2019	2,428,666	13,817	481.6
2020	2,626,927	14,553	494.6
2021	2,634,571	15,879	454.6
2022	2,901,830	16,389	485.1
4-Year Average:	2,647,998	15,159	478.9

The 478.9 gpd/ERU average usage calculated from the City's historical usage includes both indoor and outdoor water. This demand is lower than the states combined indoor and outdoor average day demand. This plan will determine usage demand from the historical usage instead of the numbers from the State Code. This method will result in a more realistic analysis.

One important note for this plan is that construction takes water from the culinary water system. This water isn't being used by Washington City connections, and therefore, should not be included in the required demand for source or storage. The amount of construction water has been counted by meters and tabulated over the last 3 years. The volume of water shown in the results above and that are used for this report do not include construction water. Construction water will be discussed in a later section.

The calculations in this report will be based on the historical average usage of 478.9 gpd/ERU (0.33 gpm/ERU). It is recommended that future improvements be sized based on this average usage.

F. PEAK DAY DEMAND CULINARY WATER USAGE

Peak Day Demand (PDD) is defined by the Utah Administrative Code as the "anticipated water demand on the day of the highest water consumption". The state minimum The state code uses double the average day demand to calculate the PDD. The code states that this can be used in lieu of actual meter data. Washington City has provided their meter data from 2019 to 2022 and the actual PDD was found. The water meters measured how much water was used every minute of every day. This total was summed up for every day of the year and the highest daily total volume used was determined to be the PDD. This was done for all 4 years of data provided. The PDD was divided by the number of ERUs to find the PDD in terms of gpd/ERU.

Figure II-7 below shows a summary of the PDD from 2019 to 2021.

Figure II-7: Washington City Historical PDD Summary

Calendar Year	Peak Day Demand (gal)	ERUs	PDD (gpd/ERU)
2019	13,330,000	13,817	964.7
2020	13,735,000	14,553	943.8
2021	13,718,000	15,879	863.9
2022	13,637,000	16,389	832.1
		AVG	901.1

The historical average PDD from the last 4 years was found to be 901 gpd. All further calculations with the PDD will use this number.

G. PEAK INSTANTANEOUS DEMAND CULINARY WATER USAGE

Peak Instantaneous Demand (PID) can be described as the highest demand on the system at any one instance. The Utah Administrative Code states that for systems with 240 connections or greater, the equation Q=1.6N, where N equals the number of connections, can be used to find the PID. If available, this can be determined based on meter readings. In the case of this study, usage data on a per minute basis is available from the last 4 years. Figure II-8 below shows the PID from the last 4 years of data.

Figure II-8: Washington City Historical PID Summary

Calendar Year	Peak Instant Date	Peak Instantaneous Demand (gal)	Peak Instantaneous Demand (gal)
2019	2-Sep	1,248,949	20,816
2020	13-Jul	1,571,003	26,183
2021	12-Jul	1,282,092	21,368
2022	18-Jul	1,186,019	19,767
	AVG	1,322,016	22,034

The PID that will be used for this study is 22,034 gpm.

H. USAGE REDUCTION - CONSERVATION

This plan assumes a conservation rate of 0.5% per year over the planning period (10% by the end of planning window). This conservation factor is used to represent conservation efforts from the City, existing customers, or new connections. The assumed conservation results in the following demands at the end of the planning window.

- ADD (2042) = 433 gpd/ERU
- PDD (2042) = 815 gpd/ERU

The conservation factor is not used for the PID. As mentioned above, the PID is the highest demand on the system at any given moment. Conservation efforts do not have a major impact on the amount of water that could be used at any given moment.

Conservation is a major focus for Washington City and the surrounding communities. The 0.5% conservation rate assumed in this plan is a relatively small reduction from conservation. The City has a conservation goal that is higher than 0.5% per year. The City's Water Conservation Plan established a goal that would have usage drop to 12,200 gal a month or 406 gpd/ERU. This is a reduction of 18% from current usage. If this was achieved in the planning window this would be a reduction of 0.9% per year or more.

III. WATER SOURCE CAPACITY ANALYSIS

A. EXISTING WATER SOURCE

To analyze source capacity, all available culinary water sources must first be identified. These sources are listed in Figure III-1. The flow capacity numbers were acquired from City staff.

Figure III-1: Washington City Existing Water Sources

Wells	Total Flow	
	CFS	gpm
No. 2	0.909	408
No. 3	0.245	110
No. 4	1.453	652
No. 5	1.689	758
No. 6	1.448	650
Grapevine Well No. 1	0.207	93
Grapevine Well No. 2	0.180	81
Grapevine Well No. 3	0.227	102
Grapevine Well No. 4	0.303	136
Grapevine Well No. 5	0.254	114
Grapevine Well No. 6	0.430	193
Subtotal Wells =	7.346	3,297
Microfiltration (Quail Lake)	4.345	1950
Washington Dam Booster	6.005	2695
Fields Road WCWCD Connection	8.913	4000
East Regional WCWCD Connection	8.913	4000
SHRP WCWCD Connection	3.342	1500
Grand Totals =	38.864	17,442

Most of the source capacity is currently coming from connections to the Washington County Water Conservancy District (WCWCD).

B. EXISTING REQUIRED WATER SOURCE CAPACITY

State of Utah Public Drinking Water Regulations, R309-510-7 states that a water system's source needs to meet "the anticipated water demands on the day of the highest water consumption, which is the Peak Day Demand". The PDD was determined previously as 930 gpd/ERU. The source capacity demand for the water system was calculated by multiplying the PDD from Section II-F by the total number of existing ERUs in the system. The results of the analysis are presented in gallons per minute and are shown in Figure III-2.

Figure III-2: Required Source Capacity (Existing Conditions)

Total Required Source Capacity	**10,256**	gpm
Total Existing Source Available	**17,442**	gpm
Existing Culinary System Source Capacity Surplus	**7,186**	gpm
Surplus Capacity can Serve	**11,483**	ERUs

PROJECTED REQUIRED WATER SOURCE CAPACITY

Projected required source capacity for the 10-year and 20-year planning periods uses the same calculations as above. These calculations reveal that the water system will have a deficit of source capacity. The projected required source capacity for the 10-year and 20-year planning periods are shown in Figure III-3 and Figure III-4.

Figure III-3: Required Source Capacity (10-Year Planning Period)

Total Required Source Capacity	16,370	gpm
Total Existing Source Available	17,442	gpm
Culinary System Source Capacity Deficit	1,072	gpm

Figure III-4: Required Source Capacity (20-Year Planning Period)

Total Required Source Capacity	21,962	gpm
Total Existing Source Available	17,442	gpm
Culinary System Source Capacity Deficit	-4,520	gpm

C. RECOMMENDED WATER SOURCE CAPACITY IMPROVEMENTS

The analysis above shows that the existing available source is sufficient to accommodate an existing peak day demand. However, based on the growth rates used in this plan the City will run out of available source by 2034.

At the current time, there are no other feasible new source improvements for the City to develop. New source capacity will most likely come from purchasing water from the WCWCD. One major drawback to this option is that the WCWCD does not guarantee that there is additional water available to be purchased. The City should work closely with WCWCD to plan for future needs.

The other major drawback to purchasing additional water from the WCWCD is cost. Currently the cost to purchase 1,000 gallons of culinary grade water is $1.54 and is anticipated to increase to $1.74 by 2025. The amount of water currently purchased will carry the city through the 10-year planning window. However, by the end of the 20-year window the additional water the city would need to purchase would amount to approximately $617,000 annually. Note that this cost is just the purchase cost to the district. This cost does not include costs to get water into the system such as pumping costs. This number also assumes the district rate does not increase after 2025.

Another option to increase source capacity is using secondary water for outdoor use. Implementing an irrigation system that uses secondary water will help alleviate the amount of culinary source required to meet the demands of the system. Every gallon of non-culinary water used for outdoor watering adds a gallon of water available for culinary use. Figure III-5 below shows a summary of average indoor versus outdoor usage in the City.

Figure III-5: Average Outdoor Vs. Indoor Water Use

Calendar Year	Avg Daily Usage (gal)	Avg Indoor Usage (gal)	Avg Outdoor Usage (gal)	% Outdoor Usage
2019	6,653,879	2,514,968	4,138,910	62%
2020	7,197,060	2,566,333	4,630,727	64%
2021	7,218,003	3,053,133	4,164,870	58%
2022	7,950,219	3,712,078	4,238,141	53%
Avg	7,254,790	2,961,628	4,293,162	59%

The following information was discovered while comparing indoor vs outdoor watering use in the City:

- Approx. 59% of culinary water is used for outdoor watering on a daily basis.
- In one year approximately 1.5 billion gallons of culinary water is used for outdoor watering.

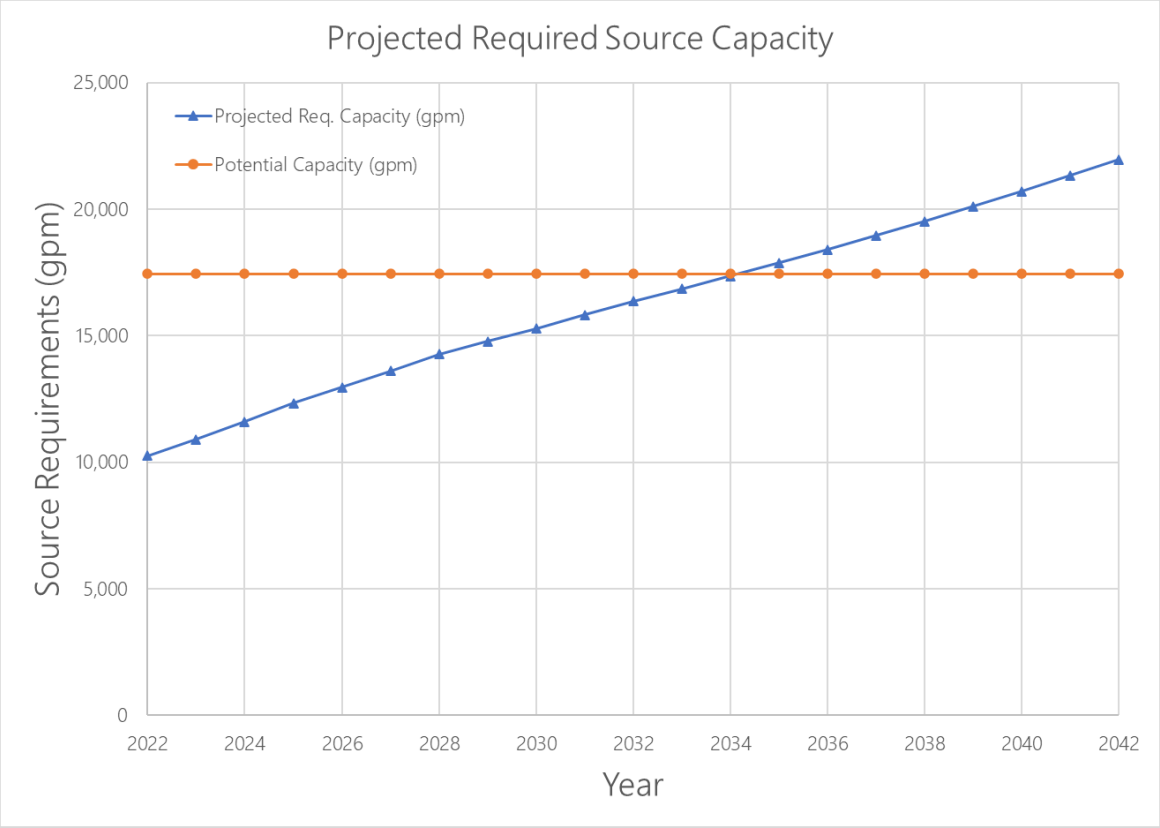
The major downside for a secondary water system is also cost. This cost is initially in the form of upfront capital cost to design and construct a pressurized irrigation system. The City does have some infrastructure already in place that could be used as a starting point to implement an irrigation system with a smaller amount of upfront costs than constructing a completely new system.

This plan assumes that future source water will come from purchasing additional water from the WCWCD. To deliver this water to the system, pump stations will need to be constructed and connections made to WCWCD lines. These pump station projects are included in the recommended distribution improvements.

D. SOURCE CAPACITY SUMMARY

Figure III-6 shows the comparison between the available source capacity and the projected required source capacity.

Figure III-6: Projected Source Capacity



IV. WATER STORAGE CAPACITY ANALYSIS

Water storage capacity requirements are found in the State of Utah Public Drinking Water Regulations, R309-510. These regulations require storage for the community's culinary water system to meet one full day's average use requirement for all connections in the system, in addition to fire flows, for a minimum of two hours, and emergency storage as deemed necessary.

A. EXISTING WATER STORAGE CAPACITY

There are currently seven culinary water storage tanks in Washington City. These tanks are identified in Figure IV-1 below:

Figure IV-1: Storage Capacity Summary

Existing Storage Capacity:	Available Storage (gal)
RED CLIFFS 2 MG TANK	2,110,000
RED CLIFFS 1 MG TANK	1,020,000
RED CLIFFS 2.3 MG TANK	2,320,000
GRAPE VINE 1 MG TANK	1,060,000
WARNER VALLEY TANK	1,030,000
WASHINGTON DAM ROAD TANK	2,270,000
WATER TREATMENT PLANT TANK	CT ONLY
Total Existing Storage Capacity	**9,810,000**

B. EXISTING REQUIRED WATER STORAGE CAPACITY

As shown in Section II-E, average water usage per ERU, also known as the Average Day Demand (ADD), in the water system is 478.9 gpd/ERU for both indoor and outdoor usage. In general, fire flow requirements are set by the local Fire Authority or are based on building size and type of construction. At the direction of the City, this plan uses 1,500 gpm, the same minimum fire flow as the previous plans.

The required storage capacity was calculated by multiplying the ADD by the total number of ERUs currently existing in the system. When compared with the system's total storage capacity summarized above, the calculation shows that the City has a small surplus of total storage capacity under current conditions. The results of this analysis are shown in Figure IV-2.

Figure IV-2: Required Storage Capacity (Existing Conditions)

Total Required Storage Capacity	8,029,456	gal
Total Existing Storage Capacity	9,810,000	gal
Existing Culinary System Storage Capacity Surplus	1,780,544	gal
Surplus Capacity can Serve	3,718	ERUs

C. PROJECTED REQUIRED WATER STORAGE CAPACITY

The projected culinary water storage capacity required at the end of the planning period is determined from the same factors explained in Section B above, but the projected number of ERUs are inserted into the calculations instead of the number of existing ERUs. The results of the analysis are shown below in Figure IV-3 and Figure IV-4.

Figure IV-3: Required Storage Capacity (10-Year Planning Window)

Total Required Storage Capacity	12,708,360	gal
Total Existing Storage Capacity	9,810,000	gal
Projected Culinary System Storage Capacity Deficit	-2,898,360	gal

Figure IV-4: Required Storage Capacity (20-Year Planning Window)

Total Required Storage Capacity	16,988,484	gal
Total Existing Storage Capacity	9,810,000	gal
Projected Culinary System Storage Capacity Deficit	-7,178,484	gal

D. RECOMMENDED WATER STORAGE CAPACITY IMPROVEMENTS

The analysis above shows that the City has adequate storage for their current needs. However, with the projected growth of this plan the required storage will surpass the storage that is currently available. This plan provides recommended improvements to provide the future required storage capacity.

An analysis was done to determine the number of buildout ERUs and where these ERUs will be located within the current city boundary. This was done by using the City's current zoning map and assuming the City would be built out to the max density allowed by the current zones. For this analysis the City was divided into thirds (north, central, and south). Storage to consider elevation requirements. The analysis resulted in the following number of additional ERUs per region to achieve buildout:

- North: 6,000 ERUs
- Central: 6,000 ERUs
- South: 16,000 ERUs

The additional ERUs to reach buildout will require approximately 14 million gallons of storage. With the City's existing storage surplus there is approximately 1 million gallons available in the north section of the City. This results in the need for an additional 13 million gallons of storage tanks to be constructed to achieve buildout. The following is the approximate storage needs for each section of the City based on the current ADD and storage requirements:

- North: 2 million gallons
- Central: 3 million gallons

- South: 8 million gallons

Based on the growth rate used for this plan it is anticipated that buildout will occur beyond the 20-year planning window. To accommodate the projected storage requirements this plan recommends six storage projects to be installed in the central and south areas of the City. The north section does not include any locations of suitable elevation and location for installing a storage structure. However, one of the six storage tanks is located to provide some storage to address the demand of the north section.

With the existing surplus and the storage from a portion of one of the proposed storage tanks there will be approximately 2.5 million gallons provided for the north towards build out growth. An additional 500 Thousand gallons of storage will be required in the north to handle build out ERU's. This additional storage is anticipated to happen outside the 20-year planning window.

The following are descriptions of the recommended improvements as well as their recommended size and installation window. It is important to note that the installation window is approximate based on today's data. Windows are subject to change based on development areas and the City's ability to obtain land to install tanks.

1. 0 to 5 YEAR IMPROVEMENTS

- Long Valley Tank – This tank is located in the vicinity of the Long Valley development that is currently under construction. It is recommended that this tank be a 2.5-million-gallon tank. This tank is currently in the design process and anticipated to be constructed in 2023.

- Airport Tank 1 – This tank will be located in the south end of the City near the airport. It is recommended that this tank be a 2.5-million-gallon tank. The primary purpose of this tank will be to serve the new developments near the airport. This tank is planned to be located on BLM property and will require working with BLM to obtain approval.

- Sunrise Valley Tank – This tank will be located south of the landfill and west of Sunrise Valley. This tank will serve the new Sunrise Valley development and surrounding area. This tank will also serve portions of Coral Canyon that are on a lower pressure zone. It is recommended that this tank be a 2.5-million-gallon tank.

2. 5 to 10 YEAR IMPROVEMENTS

- There are no recommended improvements for storage in the 5-10 year planning window, unless accelerated growth results in the need for sooner improvements.

3. 10 to 20 YEAR IMPROVEMENTS

- Airport Tank 2 – As the area around the airport develops further, additional storage will be required for the area. This tank is recommended to be 2.5 million gallons and to be located adjacent to the first Airport Tank.

- Majestic Tank – This tank will be located west of SR-7. This tank would serve the southern Washington Fields area and is recommended to be a 2.5-million-gallon tank.

- Stucki Farms Tank – This tank would be located west of the Stucki Farms Development, on the ridge between Stucki Farms and southern Washington Fields. This tank is recommended to be a 1-million-gallon tank and will serve the southern Washington Fields area.

These recommended storage improvements are summarized in Figure IV-5. Appendix D includes an exhibit showing the location of these improvements.

Figure IV-5: Summary of Recommended Storage Improvements

Proposed Tank	Approx. High Water Elevation (ft)	Available Storage (gal)	Est. Installation Date
Long Valley 2.5 MG Tank	3140	2,500,000	2023
Airport 1 2.5 MG Tank	3040	2,500,000	2024
Sunrise Valley 2.5 MG Tank	3000	2,500,000	2025
Airport 2 2.5 MG Tank	3040	2,500,000	2032
Majestic 2.5 MG Tank	3040	2,500,000	2036
Stucki Farms 1 MG Tank	2815	1,000,000	2038
Total Projected New Storage		**13,500,000**	

E. STORAGE CAPACITY SUMMARY

Figure IV-6 and Figure IV-7 both show the comparison between the available storage capacity and the projected required storage capacity. The available storage capacity in Figure IV-7 represents the storage capacity available with the implementation of the recommended improvements.

Figure IV-6: Projected Storage Capacity with Existing Conditions

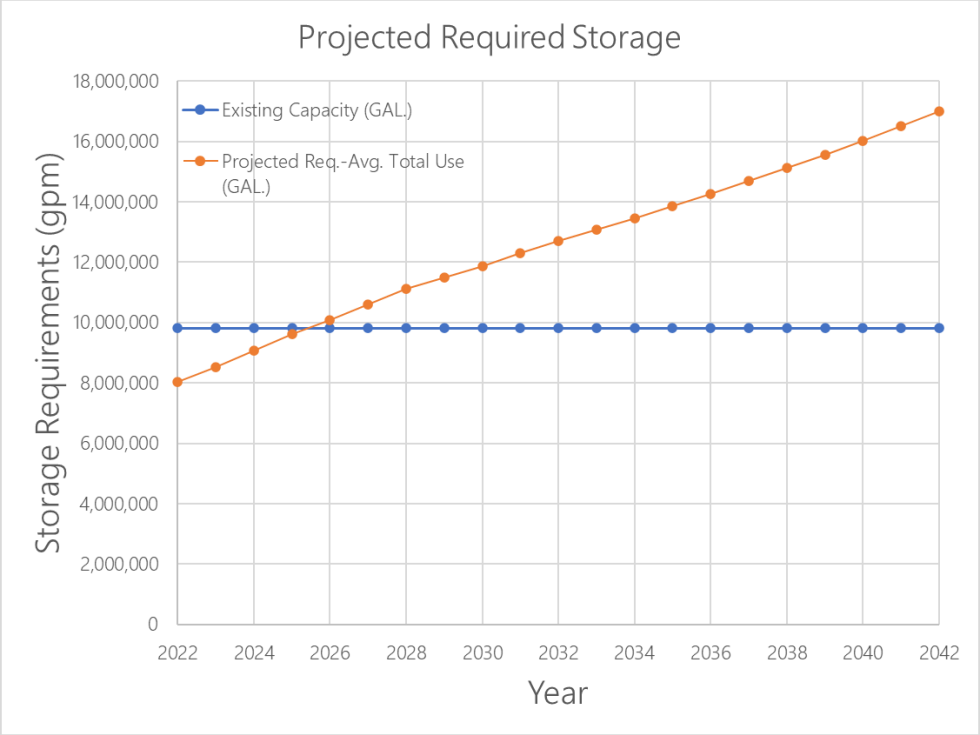
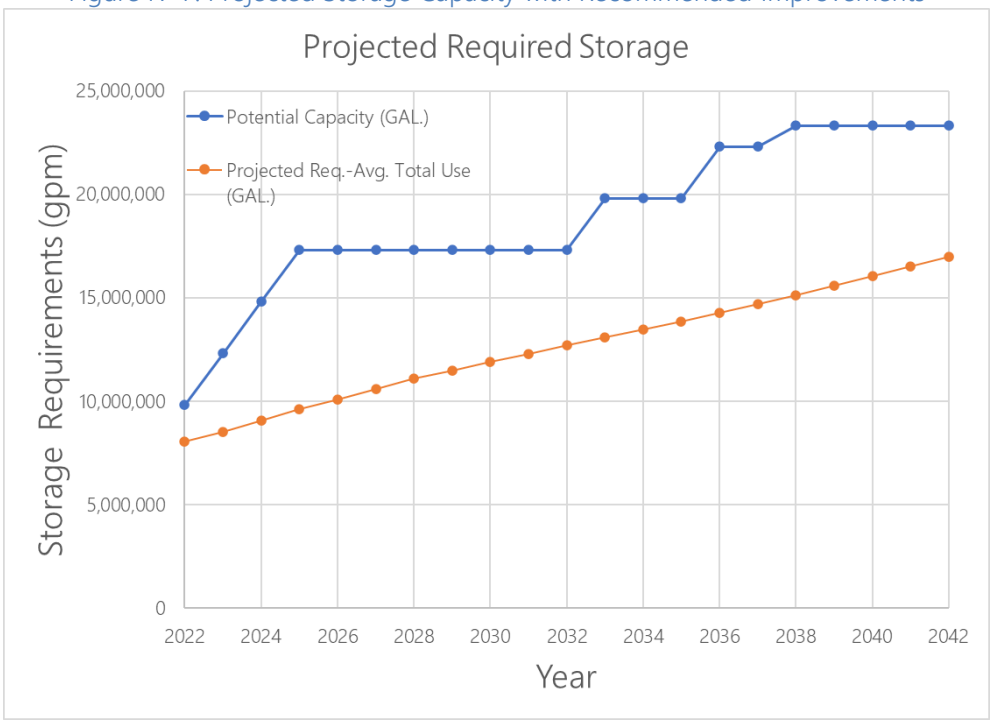


Figure IV-7: Projected Storage Capacity with Recommended Improvements



V. WATER DISTRIBUTION SYSTEM ANALYSIS

The State of Utah Public Drinking Water Regulations, R309-105-9, states three pressure conditions which must be met to demonstrate adequate service capacity of a system. These conditions are:

- At least 40 psi must be retained as residual pressure in the distribution system under a Peak Day Demand (PDD).
- At least 30 psi must be retained as residual pressure in the distribution system under Peak Instantaneous Demand (PID)
- At least 20 psi must be retained as residual pressure in the distribution system under PDD plus fire flow conditions.

The existing Washington City culinary water distribution system has been modeled using the computer program Water Gem by Bently. Historically, the distribution system was modeled in a static scenario to analyze Average Day, Peak Instantaneous, and Peak Day with fire flow demands. In addition to the static scenario, a dynamic model was created using the real time flow data available from the City's meters. The dynamic model provides a view of how the system's sources, storage, and distribution system, including pumps and valves, work together to provide the continuous demands to the system.

The main benefit to the dynamic water model is that it will provide a tool for City staff to evaluate and plan how the system will function based on adjustments such as turning on or off certain pumps or adjusting a setting on a PRV. This will also give the City staff the ability to come up with solutions for emergency scenarios and faster feedback than trying the solutions in the field first.

A. EXISTING DISTRIBUTION SYSTEM ANALYSIS

The existing PDD and PID were calculated in Section II. These flows are shown below:

- PDD – 901 gpd/ERU = 10,256 gpm with the existing number of ERUs
- PID – 22,034 gpm

As mentioned in Section IV, this report used a fire flow of 1,500 gpm.

The existing model scenarios for Peak Day Demand, Peak Day Demand with fire flow, and Peak Instantaneous Demand, show that the existing system is adequate to meet these demands with the exception of a couple small areas. These areas include:

- Perry's Landing - this is a development on the north edge of the city below the Red Cliff storage tanks. The development is on the top edge of the lower pressure zone and therefore experiences low pressures and fire flows.

- Shadow Ridge - this is a small area on the north side of Telegraph on the west side of town. Currently the main line into the area is a 6" line that does not provide adequate fire flow.

- Lion's Head Dr. - this is located in the Green Spring area. Lions Head Dr. is located on the edge of a pressure zone and the high end of the pressure zone shows low fire flows.

B. PROJECTED DISTRIBUTION SYSTEM ANALYSIS

The projected distribution system was modeled in a static scenario with the following future demands:

- PDD – 832 gpd/ERU = 21,962 gpm with the projected (2042) number of ERUs
- PID – 52,157 gpm
- Fire flow of 1,500 gpm

Most of the new growth will occur in newly developed areas. Because of this, the new developments will be required to install the needed distribution improvements for the development. The new demand on the system is not anticipated to have enough of an impact on the existing distribution system to cause areas to fall below the State's minimum pressure requirements or for pipe velocities to be above 5 feet per second.

The new growth areas do require transmission lines to deliver water to the development or the storage tanks that are serving the development. As discussed in the source capacity section these new developments will also require additional source which will need to come from WCWCD. To deliver this source capacity, new pump stations will be needed.

This section includes the recommended transmission lines, and booster pump stations.

C. RECOMMENDED DISTRIBUTION SYSTEM IMPROVEMENTS

The following are descriptions of the recommended improvements as well as their recommended size and installation window:

1. 0 to 5 YEAR IMPROVEMENTS

- Washington Fields Transmission Line – This project will extend the transmission line in Washington Fields Road south towards the airport for the future development in the area, and be used for getting water to the Airport Tank. This project is currently being designed and is planned to be constructed in 2023.

- Airport Connection Phase 1 – This is a booster pump station that will be constructed near the Washington Fields Transmission line. The booster pump will be used to take water from the WCWCD line to fill the Airport Tank using the Washington Fields Road transmission line. This is anticipated to be approximately a 1,500-gpm booster pump station and constructed in 2024

- Perry's Landing Pressure Zone Adjustment – This project will add piping and valving to the development to adjust the pressure zone and move the development into the higher-pressure zone. This project Is anticipated to be installed in 2024.

- Fields Road to Airport Tank Transmission – This project is a transmission line that connects the Fields Road Transmission line and the Airport Tank. It is anticipated that this project will be installed in 2024.

- Sunrise Valley Transmission Line – This transmission line will have two segments one will run from the proposed Sunrise Valley tank to Sunrise Valley. The second segment will tie into the Coral Canyon line in Telegraph Road. It is anticipated that this project will be constructed in 2025.

- Shadow Ridge 6" Line Replacement – This project replaces an existing 6" with an 8" line to increase pressures and fire flows in the area. This project is anticipated to be installed in 2025.

- Lions Head Dr. PRV – This project adds a connection between the two pressure zones in the area and adds a low flow PRV allowing for fire flows to cross between pressure zones to increase fire flow in the lower pressure zone area. This project is anticipated to be installed in 2025.

2. 5 to 10 YEAR IMPROVEMENTS

- This plan does not have any recommended distribution projects included in the 5-to-10-year window.

3. 10 to 20 YEAR IMPROVEMENTS

- East Regional Connection Phase 2 – This project will expand the existing East Regional pump station to double the flow that it can produce. The project will involve renovating the existing building, adding more pumps, and installing a parallel transmission line that follows the alignment of the first phase of the East Regional Connection Project. This project is anticipated to be constructed in 2033.

- Church Farm Road Transmission Line – This transmission line is anticipated to run from Warner Valley Road to the Airport Tanks via Church Road. This project is anticipated to be installed in 2033.

- Airport Connection Phase 2 – This project will expand the first phase pump station to increase the flow that it can produce. It is anticipated that the flow will need to be increased by 1,700 gpm. This project is anticipated to be constructed in 2034.

- Airport Connection Phase 3 – This project will add a second booster pump station and connection to the WCWCD line in Warner Valley Road. This pump station will deliver water to the Airport tanks. It is anticipated that this pump will need to produce 5,000 gpm. This pump station will deliver water to the tanks via the Church Road transmission line.

VI. SUMMARY OF RECOMMENDED IMPROVEMENTS

Figure IV-1 is a summary of all the recommendations for improvements to the storage and distribution systems. As mentioned before, there are no specific source recommendations, except as they relate to the distribution needs to deliver water from the WCWCD. Project installation years are estimated for planning purposes. Actual project time frames will be based on development locations, availability of funding, and availability of land to install project.

Figure VI-1: Summary of Recommended Improvements

Storage Improvements	Est. Installation Year	Est. Cost
Long Valley - 2.5 MG Tank	2023	$ 7,538,500
Airport 1 - 2.5 MG Tank	2024	$ 6,613,300
Sunrise Valley - 2.5 MG Tank	2025	$ 6,996,700
Airport 2 - 2.5 MG Tank	2033	$ 6,524,700
Majestic - 2.5 MG Tank	2036	$ 7,596,800
Stucki Farms - 1 MG Tank	2038	$ 5,504,300
	Storage Subtotal =	**$ 40,774,300**
Distribution Improvements	**Est. Installation Year**	**Est. Cost**
Washington Fields Rd. Transmission Line	2023	$ 2,716,800
Fields Road To Airport Tank Transmission Line	2024	$ 4,410,300
Airport Connection Phase 1	2024	$ 994,900
Perry's Landing Pressure Zone Adjustment	2024	$ 389,900
Sunrise Valley Transmission Line	2025	$ 2,186,700
Shadow Ridge 6" Line Replacement	2025	$ 264,000
Lion's Head Dr. PRV	2025	$ 164,400
Church Road Transmission Line	2033	$ 4,357,400
East Regional Connection Phase 2	2033	$ 8,587,800
Airport Connection Phase 2	2034	$ 3,217,200
Airport Connection Phase 3	2037	$ 3,811,500
	Distribution Subtotal =	**$ 31,100,900**
Grand Total of All Projects		**$ 71,875,200**

**This summary is estimated with 2023 prices*

A. ENGINEER'S OPINION OF PROBABLE COST

Opinions of probable cost for the recommended improvements have been prepared and are included in Appendix C. Opinions of probable cost for each of the capital projects are based on experience with similar projects, bid tabulations from past projects, and from information provided by the City through prior experience.

It is important to note that cost estimates from this update are significantly higher than the previous master plan. It is common for project costs to increase over time with inflation. Typically, it is expected to see an annual increase of approximately 3%. Due to the material and construction market changes that have happened from 2020 to now the market has experienced project cost increases between 50 to 100% from 2019 costs. This increase in project costs is

reflected in the opinions of cost for the recommended projects. These increased costs are also a factor in the increases to fees in later sections.

The opinions of probable project costs included in this report are planning-level cost only. As the City seeks to undertake specific projects, more detailed and updated costs should be prepared to guide project development though the preliminary engineering and budgeting acquisition phases.

VII. WATER CONSERVATION

The analyses above show that the City will have deficiencies in both source and storage capacities within the 10-year window. One way for the City to mitigate the need or timing of these improvements is through conservation.

The usage analysis in this plan is based on historic usage. If the per ERU usage is reduced, that would reduce the Average Day, Peak Day, and Peak Instantaneous Demands. A reduction in these demands could delay the need for some of these improvements.

A. SECONDARY WATER USE (IRRIGATION)

As mentioned in the source capacity analysis, most of the City's outdoor watering uses culinary water. This results in approximately 1.5 billion gallons of culinary water being used for outdoor purposes each year. There are no available source improvements the City could make to get culinary grade water but there are options to increase and implement secondary water sources. These potential options include the pursuit of rights for new wells, shares to get water from the Virgin River, improving existing spring and well irrigation sources, and in the near future, the WCWCD's Warner Valley Reservoir.

The City already has some existing infrastructure in place for a pressurized irrigation system. Connecting this existing system to an irrigation source would immediately begin to alleviate the existing required source capacity.

One of the challenges of implementing a secondary water system is the quality of water of the sources that are available. Many of the available sources such as the canal company and wells in the fields are high in Total Dissolved Solids (TDS) which is not good for plants. For a full functioning system, it is likely that the high TDS source would need to be blended with higher quality spring water or possible even culinary water before being utilized into a system.

B. CONSERVATION FOCUSED USER RATE STRUCTURE

One way to promote potential conservation is through the City's user rate structure. Washington City currently has a tiered user rate structure. This means that after a customer uses a specified amount of water the rate they are charged per thousand gallons goes up. For example, the current rate structure charges $0.74 per thousand gallons used for the first 5,000 gallon and then $0.86 per thousand gallons for the next 5,000 gallons.

This tier structure can be used to incentivize conservation from all customers by increasing the rates of their higher rate tiers. A higher gap in the fees for each tier will incentivize customers to use less water or pay a higher monthly water bill. A similar program has been introduced by the Washington County Water Conservancy District. Their program places a fee for all usage over a certain amount.

A user rate analysis is part of this plan and is shown in a later section. That analysis looks at a conservation focused tier structure as part of the recommended user rate.

C. WATER CONSERVANCY DISTRICT PROGRAMS

The Washington County Water Conservancy District has multiple programs that the City and residents could use to promote water conservation. The District's website has a list of programs and incentives that are currently available. Below is the website that contains a list of available programs.

https://www.wcwcd.org/conservation/programs/

D. CONSTRUCTION WATER

Currently the water used for construction projects in the City is culinary grade water. This is because there is no other option available in the city. As mentioned earlier, this water was not included in the sizing requirement for the water system as it is not being used by Washington City connections. However, when culinary water is being used for construction, that water is not available for the residents of the City. Construction water demands on the system could be mitigated by providing non-culinary grade water for construction. This could include secondary (irrigation water) or reuse water. Figure VII-1 shows the annual construction water use over the last 4 years.

Figure VII-1: Annual Construction Water Usage

Calendar Year	Total Construction Water Usage (gal)
2019	59,127,000
2020	131,619,000
2021	169,356,000
2022	139,832,000

VIII. POSSIBLE FINANCING PLAN

In discussions with Staff and looking at the water system financials, after the construction of the Long Valley Tank the impact fee and water fund balances will not have enough funds to construct the other remaining recommended projects in the recommended time frame. Based on current data the City may need to finance the first few projects in order for them to be constructed in the recommended time frame. This plan assumes that the City will seek financing options for the construction of the following projects:

- Airport Tank 1
- Fields Road to Airport Transmission Line
- Airport Connection Phase 1
- Sunrise Valley Tank
- Sunrise Valley Transmission Line

For culinary water projects typical sources of funding include Utah's Division of Drinking Water (DDW), the Utah Community Impact Board (CIB), or the open market. At this time, it is not anticipated that any grant money would be available for these projects. This plan assumes that any funding would come as a loan. This plan uses a loan term of 30 years at 2.5%. These terms are only for planning purposes.

The above five projects can realistically be combined into two projects, the Airport Tank and Sunrise Valley Tank projects. This is done to simplify the possible financing plan into two bonds, one for each project. Using the costs from Section VI, accounting for inflation, and using the terms mentioned above results in the following new debt services:

- Airport Tank Project - $591,442/year
- Sunrise Valley Tank – $465,482/year

These debt services will be used for the financial analyses in later sections.

IX. FINANCIAL ANALYSIS

A. EXISTING USER RATE

Water rates are a combination of base rates and overage (or variable) rates. The base rate is charged to all connections in the system whether or not water is used and should cover all fixed costs of the system. Overage rates are often set to encourage water conservation and should cover variable costs of the system. Washington City currently has the following rate structure:

Meter Size	Base Rate
5/8"	$18.17
3/4"	$18.17
1"	$33.00
1 1/2"	$73.00
2"	$130.00
3"	$291.00
4"	$517.00
6"	$1,163.00

Tier	Threshold Gallons	Washington City	WCWCD*	Rate/1000 gal
1	0 - 5,000	$0.74	$0.96	$1.70
2	5,001 - 10,000	$0.86	$0.96	$1.82
3	10,001 - 15,000	$0.98	$0.96	$1.94
4	15,001 - 20,000	$1.10	$0.96	$2.06
5	20,001 - 25,000	$1.20	$0.96	$2.16
6	25,001 - 30,000	$1.34	$0.96	$2.30
7	30,001 - 35,000	$1.51	$0.96	$2.47
8	35,001 - 40,000	$1.68	$0.96	$2.64
9	40,001 - Unlimited	$1.85	$0.96	$2.81

Increases in the base rate are correlated to connection size. The base rates are proportional to the surface area of the respective meter. For example, a 1 ½" water meter has four times the area of the ¾" water meter. Thus, the base rate for a 1 ½" water meter is four times the standard base rate.

B. WCWCD RATE

A large portion of the water source used in the City comes from the WCWCD. Currently the City is charged $1.54 per thousand gallons that it delivers to residents. WCWCD is increasing this rate by $0.10 every year through 2025.

The City provides in its rate structure a per thousand-gallon cost for water from the WCWCD. This is a weighted average that takes into account the amount of source that the City provides that is not from WCWCD. During the previous user rate adjustment, the City produced

approximately 60% of the water being used with the remaining 40% coming from the WCWCD. Taking into account the cost for the City to produce 1,000 gallons of water vs the cost to purchase 1,000 gallons of water it was calculated that the weighted average cost of water to residents was $0.96.

In 2022 the city only produced 40% of the water and the remaining 60% came from the WCWCD. As the City continues to grow this number will continue to grow further apart. By using the same method of a weighted average, the average cost for 1,000 gallons is $1.41. It is recommended that the city increase its WCWCD portion of the user rate to $1,41.

As stated previously, the WCWCD rate for water is increasing annually. It is recommended that the City increase this portion each year to match the increase of the WCWCD water cots.

In addition to the cost for purchasing water from the WCWCD, each user is also charged a $1.75 surcharge each month from the WCWCD.

C. AVERAGE RATE DETERMINATION

The study provides an average rate analysis to determine the average water rate per ERU needed to cover the expenses of the water system. The analysis uses recent fiscal year expenses and annual budgets to project the following year's expenses, and also uses new expenses associated with proposed improvements such as new debt services. This analysis considers projected expenses and income sources to determine the amount of revenue needed to be generated by user rates.

The target revenue needed from user rates is divided by the estimated number of ERUs serviced by the system and converted to an average monthly rate. This gives the average user rate needed per ERU to cover the expenses of the water system. The analysis results in an average user rate per ERU of $57.23 per month. The table below shows the user rate analysis.

Figure IX-1 User Rate Analysis

Average Water Rate Analysis Washington City						
FY 2024	%	Fixed	%	Variable	Total	
SalariesRegular	90%	$ 1,092,635	10%	$ 121,404	$ 1,214,038	
Employee Benefits	90%	$ 732,148	10%	$ 81,350	$ 813,497	
Overtime	0%	$ -	100%	$ 21,113	$ 21,113	
Uniforms	80%	$ 4,984	20%	$ 1,246	$ 6,230	
Dues And Memberships	0%	$ -	100%	$ 3,756	$ 3,756	
Software Subscriptions	0%	$ -	100%	$ 1,031	$ 1,031	
Training & Travel	0%	$ -	100%	$ 11,833	$ 11,833	
Office Equipment- Supplies & Maint.	25%	$ 5,102	75%	$ 15,307	$ 20,409	
Supplies & Materials	25%	$ 67,702	75%	$ 203,106	$ 270,808	
Fuel	0%	$ -	100%	$ 38,550	$ 38,550	
Fleet Charges	25%	$ 17,002	75%	$ 51,006	$ 68,008	
Small Tools & Minor Equipment	25%	$ 2,509	75%	$ 7,528	$ 10,037	
Building & Grounds	75%	$ 9,821	25%	$ 3,274	$ 13,095	
Utilities	10%	$ 124,490	90%	$ 1,120,413	$ 1,244,903	
Telephone	25%	$ 3,609	75%	$ 10,827	$ 14,436	
Professional & Technical	25%	$ 28,539	75%	$ 85,618	$ 114,158	
Water Purchase Sandhollow	0%	$ -	100%	$ 2,709,367	$ 2,709,367	
Water Purchase Quail Lake Raw	0%	$ -	100%	$ 988,914	$ 988,914	
Administrative Costs	50%	$ 189,283	50%	$ 189,283	$ 378,567	
District Surcharge	0%	$ -	100%	$ 400,273	$ 400,273	
Uncolectable accounts	100%	$ 5,931	0%	$ -	$ 5,931	
Fees & Charges	0%	$ -	100%	$ 5,410	$ 5,410	
Miscellaneous Service	0%	$ -	100%	$ 2,894	$ 2,894	
Other Projects	30%	$ 244,195	70%	$ 569,789	$ 813,984	
Funded Depreciation	100%	$ 1,500,000	0%	$ -	$ 1,500,000	
Total O&M Expenses					**$ 10,671,243**	
OTHER EXPENSES						
Capital Projects/ Replenish Enterprise Fund	0%	$ -	100%	$ 1,658,076	$ 1,658,076	
EXISTING DEBT SERVICE NOT IMPACT FEE ELIGIBLE						
Water Revenue Refunding Bonds 2016B	100%	$ 411,770	0%	$ -	$ 411,770	
NEW DEBT SERVICE						
Airport Tank and Transmission Line	100%	$ 591,442	0%		$ 591,442	
Sunrise Valley Tank and Tansmission Line	100%	$ 465,482	0%		$ 465,482	
TOTAL EXPENSES:		$ 5,496,645		$ 8,301,368	**$ 13,798,013**	
OTHER INCOME (BESIDES WATER SALES)						
Connection Fees	0%	$ -	100%	$ 453,326	$ 453,326	
Other Revenue (Hydrant Meters, etc.)	0%	$ -	100%	$ 665,939	$ 665,939	
Interest	30%	$ 59,904	70%	$ 139,777	$ 199,681	
Total Other Income:		$ 59,904		$ 1,259,042	**$ 1,318,946**	
Total Expenses - Total Other Income:		$ 5,436,741		$ 7,042,326	**$ 12,479,067**	
Total Project System Billed ERU's in FY 2024		18,729		18,729	**18,729**	
Monthly Cost Per Billed ERU in FY 2024		$ 24.19		$ 31.33	**$ 55.53**	
BASE AND OVERAGE RATE DETERMINATION						
Resident Base Cost (0 Gallons)		**$ 24.19**				
Non-Resident Base Cost (0 Gallons)		**$ 48.38**				
Resident Variable Cost (Avg Usage)				**$ 31.33**		
Non-Resident Variable Cost (Avg Usage)				**$ 62.67**		
Average Use/Billed ERU (Gal)				12,200		
Resident Cost/1000 Gallons				$ 2.57		
Total Average Monthly Resident Rate/Billed ERU					**$ 55.53**	
Total Average Monthly Non-Resident Rate/Billed ERU					**$ 111.05**	
WCWCD Surcharge (Surcharge is added on top of base rate)					**$ 1.75**	

D. BASE AND OVERAGE RATE DETERMINATION

All expenses and other income is separated into fixed and variable costs to calculate the base and overage rates. This splits the total average rate into an average base rate and an average overage rate. For an average residential user, the base rate was calculated as $24.19 per month and the average overage rate as $31.33 per month for a total of $55.53. These calculations are based on residents of Washington City. Non-residents base rates are double the resident rates at $48.38 and the average overage rate at $62.67. Figure IX-2 shows a summary of the calculated monthly base rate for each meter size. It should be noted that the WCWCD surcharge is not included in the $55.53 calculated above and the $1.75 surcharge would be added to the base rate.

Figure IX-2: Calculated Base Rate

Meter Size	Base Rate
5/8"	$24.19
3/4"	$24.19
1"	$44.00
1 1/2"	$97.00
2"	$173.00
3"	$388.00
4"	$689.00
6"	$1,549.00

The average rate determinations above are higher than what the City is currently collecting from users. This indicates that the City will not be able to cover the required project and ongoing expenses with the current user rate structure. It is recommended that the City establish a new rate structure so that the water system is collecting enough revenue to cover expenses. The figures below (Figures IX-3 to IX-5) show the recommended base rate structure based on this analysis.

While changing the overage rate structure it is recommended that the City creates a structure that promotes conservation. One of the main benefits of a tiered overage rate structure is that it promotes conservation by incentivizing users to use less water and those that choose not to are charged a higher rate. The City's current rate does provide this to an extent. However, as water availability and cost are becoming more of an issue, the City desires to increase its conservation efforts. One way to do this is to create a tier structure that is "more aggressive" and has further separation in costs between the tiers. This plan provides 3 options of what an increased tier rate could look like. These options are provided below.

Figure IX-3: Possible Overage Rate Structure Option 1

Tier	Threshold Gallons	Washington City	WCWCD*	Rate/1000 gal
1	0 - 12,000	$1.16	$1.41	$2.57
2	12,001 - 15,000	$1.28	$1.41	$2.68
3	15,001 - 20,000	$1.40	$1.41	$2.81
4	20,001 - 25,000	$1.54	$1.41	$2.95
5	25,001 - 30,000	$1.70	$1.41	$3.11
6	30,001 - 35,000	$1.87	$1.41	$3.28
7	35,001 - 40,000	$2.05	$1.41	$3.46
8	40,001 - 45,000	$2.26	$1.41	$3.67
9	45,001 & Up	$2.49	$1.41	$3.89
Average Water Use Cost Based On		12,200	gal	**$31.36**
			Base Rate	**$24.19**
Total Average Water Bill (Base Rate Plus Overage Plus $1.75 Surchage)				**$57.30**

Figure IX-4: Possible Overage Rate Structure Option 2

Tier	Threshold Gallons	Washington City	WCWCD*	Rate/1000 gal
1	0 - 12,000	$1.16	$1.41	$2.57
2	12,001 - 20,000	$1.45	$1.41	$2.86
3	20,001 - 30,000	$1.81	$1.41	$3.22
4	30,001 - 40,000	$2.26	$1.41	$3.67
5	40,001 & Up	$2.83	$1.41	$4.24
Average Water Use Cost Based On		12,200	gal	**$31.39**
			Base Rate	**$24.19**
Total Average Water Bill (Base Rate Plus Overage Plus $1.75 Surchage)				**$57.33**

Figure IX-5: Possible Overage Rate Structure Option 3

Tier	Threshold Gallons	Washington City	WCWCD*	Rate/1000 gal
1	0 - 12,000	$1.16	$1.41	$2.57
2	12,001 - 20,000	$1.28	$1.41	$2.68
3	20,001 - 30,000	$1.59	$1.41	$3.00
4	30,001 - 40,000	$2.39	$1.41	$3.80
5	40,001 & Up	$3.59	$1.41	$5.00
Average Water Use Cost Based On		12,200	gal	**$31.36**
			Base Rate	**$24.19**
Total Average Water Bill (Base Rate Plus Overage Plus $1.75 Surchage)				**$57.30**

Another factor to consider with conservation is that a reduction in water use is also a reduction in water sales and therefore a reduction in revenue. Historically the City's overage rate has been set up so that the historical average water use would cover the variable expenses. The historical usage typically would put a user into the third tier of the rate structure. It is possible that if this method continues, when the City hits its conservation goal the variable expenses would not be covered because more users would not fall into the second or third tier. Therefore, it is recommended that the rate structure be set so that the first tier would cover all variable expenses. The 3 options mentioned above incorporate this idea.

E. CASH FLOW

A 20-year cash flow analysis was prepared for this update. This cash flow shows several years of past revenues and expenses, along with twenty years of projected revenues and expenses for the water system. These projections are based on assumptions of inflation, growth, average rates, proposed, projects, etc. Calculations for average rates and impact fees have been carried over to the cash flow analysis. The cash flow analysis is shown in Appendix E

Water rates and fees should be reviewed by the City periodically to ensure that they keep up with inflation rates and increased costs in system maintenance. Washington City does not have to adopt the amounts shown in the rate analysis. However, the rates suggested are calculated to cover expenses and ensure that the water fund remains viable.

X. IMPACT FEES

This report constitutes an Impact Fee Facilities Plan to determine the public facilities requirement to serve growth resulting from new development activity. A community may charge an impact fee to provide funding for the projects required by this growth. The total cost that is eligible for the impact fee assessment is equal to the portion of any planned improvements project that will be constructed in the planning window. The combined costs for these projects are divided by the projected number of new ERUs that will be added to the system. Impact fees can also cover debt service that is incurred by projects that provide excess capacity to be used for growth.

A. EXISTING IMPACT FEES

Figure X-1 below shows the existing impact fees charged by Washington City. The existing impact fees are associated with meter size and ERU's per meter size.

Figure X-1: Existing Impact Fees

Meter Size	ERUs	Impact Fee
5/8" & 3/4"	1	$2,412.00
1"	1.78	$4,288.00
1 1/2"	4.00	$9,648.00
2"	7.11	$17,152.00
3"	16.00	$38,592.00
4"	28.44	$68,608.00
6"	64.00	$154,368.00

B. PROPOSED IMPACT FEES

This plan includes an Impact Fee Analysis to determine the updated fee that the City can assess for its culinary water impact fee. As stated above an impact fee covers the cost for a project falling within the planning window, which for this analysis is 10 years. The impact fee can also cover debt services for past projects that can be attributed to growth.

According to state impact fee laws, impact fees must be used within six years (6) of their receipt. This plan accounts for incoming fees to be used for eligible projects and debts in the continuous six-year window.

The max allowable impact fee is calculated to be $4,741.98 per ERU. This is $2,329.98 more than the existing impact fee. Figure X-2 shows the results of the impact fee analysis. This considerable increase is primarily due to increases in construction and material costs over the past 3 years.

Figure X-2: Impact Fee Analysis

Impact Fee Analysis Washington City					
Existing Debt Service	**Debt to be Paid FY2024-33**			**Impact Fee % Eligible**	**Eligible Costs**
Water Revenue Refunding Bonds 2016B	$ 5,244,791			34%	$ 1,783,229
Subtotal					**$ 1,783,229**
Proposed Improvement Projects (FY2024-34)	**Total Current Estimated Cost**	**Year of Improvement**		**Impact Fee % Eligible**	**Eligible Costs w/ Inflation**
Plans/Studies					
Culinary Water Master Plan	$ 60,000	2028		100%	$ 67,531
Subtotal					**$ 67,531**
Source Projects					
0	$ -	2030-2033		100%	$ -
Subtotal					**$ -**
Storage Projects (0-10 yr)					
0	$ 7,538,500	2024		100%	$ 7,538,500
0	$ 11,023,600	2025		100%	$ 11,354,308
0	$ 9,183,400	2026		100%	$ 9,742,669
0	$ 7,596,800	2032		100%	$ 9,623,399
Subtotal					**$ 38,258,876**
Distribution Projects (0-10 yr)					
Washington Fields Rd. Transmission Line	$ 2,716,800	2024		100%	$ 2,716,800
Airport Connection PH1	$ 994,900	2025		100%	$ 1,024,747
Perry's Landing Pressure Zone Adjustment	$ 389,900	2025		0%	$ -
Sunrise Valley Transmission Line	$ 2,186,650	2026		100%	$ 2,319,817
Shadow Ridge 6" Line Replacement	$ 264,000	2026		0%	$ -
Lion's Head Dr. PRV	$ 164,400	2027		0%	$ -
Subtotal					**$ 6,061,364**
Total Cost Eligible For Impact Fee					**$ 46,170,999**
Projected No. of Existing Culinary ERUs (beginning FY 2024)					18,729
Anticipated No. of Culinary ERUs (beginning FY 2033)					28,465
No. of New ERUs Due to Growth					**9,737**
Maximum Impact Fee = Total Eligible Cost / New ERU's					**$ 4,741.98**

Part of the impact fee analysis is to determine what percentage each project of the capital facilities plan is impact fee eligible. The impact fee eligible percentage of the existing debt service was determined in a previous master plan and should be carried over for the life of the debts. The majority of projects in the capital facilities plan are driven fully by growth, meaning that if growth were to suddenly stop in the City these projects would not be needed. Because these projects are driven fully by growth, they are considered 100% impact fee eligible. The projects not driven by growth are intended to address existing problems and therefore are not considered impact fee eligible.

It is important to note these impact fees are for the improvements shown in the 0 to 10-year planning window and do not provide for the City to design and build anything beyond the proposed projects. All new additions to the system will need to be considered in the impact fee calculations. Otherwise, developers should be required to make the improvements.

C. CONNECTION FEES

Currently the City charges a connection for any new water service that is connected to the system. These existing connection fees are shown below in

Figure X-3: Existing Connection Fees

Meter Size	Connection Fee
5/8" & 3/4"	$277
1"	$352
1 1/2"	$629
2"	$822
3"	$2,060
4"	$2,501
6"	$4,687

According to Utah State law, connection fees are to not be more than the actual cost of establishing the connection including a water meter and labor to connect the meter to the water main line. Figure X-4 shows proposed connection fees based on meter size. This includes the cost of the meter, and associated materials, and 2 hours of labor and equipment expense. These fees should be looked at periodically and adjusted as prices for materials and labor increase.

Figure X-4: Proposed Connection Fees

Meter Size	Connection Fee
5/8" & 3/4"	$380
1"	$480
1 1/2"	$772
2"	$974
3"	$1,562
4"	$1,987
6"	$3,107

D. IMPACT FEE RELATED ITEMS

In general, it is beneficial to update this impact fee facilities plan and analysis at least every five years, or more frequently if drastic growth or changes affect the assumptions and data in this plan. It is assumed that this plan will be updated as recommended.

There are a few items relating to impact fees that Washington City must consider when planning for, collecting, and expending impact fees in accordance with Utah Code 11-36a-101.

City staff must understand that impact fees can only be expended for a system improvement that is identified in the Impact Fee Facilities Plan and is for the specific facility type for which the fee was collected. Impact fees must be expended or encumbered for permissible use within six

years of their receipt unless 11-6a-602(2)(b) applies. Also, impact fees must have proper accounting (track each fee in and out) in accordance with Utah Code 11-36a-601.

In accordance with Utah Code 11-36a-306 a certification of impact fee analysis is located in Appendix E.

APPENDIX A
Growth Rate Analysis

Population & Growth Rate				
Calendar Year	Population	Est. Growth rate	# of Conn.	# of ERU
2022	40,594	-	13,916	16,389
2023	43,395	6.9%	14,876	17,520
2024	46,389	6.9%	15,903	18,729
2025	49,590	6.9%	17,000	20,021
2026	52,318	5.5%	17,935	21,122
2027	55,195	5.5%	18,921	22,284
2028	58,231	5.5%	19,962	23,509
2029	60,560	4.0%	20,761	24,450
2030	62,982	4.0%	21,591	25,428
2031	65,502	4.0%	22,455	26,445
2032	68,122	4.0%	23,353	27,503
2033	70,506	3.5%	24,170	28,465
2034	72,974	3.5%	25,016	29,462
2035	75,528	3.5%	25,892	30,493
2036	78,171	3.5%	26,798	31,560
2037	80,907	3.5%	27,736	32,665
2038	83,739	3.5%	28,707	33,808
2039	86,670	3.5%	29,711	34,991
2040	89,703	3.5%	30,751	36,216
2041	92,843	3.5%	31,827	37,483
2042	96,092	3.5%	32,941	38,795

APPENDIX B
Water Use Analysis

Historical Usage Table			
Year	Total Usage (Thousand gallons)	Number of ERUs	Usage Per ERU (gpd/ERU)
2019	2,428,666	13,817	481.6
2020	2,626,927	14,553	494.6
2021	2,634,571	15,879	454.6
2022	2,889,856	16,389	483.1
4-Year Average:	2,645,005	15,159	478.4

Peak Instantaneous Demand Table			
Calendar Year	Peak Instant Date	Peak Instantaneous Demand (gal)	Peak Instantaneous Demand (gal)
2019	2-Sep	1,248,949	20,816
2020	13-Jul	1,571,003	26,183
2021	12-Jul	1,282,092	21,368
	18-Jul	1,186,019	19,767
	AVG	1,322,016	22,034

**This data was provided by the City and uses real-time meter data*

$$Required\ Source\ Capacity = \#ERU\ X\ \frac{gpd}{\#ERU}\ X\ \frac{1\ Day}{24\ hr}\ X\ \frac{1\ hr}{60\ min}$$

$$Required\ Storage\ Capacity = \#ERU\ X\ \frac{gpd}{\#ERU} + Fire\ Flow\ (1{,}500gpm)\frac{60\ min}{1\ hr}\ X\ 2hr$$

Current & Projected Required Source Capacity						
Calendar Year	# of ERU	% Reduction in Usage Per ERU	Peak Day Usage (gpm/ERU)	Source Capacity Required (gpm)	Existing Source Available (gpm)	Source Capacity Surplus/Deficit (gpm)
2022	16,389	0.5%	901.14	10,256	17,442	7,186
2023	17,520	0.5%	896.64	10,909	17,442	6,533
2024	18,729	0.5%	892.15	11,603	17,442	5,839
2025	20,021	0.5%	887.69	12,342	17,442	5,100
2026	21,122	0.5%	883.25	12,956	17,442	4,486
2027	22,284	0.5%	878.84	13,600	17,442	3,842
2028	23,509	0.5%	874.44	14,276	17,442	3,166
2029	24,450	0.5%	870.07	14,773	17,442	2,669
2030	25,428	0.5%	865.72	15,287	17,442	2,155
2031	26,445	0.5%	861.39	15,819	17,442	1,623
2032	27,503	0.5%	857.09	16,370	17,442	1,072
2033	28,465	0.5%	852.80	16,858	17,442	584
2034	29,462	0.5%	848.54	17,361	17,442	81
2035	30,493	0.5%	844.29	17,878	17,442	(436)
2036	31,560	0.5%	840.07	18,412	17,442	(970)
2037	32,665	0.5%	835.87	18,961	17,442	(1,519)
2038	33,808	0.5%	831.69	19,526	17,442	(2,084)
2039	34,991	0.5%	827.53	20,109	17,442	(2,667)
2040	36,216	0.5%	823.40	20,708	17,442	(3,266)
2041	37,483	0.5%	819.28	21,326	17,442	(3,884)
2042	38,795	0.5%	815.18	21,962	17,442	(4,520)

Storage Capacity Analysis								
Calendar Year	# of ERU	% Reduction in Usage Per ERU	Average Day Usage (gpd/ERU)	Required Storage Capacity (gal)	Existing Storage Capacity (gal)	Storage Capacity Surplus/Deficit (gal)	Projected Storage Capacity (gal)	Projected Storage Capacity Surplus/Deficit (gal)
2022	16,389	0.5%	478.4	8,021,255	9,810,000	1,788,745	9,810,000	1,788,745
2023	17,520	0.5%	476.1	8,520,390	9,810,000	1,289,610	12,310,000	3,789,610
2024	18,729	0.5%	473.7	9,051,298	9,810,000	758,702	14,810,000	5,758,702
2025	20,021	0.5%	471.3	9,616,000	9,810,000	194,000	17,310,000	7,694,000
2026	21,122	0.5%	468.9	10,085,205	9,810,000	(275,205)	17,310,000	7,224,795
2027	22,284	0.5%	466.6	10,577,742	9,810,000	(767,742)	17,310,000	6,732,258
2028	23,509	0.5%	464.3	11,094,769	9,810,000	(1,284,769)	17,310,000	6,215,231
2029	24,450	0.5%	461.9	11,474,603	9,810,000	(1,664,603)	17,310,000	5,835,397
2030	25,428	0.5%	459.6	11,867,655	9,810,000	(2,057,655)	17,310,000	5,442,345
2031	26,445	0.5%	457.3	12,274,386	9,810,000	(2,464,386)	17,310,000	5,035,614
2032	27,503	0.5%	455.1	12,695,270	9,810,000	(2,885,270)	17,310,000	4,614,730
2033	28,465	0.5%	452.8	13,068,538	9,810,000	(3,258,538)	19,810,000	6,741,462
2034	29,462	0.5%	450.5	13,452,939	9,810,000	(3,642,939)	19,810,000	6,357,061
2035	30,493	0.5%	448.3	13,848,804	9,810,000	(4,038,804)	19,810,000	5,961,196
2036	31,560	0.5%	446.0	14,256,477	9,810,000	(4,446,477)	22,310,000	8,053,523
2037	32,665	0.5%	443.8	14,676,307	9,810,000	(4,866,307)	22,310,000	7,633,693
2038	33,808	0.5%	441.6	15,108,660	9,810,000	(5,298,660)	23,310,000	8,201,340
2039	34,991	0.5%	439.4	15,553,907	9,810,000	(5,743,907)	23,310,000	7,756,093
2040	36,216	0.5%	437.2	16,012,434	9,810,000	(6,202,434)	23,310,000	7,297,566
2041	37,483	0.5%	435.0	16,484,636	9,810,000	(6,674,636)	23,310,000	6,825,364
2042	38,795	0.5%	432.8	16,970,922	9,810,000	(7,160,922)	23,310,000	6,339,078

APPENDIX C
Engineers Opinion of Probable Cost

Recommended Improvements Project List

1. Long Valley Tank
2. Airport Tank 1
3. Sunrise Valley Tank
4. Airport Tank 2
5. Majestic Tank
6. Stucki Farms
7. Washington Fields Road Transmission Line
8. Fields Road to Airport Tank Transmission Line
9. Airport Connection Phase 1
10. Perry's Landing Pressure Zone Adjustment
11. Sunrise Valley Transmission Line
12. Shadow Ridge 6" Line Replacement
13. Lion's Head Drive PRV
14. Church Farm Road Transmission Line
15. East Regional Connection Phase 2
16. Airport Connection Phase 2
17. Airport Connection Phase 3

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Engineer's Opinion of Probable Cost

LONG VALLEY TANK
WASHINGTON CITY

13-Mar-23
BCW/tcd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 282,700.00	$ 282,700.00
2	Traffic Control	1	LS	$ 2,000.00	$ 2,000.00
3	Pre-Construction DVD	1	LS	$ 1,000.00	$ 1,000.00
4	Dust Control & Watering	1	LS	$ 10,000.00	$ 10,000.00
5	Subsurface Investigation	30	HR	$ 250.00	$ 7,500.00
6	Restore Surface Improvements	1	LS	$ 10,000.00	$ 10,000.00
7	Construction Staking	1	LS	$ 12,000.00	$ 12,000.00
8	Earthwork for Tank	1	LS	$ 400,000.00	$ 400,000.00
9	Access Road (Road Base)	16,500	SF	$ 2.00	$ 33,000.00
10	2.5MG Concrete Storage Tank	1	LS	$ 3,500,000.00	$ 3,500,000.00
11	Tank Site Appurtenances	1	LS	$ 250,000.00	$ 250,000.00
12	16" PVC, Fittings, Installation, Bedding, and Backfill	4,330	LF	$ 130.00	$ 562,900.00
13	16" Butterfly Valve Assembly	6	EA	$ 8,000.00	$ 48,000.00
14	6" Combination Air Valve	2	EA	$ 12,500.00	$ 25,000.00
15	Bitimunous Surface Course	15,600	SF	$ 6.00	$ 93,600.00
16	Solid Rock Excavation	490	CY	$ 50.00	$ 24,500.00
17	Misc. Tie-Ins and Connections	1	LS	$ 40,000.00	$ 40,000.00
18	Wash Crossing	1	LS	$ 40,000.00	$ 40,000.00
19	Highway Crossing	1	LS	$ 100,000.00	$ 100,000.00
20	Booster Station Building	1	LS	$ 225,000.00	$ 225,000.00
21	Booster Pumps	1	LS	$ 100,000.00	$ 100,000.00
22	Misc Pump Piping/Connections	1	LS	$ 50,000.00	$ 50,000.00
23	Electrical Improvements	1	LS	$ 120,000.00	$ 120,000.00
			SUBTOTAL		**$ 5,937,200.00**
			CONTINGENCY	20%	**$ 1,187,440.00**
			CONSTRUCTION TOTAL		**$ 7,124,640.00**
INCIDENTALS					
1	Engineering Design	2.2%	LS	$ 167,500.00	$ 167,500.00
2	Bidding & Negotiating	0.1%	HR	$ 9,700.00	$ 9,700.00
3	Engineering Construction Services	1.8%	HR	$ 138,800.00	$ 138,800.00
4	Topographic & Property Survey	0.1%	EST	$ 10,000.00	$ 10,000.00
5	Geotechnical Report	0.2%	EST	$ 12,900.00	$ 12,900.00
6	SCADA Design & Improvements	0.7%	EST	$ 50,000.00	$ 50,000.00
7	Miscellaneous Professional Services	0.3%	EST	$ 25,000.00	$ 25,000.00
			SUBTOTAL		$ 413,900.00
			TOTAL PROJECT COST		**$ 7,538,540.00**

In providing opinions of probable construction cost, the Client understands that the Engineer has no control over costs or the price of labor, equipment or materials, or over the Contractor's method of pricing, and that the opinion of probable construction cost provided herein is made on the basis of the Engineer's qualifications and experience. The Engineer makes no warranty, expressed or implied, as to the accuracy of such opinions compared to bid or actual costs.

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Engineer's Opinion of Probable Cost

AIRPORT TANK 1
WASHINGTON CITY

13-Mar-23
BCW/tcd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 226,200.00	$ 226,200.00
2	Traffic Control	1	LS	$ 3,000.00	$ 3,000.00
3	Pre-Construction DVD	1	LS	$ 3,000.00	$ 3,000.00
4	Dust Control & Watering	1	LS	$ 15,000.00	$ 15,000.00
5	Subsurface Investigation	8	HR	$ 250.00	$ 2,000.00
6	Restore Surface Improvements	1	LS	$ 15,000.00	$ 15,000.00
7	Construction Staking	1	LS	$ 20,000.00	$ 20,000.00
8	Earthwork for Tank	1	LS	$ 400,000.00	$ 400,000.00
9	Tank Access Rd	55,000	SF	$ 3.25	$ 178,800.00
10	2.5MG Concrete Storage Tank	1	LS	$ 3,500,000.00	$ 3,500,000.00
11	Tank Site Appurtenances	1	LS	$ 240,000.00	$ 240,000.00
12	24" DIP, Fittings, Installation, Bedding, and Backfill	200	LF	$ 250.00	$ 50,000.00
13	24" Butterfly Valve Assembly	2	EA	$ 12,750.00	$ 25,500.00
14	Fencing and Gate	1	LS	$ 20,000.00	$ 20,000.00
15	Solid Rock Excavation	300	CY	$ 50.00	$ 15,000.00
16	Misc. Tie-Ins and Connections	1	LS	$ 25,000.00	$ 25,000.00
17	Surface Restoration Improvements	1	LS	$ 12,000.00	$ 12,000.00
			SUBTOTAL		**$ 4,750,500.00**
			CONTINGENCY	20%	**$ 950,100.00**
			CONSTRUCTION TOTAL		**$ 5,700,600.00**
INCIDENTALS					
1	Engineering Design	5.0%	LS	$ 331,700.00	$ 331,700.00
2	Bidding & Negotiating	0.2%	HR	$ 10,000.00	$ 10,000.00
3	Engineering Construction Services	5.7%	HR	$ 380,000.00	$ 380,000.00
4	Topographic & Property Survey	0.1%	EST	$ 6,000.00	$ 6,000.00
5	Geotechnical Report	0.1%	EST	$ 10,000.00	$ 10,000.00
6	SCADA Design & Improvements	0.8%	EST	$ 50,000.00	$ 50,000.00
7	BLM POD & EA	1.5%	EST	$ 100,000.00	$ 100,000.00
8	Miscellaneous Professional Services	0.4%	EST	$ 25,000.00	$ 25,000.00
			SUBTOTAL		$ 912,700.00
			TOTAL PROJECT COST		**$ 6,613,300.00**

In providing opinions of probable construction cost, the Client understands that the Engineer has no control over costs or the price of labor, equipment or materials, or over the Contractor's method of pricing, and that the opinion of probable construction cost provided herein is made on the basis of the Engineer's qualifications and experience. The Engineer makes no warranty, expressed or implied, as to the accuracy of such opinions compared to bid or actual costs.

SUNRISE ENGINEERING

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Engineer's Opinion of Probable Cost

SUNRISE VALLEY TANK
WASHINGTON CITY

13-Mar-23
BCW/tcd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 239,700.00	$ 239,700.00
2	Traffic Control	1	LS	$ 5,000.00	$ 5,000.00
3	Pre-Construction DVD	1	LS	$ 1,000.00	$ 1,000.00
4	Dust Control & Watering	1	LS	$ 15,000.00	$ 15,000.00
5	Subsurface Investigation	8	HR	$ 250.00	$ 2,000.00
6	Restore Surface Improvements	1	LS	$ 10,000.00	$ 10,000.00
7	Construction Staking	1	LS	$ 8,500.00	$ 8,500.00
8	Earthwork for Tank	1	LS	$ 400,000.00	$ 400,000.00
9	Access Road (Road Base)	20,000	SF	$ 2.00	$ 40,000.00
10	2.5MG Concrete Storage Tank	1	LS	$ 3,500,000.00	$ 3,500,000.00
11	Tank Site Appurtenances	1	LS	$ 250,000.00	$ 250,000.00
12	16" PVC, Fittings, & Installation	2,200	LF	$ 130.00	$ 286,000.00
13	16" Butterfly Valve Assembly	4	EA	$ 8,000.00	$ 32,000.00
14	Fencing and Gate	1	LS	$ 20,000.00	$ 20,000.00
15	Solid Rock Excavation	100	CY	$ 50.00	$ 5,000.00
16	Misc. Tie-Ins and connections	1	LS	$ 50,000.00	$ 50,000.00
17	Control valves, Flow Meter, and vault	1	LS	$ 150,000.00	$ 150,000.00
18	Electrical Improvements	1	LS	$ 20,000.00	$ 20,000.00
			SUBTOTAL		**$ 5,034,200.00**
			CONTINGENCY	20%	**$ 1,006,800.00**
			CONSTRUCTION TOTAL		**$ 6,041,000.00**
INCIDENTALS					
1	Engineering Design	5.0%	LS	$ 350,000.00	$ 350,000.00
2	Bidding & Negotiating	0.1%	HR	$ 10,000.00	$ 10,000.00
3	Engineering Construction Services	5.8%	HR	$ 402,700.00	$ 402,700.00
4	Topographic & Property Survey	0.1%	EST	$ 10,000.00	$ 10,000.00
5	Geotechnical Report	0.1%	EST	$ 8,000.00	$ 8,000.00
6	SCADA Design & Improvements	0.7%	EST	$ 50,000.00	$ 50,000.00
7	BLM POD & EA	1.4%	EST	$ 100,000.00	$ 100,000.00
8	Miscellaneous Professional Services	0.4%	EST	$ 25,000.00	$ 25,000.00
			SUBTOTAL		$ 955,700.00
			TOTAL PROJECT COST		**$ 6,996,700.00**

In providing opinions of probable construction cost, the Client understands that the Engineer has no control over costs or the price of labor, equipment or materials, or over the Contractor's method of pricing, and that the opinion of probable construction cost provided herein is made on the basis of the Engineer's qualifications and experience. The Engineer makes no warranty, expressed or implied, as to the accuracy of such opinions compared to bid or actual costs.

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Engineer's Opinion of Probable Cost

AIRPORT TANK 2
WASHINGTON CITY

13-Mar-23
BCW/tcd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 223,100.00	$ 223,100.00
2	Pre-Construction DVD	1	LS	$ 3,000.00	$ 3,000.00
3	Dust Control & Watering	1	LS	$ 15,000.00	$ 15,000.00
4	Subsurface Investigation	8	HR	$ 250.00	$ 2,000.00
5	Restore Surface Improvements	1	LS	$ 15,000.00	$ 15,000.00
6	Construction Staking	1	LS	$ 20,000.00	$ 20,000.00
7	Earthwork for Tank	1	LS	$ 400,000.00	$ 400,000.00
8	2.5MG Concrete Storage Tank	1	LS	$ 3,500,000.00	$ 3,500,000.00
9	Tank Site Appurtenances	1	LS	$ 250,000.00	$ 250,000.00
10	24" DIP, Fittings, Installation, Bedding, and Backfill	200	LF	$ 250.00	$ 50,000.00
11	24" Butterfly Valve Assembly	2	EA	$ 12,750.00	$ 25,500.00
12	Fencing and Gate	1	LS	$ 20,000.00	$ 20,000.00
13	Solid Rock Excavation	300	CY	$ 50.00	$ 15,000.00
14	Misc. Tie-Ins and Connections	1	LS	$ 25,000.00	$ 25,000.00
15	Surface Restoration Improvements	1	LS	$ 12,000.00	$ 12,000.00
16	Misc Pump Piping/Connections	1	LS	$ 9,000.00	$ 9,000.00
17	Electrical Improvements	1	LS	$ 100,000.00	$ 100,000.00
			SUBTOTAL		**$ 4,684,600.00**
			CONTINGENCY	20%	**$ 936,900.00**
			CONSTRUCTION TOTAL		**$ 5,621,500.00**
INCIDENTALS					
1	Engineering Design	5.0%	LS	$ 327,400.00	$ 327,400.00
2	Bidding & Negotiating	0.2%	HR	$ 10,000.00	$ 10,000.00
3	Engineering Construction Services	5.7%	HR	$ 374,800.00	$ 374,800.00
4	Topographic & Property Survey	0.1%	EST	$ 6,000.00	$ 6,000.00
5	Geotechnical Report	0.1%	EST	$ 10,000.00	$ 10,000.00
6	SCADA Design & Improvements	0.8%	EST	$ 50,000.00	$ 50,000.00
7	BLM POD & EA	1.5%	EST	$ 100,000.00	$ 100,000.00
8	Miscellaneous Professional Services	0.4%	EST	$ 25,000.00	$ 25,000.00
			SUBTOTAL		$ 903,200.00
			TOTAL PROJECT COST		**$ 6,524,700.00**

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SUNRISE ENGINEERING

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Engineer's Opinion of Probable Cost

MAJESTIC TANK
WASHINGTON CITY

13-Mar-23
BCW/tcd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 264,500.00	$ 264,500.00
2	Traffic Control	1	LS	$ 3,000.00	$ 3,000.00
3	Pre-Construction DVD	1	LS	$ 3,000.00	$ 3,000.00
4	Dust Control & Watering	1	LS	$ 15,000.00	$ 15,000.00
5	Subsurface Investigation	40	HR	$ 250.00	$ 10,000.00
6	Restore Surface Improvements	1	LS	$ 15,000.00	$ 15,000.00
7	Construction Staking	1	LS	$ 20,000.00	$ 20,000.00
8	Earthwork for Tank	1	LS	$ 500,000.00	$ 500,000.00
9	Access Road (Road Base)	37,000	SF	$ 3.25	$ 120,250.00
10	2.5MG Concrete Storage Tank	1	LS	$ 3,500,000.00	$ 3,500,000.00
11	Tank Site Appurtenances	1	LS	$ 250,000.00	$ 250,000.00
12	16" PVC, Fittings, & Installation	2,200	LF	$ 130.00	$ 286,000.00
13	16" Butterfly Valve Assembly	6	EA	$ 8,000.00	$ 48,000.00
14	Fencing and Gate	1	LS	$ 20,000.00	$ 20,000.00
15	Bitimunous Surface Course	1,800	SF	$ 7.50	$ 13,500.00
16	Solid Rock Excavation	500	CY	$ 50.00	$ 25,000.00
17	Misc. Tie-Ins and Connections	1	LS	$ 25,000.00	$ 25,000.00
18	Surface Restoration Improvements	1	LS	$ 12,000.00	$ 12,000.00
19	Booster Station Building	1	LS	$ 225,000.00	$ 225,000.00
20	Booster Pumps	1	LS	$ 100,000.00	$ 100,000.00
21	Electrical Improvements	1	LS	$ 100,000.00	$ 100,000.00
			SUBTOTAL		**$ 5,555,250.00**
			CONTINGENCY	20%	**$ 1,111,050.00**
			CONSTRUCTION TOTAL		**$ 6,666,300.00**
INCIDENTALS					
1	Engineering Design	5.0%	LS	$ 383,100.00	$ 383,100.00
2	Bidding & Negotiating	0.1%	HR	$ 10,000.00	$ 10,000.00
3	Engineering Construction Services	5.8%	HR	$ 444,400.00	$ 444,400.00
4	Topographic & Property Survey	0.1%	EST	$ 10,000.00	$ 10,000.00
5	Geotechnical Report	0.1%	EST	$ 8,000.00	$ 8,000.00
21	SCADA Design & Improvements	0.7%	EST	$ 50,000.00	$ 50,000.00
39	Miscellaneous Engineering Services	0.3%	EST	$ 25,000.00	$ 25,000.00
			SUBTOTAL		$ 930,500.00
			TOTAL PROJECT COST		**$ 7,596,800.00**

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Engineer's Opinion of Probable Cost

STUCKI FARMS TANK
WASHINGTON CITY

13-Mar-23
BCW/tcd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 190,400.00	$ 190,400.00
2	Traffic Control	1	LS	$ 3,000.00	$ 3,000.00
3	Pre-Construction DVD	1	LS	$ 3,000.00	$ 3,000.00
4	Dust Control & Watering	1	LS	$ 15,000.00	$ 15,000.00
5	Subsurface Investigation	40	HR	$ 250.00	$ 10,000.00
6	Restore Surface Improvements	1	LS	$ 15,000.00	$ 15,000.00
7	Construction Staking	1	LS	$ 20,000.00	$ 20,000.00
8	Earthwork for Tank	1	LS	$ 400,000.00	$ 400,000.00
9	Access Road (Road Base)	14,000	SF	$ 2.00	$ 28,000.00
10	1MG Concrete Storage Tank	1	LS	$ 1,553,000.00	$ 1,553,000.00
11	Tank Site Appurtenances	1	LS	$ 250,000.00	$ 250,000.00
12	8" PVC, Fittings, & Installation	3,300	LF	$ 130.00	$ 429,000.00
13	8" Butterfly Valve Assembly	4	EA	$ 8,000.00	$ 32,000.00
14	10" PVC, Fittings, & Installation	3,200	LF	$ 130.00	$ 416,000.00
15	10" Butterfly Valve Assembly	4	EA	$ 8,000.00	$ 32,000.00
16	Fencing and Gate	1	LS	$ 20,000.00	$ 20,000.00
17	Bitimunous Surface Course	17,600	SF	$ 6.00	$ 105,600.00
18	Solid Rock Excavation	300	CY	$ 50.00	$ 15,000.00
19	Misc. Tie-Ins and Connections	1	LS	$ 25,000.00	$ 25,000.00
20	Surface Restoration Improvements	1	LS	$ 12,000.00	$ 12,000.00
21	Booster Station Building	1	LS	$ 225,000.00	$ 225,000.00
22	Booster Pumps	1	LS	$ 100,000.00	$ 100,000.00
23	Electrical Improvements	1	LS	$ 100,000.00	$ 100,000.00
			SUBTOTAL		**$ 3,999,000.00**
			CONTINGENCY	20%	**$ 799,800.00**
			CONSTRUCTION TOTAL		**$ 4,798,800.00**
INCIDENTALS					
1	Engineering Design	5.1%	LS	$ 282,600.00	$ 282,600.00
2	Bidding & Negotiating	0.2%	HR	$ 10,000.00	$ 10,000.00
3	Engineering Construction Services	5.8%	HR	$ 319,900.00	$ 319,900.00
4	Topographic & Property Survey	0.2%	EST	$ 10,000.00	$ 10,000.00
5	Geotechnical Report	0.1%	EST	$ 8,000.00	$ 8,000.00
21	SCADA Design & Improvements	0.9%	EST	$ 50,000.00	$ 50,000.00
39	Miscellaneous Engineering Services	0.5%	EST	$ 25,000.00	$ 25,000.00
			SUBTOTAL		$ 705,500.00
			TOTAL PROJECT COST		**$ 5,504,300.00**

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Engineer's Opinion of Probable Cost

WASHINGTON FIELDS RD. TRANSMISSION LINE
WASHINGTON CITY

3-Mar-23
BCW

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 94,000.00	$ 94,000.00
2	Traffic Control	1	LS	$ 5,000.00	$ 5,000.00
3	Pre-Construction DVD	1	LS	$ 1,000.00	$ 1,000.00
4	Dust Control & Watering	1	LS	$ 5,000.00	$ 5,000.00
5	Subsurface Investigation	4	HR	$ 250.00	$ 1,000.00
6	Restore Surface Improvements	1	LS	$ 2,500.00	$ 2,500.00
7	Construction Staking	1	LS	$ 2,000.00	$ 2,000.00
8	8" PVC Line, Fittings, Tracer wire, Bedding, Backfill & Installation (C900 DR-18)	150	LF	$ 80.00	$ 12,000.00
9	12" PVC Line, Fittings, Tracer wire, Bedding, Backfill & Installation (C900 DR-18)	50	EA	$ 110.00	$ 5,500.00
10	16" PVC Line, Fittings, Tracer wire, Bedding, Backfill & Installation (C900 DR-18)	11,880	SF	$ 130.00	$ 1,544,400.00
11	8" Gate Valve Assembly	4	EA	$ 4,000.00	$ 16,000.00
12	12" Gate Valve Assembly	2	EA	$ 7,500.00	$ 15,000.00
13	16" Butterfly Valve Assembly	14	EA	$ 9,000.00	$ 126,000.00
14	3" Air Valve Assembly	1	EA	$ 19,000.00	$ 19,000.00
15	4" Air Valve Assembly	1	EA	$ 25,000.00	$ 25,000.00
16	Fire Hydrant Assembly	9	EA	$ 10,000.00	$ 90,000.00
17	Misc. Water Connections, Fittings, Caps, Disconnects, Tee's & Tie-ins	1	LS	$ 11,500.00	$ 11,500.00
			SUBTOTAL		**$ 1,974,900.00**
			CONTINGENCY	20%	**$ 395,000.00**
			CONSTRUCTION TOTAL		**$ 2,369,900.00**
INCIDENTALS					
1	Engineering Design	5.4%	LS	$ 146,400.00	$ 146,400.00
2	Bidding & Negotiating	0.3%	HR	$ 7,500.00	$ 7,500.00
3	Engineering Construction Services	5.8%	HR	$ 158,000.00	$ 158,000.00
4	Topographic & Property Survey	0.1%	EST	$ 2,500.00	$ 2,500.00
5	SCADA Design & Improvements	1.1%	EST	$ 30,000.00	$ 30,000.00
6	Miscellaneous Professional Services	0.1%	EST	$ 2,500.00	$ 2,500.00
			SUBTOTAL		$ 346,900.00
			TOTAL PROJECT COST		**$ 2,716,800.00**

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SUNRISE ENGINEERING

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Engineer's Opinion of Probable Cost

FIELDS ROAD TO AIRPORT TANK TRANSMISSION LINE
WASHINGTON CITY

13-Mar-23
BCW/tcd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 148,400.00	$ 148,400.00
2	Traffic Control	1	LS	$ 3,000.00	$ 3,000.00
3	Pre-Construction DVD	1	LS	$ 3,000.00	$ 3,000.00
4	Dust Control & Watering	1	LS	$ 15,000.00	$ 15,000.00
5	Subsurface Investigation	30	HR	$ 250.00	$ 7,500.00
6	Restore Surface Improvements	1	LS	$ 15,000.00	$ 15,000.00
7	Construction Staking	1	LS	$ 20,000.00	$ 20,000.00
8	20" DIP, Fittings, Installation, Bedding, and Backfill	4,100	LF	$ 190.00	$ 779,000.00
9	30" DIP, Fittings, Installation, Bedding, and Backfill	5,800	LF	$ 300.00	$ 1,740,000.00
10	20" Butterfly Valve Assembly	5	EA	$ 11,500.00	$ 57,500.00
11	30" Butterfly Valve Assembly	4	EA	$ 15,000.00	$ 60,000.00
12	Bitimunous Surface Course	11,200	SF	$ 7.00	$ 78,400.00
13	Solid Rock Excavation	100	CY	$ 50.00	$ 5,000.00
14	Misc. Tie-Ins and Connections	1	LS	$ 25,000.00	$ 25,000.00
15	Surface Restoration Improvements	1	LS	$ 10,000.00	$ 10,000.00
16	Highway Crossing	1	EA	$ 150,000.00	$ 150,000.00
			SUBTOTAL		**$ 3,116,800.00**
			CONTINGENCY	20%	**$ 623,400.00**
			CONSTRUCTION TOTAL		**$ 3,740,200.00**
INCIDENTALS					
1	Engineering Design	5.1%	LS	$ 223,800.00	$ 223,800.00
2	Bidding & Negotiating	0.2%	HR	$ 10,000.00	$ 10,000.00
3	Engineering Construction Services	5.7%	HR	$ 249,300.00	$ 249,300.00
4	Topographic & Property Survey	0.3%	EST	$ 12,000.00	$ 12,000.00
6	SCADA Design & Improvements	1.1%	EST	$ 50,000.00	$ 50,000.00
7	BLM POD & EA	2.3%	EST	$ 100,000.00	$ 100,000.00
8	Miscellaneous Professional Services	0.6%	EST	$ 25,000.00	$ 25,000.00
			SUBTOTAL		$ 670,100.00
			TOTAL PROJECT COST		**$ 4,410,300.00**

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Engineer's Opinion of Probable Cost

AIRPORT CONNECTION PHASE 1
Washington City

25-Apr-23
BCW/

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 31,650.00	$ 31,650.00
2	Pre-Construction DVD	1	LS	$ 1,000.00	$ 1,000.00
3	Traffic Control	1	LS	$ 7,500.00	$ 7,500.00
4	SWPPP Compliance and Erosion Control	1	LS	$ 10,000.00	$ 10,000.00
5	Dust Control & Watering	1	LS	$ 10,000.00	$ 10,000.00
6	Subsurface Investigation	20	HR	$ 250.00	$ 5,000.00
7	Construction Staking	1	LS	$ 5,000.00	$ 5,000.00
8	Clearing, Grubbing, Excavation, & Demolition	1	LS	$ 7,500.00	$ 7,500.00
9	16" PVC C900 Fittings, Installation, Bedding, and Backfill	100	LF	$ 130.00	$ 13,000.00
10	16" Butterfly Valve Assembly	4	EA	$ 8,000.00	$ 32,000.00
11	Misc. Connections, Fittings, & Tie-Ins	1	LS	$ 5,000.00	$ 5,000.00
12	Bitimunous Surface Course - Pipe Trench	1,000	SF	$ 7.00	$ 7,000.00
13	Bitimunous Surface Course - Building Pad	10,000	SF	$ 6.00	$ 60,000.00
14	6" Roadbase	10,000	SF	$ 2.00	$ 20,000.00
15	Booster Pump Station	1	LS	$ 300,000.00	$ 300,000.00
16	Booster Pump Station Electrical and Mechanical	1	LS	$ 80,000.00	$ 80,000.00
17	Booster Pump Station Site	1	LS	$ 25,000.00	$ 25,000.00
18	Generator and Hookup	1	EA	$ 25,000.00	$ 25,000.00
19	Fencing and Gate	1	LS	$ 20,000.00	$ 20,000.00
			SUBTOTAL		**$ 664,650.00**
			CONTINGENCY	20%	**$ 132,930.00**
			CONSTRUCTION TOTAL		**$ 797,580.00**
INCIDENTALS					
1	Engineering Design	5.7%	LS	$ 56,657.13	$ 56,657.13
1	Bidding & Negotiating	1.0%	HR	$ 10,000.00	$ 10,000.00
2	Engineering Construction Services	5.3%	HR	$ 53,200.00	$ 53,200.00
3	Topographic & Property Survey	0.8%	EST	$ 7,500.00	$ 7,500.00
4	Geotechnical Report	0.5%	EST	$ 5,000.00	$ 5,000.00
20	SCADA Design & Improvements	5.0%	EST	$ 50,000.00	$ 50,000.00
38	Miscellaneous Professional Services	1.5%	EST	$ 15,000.00	$ 15,000.00
39		0.0%	EST		
40		0.0%	EST		
			SUBTOTAL		$ 197,357.13
			TOTAL PROJECT COST		**$ 994,937.13**

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Engineer's Opinion of Probable Cost

PERRY'S LANDING PRESSURE ZONE ADJUSTMENT
WASHINGTON CITY

3-Mar-23
BCW

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 11,900.00	$ 11,900.00
2	Traffic Control	1	LS	$ 5,000.00	$ 5,000.00
3	Pre-Construction DVD	1	LS	$ 1,000.00	$ 1,000.00
4	Dust Control & Watering	1	LS	$ 5,000.00	$ 5,000.00
5	Subsurface Investigation	8	HR	$ 250.00	$ 2,000.00
6	Restore Surface Improvements	1	LS	$ 7,500.00	$ 7,500.00
7	Construction Staking	1	LS	$ 5,000.00	$ 5,000.00
8	8" PVC, Fittings, Installation, Bedding, and Backfill	1,000	LF	$ 70.00	$ 70,000.00
9	8" Gate Valve	4	EA	$ 3,500.00	$ 14,000.00
10	6" PRV Station	2	EA	$ 50,000.00	$ 100,000.00
11	Asphalt Restoration	4,000	SF	$ 7.00	$ 28,000.00
			SUBTOTAL		**$ 249,400.00**
			CONTINGENCY	20%	**$ 49,900.00**
			CONSTRUCTION TOTAL		**$ 299,300.00**
INCIDENTALS					
1	Engineering Design	6.6%	LS	$ 25,600.00	$ 25,600.00
2	Bidding & Negotiating	1.9%	HR	$ 7,500.00	$ 7,500.00
3	Engineering Construction Services	5.1%	HR	$ 20,000.00	$ 20,000.00
4	Topographic & Property Survey	1.3%	EST	$ 5,000.00	$ 5,000.00
5	SCADA Design & Improvements	7.7%	EST	$ 30,000.00	$ 30,000.00
6	Miscellaneous Professional Services	0.6%	EST	$ 2,500.00	$ 2,500.00
			SUBTOTAL		$ 90,600.00
			TOTAL PROJECT COST		**$ 389,900.00**

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Engineer's Opinion of Probable Cost

SUNRISE VALLEY TRANSMISSION LINE
WASHINGTON CITY

13-Mar-23
BCW/tcd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 73,200.00	$ 73,200.00
2	Traffic Control	1	LS	$ 20,000.00	$ 20,000.00
3	Pre-Construction DVD	1	LS	$ 1,500.00	$ 1,500.00
4	Dust Control & Watering	1	LS	$ 15,000.00	$ 15,000.00
5	Subsurface Investigation	16	HR	$ 250.00	$ 4,000.00
6	Restore Surface Improvements	1	LS	$ 10,000.00	$ 10,000.00
7	Construction Staking	1	LS	$ 15,000.00	$ 15,000.00
8	12" PVC, Fittings, Installation, Bedding and Backfill	4,000	LF	$ 110.00	$ 440,000.00
9	16" PVC, Fittings, & Installation	3,100	LF	$ 130.00	$ 403,000.00
10	12" Butterfly Valve Assembly	4	EA	$ 6,750.00	$ 27,000.00
11	16" Butterfly Valve Assembly	6	EA	$ 8,000.00	$ 48,000.00
12	Bitimunous Surface Course	56,000	SF	$ 6.00	$ 336,000.00
13	Solid Rock Excavation	75	CY	$ 50.00	$ 3,750.00
14	Misc. Tie-Ins and connections	1	LS	$ 50,000.00	$ 50,000.00
15	Combination Air Valve Assembly	1	LS	$ 20,000.00	$ 20,000.00
16	PRV Station	1	EA	$ 50,000.00	$ 50,000.00
17	Electrical Improvements	1	LS	$ 20,000.00	$ 20,000.00
			SUBTOTAL		**$ 1,536,450.00**
			CONTINGENCY	20%	**$ 307,300.00**
			CONSTRUCTION TOTAL		**$ 1,843,750.00**
INCIDENTALS					
1	Engineering Design	5.4%	LS	$ 117,000.00	$ 117,000.00
2	Bidding & Negotiating	0.5%	HR	$ 10,000.00	$ 10,000.00
3	Engineering Construction Services	5.6%	HR	$ 122,900.00	$ 122,900.00
4	Topographic & Property Survey	0.5%	EST	$ 10,000.00	$ 10,000.00
5	Geotechnical Report	0.4%	EST	$ 8,000.00	$ 8,000.00
6	SCADA Design & Improvements	2.3%	EST	$ 50,000.00	$ 50,000.00
7	Miscellaneous Professional Services	1.1%	EST	$ 25,000.00	$ 25,000.00
			SUBTOTAL		$ 342,900.00
			TOTAL PROJECT COST		**$ 2,186,650.00**

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Engineer's Opinion of Probable Cost

SHADOW RIDGE 6" LINE REPLACEMENT 3-Mar-23
WASHINGTON CITY BCW

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 8,600.00	$ 8,600.00
2	Traffic Control	1	LS	$ 7,500.00	$ 7,500.00
3	Pre-Construction DVD	1	LS	$ 1,000.00	$ 1,000.00
4	Dust Control & Watering	1	LS	$ 5,000.00	$ 5,000.00
5	Subsurface Investigation	8	HR	$ 250.00	$ 2,000.00
6	Restore Surface Improvements	1	LS	$ 7,500.00	$ 7,500.00
7	Construction Staking	1	LS	$ 2,500.00	$ 2,500.00
8	8" PVC, Fittings, Installation, Bedding, and Backfill	1,150	LF	$ 70.00	$ 80,500.00
9	8" Gate Valve	5	EA	$ 3,500.00	$ 17,500.00
10	Asphalt Restoration	6,900	SF	$ 7.00	$ 48,300.00
			SUBTOTAL		**$ 180,400.00**
			CONTINGENCY	20%	**$ 36,100.00**
			CONSTRUCTION TOTAL		**$ 216,500.00**
INCIDENTALS					
1	Engineering Design	7.4%	LS	$ 19,600.00	$ 19,600.00
2	Bidding & Negotiating	2.8%	HR	$ 7,500.00	$ 7,500.00
3	Engineering Construction Services	5.5%	HR	$ 14,400.00	$ 14,400.00
4	Topographic & Property Survey	1.3%	EST	$ 3,500.00	$ 3,500.00
5	Miscellaneous Professional Services	0.9%	EST	$ 2,500.00	$ 2,500.00
			SUBTOTAL		$ 47,500.00
			TOTAL PROJECT COST		**$ 264,000.00**

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SUNRISE ENGINEERING

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Engineer's Opinion of Probable Cost

LION'S HEAD DR. PRV
WASHINGTON CITY

3-Mar-23
BCW

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 4,100.00	$ 4,100.00
2	Traffic Control	1	LS	$ 5,000.00	$ 5,000.00
3	Pre-Construction DVD	1	LS	$ 1,000.00	$ 1,000.00
4	Dust Control & Watering	1	LS	$ 5,000.00	$ 5,000.00
5	Subsurface Investigation	8	HR	$ 250.00	$ 2,000.00
6	Restore Surface Improvements	1	LS	$ 2,500.00	$ 2,500.00
7	Construction Staking	1	LS	$ 2,000.00	$ 2,000.00
8	8" PVC, Fittings, Installation, Bedding, and Backfill	50	LF	$ 80.00	$ 4,000.00
9	6" PRV Station	1	EA	$ 50,000.00	$ 50,000.00
10	Asphalt Restoration	1,500	SF	$ 7.50	$ 11,250.00
			SUBTOTAL		**$ 86,850.00**
			CONTINGENCY	20%	**$ 17,400.00**
			CONSTRUCTION TOTAL		**$ 104,250.00**
INCIDENTALS					
1	Engineering Design	6.5%	LS	$ 10,700.00	$ 10,700.00
2	Bidding & Negotiating	4.6%	HR	$ 7,500.00	$ 7,500.00
3	Engineering Construction Services	4.2%	HR	$ 6,900.00	$ 6,900.00
4	Topographic & Property Survey	1.5%	EST	$ 2,500.00	$ 2,500.00
5	SCADA Design & Improvements	18.3%	EST	$ 30,000.00	$ 30,000.00
6	Miscellaneous Professional Services	1.5%	EST	$ 2,500.00	$ 2,500.00
			SUBTOTAL		$ 60,100.00
			TOTAL PROJECT COST		**$ 164,350.00**

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Engineer's Opinion of Probable Cost

CHURCH ROAD TRANSMISSION LINE
WASHINGTON CITY

13-Mar-23
BCW/tcd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 146,200.00	$ 146,200.00
2	Traffic Control	1	LS	$ 7,500.00	$ 7,500.00
3	Pre-Construction DVD	1	LS	$ 1,000.00	$ 1,000.00
4	Dust Control & Watering	1	LS	$ 20,000.00	$ 20,000.00
5	Subsurface Investigation	16	HR	$ 250.00	$ 4,000.00
6	20" DIP, Fittings, Installation, Bedding, and Backfill	12,400	LF	$ 190.00	$ 2,356,000.00
7	20" Butterfly Valve Assembly	15	EA	$ 11,500.00	$ 172,500.00
8	Fire Hydrant Assembly	10	EA	$ 7,000.00	$ 70,000.00
9	Solid Rock Excavation	300	CY	$ 50.00	$ 15,000.00
10	Misc. Tie-Ins and Connections	1	LS	$ 30,000.00	$ 30,000.00
11	Roadway Restoration (Roadbase)	99,200	SF	$ 2.50	$ 248,000.00
			SUBTOTAL		**$ 3,070,200.00**
			CONTINGENCY	20%	**$ 614,000.00**
			CONSTRUCTION TOTAL		**$ 3,684,200.00**
INCIDENTALS					
1	Engineering Design	5.1%	LS	$ 220,600.00	$ 220,600.00
2	Bidding & Negotiating	0.2%	HR	$ 10,000.00	$ 10,000.00
3	Engineering Construction Services	5.6%	HR	$ 245,600.00	$ 245,600.00
4	Topographic & Property Survey	0.3%	EST	$ 12,000.00	$ 12,000.00
5	Geotechnical Report	0.3%	EST	$ 10,000.00	$ 10,000.00
6	SCADA Design & Improvements	1.1%	EST	$ 50,000.00	$ 50,000.00
7	BLM POD & EA	2.3%	EST	$ 100,000.00	$ 100,000.00
8	Miscellaneous Professional Services	0.6%	EST	$ 25,000.00	$ 25,000.00
			SUBTOTAL		$ 673,200.00
			TOTAL PROJECT COST		**$ 4,357,400.00**

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Engineer's Opinion of Probable Cost

EAST REGIONAL CONNECITON PHASE 2
Washington City

25-Apr-23
BCW/

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 297,490.00	$ 297,490.00
2	Pre-Construction DVD	1	LS	$ 1,000.00	$ 1,000.00
3	Traffic Control	1	LS	$ 25,000.00	$ 25,000.00
4	SWPPP Compliance and Erosion Control	1	LS	$ 12,500.00	$ 12,500.00
5	Dust Control & Watering	1	LS	$ 12,500.00	$ 12,500.00
6	Subsurface Investigation	20	HR	$ 250.00	$ 5,000.00
7	Construction Staking	1	LS	$ 10,000.00	$ 10,000.00
8	Clearing, Grubbing, Excavation, & Demolition	1	LS	$ 6,000.00	$ 6,000.00
9	16" PVC C900 Fittings, Installation, Bedding, and Backfill	9,700	LF	$ 130.00	$ 1,261,000.00
10	24" DIP Fittings, Installation, Bedding, and Backfill	6,100	LF	$ 250.00	$ 1,525,000.00
11	16" Butterfly Valve Assembly	10	EA	$ 8,000.00	$ 80,000.00
12	24" Butterfly Valve Assembly	8	EA	$ 12,750.00	$ 102,000.00
13	Combination Air Valve	5	EA	$ 20,000.00	$ 100,000.00
14	Control Valve Vault	1	EA	$ 200,000.00	$ 200,000.00
15	PRV Station	1	EA	$ 50,000.00	$ 50,000.00
16	Misc. Connections, Fittings, & Tie-Ins	1	LS	$ 25,000.00	$ 25,000.00
17	Bitimunous Surface Course - Pipe Trench	126,400	SF	$ 7.00	$ 884,800.00
18	Booster Pump Station	1	LS	$ 1,000,000.00	$ 1,000,000.00
19	Booster Pump Station Electrical and Mechanical	1	LS	$ 500,000.00	$ 500,000.00
20	Booster Pump Station Site	1	LS	$ 50,000.00	$ 50,000.00
21	Generator and Hookup	1	EA	$ 50,000.00	$ 50,000.00
22	Metering Station	1	LS	$ 50,000.00	$ 50,000.00
			SUBTOTAL		**$ 6,247,290.00**
			CONTINGENCY	20%	**$ 1,249,458.00**
			CONSTRUCTION TOTAL		**$ 7,496,748.00**
INCIDENTALS					
1	Engineering Design	5.0%	LS	$ 426,208.16	$ 426,208.16
1	Bidding & Negotiating	0.1%	HR	$ 10,000.00	$ 10,000.00
2	Engineering Construction Services	5.8%	HR	$ 499,800.00	$ 499,800.00
3	Topographic & Property Survey	0.2%	EST	$ 20,000.00	$ 20,000.00
4	Geotechnical Report	0.1%	EST	$ 10,000.00	$ 10,000.00
20	SCADA Design & Improvements	0.9%	EST	$ 75,000.00	$ 75,000.00
38	Miscellaneous Professional Services	0.6%	EST	$ 50,000.00	$ 50,000.00
39		0.0%	EST		
40		0.0%	EST		
			SUBTOTAL		$ 1,091,008.16
			TOTAL PROJECT COST		**$ 8,587,756.16**

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Engineer's Opinion of Probable Cost

AIRPORT CONNECTION PHASE 2
Washington City

25-Apr-23
BCW/

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 107,400.00	$ 107,400.00
2	Pre-Construction DVD	1	LS	$ 1,000.00	$ 1,000.00
3	Traffic Control	1	LS	$ 25,000.00	$ 25,000.00
4	SWPPP Compliance and Erosion Control	1	LS	$ 15,000.00	$ 15,000.00
5	Dust Control & Watering	1	LS	$ 15,000.00	$ 15,000.00
6	Subsurface Investigation	20	HR	$ 250.00	$ 5,000.00
7	Construction Staking	1	LS	$ 12,500.00	$ 12,500.00
8	Clearing, Grubbing, Excavation, & Demolition	1	LS	$ 7,500.00	$ 7,500.00
9	16" PVC C900 Fittings, Installation, Bedding, and Backfill	100	LF	$ 130.00	$ 13,000.00
10	16" Butterfly Valve Assembly	4	EA	$ 8,000.00	$ 32,000.00
11	Control Valve Vault	1	EA	$ 200,000.00	$ 200,000.00
12	Misc. Connections, Fittings, & Tie-Ins	1	LS	$ 5,000.00	$ 5,000.00
13	Bitimunous Surface Course - Pipe Trench	1,000	SF	$ 7.00	$ 7,000.00
14	Bitimunous Surface Course - Building Pad	15,000	SF	$ 6.00	$ 90,000.00
15	6" Roadbase	15,000	SF	$ 2.00	$ 30,000.00
16	Booster Pump Station	1	LS	$ 1,000,000.00	$ 1,000,000.00
17	Booster Pump Station Electrical and Mechanical	1	LS	$ 500,000.00	$ 500,000.00
18	Booster Pump Station Site	1	LS	$ 50,000.00	$ 50,000.00
19	Generator and Hookup	1	EA	$ 50,000.00	$ 50,000.00
20	Fencing and Gate	1	LS	$ 40,000.00	$ 40,000.00
21	Metering Station	1	LS	$ 50,000.00	$ 50,000.00
			SUBTOTAL		**$ 2,255,400.00**
			CONTINGENCY	20%	**$ 451,080.00**
			CONSTRUCTION TOTAL		**$ 2,706,480.00**
INCIDENTALS					
1	Engineering Design	5.1%	LS	$ 165,330.85	$ 165,330.85
1	Bidding & Negotiating	0.3%	HR	$ 10,000.00	$ 10,000.00
2	Engineering Construction Services	5.6%	HR	$ 180,400.00	$ 180,400.00
3	Topographic & Property Survey	0.6%	EST	$ 20,000.00	$ 20,000.00
4	Geotechnical Report	0.3%	EST	$ 10,000.00	$ 10,000.00
20	SCADA Design & Improvements	2.3%	EST	$ 75,000.00	$ 75,000.00
38	Miscellaneous Professional Services	1.6%	EST	$ 50,000.00	$ 50,000.00
39		0.0%	EST		
40		0.0%	EST		
			SUBTOTAL		$ 510,730.85
			TOTAL PROJECT COST		**$ 3,217,210.85**

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Engineer's Opinion of Probable Cost

AIRPORT CONNECTION PHASE 3
Washington City

25-Apr-23
BCW/

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
1	Mobilization	5%	LS	$ 128,402.50	$ 128,402.50
2	Pre-Construction DVD	1	LS	$ 1,000.00	$ 1,000.00
3	Traffic Control	1	LS	$ 25,000.00	$ 25,000.00
4	SWPPP Compliance and Erosion Control	1	LS	$ 15,000.00	$ 15,000.00
5	Dust Control & Watering	1	LS	$ 15,000.00	$ 15,000.00
6	Subsurface Investigation	20	HR	$ 250.00	$ 5,000.00
7	Construction Staking	1	LS	$ 12,500.00	$ 12,500.00
8	Clearing, Grubbing, Excavation, & Demolition	1	LS	$ 7,500.00	$ 7,500.00
9	16" PVC C900 Fittings, Installation, Bedding, and Backfill	50	LF	$ 130.00	$ 6,500.00
10	20" PVC C900 Fittings, Installation, Bedding, and Backfill	50	LF	$ 131.00	$ 6,550.00
11	16" Butterfly Valve Assembly	2	EA	$ 8,000.00	$ 16,000.00
12	20" Butterfly Valve Assembly	2	EA	$ 11,500.00	$ 23,000.00
13	Control Valve Vault	1	EA	$ 200,000.00	$ 200,000.00
14	Misc. Connections, Fittings, & Tie-Ins	1	LS	$ 5,000.00	$ 5,000.00
15	Bitimunous Surface Course - Building Pad	15,000	SF	$ 6.00	$ 90,000.00
16	6" Roadbase	15,000	SF	$ 2.00	$ 30,000.00
17	Booster Pump Station	1	LS	$ 1,250,000.00	$ 1,250,000.00
18	Booster Pump Station Electrical and Mechanical	1	LS	$ 600,000.00	$ 600,000.00
19	Booster Pump Station Site	1	LS	$ 75,000.00	$ 75,000.00
20	Generator and Hookup	1	EA	$ 75,000.00	$ 75,000.00
21	Fencing and Gate	1	LS	$ 60,000.00	$ 60,000.00
22	Metering Station	1	LS	$ 50,000.00	$ 50,000.00
			SUBTOTAL		**$ 2,696,452.50**
			CONTINGENCY	20%	**$ 539,290.50**
			CONSTRUCTION TOTAL		**$ 3,235,743.00**
INCIDENTALS					
1	Engineering Design	5.1%	LS	$ 195,075.93	$ 195,075.93
1	Bidding & Negotiating	0.3%	HR	$ 10,000.00	$ 10,000.00
2	Engineering Construction Services	5.7%	HR	$ 215,700.00	$ 215,700.00
3	Topographic & Property Survey	0.5%	EST	$ 20,000.00	$ 20,000.00
4	Geotechnical Report	0.3%	EST	$ 10,000.00	$ 10,000.00
20	SCADA Design & Improvements	2.0%	EST	$ 75,000.00	$ 75,000.00
38	Miscellaneous Professional Services	1.3%	EST	$ 50,000.00	$ 50,000.00
39		0.0%	EST		
40		0.0%	EST		
			SUBTOTAL		$ 575,775.93
			TOTAL PROJECT COST		**$ 3,811,518.93**

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APPENDIX D
System Maps

WASHINGTON CITY EXISTING WATER SYSTEM

MAP LEGEND

North

0 2,500 5,000

1 In = 5,000 Feet

Water Mains

- 1"
- 2"
- 3"
- 4"
- 6"
- 8"
- 10"
- 12"
- 14"
- 16"
- 20"
- 24"
- 30"
- 36"
- 48"
- 60"
- 72"
- Unknown

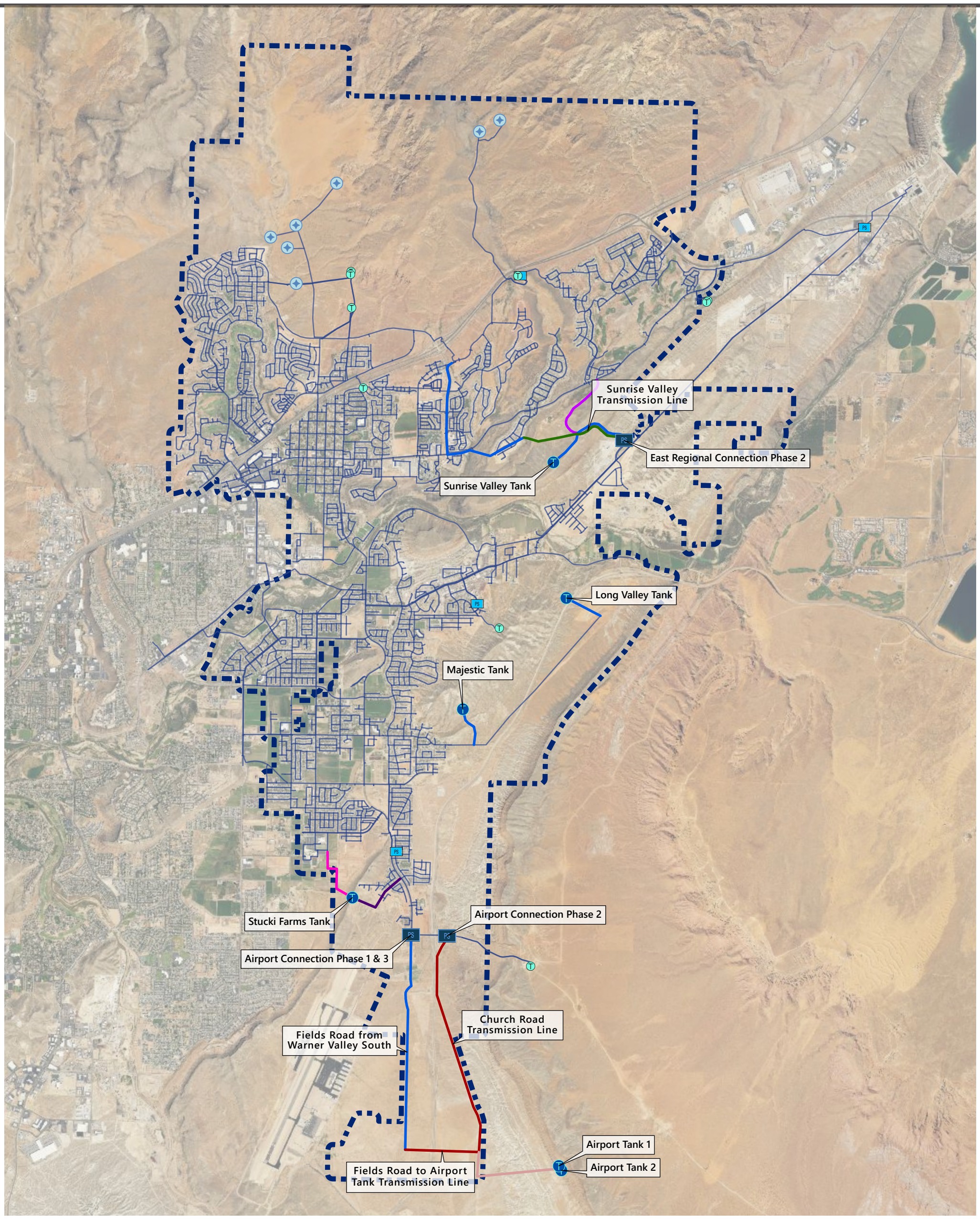
- Water Tank
- Production Well
- Water Pumps
- Washington City Boundary

Washington City
Where Dixie Begins

SUNRISE ENGINEERING

Map Date: 5/25/2023

WATER SYSTEM WITH FUTURE IMPROVEMENTS



MAP LEGEND

North

0 2,500 5,000

1 In = 5,000 Feet

Future Water Main
- 8"
- 10"
- 12"
- 16"
- 20"
- 24"
- 30"

Future Water Pump

Future Water Tank

Existing Water Mains

Production Well

Water Pumps

Water Tank

Washington City Boundary

Washington City
Where Dixie Begins

SUNRISE ENGINEERING

Map Date: 5/25/2023

APPENDIX E
Cash Flow

#	Cash Flow / Fiscal Year		Actual 2019	Actual 2020	Actual 2021	Actual 2022	Budgeted 2023	Projected 2024	Projected 2025	Projected 2026
4	**WATER SYSTEM INFORMATION**									
5	Annual Population Growth Rate		-	-	-	-	6.9%	6.9%	6.9%	6.9%
6	Annual Interest Rate (Inflation)		-	-	-	-	3.0%	3.0%	3.0%	3.0%
7	Average Rate/ERU/Month (Annual Change =)		33.37	33.01	35.79	40.48	36.14	55.53	55.53	55.53
8	Impact fee		2,121	2,121	2,121	2,121	2,121	4,742	4,742	4,742
9	Connection Fee		225	225	225	225	225	375	375	375
14	Total ERU's		13,817	14,553	15,879	16,389	17,520	18,729	20,021	21,402
15	New ERU's		-	735	1326	510	1131	1209	1292	1381
16										
17	**WATER FUND ACCOUNTING**									
18	**Water Revenues**									
19	Water Sales		5,532,490	5,764,108	6,820,455	7,960,492	7,597,284	12,480,056	12,910,617	13,801,450
20	Connection Fees		170,907	165,161	204,439	271,522	182,950	453,326	484,605	518,043
21	Other Revenue (Hydrant Meters, etc.)		298,820	393,433	492,566	636,771	656,315	665,939	680,961	693,654
22	Interest		119,895	181,285	215,695	120,587	177,933	199,681	206,570	220,823
23	***TOTAL WATER FUND REVENUE***		**6,122,112**	**6,503,987**	**7,733,155**	**8,989,372**	**8,614,482**	**13,799,001**	**14,282,753**	**15,233,970**
24										
25	**Water Expenses**									
26	SalariesRegular		819,858	820,047	906,551	957,730	1,204,764	1,214,038	1,334,228	1,466,317
27	Employee Benefits		546,621	561,644	629,189	568,225	847,950	813,497	894,034	982,543
28	Overtime		6,530	12,105	16,286	16,157	17,000	21,113	22,475	23,925
29	Uniforms		3,359	3,557	4,068	2,984	7,030	6,230	6,632	7,060
30	Dues And Memberships		2,231	2,375	2,405	2,410	4,000	3,756	3,998	4,256
31	Software Subscriptions		4,000	100	-	1,057	-	1,031	1,098	1,169
32	Training & Travel		1,030	9,219	7,149	5,299	11,360	11,833	12,597	13,409
33	Office Equipment- Supplies & Maint.		3,218	93,216	1,858	1,050	2,350	20,409	21,725	23,127
34	Supplies & Materials		30,008	15,555	150,232	142,720	228,700	270,808	288,275	306,869
35	Fuel		27,693	38,389	38,550	24,313	42,000	38,550	41,037	43,684
36	Fleet Charges		7,019	32,798	44,375	22,850	67,244	68,008	72,394	77,064
37	Small Tools & Minor Equipment		13,335	10,779	7,112	5,894	15,100	10,037	10,685	11,374
38	Building & Grounds		452,100	460,685	12,712	10,910	13,450	13,095	13,940	14,839
39	Utilities		9,562	14,416	469,082	491,813	693,450	1,244,903	1,325,199	1,410,675
40	Telephone		64,260	21,004	11,331	11,208	13,690	14,436	15,367	16,358
41	Professional & Technical		1,448,034	1,117,901	44,301	36,612	98,616	114,158	121,521	129,359
42	Water Purchase Sandhollow		201,157	341,317	1,360,873	1,840,660	2,039,321	2,709,367	2,904,142	3,091,459
43	Water Purchase Quail Lake Raw		54,031	68,772	430,588	450,072	882,813	988,914	1,052,699	1,120,598
44	Administrative Costs		253,880	300,672	304,322	401,160	310,927	378,567	402,984	428,977
45	District Surcharge		92,137	269,129	286,418	307,294	316,387	400,273	426,090	453,573
46	Uncolectable accounts		-	-	-	9,742	2,000	5,931	3,763	4,005
47	Fees & Charges		4,250	4,250	4,250	4,250	5,700	5,410	5,759	6,130
48	Miscellaneous Service		484,888	213	239	4,400	800	2,894	3,080	3,279
49	Other Projects		566,332	608,124	794,439	718,803	728,800	813,984	866,486	922,374
50	Funded Depreciation		-	1,418,225	1,444,524	1,506,939	1,500,000	1,500,000	1,500,000	1,500,000
51	***Sub-Total Expenses***		**5,095,533**	**4,806,264**	**5,526,328**	**6,037,613**	**7,553,452**	**10,671,243**	**11,350,209**	**12,062,422**
52	**Existing Debt Service**	**% Non-Impact Fee Eligible**								
53	Water Revenue Refunding Bonds 2016B	66%	196,874	196,874	457,574	410,846	411,770	382,598	209,018	157,538
54	***Sub-Total Existing Non-Impact Fee Debt Service***		**196,874**	**196,874**	**457,574**	**410,846**	**411,770**	**382,598**	**209,018**	**157,538**
55	**New Debt Service**									
56	N/A		-	-	-	-	-	-	-	-
57	***Sub-Total New Non-Impact Fee Debt Service***		-	-	-	-	-	-	-	-
58	***TOTAL WATER FUND EXPENSES***		**5,292,407**	**5,003,138**	**5,983,902**	**6,448,459**	**7,965,222**	**11,053,841**	**11,559,226**	**12,219,960**
59										
60	***NET CASHFLOW WATER FUND***		**829,705**	**1,500,849**	**1,749,253**	**2,540,913**	**649,260**	**2,745,160**	**2,723,527**	**3,014,010**
61										
62	**IMPACT FEE FUND ACCOUNTING**									
63	**Impact Fee Fund Revenues**									
64	Impact Fees		1,658,873	1,899,956	2,058,147	2,416,816	1,567,800	5,732,434	6,127,972	6,550,802
65	Interest		20,844	25,755	45,521	16,405	-	17,771	18,997	20,307
66	***TOTAL IMPACT FEE FUND REVENUE***		**1,679,717**	**1,925,710**	**2,103,667**	**2,433,221**	**1,567,800**	**5,750,204**	**6,146,968**	**6,571,109**
67										
68	**Existing Eligible Debt Service**	**% Impact Fee Eligible**								
69	Water Revenue Refunding Bonds 2016B	34%	101,420	101,420	235,720	211,648	212,124	197,096	107,676	81,156
70	***Sub-Total Impact Fee Debt Service***		**101,420**	**101,420**	**235,720**	**211,648**	**212,124**	**197,096**	**107,676**	**81,156**
71	**New Debt Service**									
72	Airport Tank	$ 12,379,055	-	-	-	-	-	-	-	591,442
	Sunrise Valley Tank	$ 9,742,669	-	-	-	-	-	-	-	-
73	***Sub-Total New Impact Fee Debt Service***		-	-	-	-	-	-	-	**591,442**
74	Misc. Impact Fee Projects		1,921,968	125,780	528,305	195,115	6,433,000	-	-	-
75										
76	***NET CASHFLOW IMPACT FEE FUND***		**(343,671)**	**1,698,511**	**1,339,642**	**2,026,458**	**(5,077,324)**	**5,553,108**	**6,039,292**	**5,898,511**
77										
78	**CASH ON HAND**									
79	Water Fund Balance (FY Year End June 30)		(3,101,463)	(1,600,614)	148,639	2,689,552	3,338,812	-	2,321,930	5,055,862
	% of Expences (goal = 150%)								20%	41%
80	Imapct Fee Fund Balance (FY Year End June 30)						2,637,936	-	5,637,695	(806,357)
81	***TOTAL***		**(3,101,463)**	**(1,600,614)**	**148,639**	**2,689,552**	**5,976,748**	**-**	**7,959,626**	**4,249,506**
82										
	Renewal and Replacement Fund Balance		-	1,418,225	2,862,749	4,369,688	5,869,688	7,369,688	8,869,688	10,369,688
83	**PLAN FOR NEW PROJECTS**									
								Long Valley Tank	Airport 1 Tank	Sunrise Valley Tank
84	Storage Project									
85	Impact Fee Eligible Cost							7,538,500	11,354,308	9,742,669
86	Non-Impact Fee Eligible Cost							-	-	-
87	Total Project Cost							7,538,500	11,354,308	9,742,669
								Washington Fields Rd. Transmission Line	Airport Connection PH1	Sunrise Valley Transmission Line
	Booster Pumps/Transmission Lines									
	Impact Fee Eligible Cost							2,716,800	1,024,747	2,319,817
	Non-Impact Fee Eligible Cost							-	-	-
	Total Project Cost							2,716,800	1,024,747	2,319,817
									Perry's Landing PZ Adjustment	Shaddow Ridge
88	Other Projects									
89	Impact Fee Eligible Cost							-	-	-
90	Non-Impact Fee Eligible Cost							-	401,597	280,078
91	Total Project Cost							-	401,597	280,078
92	**RENEWAL & REPLACEMENT PROJECTS**									
93	Project Cost (Paid by Water Fund)							250,000	266,125	283,290
94										

#	Cash Flow / Fiscal Year	Projected 2027	Projected 2028	Projected 2029	Projected 2030	Projected 2031	Projected 2032	Projected 2033	Projected 2034	Projected 2035
4	**WATER SYSTEM INFORMATION**									
5	Annual Population Growth Rate	5.5%	5.5%	5.5%	4.0%	4.0%	4.0%	4.0%	4.0%	3.5%
6	Annual Interest Rate (Inflation)	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
7	Average Rate/ERU/Month (Annual Change =)	55.53	55.53	55.53	55.53	55.53	55.53	55.53	55.53	55.53
8	Impact fee	4,742	4,742	4,742	4,742	4,742	4,742	4,742	4,742	4,742
9	Connection Fee	375	375	375	375	375	375	375	375	375
14	Total ERU's	22,580	23,821	25,132	26,137	27,182	28,270	29,400	30,576	31,647
15	New ERU's	1177	1242	1310	1005	1045	1087	1131	1176	1070
16										
17	**WATER FUND ACCOUNTING**									
18	**Water Revenues**									
19	Water Sales	14,653,918	15,459,884	16,310,177	17,081,637	17,764,902	18,475,498	19,214,518	19,983,099	20,731,486
20	Connection Fees	441,425	465,703	491,317	376,974	392,053	407,735	424,045	441,007	401,316
21	Other Revenue (Hydrant Meters, etc.)	707,927	721,814	736,316	750,937	765,935	781,189	796,769	812,649	828,850
22	Interest	234,463	247,358	260,963	273,306	284,238	295,608	307,432	319,730	331,704
23	***TOTAL WATER FUND REVENUE***	**16,037,732**	**16,894,759**	**17,798,773**	**18,482,854**	**19,207,129**	**19,960,031**	**20,742,764**	**21,556,484**	**22,293,355**
24										
25	**Water Expenses**									
26	SalariesRegular	1,590,954	1,726,185	1,872,911	2,004,014	2,144,295	2,294,396	2,455,004	2,626,854	2,797,599
27	Employee Benefits	1,066,059	1,156,674	1,254,991	1,342,841	1,436,840	1,537,419	1,645,038	1,760,190	1,874,603
28	Overtime	25,300	26,755	28,293	29,708	31,194	32,753	34,391	36,110	37,826
29	Uniforms	7,466	7,895	8,349	8,767	9,205	9,665	10,149	10,656	11,162
30	Dues And Memberships	4,501	4,760	5,033	5,285	5,549	5,827	6,118	6,424	6,729
31	Software Subscriptions	1,236	1,307	1,382	1,451	1,524	1,600	1,680	1,764	1,848
32	Training & Travel	14,180	14,995	15,858	16,651	17,483	18,357	19,275	20,239	21,200
33	Office Equipment- Supplies & Maint.	24,456	25,863	27,350	28,717	30,153	31,661	33,244	34,906	36,564
34	Supplies & Materials	324,514	343,173	362,906	381,051	400,103	420,109	441,114	463,170	485,170
35	Fuel	46,196	48,852	51,661	54,244	56,956	59,804	62,794	65,934	69,066
36	Fleet Charges	81,495	86,181	91,136	95,693	100,478	105,502	110,777	116,316	121,841
37	Small Tools & Minor Equipment	12,028	12,720	13,451	14,124	14,830	15,571	16,350	17,167	17,983
38	Building & Grounds	15,692	16,594	17,549	18,426	19,347	20,315	21,330	22,397	23,461
39	Utilities	1,491,788	1,577,566	1,668,276	1,751,690	1,839,275	1,931,238	2,027,800	2,129,190	2,230,327
40	Telephone	17,298	18,293	19,345	20,312	21,328	22,394	23,514	24,689	25,862
41	Professional & Technical	136,797	144,663	152,981	160,630	168,662	177,095	185,950	195,247	204,521
42	Water Purchase Sandhollow	3,269,218	3,457,198	3,655,987	3,838,786	4,030,726	4,232,262	4,443,875	4,666,069	4,887,707
43	Water Purchase Quail Lake Raw	1,185,033	1,253,172	1,325,230	1,391,491	1,461,066	1,534,119	1,610,825	1,691,366	1,771,706
44	Administrative Costs	453,643	479,727	507,312	532,677	559,311	587,277	616,641	647,473	678,228
45	District Surcharge	479,653	507,233	536,399	563,219	591,380	620,949	651,997	684,597	717,115
46	Uncolectable accounts	4,236	4,479	4,737	4,973	5,222	5,483	5,757	6,045	6,332
47	Fees & Charges	6,483	6,856	7,250	7,612	7,993	8,393	8,812	9,253	9,692
48	Miscellaneous Service	3,468	3,667	3,878	4,072	4,275	4,489	4,713	4,949	5,184
49	Other Projects	975,411	1,031,497	1,090,808	1,145,349	1,202,616	1,262,747	1,325,884	1,392,178	1,458,307
50	Funded Depreciation	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000
51	***Sub-Total Expenses***	**12,737,105**	**13,456,306**	**14,223,073**	**14,921,784**	**15,659,811**	**16,439,424**	**17,263,031**	**18,133,184**	**19,000,033**
52	**Existing Debt Service**									
53	Water Revenue Refunding Bonds 2016B	398,438	398,702	398,570	401,342	400,286	398,834	400,286	397,910	395,138
54	***Sub-Total Existing Non-Impact Fee Debt Service***	**398,438**	**398,702**	**398,570**	**401,342**	**400,286**	**398,834**	**400,286**	**397,910**	**395,138**
55	**New Debt Service**									
56	N/A	-	-	-	-	-	-	-	-	-
57	***Sub-Total New Non-Impact Fee Debt Service***	-	-	-	-	-	-	-	-	-
58	***TOTAL WATER FUND EXPENSES***	**13,135,543**	**13,855,008**	**14,621,642**	**15,323,126**	**16,060,096**	**16,838,258**	**17,663,317**	**18,531,094**	**19,395,171**
59										
60	***NET CASHFLOW WATER FUND***	**2,902,189**	**3,039,751**	**3,177,131**	**3,159,728**	**3,147,033**	**3,121,773**	**3,079,447**	**3,025,390**	**2,898,184**
61										
62	**IMPACT FEE FUND ACCOUNTING**									
63	**Impact Fee Fund Revenues**									
64	Impact Fees	5,581,948	5,888,955	6,212,847	4,766,948	4,957,626	5,155,931	5,362,168	5,576,655	5,074,756
65	Interest	17,304	18,256	19,260	14,778	15,369	15,983	16,623	17,288	15,732
66	***TOTAL IMPACT FEE FUND REVENUE***	**5,599,252**	**5,907,210**	**6,232,107**	**4,781,726**	**4,972,995**	**5,171,915**	**5,378,791**	**5,593,943**	**5,090,488**
67										
68	**Existing Eligible Debt Service**									
69	Water Revenue Refunding Bonds 2016B	205,256	205,392	205,324	206,752	206,208	205,460	206,208	204,984	203,556
70	***Sub-Total Impact Fee Debt Service***	**205,256**	**205,392**	**205,324**	**206,752**	**206,208**	**205,460**	**206,208**	**204,984**	**203,556**
71	**New Debt Service**									
72	Airport Tank	591,442	591,442	591,442	591,442	591,442	591,442	591,442	591,442	591,442
	Sunrise Valley Tank	465,482	465,482	465,482	465,482	465,482	465,482	465,482	465,482	465,482
73	***Sub-Total New Impact Fee Debt Service***	**1,056,924**	**1,056,924**	**1,056,924**	**1,056,924**	**1,056,924**	**1,056,924**	**1,056,924**	**1,056,924**	**1,056,924**
74	Misc. Impact Fee Projects	-	-	-	-	-	-	-	-	-
75										
76	***NET CASHFLOW IMPACT FEE FUND***	**4,337,072**	**4,644,895**	**4,969,859**	**3,518,050**	**3,709,863**	**3,909,531**	**4,115,659**	**4,332,035**	**3,830,008**
77										
78	**CASH ON HAND**									
79	Water Fund Balance (FY Year End June 30)	7,958,052	10,997,802	14,174,933	17,334,661	20,481,694	23,603,467	26,682,914	29,708,304	32,606,488
	% of Expences (goal = 150%)	61%	79%	97%	113%	128%	140%	151%	160%	168%
80	Imapct Fee Fund Balance (FY Year End June 30)	3,530,715	8,175,610	13,077,939	16,595,989	20,305,852	24,215,383	28,922,484	33,845,961	38,267,412
81	***TOTAL***	**11,488,767**	**19,173,413**	**27,252,873**	**33,930,651**	**40,787,547**	**47,818,851**	**55,605,400**	**63,554,267**	**70,873,902**
82										
	Renewal and Replacement Fund Balance	11,869,688	13,369,688	14,869,688	16,369,688	17,869,688	19,369,688	20,869,688	22,369,688	23,869,688
83	**PLAN FOR NEW PROJECTS**									
									Airport Tank 2	
84	Storage Project									
85	Impact Fee Eligible Cost						-			
86	Non-Impact Fee Eligible Cost	-	-	-	-	-	-	-	-	-
87	Total Project Cost									
									East Regional Ph2	Airport Connection Ph2
	Booster Pumps/Transmission Lines									
	Impact Fee Eligible Cost									
	Non-Impact Fee Eligible Cost	-	-	-	-	-	-	-	-	-
	Total Project Cost									
				Culinary Water Master Plan						
88	Other Projects									
89	Impact Fee Eligible Cost			67,531			-			
90	Non-Impact Fee Eligible Cost	-	-	-	-	-	-	-	-	-
91	Total Project Cost			67,531			-			
92	**RENEWAL & REPLACEMENT PROJECTS**									
93	Project Cost (Paid by Water Fund)	299,579	316,805	335,021	351,772	369,361	387,829	407,221	427,582	447,892
94										

#	Cash Flow / Fiscal Year	Projected 2036	Projected 2037	Projected 2038	Projected 2039	Projected 2040	Projected 2041	Projected 2042	Projected 2043	Projected 2044
4	**WATER SYSTEM INFORMATION**									
5	Annual Population Growth Rate	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%
6	Annual Interest Rate (Inflation)	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
7	Average Rate/ERU/Month (Annual Change =)	55.53	55.53	55.53	55.53	55.53	55.53	55.53	55.53	55.53
8	Impact fee	4,742	4,742	4,742	4,742	4,742	4,742	4,742	4,742	4,742
9	Connection Fee	375	375	375	375	375	375	375	375	375
14	Total ERU's	32,754	33,901	35,087	36,315	37,586	38,902	40,263	41,673	43,131
15	New ERU's	1108	1146	1187	1228	1271	1316	1362	1409	1459
16										
17	**WATER FUND ACCOUNTING**									
18	**Water Revenues**									
19	Water Sales	21,457,088	22,208,086	22,985,369	23,789,856	24,622,501	25,484,289	26,376,239	27,299,407	28,254,887
20	Connection Fees	415,362	429,900	444,946	460,519	476,637	493,320	510,586	528,456	546,952
21	Other Revenue (Hydrant Meters, etc.)	845,372	862,224	879,412	896,943	914,823	933,059	951,659	970,630	989,979
22	Interest	343,313	355,329	367,766	380,638	393,960	407,749	422,020	436,791	452,078
23	***TOTAL WATER FUND REVENUE***	**23,061,135**	**23,855,539**	**24,677,493**	**25,527,956**	**26,407,922**	**27,318,417**	**28,260,504**	**29,235,284**	**30,243,896**
24										
25	**Water Expenses**									
26	SalariesRegular	2,979,443	3,173,107	3,379,359	3,599,017	3,832,954	4,082,096	4,347,432	4,630,015	4,930,966
27	Employee Benefits	1,996,452	2,126,221	2,264,426	2,411,614	2,568,368	2,735,312	2,913,108	3,102,460	3,304,120
28	Overtime	39,622	41,504	43,476	45,541	47,704	49,970	52,344	54,830	57,434
29	Uniforms	11,692	12,248	12,829	13,439	14,077	14,746	15,446	16,180	16,949
30	Dues And Memberships	7,049	7,384	7,734	8,102	8,487	8,890	9,312	9,754	10,218
31	Software Subscriptions	1,936	2,028	2,124	2,225	2,330	2,441	2,557	2,679	2,806
32	Training & Travel	22,207	23,262	24,367	25,524	26,737	28,007	29,337	30,731	32,190
33	Office Equipment- Supplies & Maint.	38,301	40,120	42,026	44,022	46,113	48,303	50,598	53,001	55,519
34	Supplies & Materials	508,216	532,356	557,643	584,131	611,877	640,941	671,386	703,277	736,683
35	Fuel	72,346	75,783	79,383	83,153	87,103	91,240	95,574	100,114	104,870
36	Fleet Charges	127,628	133,690	140,041	146,693	153,660	160,959	168,605	176,614	185,003
37	Small Tools & Minor Equipment	18,837	19,732	20,669	21,651	22,679	23,756	24,885	26,067	27,305
38	Building & Grounds	24,575	25,742	26,965	28,246	29,588	30,993	32,465	34,007	35,623
39	Utilities	2,336,267	2,447,240	2,563,484	2,685,249	2,812,799	2,946,407	3,086,361	3,232,963	3,386,529
40	Telephone	27,091	28,377	29,725	31,137	32,616	34,166	35,788	37,488	39,269
41	Professional & Technical	214,236	224,412	235,072	246,238	257,934	270,186	283,020	296,463	310,546
42	Water Purchase Sandhollow	5,119,873	5,363,067	5,617,813	5,884,659	6,164,180	6,456,979	6,763,685	7,084,960	7,421,496
43	Water Purchase Quail Lake Raw	1,855,862	1,944,016	2,036,356	2,133,083	2,234,405	2,340,539	2,451,715	2,568,171	2,690,159
44	Administrative Costs	710,443	744,190	779,539	816,567	855,354	895,983	938,542	983,123	1,029,821
45	District Surcharge	751,178	786,859	824,235	863,386	904,397	947,356	992,355	1,039,492	1,088,868
46	Uncolectable accounts	6,633	6,948	7,278	7,624	7,986	8,366	8,763	9,179	9,615
47	Fees & Charges	10,153	10,635	11,140	11,669	12,224	12,804	13,412	14,050	14,717
48	Miscellaneous Service	5,430	5,688	5,959	6,242	6,538	6,849	7,174	7,515	7,872
49	Other Projects	1,527,576	1,600,136	1,676,143	1,755,759	1,839,158	1,926,518	2,018,028	2,113,884	2,214,293
50	Funded Depreciation	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000
51	***Sub-Total Expenses***	**19,913,048**	**20,874,746**	**21,887,785**	**22,954,971**	**24,079,268**	**25,263,807**	**26,511,892**	**27,827,016**	**29,212,868**
52	**Existing Debt Service**									
53	Water Revenue Refunding Bonds 2016B	378,770	233,834	214,892	212,846	214,001	148,958	171,497	166,650	112,303
54	***Sub-Total Existing Non-Impact Fee Debt Service***	**378,770**	**233,834**	**214,892**	**212,846**	**214,001**	**148,958**	**171,497**	**166,650**	**112,303**
55	**New Debt Service**									
56	N/A	-	-	-	-	-	-	-	-	-
57	***Sub-Total New Non-Impact Fee Debt Service***	-	-	-	-	-	-	-	-	-
58	***TOTAL WATER FUND EXPENSES***	**20,291,818**	**21,108,580**	**22,102,677**	**23,167,817**	**24,293,269**	**25,412,764**	**26,683,389**	**27,993,666**	**29,325,171**
59										
60	***NET CASHFLOW WATER FUND***	**2,769,317**	**2,746,959**	**2,574,816**	**2,360,139**	**2,114,653**	**1,905,652**	**1,577,115**	**1,241,618**	**918,725**
61										
62	**IMPACT FEE FUND ACCOUNTING**									
63	**Impact Fee Fund Revenues**									
64	Impact Fees	5,252,373	5,436,206	5,626,473	5,823,399	6,027,218	6,238,171	6,456,507	6,682,485	6,916,372
65	Interest	16,282	16,852	17,442	18,053	18,684	19,338	20,015	20,716	21,441
66	***TOTAL IMPACT FEE FUND REVENUE***	**5,268,655**	**5,453,058**	**5,643,915**	**5,841,452**	**6,045,903**	**6,257,509**	**6,476,522**	**6,703,201**	**6,937,813**
67										
68	**Existing Eligible Debt Service**									
69	Water Revenue Refunding Bonds 2016B	195,124	120,460	110,702	109,648	110,243	76,736	88,347	85,850	57,853
70	***Sub-Total Impact Fee Debt Service***	**195,124**	**120,460**	**110,702**	**109,648**	**110,243**	**76,736**	**88,347**	**85,850**	**57,853**
71	**New Debt Service**									
72	Airport Tank	591,442	591,442	591,442	591,442	591,442	591,442	591,442	591,442	591,442
	Sunrise Valley Tank	465,482	465,482	465,482	465,482	465,482	465,482	465,482	465,482	465,482
73	***Sub-Total New Impact Fee Debt Service***	**1,056,924**	**1,056,924**	**1,056,924**	**1,056,924**	**1,056,924**	**1,056,924**	**1,056,924**	**1,056,924**	**1,056,924**
74	Misc. Impact Fee Projects	-	-	-	-	-	-	-	-	-
75										
76	***NET CASHFLOW IMPACT FEE FUND***	**4,016,607**	**4,275,674**	**4,476,289**	**4,674,880**	**4,878,736**	**5,123,850**	**5,331,252**	**5,560,427**	**5,823,036**
77										
78	**CASH ON HAND**									
79	Water Fund Balance (FY Year End June 30)	35,375,805	38,122,764	40,697,580	43,057,719	45,172,371	47,078,024	48,655,139	49,896,757	50,815,482
	% of Expences (goal = 150%)	174%	181%	184%	186%	186%	185%	182%	178%	173%
80	Imapct Fee Fund Balance (FY Year End June 30)	42,875,461	47,742,577	52,810,309	58,076,631	63,546,809	69,262,101	75,184,795	81,336,664	87,751,141
81	***TOTAL***	**78,251,268**	**85,865,343**	**93,507,890**	**101,134,352**	**108,719,183**	**116,340,127**	**123,839,935**	**131,233,422**	**138,566,625**
82										
	Renewal and Replacement Fund Balance	25,369,688	26,869,688	28,369,688	29,869,688	31,369,688	32,869,688	34,369,688	35,869,688	37,369,688
83	**PLAN FOR NEW PROJECTS**									
			Majestic Tank		Stuki Farms Tank					
84	Storage Project									
85	Impact Fee Eligible Cost		-							
86	Non-Impact Fee Eligible Cost	-	-	-	-	-	-	-	-	-
87	Total Project Cost									
				Airport Connection Ph 3			East Regional Ph3			
	Booster Pumps/Transmission Lines									
	Impact Fee Eligible Cost									
	Non-Impact Fee Eligible Cost	-	-	-	-	-	-	-	-	-
	Total Project Cost									
88	Other Projects									
89	Impact Fee Eligible Cost									
90	Non-Impact Fee Eligible Cost	-	-	-	-	-	-	-	-	-
91	Total Project Cost									
92	**RENEWAL & REPLACEMENT PROJECTS**									
93	Project Cost (Paid by Water Fund)	469,167	491,452	514,796	539,249	564,863	591,694	619,799	649,240	680,079
94										

APPENDIX F
Impact Fee Certification

CERTIFICATION OF IMPACT FEE ANALYSIS BY CONSULTANT

In accordance with Utah Code Annotated § 11-36a-306, Blaine Worrell, P.E., on behalf of Sunrise Engineering, Inc., make the following certification:

I certify that the attached Impact Fee Facilities Plan and Impact Fee Analysis:

1. Includes only the costs of public facilities that are:
    a. Allowed under the Impact Fees Act; and
    b. Actually incurred; or
    c. Projected to be incurred or encumbered within six years after the day on which each impact fee is paid;

2. Does not include:
    a. costs of operation and maintenance of public facilities;
    b. costs for qualifying public facilities that will raise the level of service for the facilities, through impact fees, above the level of service that is supported by existing residents; or
    c. an expense for overhead, unless the expense is calculated pursuant to a methodology that is consistent with generally accepted cost accounting practices and that methodological standards set forth by the Federal Office of Management and Budget for federal grant reimbursement;

3. Offsets costs with grants or other alternate sources of payment; and

4. Complies in each and every relevant respect with the Impact Fees Act.

Blaine Worrell, P.E., makes this certification with the following qualifications:

1. All of the recommendations for implementation of the Impact Fee Facilities Plan ("IFFP") made in the IFFP documents or in the Impact Fee Analysis documents are followed in their entirety by the Washington City, Utah, staff, and elected officials.

2. If all or a portion of the IFFP or Impact Fee Analyses are modified or amended, this certification is no longer valid.

3. All information provided to Sunrise Engineering, Inc., its contractors or suppliers, is assumed to be correct, complete and accurate. This includes information provided by Washington City, Utah, and outside sources.

4. The undersigned is trained and licensed as a professional engineer and has not been trained or licensed as a lawyer. Nothing in the foregoing certification shall be deemed an opinion of law or an opinion of compliance with law which under applicable professional licensing laws or regulations or other laws or regulations must be rendered by a lawyer licensed in the State of Utah.

5. The foregoing Certification is an expression of professional opinion based on the undersigned's best knowledge, information and belief and shall not be construed as a warranty or guaranty of any fact or circumstance.

6. The foregoing certification is made only to Washington City, Utah, and may not be used or relied upon by any other person or entity without the expressed written authorization of the undersigned.

Sunrise Engineering, Inc.

By: _____

Dated: 07/28/2023