

**CITY OF MOAB RESOLUTION NO. 01-2025**  
**A RESOLUTION ADOPTING THE SEWER IMPACT FEE FACILITIES PLAN AND**  
**IMPACT FEE ANALYSIS 2023 AMENDMENT**

The following findings describe the reasons for this resolution and explain its purpose.

- a. The City adopted the 2016 Impact Fee Facilities Plan (IFFP) with the approval of Ordinance 2016-08, and subsequently the 2017 amendment to that plan.
- b. Impact fees can be updated to account for revised anticipated construction costs.
- c. The Sewer Impact Fee Facilities plan and Impact Fee Analysis 2023 Amendment includes updated impact fees based on more-current construction costs.

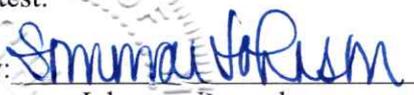
Now therefore, the City of Moab resolves as follows:

- 1. **Direction to Staff.** Update the Master Fee Schedule to include these sewer impact fee costs, and begin to charge these fees as appropriate, after the mandatory 90-day waiting period, which will terminate on June 23<sup>rd</sup>, 2025.
- 2. **Authorize the Mayor** to sign this Resolution.

PASSED AND APPROVED by a majority of the City Council, this 25<sup>th</sup> day of March, 2025.

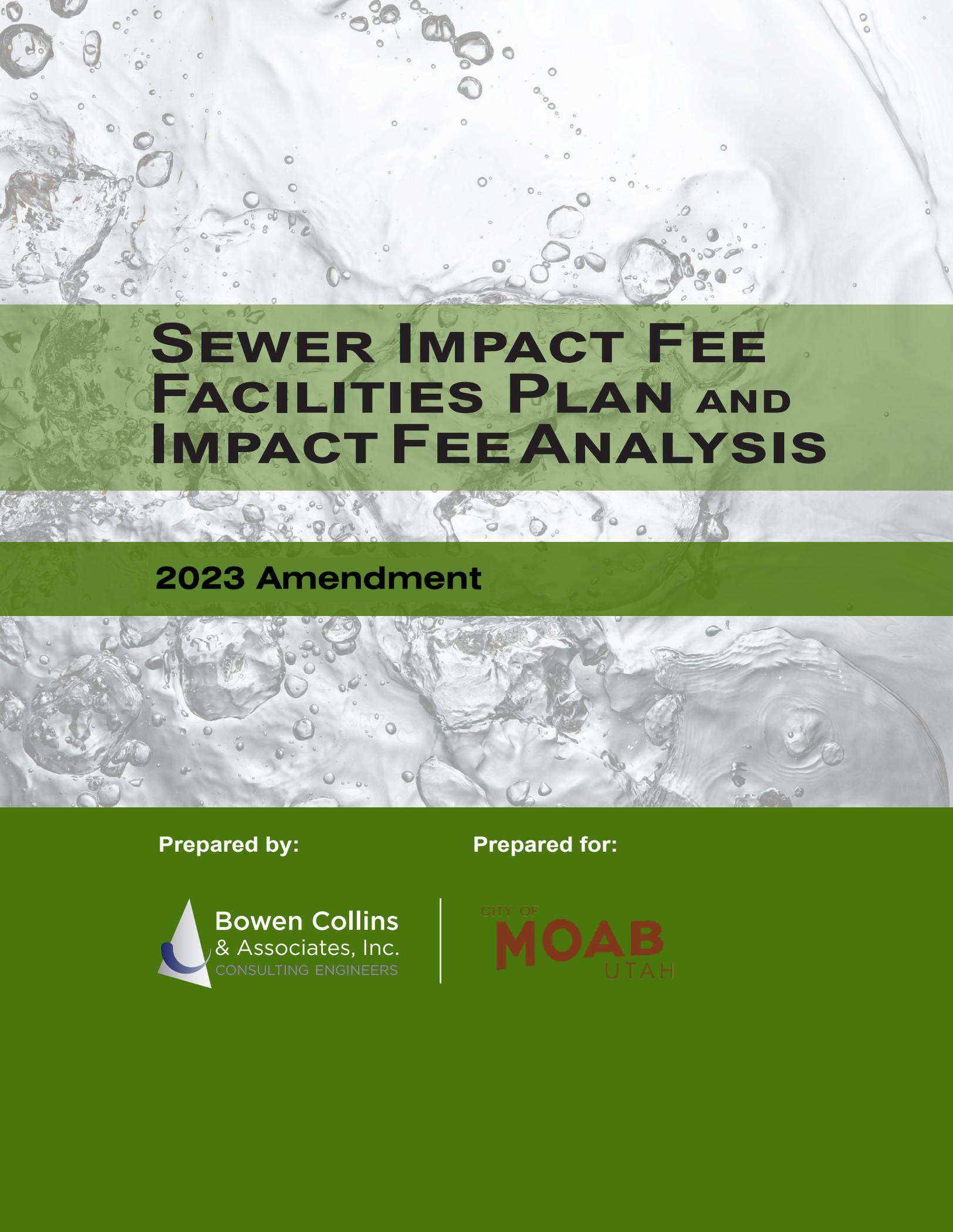
By:   
Joette Langianese, Mayor

3/25/25  
Date

Attest:  
By:   
Sommar Johnson, Recorder



3/25/25  
Date



# SEWER IMPACT FEE FACILITIES PLAN AND IMPACT FEE ANALYSIS

**2023 Amendment**

**Prepared by:**



**Prepared for:**



# SEWER IMPACT FEE FACILITIES PLAN

**2023 Amendment**

**Prepared for:**



**Prepared by:**



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## **EXECUTIVE SUMMARY – IFFP (SEWER)**

The purpose of an impact fee facilities plan (IFFP) is to identify demands placed upon Moab City facilities by future development and evaluate how these demands will be met by the City. The IFFP is also intended to outline the improvements which may be funded through impact fees.

This report was originally completed in October of 2016 and was updated in February of 2017 to reflect higher than expected construction costs associated with the City’s new wastewater treatment plant. In 2023 the City requested that BC&A amend the adopted report to reflect real costs to the City for projects that have been completed, including two projects that were not originally part of the 10-year planning window. This amendment only changes project costs and the resulting impact fee calculations. All other components of the analysis, including the 2017 growth projections and level of service assumptions, were unaltered as part of this analysis.

### **WHY IS AN IFFP NEEDED?**

The IFFP provides a technical basis for assessing updated impact fees throughout the City. This document addresses the future infrastructure needed to serve the City. The existing and future capital projects documented in this IFFP will ensure that level of service standards are maintained for all existing and future residents who reside within the service area. Local governments must pay strict attention to the required elements of the Impact Fee Facilities Plan which are enumerated in the Impact Fees Act.

### **SERVICE AREAS**

For the purpose of impact fee calculations, the Moab City sewer system has been divided into three service areas. The “Moab City” service area includes all areas within the corporate boundaries of the City. The “Other Agencies” service area includes all growth outside of the City’s corporate boundary that is still expected to flow to the City. This could potentially include flow from the Spanish Valley Water & Sewer Improvement District (SVW&SID) and San Juan County. The “Septage Haulers” service area is not associated with a specific area at all, but refers to those customers that will bring septage directly to the City plan from septic tanks, campgrounds, and pit toilets serving the recreational areas surrounding Moab City.

### **PROJECTED FUTURE GROWTH**

To evaluate the use of existing capacity and the need for future capacity, it is first necessary to calculate the demand associated with existing development and projected growth. Using available information for existing development and growth projections from the City’s Capital Facilities Plan, projected growth in system demand is summarized in Tables ES-1 and ES-2. Because of the different issues associated with flow and treatment, growth has been evaluated for these two categories separately.

**Table ES-1  
Projected Moab Sewer System Growth – Flow ERUs**

	<b>Projected Flow ERUs – Moab City</b>	<b>Projected Flow ERUs – Other Agencies</b>	<b>Projected Flow ERUs – Septage</b>	<b>Projected Flow ERUs – Total</b>	<b>Estimated Dry Weather Sewer Flows (mgd)</b>
<b>2017</b>	5,467	2,707	38	8,212	1.19
<b>2022</b>	5,774	3,536	47	9,357	1.35
<b>2027</b>	6,099	4,215	55	10,370	1.50
<b>2032</b>	6,442	4,931	64	11,437	1.66
<b>2035</b>	6,657	5,379	69	12,105	1.75
<b>2060</b>	8,320	6,111	83	14,514	2.13

**Table ES-2  
Projected Moab Sewer System Growth – Treatment ERUs**

	<b>Projected Treatment ERUs – Moab City</b>	<b>Projected Treatment ERUs – Other Agencies</b>	<b>Projected Treatment ERUs – Septage</b>	<b>Projected Treatment ERUs – Total</b>
<b>2017</b>	6,107	2,944	1,373	10,424
<b>2022</b>	6,450	3,891	1,688	12,030
<b>2027</b>	6,813	4,688	2,004	13,505
<b>2032</b>	7,196	5,524	2,319	15,040
<b>2035</b>	7,436	6,046	2,509	15,991
<b>2060</b>	9,147	6,722	3,191	19,060

Demands are projected in terms of Equivalent Residential Units (ERUs). An ERU represents the demand that a typical single family residence places on the system. The basis of an ERU (based on both flow and treatment demands) is summarized in Table ES-3.

**Table ES-3  
Moab Service Area Flow and Treatment ERUs**

<b>Item</b>	<b>Value</b>
<b>Flow</b>	
Equivalent Residential Units (ERUs)	8,232
Domestic Wastewater Production (mgd)	1.07
Infiltration, Maximum Month (mgd)	0.12
Average Day, Maximum Month Flow (mgd)	1.19
Peak Hour Flow (mgd)	2.98
<b>Flows per ERU</b>	
Domestic Wastewater Production (gpd/ERU)	130.2
Average Day, Maximum Month Flow (gpd/ERU)	144.6
Peak Hour Flow (gpd/ERU)	361.5
Average Indoor Water Use (gallons/month/ERU)	4,400
<b>Treatment</b>	
Treatment Equivalent Residential Units (ERUs)	10,221
BOD Loading, Maximum Month (lbs)	112,400
TSS Loading, Maximum Month (lbs)	105,300
<b>Wastewater Strength per ERU</b>	
BOD (mg/L)	300
TSS (mg/L)	280
BOD (lbs/month/ERU)	11.0
TSS (lbs/month/ERU)	10.3

## LEVEL OF SERVICE

Level of service is defined in the Impact Fees Act as “the defined performance standard or unit of demand for each capital component of a public facility within a service area”. Performance standards are those standards that are used to design and evaluate the performance of facilities. While the Impact Fees Act includes “defined performance standard” as part of the level of service definition, this report will make a subtle distinction between performance standard and level of service. The performance standard will be considered the desired minimum level of performance for each component, while the existing level of service will be the actual current performance of the component and the proposed level of service will be the proposed actual performance of the component in the future. For the wastewater collection system, summary values for each of these categories are contained in Table ES-4.

**Table ES-4  
Performance Standards and Level of Service  
for Collection System Components**

	<b>Existing Performance Standard</b>	<b>Existing Level of Service</b>	<b>Proposed Level of Service</b>
<b>Pipeline Capacity</b>			
Maximum Ratio of Flow <sup>1</sup> to Pipeline Capacity	0.75	0.74 <sup>2</sup>	0.75

<sup>1</sup> Peak hour, dry weather flow

<sup>2</sup> Because there are thousands of pipeline components, the value given is for the worst case only. All other components have a higher level of service.

For treatment facilities, the City has decided to completely replace the existing treatment plant with a new facility. As a result, the existing facility will effectively provide no existing level of service moving forward from an impact fee perspective. Construction of the new facilities will represent a new level of service to be paid for proportionally by both existing and future users based on the level of benefit received.

#### **EXISTING CAPACITY AVAILABLE TO SERVE FUTURE GROWTH**

Projected future growth will be met through a combination of available excess capacity in existing facilities and construction of additional capacity in new facilities. Defining existing system capacity in terms of a single number is difficult. To improve the accuracy of the analysis, the system was divided into two different components (pipeline capacity and treatment, and plant capacity). Excess capacity in each component of the system is as follows:

#### **Pipeline Capacity**

Use of collection capacity was evaluated using the updated computer model of the City's collection system. As a whole, the calculated percentage of existing capacity in collection system facilities that is or will be used by varying customer groups is summarized in Table ES-5.

**Table ES-5  
Use of Existing Capacity**

<b>Pipeline Capacity</b>	<b>Existing Users</b>	<b>10-Year Growth</b>	<b>Growth Beyond 10- Years</b>	<b>Total</b>
Moab City	53.2%	4.7%	15.9%	73.8%
Other Agencies	20.6%	2.4%	3.2%	26.2%
Septage Haulers	0.0%	0.0%	0.0%	0.0%
Total	73.8%	7.1%	19.1%	100.0%

#### **Treatment Plant Capacity**

As noted previously, no existing treatment plant capacity will be used into the future.

## **REQUIRED SYSTEM IMPROVEMENTS**

Beyond available existing capacity, additional improvements required to serve new growth are summarized in Table ES-6. To satisfy the requirements of state law, Table ES-6 provides a breakdown of the percentage of the project costs attributed to existing and future users. For future use, capacity has been divided between capacity to be used by growth within the 10-year planning window of this IFFP and capacity that will be available for growth beyond the 10-year window. Use of capacity has also been divided between the several service areas.

**Table ES-6  
Project Costs Allocated to Projected Development, 10-year Planning Window**

Name	Total Cost	Percent to Moab City Service Area			Percent to Other Agencies Service Area			Percent to Septage Haulers Service Area		
		Existing	10-yr Growth	Beyond 10-yr	Existing	10-yr Growth	Beyond 10-yr	Existing	10-yr Growth	Beyond 10-yr
New South Trunkline	\$6,937,000	0.00%	5.91%	23.83%	0%	33.34%	36.92%	0%	0%	0%
New Wastewater Treatment Plant	\$15,510,700	38.25%	4.42%	3.83%	18.44%	10.92%	8.45%	8.60%	3.95%	3.14%
100 West Pipe	\$2,616,108	82.04%	6.86%	0.00%	9.11%	1.99%	0.00%	0.00%	0.00%	0.00%
Northwest Trunk and Lift Station	\$1,486,799	32.49%	14.98%	52.53%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Birch and Tuscher	\$3,092,454	60.22%	23.77%	16.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Outfall for WRF	\$2,645,000	37.80%	8.78%	16.45%	18.78%	6.08%	12.11%	0.00%	0.00%	0.00%
Vehicle Storage Shed	\$550,000	45.36%	5.24%	4.55%	21.87%	12.96%	10.02%	0.00%	0.00%	0.00%

## IMPACT FEE FACILITIES PLAN (SEWER)

### INTRODUCTION

Moab City has retained Bowen Collins & Associates (BC&A) to prepare an impact fee facilities plan (IFFP) for sewer collection services provided by the City. The purpose of an IFFP is to determine the public facilities required to service development resulting from new development activity. The IFFP is also intended to outline the improvements which may be funded through impact fees.

### 2023 Amendment

This report was originally completed in October of 2016, but was updated in February of 2017 to reflect higher than expected construction costs associated with the City's new wastewater treatment plant. In 2023, the City requested that BC&A amend the adopted report to reflect real costs to the City for projects that have been completed, including two projects that were not originally part of the 10-year planning window (i.e., 100 West Pipeline and Northwest Trunkline and Lift Station). This amendment only changes project costs and the resulting impact fee calculations. All other components of the analysis, including the 2017 growth projections and level of service assumptions, were unaltered as part of this analysis.

Stylistically, it should be noted that this amendment has been written to keep language consistent with the original planning window (2017 to 2027). This means that the language may still refer to some facilities in the future tense even though they are complete as of the writing of this amendment in 2023. Examples of this include the new wastewater treatment plan and the 100 West Pipeline project. In these cases, the reported costs, lengths, etc. are all based on actual, past observed values even though the projects are still referred to in the future tense.

### Service Areas

For the purpose of impact fee calculations, the Moab City sewer system has been divided into three service areas. The "Moab City" service area includes all areas within the corporate boundaries of the City. The "Other Agencies" service area includes all growth outside of the City's corporate boundary that is still expected to flow to the City. This could potentially include flow from the Spanish Valley Water & Sewer Improvement District (SVW&SID) and San Juan County. The "Septage Haulers" service area is not associated with a specific area at all, but refers to those customers that will bring septage directly to the City plan from septic tanks, campgrounds, and pit toilets serving the recreational areas surrounding Moab City.

It is important to divide the system into service areas because of the difference in facilities that will be used to serve each service area. This is primarily in connection with sewer collection facilities in the City. While the treatment facilities used to service each service area will be essentially identical, the collection facilities will be significantly different. Much of the growth in Moab City will use available capacity in existing collection pipelines throughout the City. Growth in the "Other Agency" service area will predominantly be served by a new trunkline along the southern edge of the City. Septage haulers will not use any collection capacity at all. This different

use of collection will be reflected in the calculation of impact fees as described in the remainder of this report.

## Requirements

Requirements for the preparation of an IFFP are outlined in Title 11, Chapter 36a of the Utah Code (the Impact Fees Act). Under these requirements, an IFFP shall accomplish the following for each facility:

1. Identify the existing level of service
2. Establish a proposed level of service
3. Identify excess capacity to accommodate future growth at the proposed level of service
4. Identify demands placed upon existing public facilities by new development
5. Identify the means by which demands from new development will be met
6. Consider the following additional issues
  - a. revenue sources to finance required system improvements
  - b. necessity of improvements to maintain the proposed level of service
  - c. need for facilities relative to planned locations of schools

The following sections of this report have been organized to address each of these requirements.

### **EXISTING LEVEL OF SERVICE - 11-36a-302(1)(a)(i)**

Level of service is defined in the Impact Fees Act as “the defined performance standard or unit of demand for each capital component of a public facility within a service area”. This section discusses the level of service being currently provided to existing users. The level of service is the same for all service areas.

### **Unit of Demand**

The projected flow used to design and evaluate system components will vary depending on the nature of each component. For example, most treatment plant processes are designed based on average day, maximum month flow (with consideration of wastewater strength characteristics). Conversely, conveyance pipelines must be designed based on peak hour flow (function of daily flow and diurnal flow variation).

For the purposes of this analysis, it is useful to define these various demands in terms of Equivalent Residential Units (ERUs). An ERU represents the demand that a typical single family residence places on the system. Because of the different types of facilities in the City wastewater system, it is useful to define an ERU in terms of flow only (for use in the evaluation of conveyance facilities), and treatment (considering both flow and wastewater strength). The basis of both flow and treatment ERUs for historical wastewater characteristics and flow rates has been documented in a technical memorandum dated September 21, 2016 and has been included as Appendix A. The major components of the flow and treatment ERUs are summarized in Table 1.

**Table 1**  
**Wastewater System Flow and Treatment ERUs**

<b>Item</b>	<b>Value</b>
<b>Flow</b>	
Equivalent Residential Units (ERUs)	8,232
Domestic Wastewater Production (mgd)	1.07
Infiltration, Maximum Month (mgd)	0.12
Average Day, Maximum Month Flow (mgd)	1.19
Peak Hour Flow (mgd)	2.98
<b>Flows per ERU</b>	
Domestic Wastewater Production (gpd/ERU)	130.2
Average Day, Maximum Month Flow (gpd/ERU)	144.6
Peak Hour Flow (gpd/ERU)	361.5
Average Indoor Water Use (gallons/month/ERU)	4,400
<b>Treatment</b>	
Treatment Equivalent Residential Units (ERUs)	10,221
BOD Loading, Maximum Month (lbs)	112,400
TSS Loading, Maximum Month (lbs)	105,300
<b>Wastewater Strength per ERU</b>	
BOD (mg/L)	300
TSS (mg/L)	280
BOD (lbs/month/ERU)	11.0
TSS (lbs/month/ERU)	10.3

### **Performance Standard and Level of Service**

Performance standards are those standards that are used to design and evaluate the performance of facilities. While the Impact Fees Act includes “defined performance standard” as part of the level of service definition, this report will make a subtle distinction between performance standard and level of service. The performance standard will be considered the desired minimum level of performance for each component, while the existing level of service will be the actual current performance of the component. Thus, if the existing level of service is less than the performance standard it is a deficiency. If it is greater than the performance standard it may indicate excess capacity.

To improve the accuracy of the analysis, this impact fee facilities plan has divided the system into two different components (pipeline capacity and treatment capacity). Each of these components has its own set of performance standards and level of service:

### *Pipeline Capacity*

Moab engineering standards require that all sewer mains be designed such that the peak flow depth in the pipe is less than or equal to the depth associated with 75 percent of the pipe's hydraulic capacity, using a Manning's roughness factor  $n$  of 0.013 (this is approximately equal to a depth over diameter ratio of 0.65). This allows for a small amount of extra capacity to be reserved in the pipeline to account for potential inflow into the system and other unknowns.

A hydraulic computer model was used to evaluate the existing level of service of pipelines in the City's sewer collection system. The existing level of service compared to the performance standard is summarized in Table 2 below.

**Table 2  
Existing Performance Standards and Level of Service  
for Sewer Pipelines**

	<b>Existing Performance Standard</b>	<b>Existing Level of Service</b>
<b>Pipeline Capacity</b>		
Maximum Ratio of Flow <sup>1</sup> to Pipeline Capacity	0.75	0.74 <sup>2</sup>

<sup>1</sup> Peak hour, dry weather flow

<sup>2</sup> Because there are thousands of pipeline components, the value given is for the worst case only. All other components have a higher level of service.

As shown in the table, the City's pipeline existing level of service is actually better than the capacity performance standard. This indicates there is some excess capacity in all of the existing collection pipelines in the system. It should be noted that, because there are hundreds of pipeline components in the sewer collection system, the value given is actually for the worst case only. All other components have a higher level of service. Thus, the excess capacity identified in the table may actually be higher in other parts of the system. Excess capacity will be discussed in subsequent sections of this report.

### *Treatment Plant Capacity*

The Moab WWTP was initially constructed in the late 1950s to provide primary treatment of wastewater for the Moab area. A secondary treatment process was added in 1967. Additional modifications and expansions have been completed over the life of the plant. The latest expansion was completed in 1996, which included a new headworks facility, additional primary and secondary clarifiers, a new septage receiving station, and several other improvements.

The WWTP has adequately met the City's wastewater treatment needs for many years. However, population growth and increased tourism in Moab area have resulted in increased biological loading to the WWTP. The increased loading exceeds the plant's capacity to effectively treat influent wastewater to continuously meet the effluent discharge standards required by the State of Utah. Upgrades to the biological treatment process are necessary to ensure full compliance with

requirements of the discharge permit. Additionally, portions of the plant are over 60 years old and require renovation or replacement in order for the facility to provide continued reliable service.

As a result of these issues, the City has decided to completely replace the existing treatment plant with a new facility. As a result, the existing facility will effectively provide no existing level of service moving forward from an impact fee perspective. Construction of the new facilities will represent a new level of service to be paid for proportionally by both existing and future users based on the level of benefit received. This will be discussed in greater detail in subsequent sections of this report.

**PROPOSED LEVEL OF SERVICE - 11-36a-302(1)(a)(ii)**

The proposed level of service is the performance standard used to evaluate system needs in the future. The Impact Fees Act indicates that the proposed level of service may:

1. diminish or equal the existing level of service; or
2. exceed the existing level of service if, independent of the use of impact fees, the City implements and maintains the means to increase the level of service for existing demand within six years of the date on which new growth is charged for the proposed level of service.

As with existing level of service, this impact fee facilities plan has divided the system into pipeline capacity and treatment capacity to discuss proposed level of service.

**Pipeline Capacity**

By definition, the proposed future level of service for sewer system pipelines will be equal to the performance standard as summarized in Table 3.

**Table 3  
Proposed Performance Standards and Level of Service  
For Sewer Pipelines**

	<b>Proposed Performance Standard</b>	<b>Proposed Level of Service</b>
<b>Pipeline Capacity</b>		
Maximum Ratio of Flow <sup>1</sup> to Pipeline Capacity	0.75	0.75

<sup>1</sup> Peak hour, dry weather flow

**Treatment Plant Capacity**

As discussed above, the City is in the process of designing a project to completely replace its existing treatment plant. This represents an increased level of service that will need to be paid for by all users.

A treatment plant consists of a large number of different components. Each component may have different criteria for design depending on the nature of the component. For the majority of treatment related components, design is based on treating the average daily flow during the maximum month. This is the same standard used by the State of Utah Department of Environmental Quality (UDEQ) when rating the capacity of a treatment plant. Within this flow capacity, however, the treatment plant must also be designed to accommodate expected wastewater strengths. This of particular concern for Moab City because of the large amount of septage received from campgrounds and other pit toilets located in recreational areas near the City. Ultimately, capacity will be evaluated based on treatment ERUs as summarized above, which represents a composite of flow and strength.

### **EXCESS CAPACITY TO ACCOMMODATE FUTURE GROWTH - 11-36a-302(1)(a)(iii)**

Projected future growth will be met through a combination of available excess capacity in existing facilities and construction of additional capacity in new facilities. This section discusses use of available existing capacity.

#### **Pipeline Capacity**

To calculate the percentage of existing capacity to be used by future growth in existing facilities, existing and future flows were examined in system model for each collection pipeline. The method used to calculate excess capacity available for use by future flows is as follows:

1. **Calculate Flows** – The peak flow in each facility was calculated in the model for both existing and future flows. The capacity at a 0.65 depth to diameter ratio of each pipeline was also calculated.
2. **Identify Available Capacity** – Where a facility has capacity in excess of projected flows at buildout, the available capacity in the facility was defined as the difference between existing flows and buildout flows. Where the facility has capacity less than projected flows at buildout, the available capacity in the facility was defined as the difference between existing flows and the facility’s maximum capacity.
3. **Eliminate Facilities without Excess Capacity** – For the planning window period (in this case, 10 years), the projected growth in flow during the planning window was compared against the facility’s available capacity. Where the future flow exceeded the capacity of the facility, the available excess capacity was assumed to be zero. By definition, this corresponds to those facilities with deficiencies that are identified in the facilities plan. By assigning a capacity of zero, this eliminated double counting those facilities against new users.
4. **Calculate Percent of Excess Capacity Used in Remaining Facilities** – Where the future flow was less than the capacity of the facility, the percent of excess capacity to be used in each facility was calculated by dividing the growth in flow in the facility (future flow less existing flow) by the total capacity (existing flow plus available capacity).
5. **Calculate Excess Capacity for the System as a Whole** – Each pipeline in the system has a different quantity of excess capacity to be used by future growth. To develop an estimate of excess capacity on a system wide basis, the capacities of each of these pipelines and their contribution to the system as a whole must be considered. To do this, each pipeline

must first be weighted based on its estimated cost. For this purpose, each pipeline has been weighted based on the product of its diameter and length (which is a roughly proportional approximation of overall pipeline cost). For example, a pipe that is 36 inches in diameter and is 4,000 ft. long will cost proportionally more than a pipe that is 10 inches in diameter and 300 ft. long. The excess capacity in the system as a whole can then be calculated as the sum of the weighted capacity used by future growth divided by the sum of total weighted capacity in the system.

Based on the method described above, the amount of excess capacity in existing facilities available to accommodate future growth and the demands placed on the existing facilities by new development activity has been calculated for each element in the system by BC&A. Use of the existing capacity has also been divided between the various service areas.

As a whole, the calculated percentage of existing capacity in collection system facilities that is or will be used by varying customer groups is summarized in Table 4. As would be expected, Septage Haulers are not using any portion of the existing collection system.

**Table 4**  
**Use of Existing Capacity**

<b>Pipeline Capacity</b>	<b>Existing Users</b>	<b>10-Year Growth</b>	<b>Growth Beyond 10-Years</b>	<b>Total</b>
Moab City	53.2%	4.7%	15.9%	73.8%
Other Agencies	20.6%	2.4%	3.2%	26.2%
Septage Haulers	0.0%	0.0%	0.0%	0.0%
Total	73.8%	7.1%	19.1%	100.0%

### **Treatment Capacity**

As noted previously, no existing treatment plant capacity will be used into the future.

### **DEMANDS PLACED ON FACILITIES BY NEW DEVELOPMENT - 11-36a-302(a)(iv)**

Growth within the City's service area, and projections of sewer flows resulting from said growth have been evaluated as part of the City's new treatment plant design activities. Growth in terms of equivalent residential units is summarized in Tables 5 and 6. Table 5 considers growth in flow ERUs, while Table 6 examines treatment ERUs. Each table includes a breakdown of growth by service area.

**Table 5**  
**Projected Moab Sewer System Growth – Flow ERUs**

	<b>Projected Flow ERUs – Moab City</b>	<b>Projected Flow ERUs – Other Agencies</b>	<b>Projected Flow ERUs – Septage</b>	<b>Projected Flow ERUs – Total</b>	<b>Estimated Dry Weather Sewer Flows (mgd)</b>
<b>2017</b>	5,467	2,707	38	8,212	1.19
<b>2022</b>	5,774	3,536	47	9,357	1.35
<b>2027</b>	6,099	4,215	55	10,370	1.50
<b>2032</b>	6,442	4,931	64	11,437	1.66
<b>2035</b>	6,657	5,379	69	12,105	1.75
<b>2060</b>	8,320	6,111	83	14,514	2.13

**Table 6**  
**Projected Moab Sewer System Growth – Treatment ERUs**

	<b>Projected Treatment ERUs – Moab City</b>	<b>Projected Treatment ERUs – Other Agencies</b>	<b>Projected Treatment ERUs – Septage</b>	<b>Projected Treatment ERUs – Total</b>
<b>2017</b>	6,107	2,944	1,373	10,424
<b>2022</b>	6,450	3,891	1,688	12,030
<b>2027</b>	6,813	4,688	2,004	13,505
<b>2032</b>	7,196	5,524	2,319	15,040
<b>2035</b>	7,436	6,046	2,509	15,991
<b>2060</b>	9,147	6,722	3,191	19,060

**INFRASTRUCTURE REQUIRED TO MEET DEMANDS OF NEW DEVELOPMENT - 11-36A-302(1)(a)(v)**

To satisfy the requirements of state law, the effect of demand placed upon existing system facilities by future development was evaluated using the process outlined below. Each of the steps were completed as part of this plan's development.

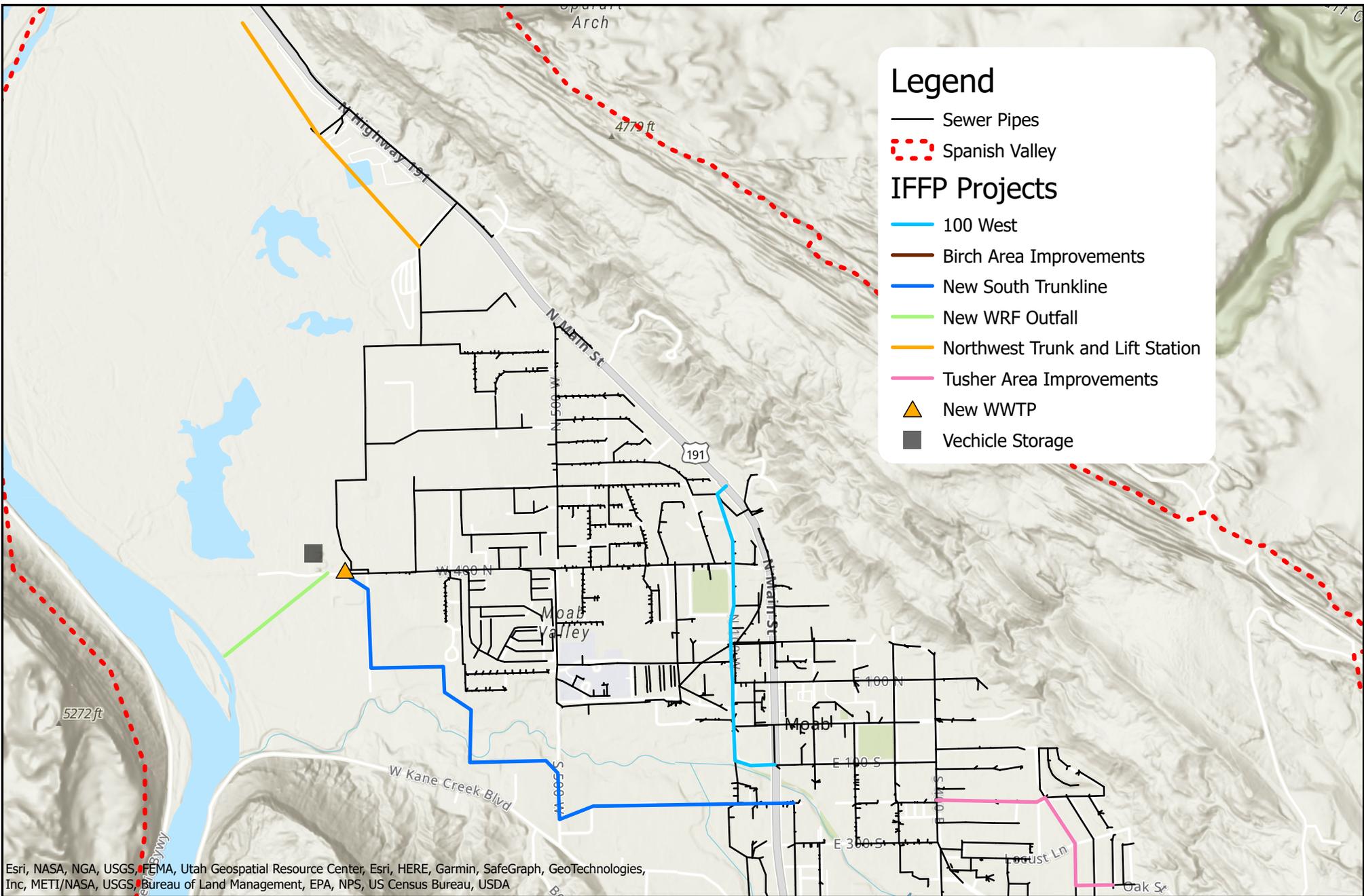
1. **Existing Demand** – The demand existing development places on the City's system was estimated based on historic water use and flow records.
2. **Existing Capacity** – The capacities of existing system collection facilities were estimated using size data provided by the City and a hydraulic computer model.
3. **Existing Deficiencies** – Existing deficiencies in the system were looked for by comparing defined levels of service against calculated capacities. No existing capacity deficiencies in the existing collection system were identified in this study.

4. **Future Demand** - The demand future development will place on the system was estimated based on development projections as summarized above.
5. **Future Deficiencies** - Future deficiencies in the collection system were identified using the defined level of service and results from the computer model.
6. **Recommended Improvements** – Needed system improvements were identified to meet demands associated with future development.

The steps listed above “identify demands placed upon existing public facilities by new development activity at the proposed level of service; and... the means by which the political subdivision or private entity will meet those growth demands” (Section 11-36a-302(1)(a) of the Utah Code).

### **10-Year Improvement Plan**

Through the analysis outlined above, capital facilities projects needed to provide service to various parts of the City through 2060 were identified. Most of these projects will need to be constructed in phases as development occurs. Only infrastructure to be constructed within a ten year horizon will be considered in the calculation of impact fees to avoid uncertainty surrounding improvements further into the future. There are seven projects identified in the capital facilities plan that will need to be constructed within the next ten years. These are shown in Figure 1 and are summarized in Table 7.



### Legend

- Sewer Pipes
- ⋯ Spanish Valley

### IFFP Projects

- 100 West
- Birch Area Improvements
- New South Trunkline
- New WRF Outfall
- Northwest Trunk and Lift Station
- Tusher Area Improvements
- ▲ New WWTP
- Vehicle Storage

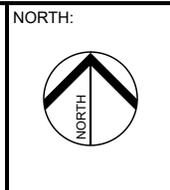
Esri, NASA, NGA, USGS, FEMA, Utah Geospatial Resource Center, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA



MOAB CITY

## IMPACT FEE FACILITIES PLAN

## 10-YEAR IFFP PROJECTS



SCALE:  
0 900 1,800  
Feet

FIGURE NO.  
**1**

**Table 7**  
**Project Costs Allocated to Projected Development, 10-year Planning Window**

Name	Total Cost	Percent to Moab City Service Area			Percent to Other Agencies Service Area			Percent to Septage Haulers Service Area		
		Existing	10-yr Growth	Beyond 10-yr	Existing	10-yr Growth	Beyond 10-yr	Existing	10-yr Growth	Beyond 10-yr
New South Trunkline	\$6,937,000	0.00%	5.91%	23.83%	0%	33.34%	36.92%	0%	0%	0%
New Wastewater Treatment Plant	\$15,510,700	38.25%	4.42%	3.83%	18.44%	10.92%	8.45%	8.60%	3.95%	3.14%
100 West Pipe	\$2,616,108	82.04%	6.86%	0.00%	9.11%	1.99%	0.00%	0.00%	0.00%	0.00%
Northwest Trunk and Lift Station	\$1,486,799	32.49%	14.98%	52.53%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Birch and Tuscher Pipeline	\$3,092,454	60.22%	23.77%	16.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Outfall for WRF	\$2,645,000	37.80%	8.78%	16.45%	18.78%	6.08%	12.11%	0.00%	0.00%	0.00%
Vehicle Storage Shed at WRF	\$550,000	45.36%	5.24%	4.55%	21.87%	12.96%	10.02%	0.00%	0.00%	0.00%

## Project Cost Attributable to Future Growth

To satisfy the requirements of state law, Table 7 provides a breakdown of the capital facilities projects and the percentage of the project costs attributed to existing and future users for each service area. As defined in Section 11-36a-102(15), the impact fee facilities plan should only include the proportionate share of “the cost of public facilities that are roughly proportionate and reasonably related to the service demands and needs of any development activity.”

For many projects, the division of costs between existing and future users is easy because 100 percent of the project costs can be attributed to one category or the other (e.g. infrastructure needed solely to serve new development can be 100 percent attributed to new growth, while projects related to existing condition or capacity deficiencies can be 100 percent attributed to existing user needs). For projects needed to address both existing deficiencies and new growth or where a higher level of service is being proposed, costs have been divided proportionally between existing and future users based on their needs in the facility. A few additional notes regarding specific projects are as follows:

- New South Trunkline – This is a new trunkline being constructed solely to provide new capacity for growth. As a result, 100 percent of its cost is attributable to new growth. It should be noted that, as part of the overall system master plan, some existing flows will be rerouted into this pipeline. However, this is being done only to free up capacity in existing pipelines for growth elsewhere in the system. As a result, new growth will pay for the new capacity in the South Trunkline that will be used by existing flows in exchange for capacity that becomes available in the existing pipelines.
- New Wastewater Treatment Plant – As discussed previously, Moab has plans to construct a new wastewater treatment plant to completely replace its existing plant. This essentially represents a new level of service benefiting all users, both existing and future. As a result, this cost was distributed proportionally between existing and future users based on current and projected treatment ERUs into the facility.
- 100 West Pipeline – The existing sewer collection line on 100 West has condition related problems that will require the pipe to be replaced. Connections that tie into the sewer line at adverse angles will be corrected to improve flow conditions. The pipe will also be upsized to accommodate short-term growth until a future South Trunkline can be constructed. The costs will be shared such that the estimated cost of pipe replacement (15-inch) will be allocated to existing users, with the cost of the upsize (cost difference between installing 15-inch and 18-inch pipe) allocated to the 10-yr window. Because of the planned completion of the South Trunkline, growth beyond the 10-year planning window is not expected to benefit from this pipe and will therefore not be responsible for any cost.
- Northwest Trunk and Lift Station – The City will construct a new lift station and gravity trunkline near the Archway Inn & Holiday Inn Express to eliminate the two private lift stations at those properties and to eliminate the septic system at the Moab RV. This trunkline and lift station are also expected to service areas of future growth in this area and eliminate the need for private lift stations which the City has historically been called upon to maintain due to the lack of the owners’ experience with sewer infrastructure. Costs were distributed proportionally between existing and future users based on current and modeled

future flows from this area.

- Birch and Tusher Area Improvements – The City has identified pipelines near Birch Avenue and Tusher Street that are in critical need of repair or replacement based on video inspection and area back-ups. In the Birch Area, approximately 2,000 feet of new 8-inch PVC sewer pipe will need to be installed along Mountain View Dr, Birch Ave, and Kane Creek Blvd. In addition to existing deficiencies, the Tusher area improvements will also add infrastructure to handle higher expected flows from new development in the Lionsback area. This project will include replacing 2,860 ft of existing 8-inch sewer pipe with 12-inch sewer, installing a lift station and force main. Costs were distributed proportionally between existing and future users based on current and modeled future flows from this area.
- WRF Outfall Improvements – The City has identified deterioration and root blockage of the existing WRF outfall pipeline, which is over 60 years old. In order to eliminate these existing issues and plan for future higher flows and changing needs of the WRF outfall, this pipe will need to be replaced and potentially realigned. These expected costs were based on existing and expected flow contributions for all users from now through buildout.
- Vehicle Storage Shed – Until now, the sewer collections vehicles and equipment have been stored in an open air area, without any buildings or facilities to protect them from the elements. The City has identified a need to build a storage shed for these vehicles and equipment to reduce maintenance costs and maximize service life. Costs for this storage shed were distributed proportionally according to existing and future flows within the collection system.

Table 7 does not include bond costs related to paying for impact fee eligible improvements. These costs are calculated as part of the impact fee analysis.

### **Project Cost Attributable to 10-Year Growth**

Included in Table 7 is a breakdown of capacity associated with growth both through the next 10 years and from 10 years out through 2060. This is necessary because some of the projects identified in the table will be built with capacity to accommodate flows beyond the 10-year growth window. This has been done following the same general process as described above.

### **Basis of Construction Cost Estimates**

The costs of construction for projects to be completed within ten years have been estimated based on past City experience with projects of a similar nature and other projects outside of the City. A detailed estimate of costs associated with the treatment plant is contained in Appendix B.

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## **ADDITIONAL CONSIDERATIONS**

### **MANNER OF FINANCING - 11-36a-302(2)**

The City may fund the infrastructure identified in this IFFP through a combination of different revenue sources.

#### **Federal and State Grants and Donations**

Impact fees cannot reimburse costs funded or expected to be funded through federal grants and other funds that the City has received for capital improvements without an obligation to repay. Grants and donations are not currently contemplated in this analysis. If grants become available for constructing facilities, impact fees will need to be recalculated and an appropriate credit given. Any existing infrastructure funded through past grants will be removed from the system value during the impact fee analysis.

#### **Bonds**

None of the costs contained in this IFFP include interest associated with bonding. The cost of bonding required to finance impact fee eligible improvements identified in the IFFP may be added to the calculation of the impact fee. This will be considered in the impact fee analysis.

#### **Interfund Loans**

Because infrastructure must generally be built ahead of growth, there often arises situations in which projects must be funded ahead of expected impact fee revenues. In some cases, the solution to this issue will be bonding. In others, funds from existing user rate revenue will be loaned to the impact fee fund to complete initial construction of the project and will be reimbursed later as impact fees are received. Consideration of potential interfund loans will be included in the impact fee analysis and should also be considered in subsequent accounting of impact fee expenditures.

#### **Impact Fees**

It is recommended that impact fees be used to fund growth-related capital projects as they help to maintain the proposed level of service and prevent existing users from subsidizing the capital needs for new growth. Based on this IFFP, an impact fee analysis will be able to calculate a fair and legal fee that new growth should pay to fund the portion of the existing and new facilities that will benefit new development.

#### **Developer Dedications and Exactions**

Developer exactions are not the same as grants. If a developer constructs a system improvement or dedicates land for a system improvement identified in this IFFP, or dedicates a public facility that is recognized to reduce the need for a system improvement, the developer will be entitled to an appropriate credit against that particular developer's impact fee liability or a proportionate reimbursement.

If the value of the credit is less than the development's impact fee liability, the developer will owe the balance of the liability to the City. If the recognized value of the improvements/land dedicated is more than the development's impact fee liability, the City must reimburse the difference to the developer.

It should be emphasized that the concept of impact fee credits pertains to system level improvements only. Developers will be responsible for the construction of project improvements (i.e. improvements not identified in the impact fee facilities plan) without credit against the impact fee.

**NECESSITY OF IMPROVEMENTS TO MAINTAIN LEVEL OF SERVICE - 11-36a-302(3)**

According to State statute, impact fees cannot be used to correct deficiencies in the City's system and must be necessary to maintain the proposed level of service established for all users. Only those facilities or portions of facilities that are required to maintain the proposed level of service for future growth have been included in this IFFP. Additionally, any portion of projects being used to cure existing deficiencies that will be paid for through future user rates will be accounted for through an impact fee credit to be calculated as part of the impact fee analysis. This will result in an equitable fee as future users will not be expected to fund any portion of the facilities that will benefit existing residents.

**IMPACT FEE CERTIFICATION - 11-36a-306(1)**

This IFFP has been prepared in accordance with Utah Code Title 11, Chapter 36a (the “Impact Fees Act”), which prescribes the laws pertaining to the imposition of impact fees in Utah. The accuracy of this IFFP relies in part upon planning, engineering, and other source data, provided by the City and its designees.

In accordance with Utah Code Annotated, 11-36a-306(1), Bowen Collins & Associates makes the following certification:

I certify that the attached impact fee facilities plan:

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. cost 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; and
3. Complies in each and every relevant respect with the Impact Fees Act.



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Keith J. Larson, P.E.

# SEWER IMPACT FEE ANALYSIS

**2023 Amendment**

**Prepared for:**



**Prepared by:**



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## EXECUTIVE SUMMARY – IFA (SEWER)

### Introduction

The purpose of the impact fee analysis (IFA) is to calculate the allowable impact fee that may be assessed to new development in accordance with Utah Code. This report was originally completed in October of 2016, but was updated in February of 2017 to reflect higher than expected construction costs associated with the City's new wastewater treatment plant.

In 2023 the City requested that BC&A amend the adopted report to reflect real costs to the City for projects that have been completed, including projects that were not originally part of the 10-year planning window. This amendment only changes project costs and the resulting impact fee calculations. All other components of the analysis, including the 2017 growth projections and level of service assumptions, were unaltered as part of this amendment.

### Why Assess an Impact Fee?

Until new development utilizes the full capacity of existing facilities, the City can assess an impact fee to recover its cost of latent capacity available to serve future development. The general impact fee methodology divides the available capacity of existing and future capital projects between the number of existing and future users. Capacity is measured in terms of Equivalent Residential Units, or ERUs, which represents the demand that a typical single family residence places on the system.

### How Are Impact Fees Calculated?

A fair impact fee is calculated by dividing the cost of existing and future facilities by the amount of new growth that will benefit from the unused capacity. Only the capacity that is needed to serve the projected growth within in the next ten years is included in the fee. Costs used in the calculation of impact fees include:

- New facilities required to maintain (but not exceed) the proposed level of service identified in the IFFP; only those expected to be built within ten years are considered in the final calculations of the impact fee.
- Historic costs of existing facilities that will serve new development
- Cost of professional services for engineering, planning, and preparation of the impact fee facilities plan and impact fee analysis

Costs not used in the impact fee calculation

- Operational and maintenance costs
- Cost of facilities constructed beyond 10 years
- Cost associated with capacity not expected to be used within 10 years
- Cost of facilities funded by grants, developer contributions, or other funds which the City is not required to repay

- Cost of renovating or reconstructing facilities which do not provide new capacity or needed enhancement of services to serve future development

### Impact Fee Calculation

Impact fees for this analysis were calculated by dividing the proportional cost of facilities required to service 10-year growth by the amount of growth expected over the next 10-years based on ERUs. This is done for both collection and treatment facilities. Calculated impact fees by component are summarized in Tables ES-1 and ES-2. Table ES-1 covers the cost of impacts on collection and treatment facilities from growth within the Moab City service area. Table ES-2 covers impact fees for capacity associated with agencies outside the City.

**Table ES-1**  
**Impact Fee Calculation per ERU – Moab City Service Area**

<b>System Components</b>	<b>Total Cost of Component</b>	<b>% Serving 10-year Growth</b>	<b>Cost Serving 10-year Growth</b>	<b>10-year ERUs Served</b>	<b>Cost Per ERU</b>
<b>Collection Facilities</b>					
Existing Facilities	\$4,151,529	4.71%	\$195,671	632	\$309.59
Existing Facility Interest Costs Outstanding	\$0	0.00%	\$0	632	\$0.00
10-year Projects	\$17,327,361	10.44%	\$1,808,591	632	\$2,861.57
10-Year Project Interest Costs	\$2,737,205	13.19%	\$361,109	632	\$571.35
Credit for User Fees Paid Toward Existing					-\$889.18
<b>Subtotal</b>	<b>\$24,216,095</b>		<b>\$2,365,371</b>		<b>\$2,853.32</b>
<b>Treatment Plant</b>					
Existing Facilities	\$0	0.00%	\$0	706	\$0.00
Existing Facility Interest Costs Outstanding	\$0	0.00%	\$0	706	\$0.00
10-year Projects	\$15,510,700	4.42%	\$685,812	706	\$971.38
10-Year Project Interest Costs	\$1,777,084	4.83%	\$85,827	706	\$121.57
Credit for User Fees Paid Toward Existing					-\$536.63
<b>Subtotal</b>	<b>\$17,287,784</b>		<b>\$771,640</b>		<b>\$556.32</b>

**Table ES-2**  
**Impact Fee Calculation per ERU – Other Agencies Service Area**

<b>System Components</b>	<b>Total Cost of Component</b>	<b>% Serving 10-year Growth</b>	<b>Cost Serving 10-year Growth</b>	<b>10-year ERUs Served</b>	<b>Cost Per ERU</b>
<b>Collection Facilities</b>					
Existing Facilities	\$4,151,529	2.39%	\$99,231	1,508	\$65.80
Existing Facility Interest Costs Outstanding	\$0	0.00%	\$0	1,508	\$0.00
10-year Projects	\$17,327,361	14.99%	\$2,596,762	1,508	\$1,721.79
10-Year Project Interest Costs	\$2,737,205	3.18%	\$87,107	1,508	\$57.76
Credit for User Fees Paid Toward Existing					\$0.00
<b>Subtotal</b>	<b>\$24,216,095</b>		<b>\$2,783,100</b>		<b>\$1,845.34</b>
<b>Treatment Plant</b>					
Existing Facilities	\$0	0.00%	\$0	1,744	\$0.00
Existing Facility Interest Costs Outstanding	\$0	0.00%	\$0	1,744	\$0.00
10-year Projects	\$15,510,700	10.92%	\$1,694,313	1,744	\$971.38
10-Year Project Interest Costs	\$1,777,084	11.93%	\$212,038	1,744	\$121.57
Credit for User Fees Paid Toward Existing					-\$217.73
<b>Subtotal</b>	<b>\$17,287,784</b>		<b>\$1,906,351</b>		<b>\$875.22</b>

Utah Code also allows for the cost of planning and engineering associated with impact fee calculations to be recovered as part of an impact fee. The final impact fee will include the cost of this study as summarized in Table ES-3.

**Table ES-3**  
**Impact Fee Costs Associated with Studies per ERU**

<b>System Components</b>	<b>Total Cost of Component</b>	<b>% Serving 10-year Growth</b>	<b>Cost Serving 10-year Growth</b>	<b>10-year ERUs Served</b>	<b>Cost Per ERU</b>
Impact Fee Studies	\$53,842	100.00%	\$53,842	2,158	\$24.95
<b>Subtotal</b>	<b>\$53,842</b>		<b>\$53,842</b>		<b>\$24.95</b>

The total impact fee per ERU can be calculated by adding up the fee for each type of system component.

## Recommended Impact Fee

Total calculated impact fees for 2016 and 2017 for different user types are summarized in Tables ES-4 and ES-5 for the Moab City and Other Agency service areas respectively. Information regarding calculation of impact fees in future years can be found in the body of the full report. This is the legal maximum amount that may be charged as an impact fee. This is separate from any additional charges levied by the City for hookup costs or for other reasonable permit and application fees.

**Table ES-4**  
**Recommended Impact Fees, 2023-2027 – Moab City**

Customer Type	Total Impact Fee per Unit				
	2023	2024	2025	2026	2027
<b>Permanent Residential</b>					
Single Family	\$3,435	\$3,481	\$3,526	\$3,569	\$3,611
Multifamily, 2 Bedrooms or Larger	\$3,435	\$3,481	\$3,526	\$3,569	\$3,611
Multifamily, 1 Bedroom or Smaller	\$1,923	\$1,950	\$1,975	\$1,999	\$2,022
<b>Overnight Accommodations</b>					
Rental Unit with Kitchen, 2 Bedrooms or Larger	\$4,122	\$4,178	\$4,232	\$4,283	\$4,333
Rental Unit with Kitchen, 1 Bedroom or Smaller	\$3,435	\$3,481	\$3,526	\$3,569	\$3,611
Hotel/Motel (No Kitchen)	\$2,689	\$2,726	\$2,761	\$2,795	\$2,827
<b>Other</b>					
Auto Repair	\$554	\$562	\$569	\$576	\$582
Bakery	\$4,296	\$4,530	\$4,755	\$4,971	\$5,178
Bank	\$1,717	\$1,741	\$1,763	\$1,785	\$1,805
Beauty/Barber Shop	\$859	\$870	\$882	\$892	\$903
Campground	\$2,700	\$2,737	\$2,772	\$2,806	\$2,839
Car Wash - Auto	\$31,564	\$31,798	\$32,023	\$32,239	\$32,446
Car Wash - Wand	\$15,782	\$15,899	\$16,011	\$16,119	\$16,223
Commercial	\$528	\$536	\$543	\$549	\$556
Dry Cleaner	\$1,899	\$1,916	\$1,933	\$1,949	\$1,964
Fast Food	\$10,873	\$11,096	\$11,309	\$11,515	\$11,712
Gas Station/Convenience Store	\$954	\$967	\$980	\$992	\$1,003
Grocery Store	\$1,108	\$1,123	\$1,138	\$1,151	\$1,165
Laundromat	\$2,241	\$2,257	\$2,272	\$2,286	\$2,300
Office	\$859	\$870	\$882	\$892	\$903
Restaurant	\$390	\$400	\$409	\$419	\$427
Retail	\$528	\$536	\$543	\$549	\$556
Schools	\$229	\$232	\$235	\$238	\$241
Theater	\$24	\$24	\$24	\$25	\$25
Warehouse	\$362	\$366	\$371	\$376	\$380

\*Includes study related costs.

**Table ES-5  
Recommended Impact Fees, 2023-2027 – Other Agencies**

Customer Type	Total Impact Fee per Unit				
	2023	2024	2025	2026	2027
<b>Permanent Residential</b>					
Single Family	\$2,746	\$2,764	\$2,763	\$2,780	\$2,778
Multifamily, 2 Bedrooms or Larger	\$2,746	\$2,764	\$2,763	\$2,780	\$2,778
Multifamily, 1 Bedroom or Smaller	\$1,537	\$1,548	\$1,547	\$1,557	\$1,556
<b>Overnight Accommodations</b>					
Rental Unit with Kitchen, 2 Bedrooms or Larger	\$3,295	\$3,317	\$3,315	\$3,336	\$3,334
Rental Unit with Kitchen, 1 Bedroom or Smaller	\$2,746	\$2,764	\$2,763	\$2,780	\$2,778
Hotel/Motel (No Kitchen)	\$2,150	\$2,164	\$2,163	\$2,177	\$2,175
<b>Other</b>					
Auto Repair	\$443	\$446	\$446	\$448	\$448
Bakery	\$5,360	\$5,453	\$5,447	\$5,535	\$5,523
Bank	\$1,373	\$1,382	\$1,381	\$1,390	\$1,389
Beauty/Barber Shop	\$686	\$691	\$691	\$695	\$695
Campground	\$2,159	\$2,173	\$2,172	\$2,186	\$2,184
Car Wash - Auto	\$23,079	\$23,172	\$23,166	\$23,253	\$23,242
Car Wash - Wand	\$11,540	\$11,586	\$11,583	\$11,627	\$11,621
Commercial	\$422	\$425	\$425	\$428	\$427
Dry Cleaner	\$1,424	\$1,431	\$1,431	\$1,437	\$1,436
Fast Food	\$9,511	\$9,600	\$9,594	\$9,677	\$9,667
Gas Station/Convenience Store	\$763	\$768	\$767	\$772	\$772
Grocery Store	\$886	\$892	\$891	\$897	\$896
Laundromat	\$1,628	\$1,634	\$1,633	\$1,639	\$1,639
Office	\$686	\$691	\$691	\$695	\$695
Restaurant	\$363	\$367	\$366	\$370	\$370
Retail	\$422	\$425	\$425	\$428	\$427
Schools	\$183	\$184	\$184	\$185	\$185
Theater	\$19	\$19	\$19	\$19	\$19
Warehouse	\$289	\$291	\$291	\$293	\$292

\*Includes study related costs.

## IMPACT FEE ANALYSIS (SEWER)

### INTRODUCTION

Moab City has retained Bowen Collins & Associates (BC&A) to prepare an impact fee analysis (IFA) for its sewer system based on a recently completed impact fee facilities plan. An impact fee is a one-time fee, not a tax, imposed upon new development activity as a condition of development approval to mitigate the impact of the new development on public infrastructure. The purpose of an IFA is to calculate the allowable impact fee that may be assessed to new development in accordance with Utah Code.

### 2023 Amendment

This report was originally completed in October of 2016, but was updated in February of 2017 to reflect higher than expected construction costs associated with the City's new wastewater treatment plant. In 2023, the City requested that BC&A amend the adopted report to reflect real costs to the City for projects that have been completed, including two projects that were not originally part of the 10-year planning window (i.e., 100 West Pipeline and Northwest Trunkline and Lift Station). This amendment only changes project costs and the resulting impact fee calculations. All other components of the analysis, including the 2017 growth projections and level of service assumptions, were unaltered as part of this analysis.

Stylistically, it should be noted that this amendment has been written to keep language consistent with the original planning window (2017 to 2027). This means that the language may still refer to some facilities in the future tense even though they are complete as of the writing of this amendment in 2023. Examples of this include the new wastewater treatment plan and the 100 West Pipeline project. In these cases, the reported costs, lengths, etc. are all based on actual, past observed values even though the projects are still referred to in the future tense.

### Service Areas

For the purpose of impact fee calculations, the Moab City sewer system has been divided into the same three service areas identified in the Impact Fee Facilities Plan. The "Moab City" service area includes all areas within the corporate boundaries of the City. The "Other Agencies" service area includes all growth outside of the City's corporate boundary that is still expected to flow to the City. This could potentially include flow from Spanish Valley Water & Sewer Improvement District (SVW&SID) and San Juan County. The "Septage Haulers" service area is not associated with a specific area at all, but refers to those customers that will bring septage directly to the City plan from septic tanks, campgrounds, and pit toilets serving the recreational areas surrounding Moab City.

It is important to divide the system into service areas because of the difference in facilities that will be used to serve each service area. This is primarily in connection with sewer collection facilities in the City. While the treatment facilities used to service each service area will be essentially identical, the collection facilities will be significantly different.

## Requirements

Requirements for the preparation of an IFA are outlined in Title 11, Chapter 36a of the Utah Code (the Impact Fees Act). Under these requirements, an IFA shall accomplish the following for each facility:

1. Identify the impact of anticipated development activity on existing capacity
2. Identify the impact of anticipated development activity on system improvements required to maintain the established level of service
3. Demonstrate how the impacts are reasonably related to anticipated development activity
4. Estimate the proportionate share of:
  - a. Costs of existing capacity that will be recouped
  - b. Costs of impacts on system improvements that are reasonably related to the new development activity
5. Identify how the impact fee was calculated
6. Consider the following additional issues
  - a. Manner of financing improvements
  - b. Dedication of system improvements
  - c. Extraordinary costs in servicing newly developed properties
  - d. Time-price differential

The following sections of this report have been organized to address each of these requirements.

### IMPACT ON SYSTEM - 11-36a-304(1)(a)(b)

Growth within the City's service area, and projections of sewer flows resulting from said growth is discussed in detail in the City's Impact Fee Facilities Plan. For the purposes of impact fee calculation, growth in the system has been expressed in terms of equivalent residential units (ERUs). An ERU represents the demand that a typical single family residence places on the system. Growth in ERUs projected for the service area is summarized in Tables 1 and 2. Table 1 considers growth in flow ERUs, while Table 2 examines treatment ERUs.

**Table 1**  
**Projected Moab Sewer System Growth – Flow ERUs**

	<b>Projected Flow ERUs – Moab City</b>	<b>Projected Flow ERUs – Other Agencies</b>	<b>Projected Flow ERUs – Septage</b>	<b>Projected Flow ERUs – Total</b>	<b>Estimated Dry Weather Sewer Flows (mgd)</b>
<b>2017</b>	5,467	2,707	38	8,212	1.19
<b>2022</b>	5,774	3,536	47	9,357	1.35
<b>2027</b>	6,099	4,215	55	10,370	1.50
<b>2032</b>	6,442	4,931	64	11,437	1.66
<b>2035</b>	6,657	5,379	69	12,105	1.75
<b>2060</b>	8,320	6,111	83	14,514	2.13

**Table 2**  
**Projected Moab Sewer System Growth – Treatment ERUs**

	<b>Projected Treatment ERUs – Moab City</b>	<b>Projected Treatment ERUs – Other Agencies</b>	<b>Projected Treatment ERUs – Septage</b>	<b>Projected Treatment ERUs – Total</b>
<b>2017</b>	6,107	2,944	1,373	10,424
<b>2022</b>	6,450	3,891	1,688	12,030
<b>2027</b>	6,813	4,688	2,004	13,505
<b>2032</b>	7,196	5,524	2,319	15,040
<b>2035</b>	7,436	6,046	2,509	15,991
<b>2060</b>	9,147	6,722	3,191	19,060

As indicated in the table, projected growth for the 10-year planning window of this impact fee analysis is 2,158 flow ERUs and 3,081 treatment ERUs (with a large part of the difference the result of increased septage deliveries). In order to maintain the established level of service, projected future growth will be met through a combination of available excess capacity in existing facilities and construction of additional capacity in new facilities. Use of excess capacity and required system improvements are detailed in the Impact Fee Facilities Plan.

#### **RELATION OF IMPACTS TO ANTICIPATED DEVELOPMENT - 11-36a-304(1)(c)**

To satisfy the requirements of state law, it is necessary to show that all impacts identified in the impact fee analysis are reasonably related to the anticipated development activity. This has been documented in detail in Impact Fee Facilities Plan. In short, only that capacity directly associated with demand placed upon existing system facilities by future development has been identified as an impact of the development. The steps completed to identify the impacts of anticipated development are as follows.

1. **Existing Demand** – The demand existing development places on the system was estimated based on historic demand records.
2. **Existing Capacity** – The capacities of existing facilities were calculated based on the level of service criteria established for each type of facility in the Impact Fee Facilities Plan.
3. **Existing Deficiencies** – Existing deficiencies in the system were looked for by comparing defined levels of service against calculated capacities. If existing deficiencies exist, projects were identified to eliminate the deficiencies. Costs associated with existing deficiencies were not assigned to impacts of development.
4. **Future Demand** - The demand future development will place on the system was estimated based on development projections as discussed in the Impact Fee Facilities Plan.
5. **Future Demand Use of Existing Capacity** – Whenever possible, excess capacity in existing facilities has been used to serve future demands. Where this occurs, the amount of capacity used by future growth has been calculated as described in detail in the Impact Fee Facilities Plan.
6. **Future Deficiencies** – Where excess capacity is inadequate to meet projected demands, future deficiencies in the system were identified using the same established level of service

criteria used for existing demands.

7. **Recommended Improvements** – Needed system improvements were identified to meet demands associated with future development.

## PROPORTIONATE SHARE ANALYSIS - 11-36a-304(d)

A comprehensive proportionate share analysis associated with anticipated future development and its impact on the system was completed as part of the Impact Fee Facilities Plan. A summary of that analysis is contained here with additional discussion of the costs of facilities impacted by growth.

### Excess Capacity to Accommodate Future Growth

As discussed previously, the City will be replacing its existing treatment plant and, as a result, there is no existing treatment plant capacity to accommodate future growth. For collection system facilities, the capacity of existing capacity used by each type of user was analyzed in detail as part of the Impact Fee Facilities Plan. Based on the analysis, the calculated percentage of existing capacity in system facilities used by existing users, growth during the 10 year planning window, and growth beyond the 10 year planning window by each service area is summarized in Table 3.

**Table 3**  
**Use of Existing Capacity**

<b>Pipeline Capacity</b>	<b>Existing Users</b>	<b>10-Year Growth</b>	<b>Growth Beyond 10-Years</b>	<b>Total</b>
Moab City	53.2%	4.7%	15.9%	73.8%
Other Agencies	20.6%	2.4%	3.2%	26.2%
Septage Haulers	0.0%	0.0%	0.0%	0.0%
Total	73.8%	7.1%	19.1%	100.0%

### Existing System Infrastructure Costs

To calculate the actual cost of excess capacity in the existing system, BC&A first looked at the actual cost of all existing facilities. Table 4 lists the actual construction costs of existing components of the City's wastewater system. There are not depreciated replacement costs, but the estimated actual cost at the time of construction. These costs were estimated from the City's existing database of assets. In this study, public facility costs already incurred by the City will be included in the impact fee only to the extent that new growth will be served by the previously constructed improvements. Since the treatment plant will be completely replaced, its existing cost is shown as zero.

**Table 4**  
**Existing Infrastructure Costs**

	<b>Collection</b>	<b>Treatment<sup>1</sup></b>
<b>Existing Infrastructure Costs</b>	\$4,151,529	\$0

<sup>1</sup> Moab will completely replace its existing treatment plant.

### Reimbursement Agreements

There are no current reimbursement agreements existing within the system.

## Future Improvements

In addition to using available existing capacity, demand associated with projected future development will be met through the construction of additional capacity in new facilities. A primary focus of the Impact Fee Facilities Plan was the identification of projects required to serve new development. The results of the Impact Fee Facilities Plan are summarized in Table 5. Included in the table are the costs of each required project and the portion of costs associated with development. All cost estimates contained in this IFA have been taken directly from the IFFP. The basis of these estimates are documented in the IFFP.

**Table 5**  
**Impact Fee Eligible Capital Projects**

<b>Project</b>	<b>City Construction Cost</b>	<b>Percent Attributable to 10-Year Growth</b>	<b>Cost Attributable to 10-Year Growth</b>
<b><i>Service Area – Moab City</i></b>			
New South Trunkline	\$6,937,000	5.91%	\$409,948
New Wastewater Treatment Plant	\$15,510,700	4.42%	\$685,964
100 West Pipe	\$2,616,108	6.86%	\$179,594
Northwest Trunk and Lift Station	\$1,486,799	14.98%	\$222,742
Birch and Tuscher	\$3,092,454	23.77%	\$735,209
Outfall for WRF	\$2,645,000	8.78%	\$232,255
Vehicle Storage Shed at WRF	\$550,000	5.24%	\$28,844
<b>Total</b>			<b>\$2,494,555</b>
<b><i>Service Area – Other Agencies</i></b>			
New South Trunkline	\$6,937,000	33.34%	\$2,312,603
New Wastewater Treatment Plant	\$15,510,700	10.93%	\$1,694,688
100 West Pipe	\$2,616,108	1.99%	\$52,068
Northwest Trunk and Lift Station	\$1,486,799	0.00%	\$0
Birch and Tuscher	\$3,092,454	0.00%	\$0
Outfall for WRF	\$2,645,000	6.08%	\$160,832
Vehicle Storage Shed at WRF	\$550,000	12.96%	\$71,259
<b>Total</b>			<b>\$4,291,450</b>
<b><i>Service Area – Septage Haulers</i></b>			
New South Trunkline	\$6,937,000	0%	\$0
New Wastewater Treatment Plant	\$15,510,700	3.94%	\$611,470
100 West Pipe	\$2,616,108	0.00%	\$0
Northwest Trunk and Lift Station	\$1,486,799	0.00%	\$0
Birch and Tuscher	\$3,092,454	0.00%	\$0
Outfall for WRF	\$2,645,000	0.00%	\$0
Vehicle Storage Shed at WRF	\$550,000	0.00%	\$0
<b>Total</b>			<b>\$611,470</b>

**IMPACT FEE CALCULATION - 11-36a-304(1)(e)**

Using the information contained in the previous sections, impact fees can be calculated by dividing the proportional cost of facilities required to service 10-year growth by the amount of growth expected over the next 10-years. This is done for both collection and treatment system components as discussed previously. Calculated impact fees by component are summarized in Tables 6 and 7 for Moab City and Other Agencies service areas respectively. Impact fees have not been calculated for the Septage Hauler service area. Although this service area does result in increases in system demand as documented above, there is no specific way to tie these increases to individual users and collect an appropriate impact fee. As a result, payment for the cost of impacts associated with increased septage loading will need to be incorporated into septage billing rates and collected over time.

**Table 6  
Impact Fee Calculation per ERU – Moab City Service Area 2023**

<b>System Components</b>	<b>Total Cost of Component</b>	<b>% Serving 10-year Growth</b>	<b>Cost Serving 10-year Growth</b>	<b>10-year ERUs Served</b>	<b>Cost Per ERU</b>
<b>Collection Facilities</b>					
Existing Facilities	\$4,151,529	4.71%	\$195,671	632	\$309.59
Existing Facility Interest Costs Outstanding	\$0	0.00%	\$0	632	\$0.00
10-year Projects	\$17,327,361	10.44%	\$1,808,591	632	\$2,861.57
10-Year Project Interest Costs	\$2,737,205	13.19%	\$361,109	632	\$571.35
Credit for User Fees Paid Toward Existing					-\$889.18
<b>Subtotal</b>	<b>\$24,216,095</b>		<b>\$2,365,371</b>		<b>\$2,853.32</b>
<b>Treatment Plant</b>					
Existing Facilities	\$0	0.00%	\$0	706	\$0.00
Existing Facility Interest Costs Outstanding	\$0	0.00%	\$0	706	\$0.00
10-year Projects	\$15,510,700	4.42%	\$685,812	706	\$971.38
10-Year Project Interest Costs	\$1,777,084	4.83%	\$85,827	706	\$121.57
Credit for User Fees Paid Toward Existing					-\$536.63
<b>Subtotal</b>	<b>\$17,287,784</b>		<b>\$771,640</b>		<b>\$556.32</b>

**Table 7**  
**Impact Fee Calculation per ERU – Other Agencies Service Area 2023**

<b>System Components</b>	<b>Total Cost of Component</b>	<b>% Serving 10-year Growth</b>	<b>Cost Serving 10-year Growth</b>	<b>10-year ERUs Served</b>	<b>Cost Per ERU</b>
<b>Collection Facilities</b>					
Existing Facilities	\$4,151,529	2.39%	\$99,231	1,508	\$65.80
Existing Facility Interest Costs Outstanding	\$0	0.00%	\$0	1,508	\$0.00
10-year Projects	\$17,327,361	14.99%	\$2,596,762	1,508	\$1,721.79
10-Year Project Interest Costs	\$2,737,205	3.18%	\$87,107	1,508	\$57.76
Credit for User Fees Paid Toward Existing					\$0.00
<b>Subtotal</b>	<b>\$24,216,095</b>		<b>\$2,783,100</b>		<b>\$1,845.34</b>
<b>Treatment Plant</b>					
Existing Facilities	\$0	0.00%	\$0	1,744	\$0.00
Existing Facility Interest Costs Outstanding	\$0	0.00%	\$0	1,744	\$0.00
10-year Projects	\$15,510,700	10.92%	\$1,694,313	1,744	\$971.38
10-Year Project Interest Costs	\$1,777,084	11.93%	\$212,038	1,744	\$121.57
Credit for User Fees Paid Toward Existing					-\$217.73
<b>Subtotal</b>	<b>\$17,287,784</b>		<b>\$1,906,351</b>		<b>\$875.22</b>

### Bonding Interest Costs

In addition to construction costs, Tables 6 and 7 include the cost of bond interest expense where applicable. This could include any outstanding interest costs on existing facilities where new growth will benefit from excess capacity and future interest costs for bonds required to build projects needed for growth as identified in the Impact Fee Facilities Plan. Similar to project construction costs, only that portion of interest expense associated with capacity for growth is included in the impact fee calculation. The current plan for the Moab City wastewater system is to apply for three bonds within the 10-yr planning window of this IFA, as described below:

- Moab City will receive a low interest loan from the State of Utah revolving construction fund. This will be used exclusively for the construction of the new wastewater treatment plant. Interest associated with this loan has been calculated based on a 1.15% interest rate and a payback period from Moab to the State of 20 years, and from outside agencies to Moab of 25 years. The percentage of interest assigned to future growth is slightly higher than the percentage calculated for the actual project to reflect the amount of cash on-hand to be contributed by existing users toward construction.
- In order to fund the 100 West pipeline project, the City will use a bond to cover the majority

of the \$2.6M estimated project cost. Moab City will contribute approximately \$140,000 of capital at the time of the 100 West project initial design and construction in 2018. Therefore, a \$2.5M bond for 15 years at 3.39% interest rate was used to calculate the appropriate interest payments for existing and future users within Moab and in outside entities.

- Moab City will require another bond to complete the Birch, Tusher, WRF outfall, and vehicle storage projects. This analysis used a \$6.5M bond at 3.61% interest rate for approximately 15 years to calculate appropriate interest payments required among user groups.

### Credit for User Fees

The City's current plans call for both Moab City and SVW&SID to pay cash for a portion of the new wastewater treatment plant costs. However, not all of the cost associated with existing capacity needs can be paid for from existing cash reserves. As a result, the plan includes a portion of the State of Utah loan going towards the construction of capacity that will benefit existing users. In this situation, user fees will be used to pay for the loan over its lifetime. Additionally, significant portions of the proceeds from the \$2.5M and \$6.5M bonds will be used to build capacity that will benefit existing users.

As currently structured, future users will pay for their portion of capacity via impact fees. They cannot also be expected to pay through user rates the portion of future bonds that will be used to build capacity for existing users. This creates the need for a credit for future users. Calculation of this credit is summarized in Tables 8 through 11. These tables includes the following information:

- **Existing Portion of Loan Paid Through User Fees** – This represents the total amount paid each year by the District toward the portion of the loans used to build capacity for existing users.
- **Cost Per ERU** – This column takes to the total amount paid and divides it by the number of ERUs projected for each year. This represents the amount paid in each year by each ERU.
- **Present Value Cost per ERU** – This column takes into account the time value of money assuming a rate of return of 3 percent annually.
- **Total User Fee Credit** – At the bottom of the table, the present value costs for all future years are added together to develop the total user fee credit.

It will be noted that, because the user fee credit is the summation of user fees paid toward existing deficiencies in each year, a new user who joins the system in five or ten years will pay less in total user fees than someone who joins the system next year. Thus, the user fee credit will decrease over time. The appropriate user fee can be calculated by adding the present value cost for all years subsequent to a new user's connection to the system. The tables below only include costs beginning in 2023. This reflects the 2023 update to this analysis as bond payments in previous years are no longer relevant.

**Table 8**  
**WRF Credit for User Fees Paid Toward Existing – Moab City 2023**

<b>WRF Loan Credits</b>				
<b>Year</b>	<b>Moab Treatment ERUs</b>	<b>Existing Capacity Portion of Loan Paid Through User Fees</b>	<b>Cost Per ERU</b>	<b>Present Value Cost Per ERU</b>
2023	6,521	\$305,066.98	\$46.78	\$46.78
2024	6,593	\$305,066.98	\$46.27	\$44.92
2025	6,666	\$305,066.98	\$45.77	\$43.14
2026	6,739	\$305,066.98	\$45.27	\$41.43
2027	6,813	\$305,066.98	\$44.78	\$39.78
2028	6,888	\$305,066.98	\$44.29	\$38.20
2029	6,964	\$305,066.98	\$43.81	\$36.69
2030	7,040	\$305,066.98	\$43.33	\$35.23
2031	7,118	\$305,066.98	\$42.86	\$33.83
2032	7,196	\$305,066.98	\$42.39	\$32.49
2033	7,275	\$305,066.98	\$41.93	\$31.20
2034	7,355	\$305,066.98	\$41.48	\$29.96
2035	7,436	\$305,066.98	\$41.02	\$28.77
2036	7,517	\$305,066.98	\$40.58	\$27.64
2037	7,598	\$305,066.98	\$40.15	\$26.54
<b>Total User Fee Credit</b>				<b>\$536.63</b>

**Table 9**  
**Credit for User Fees Paid Toward Existing – Other Agencies Service Area 2023**

<b>Year</b>	<b>Other Agency Treatment ERUs</b>	<b>Existing Capacity Portion of Loan Paid Through User Fees</b>	<b>Cost Per ERU</b>	<b>Present Value Cost Per ERU</b>
2023	4,048	\$95,299.10	\$23.54	\$18.59
2024	4,206	\$95,299.10	\$22.66	\$17.37
2025	4,365	\$95,299.10	\$21.83	\$16.25
2026	4,526	\$95,299.10	\$21.06	\$15.21
2027	4,688	\$95,299.10	\$20.33	\$14.26
2028	4,852	\$95,299.10	\$19.64	\$13.37
2029	5,018	\$95,299.10	\$18.99	\$12.56
2030	5,185	\$95,299.10	\$18.38	\$11.80
2031	5,354	\$95,299.10	\$17.80	\$11.09
2032	5,524	\$95,299.10	\$17.25	\$10.44
2033	5,696	\$95,299.10	\$16.73	\$9.83
2034	5,870	\$95,299.10	\$16.23	\$9.26
2035	6,046	\$95,299.10	\$15.76	\$8.73
2036	6,222	\$95,299.10	\$15.32	\$8.23
2037	6,398	\$95,299.10	\$14.90	\$7.77
2038	6,573	\$95,299.10	\$14.50	\$7.35
2039	6,749	\$95,299.10	\$14.12	\$6.95
2040	6,925	\$95,299.10	\$13.76	\$6.57
2041	7,101	\$95,299.10	\$13.42	\$6.22
2042	7,276	\$95,299.10	\$13.10	\$5.90
<b>Total User Fee Credit</b>				<b>\$217.73</b>

**Table 10**  
**100 West Credit for User Fees Paid Toward Existing – Moab City 2023**

<b>100 West Loan Credits</b>				
<b>Year</b>	<b>Moab Flow ERUs</b>	<b>Existing Capacity Portion of Loan Paid Through User Fees</b>	<b>Cost Per ERU</b>	<b>Present Value Cost Per ERU</b>
2023	5,838	\$172,992	\$29.63	\$29.63
2024	5,902	\$172,992	\$29.31	\$28.46
2025	5,967	\$172,992	\$28.99	\$27.33
2026	6,033	\$172,992	\$28.68	\$26.24
2027	6,099	\$172,992	\$28.36	\$25.20
2028	6,166	\$172,992	\$28.06	\$24.20
2029	6,234	\$172,992	\$27.75	\$23.24
2030	6,303	\$172,992	\$27.45	\$22.32
2031	6,372	\$172,992	\$27.15	\$21.43
2032	6,442	\$172,992	\$26.85	\$20.58
2033	6,513	\$172,992	\$26.56	\$19.76
2034	6,584	\$172,992	\$26.27	\$18.98
2035	6,657	\$0	\$0.00	\$0.00
<b>Total</b>				<b>\$287.38</b>

**Table 11**  
**\$6.5M Bond Credit for User Fees Paid Toward Existing – Moab City 2023**

<b>\$6.5M Loan Credits</b>				
<b>Year</b>	<b>Moab Flow ERUs</b>	<b>Existing Capacity Portion of Loan Paid Through User Fees</b>	<b>Cost Per ERU</b>	<b>Present Value Cost Per ERU</b>
2023	5,838	\$290,864	\$49.82	\$49.82
2024	5,902	\$290,864	\$49.28	\$47.85
2025	5,967	\$290,864	\$48.75	\$45.95
2026	6,033	\$290,864	\$48.21	\$44.12
2027	6,099	\$290,864	\$47.69	\$42.37
2028	6,166	\$290,864	\$47.17	\$40.69
2029	6,234	\$290,864	\$46.66	\$39.08
2030	6,303	\$290,864	\$46.15	\$37.52
2031	6,372	\$290,864	\$45.65	\$36.04
2032	6,442	\$290,864	\$45.15	\$34.60
2033	6,513	\$290,864	\$44.66	\$33.23
2034	6,584	\$290,864	\$44.17	\$31.91
2035	6,584	\$290,864	\$44.17	\$30.98
2036	6,584	\$290,864	\$44.17	\$30.08
2037	6,584	\$290,864	\$44.17	\$29.20
2038	6,584	\$290,864	\$44.17	\$28.35
<b>Total</b>				<b>\$601.81</b>

It will be noted that the credits for the Moab City and Other Agency service areas are different for the treatment plant expenditures. This is the result of the different growth rate projected for the two areas and the difference in payback period on the loan. Because growth outside Moab is projected to be greater than growth within Moab, there will be more connections paying toward the cost of the loan in later years. This results in a lower cost per ERU (and a corresponding lower credit).

### **Impact Fee Studies**

Utah Code allows for the cost of planning and engineering associated with impact fee calculations to be recovered as part of an impact fee. The final impact fee will include the cost of this study as summarized in Table 12.

**Table 12**  
**Impact Fee Costs Associated with Studies per ERU**

<b>System Components</b>	<b>Total Cost of Component</b>	<b>% Serving 10-year Growth</b>	<b>Cost Serving 10-year Growth</b>	<b>10-year ERUs Served</b>	<b>Cost Per ERU</b>
Impact Fee Studies	\$53,842	100.00%	\$53,842	2,158	\$24.95
<b>Subtotal</b>	<b>\$53,842</b>		<b>\$53,842</b>		<b>\$24.95</b>

### Recommended Impact Fee

The total calculated impact fees are summarized in Tables 13 and 14. Included in these tables are the appropriate user fee credits for both collection and treatment and corresponding overall fee. This is the legal maximum amount that may be charged as an impact fee. A lower amount may be adopted if desired, but a higher fee is not allowable under the requirements of Utah Code.

**Table 13**  
**Recommended Per ERU Impact Fee – Moab City Service Area**

<b>Maximum Allowable Impact Fee (Per ERU, by year)</b>					
	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>
Collection Base Impact Fee (includes study costs)	\$3,767	\$3,767	\$3,767	\$3,767	\$3,767
Collection User Fee Credit	-\$889	-\$889	-\$889	-\$889	-\$889
Net Collection Impact Fee	\$2,878	\$2,878	\$2,878	\$2,878	\$2,878
Treatment Base Impact Fee	\$1,093	\$1,093	\$1,093	\$1,093	\$1,093
Treatment User Fee Credit	-\$537	-\$490	-\$445	-\$402	-\$360
Net Treatment Impact Fee	\$556	\$603	\$648	\$691	\$733
<b>Total Overall Fee</b>	<b>\$3,435</b>	<b>\$3,481</b>	<b>\$3,526</b>	<b>\$3,569</b>	<b>\$3,611</b>

**Table 14**  
**Recommended Per ERU Impact Fee – Other Agencies Service Area**

<b>Maximum Allowable Impact Fee (Per ERU, by year)</b>					
	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>
Collection Base Impact Fee (includes study costs)	\$1,870	\$1,870	\$1,870	\$1,870	\$1,870
Treatment Base Impact Fee	\$1,093	\$1,093	\$1,093	\$1,093	\$1,093
Treatment User Fee Credit	-\$218	-\$199	-\$200	-\$183	-\$185
Net Treatment Impact Fee	\$875	\$894	\$893	\$910	\$908
<b>Total Overall Fee</b>	<b>\$2,746</b>	<b>\$2,764</b>	<b>\$2,763</b>	<b>\$2,780</b>	<b>\$2,778</b>

As discussed previously, the calculated user fee credit associated with the impact fees will decrease over time. As a result, the allowable impact fee will increase over time as shown in the tables. Impact fees beyond 2027 will need to be re-evaluated in a new IFFP and IFA.

To this point, impact fee calculations have focused on the cost per ERU for both flow and treatment ERUs. In administering impact fees, it is also useful to have impact fees defined in terms of easily measurable parameters for different types of users. Calculation of system demand in terms of ERUs has been defined in a technical memorandum dated September 21, 2016 that has been included in the appendix of the City's IFFP. Some additional categories have also been developed based on projected demand characteristics from other studies conducted by BC&A for sewer providers in Utah. Based on these definitions, total calculated impact fees (2023 calendar years) for different user types are summarized in Tables 15 and 16 for the Moab City and Other Agency service areas respectively. Future years are summarized in Tables 17 and 18. This is the legal maximum amount that may be charged as an impact fee. A lower amount may be adopted if desired, but a higher fee is not allowable under the requirements of Utah Code. This is separate from any additional charges levied by the City for hookup costs or for other reasonable permit and application fees.

**Table 15**  
**Recommended Impact Fee, 2023 – Moab City**

<b>Customer Type</b>	<b>Units</b>	<b># Flow ERUs per Unit</b>	<b># Treatment ERUs per Unit</b>	<b>Flow Impact Fee per Unit*</b>	<b>Treatment Impact Fee per Unit</b>	<b>Total Impact Fee per Unit</b>
<b>Permanent Residential</b>						
Single Family	Residence	1.00	1.00	\$2,878	\$556	\$3,435
Multifamily, 2 Bedrooms or Larger	Unit	1.00	1.00	\$2,878	\$556	\$3,435
Multifamily, 1 Bedroom or Smaller	Unit	0.56	0.56	\$1,612	\$312	\$1,923
<b>Overnight Accommodations</b>						
Rental Unit with Kitchen, 2 Bedrooms or Larger	Unit	1.20	1.20	\$3,454	\$668	\$4,122
Rental Unit with Kitchen, 1 Bedroom or Smaller	Unit	1.00	1.00	\$2,878	\$556	\$3,435
Hotel/Motel (No Kitchen)	Unit	0.78	0.78	\$2,254	\$436	\$2,689
<b>Other</b>						
Auto Repair	1,000 ft <sup>2</sup>	0.16	0.16	\$464	\$90	\$554
Bakery	1,000 ft <sup>2</sup>	0.53	5.00	\$1,515	\$2,782	\$4,296
Bank	1,000 ft <sup>2</sup>	0.50	0.50	\$1,439	\$278	\$1,717
Beauty/Barber Shop	Chair	0.25	0.25	\$720	\$139	\$859
Campground	Campsite	0.79	0.79	\$2,263	\$437	\$2,700
Car Wash - Auto	Each	10.00	5.00	\$28,783	\$2,782	\$31,564
Car Wash - Wand	Wand	5.00	2.50	\$14,391	\$1,391	\$15,782
Commercial	1,000 ft <sup>2</sup>	0.15	0.15	\$443	\$86	\$528
Dry Cleaner	1,000 ft <sup>2</sup>	0.59	0.37	\$1,693	\$206	\$1,899
Fast Food	1,000 ft <sup>2</sup>	2.86	4.76	\$8,224	\$2,649	\$10,873
Gas Station/Convenience Store	1,000 ft <sup>2</sup>	0.28	0.28	\$800	\$155	\$954
Grocery Store	1,000 ft <sup>2</sup>	0.32	0.32	\$928	\$179	\$1,108
Laundromat	Washer	0.71	0.33	\$2,056	\$185	\$2,241
Office	1,000 ft <sup>2</sup>	0.25	0.25	\$720	\$139	\$859
Restaurant	Seat	0.09	0.21	\$272	\$118	\$390
Retail	1,000 ft <sup>2</sup>	0.15	0.15	\$443	\$86	\$528
Schools	Students	0.07	0.07	\$192	\$37	\$229
Theater	Seat	0.007	0.007	\$20	\$4	\$24
Warehouse	1,000 ft <sup>2</sup>	0.11	0.11	\$303	\$59	\$362

\*Includes study related costs.

**Table 16**  
**Recommended Impact Fee, 2023 – Other Agencies**

<b>Customer Type</b>	<b>Units</b>	<b># Flow ERUs per Unit</b>	<b># Treatment ERUs per Unit</b>	<b>Flow Impact Fee per Unit*</b>	<b>Treatment Impact Fee per Unit</b>	<b>Total Impact Fee per Unit</b>
<b>Permanent Residential</b>						
Single Family	Residence	1.00	1.00	\$1,870	\$875	\$2,746
Multifamily, 2 Bedrooms or Larger	Unit	1.00	1.00	\$1,870	\$875	\$2,746
Multifamily, 1 Bedroom or Smaller	Unit	0.56	0.56	\$1,047	\$490	\$1,537
<b>Overnight Accommodations</b>						
Rental Unit with Kitchen, 2 Bedrooms or Larger	Unit	1.20	1.20	\$2,244	\$1,050	\$3,295
Rental Unit with Kitchen, 1 Bedroom or Smaller	Unit	1.00	1.00	\$1,870	\$875	\$2,746
Hotel/Motel (No Kitchen)	Unit	0.78	0.78	\$1,464	\$685	\$2,150
<b>Other</b>						
Auto Repair	1,000 ft <sup>2</sup>	0.16	0.16	\$302	\$141	\$443
Bakery	1,000 ft <sup>2</sup>	0.53	5.00	\$984	\$4,376	\$5,360
Bank	1,000 ft <sup>2</sup>	0.50	0.50	\$935	\$438	\$1,373
Beauty/Barber Shop	Chair	0.25	0.25	\$468	\$219	\$686
Campground	Campsite	0.79	0.79	\$1,470	\$688	\$2,159
Car Wash - Auto	Each	10.00	5.00	\$18,703	\$4,376	\$23,079
Car Wash - Wand	Wand	5.00	2.50	\$9,351	\$2,188	\$11,540
Commercial	1,000 ft <sup>2</sup>	0.15	0.15	\$288	\$135	\$422
Dry Cleaner	1,000 ft <sup>2</sup>	0.59	0.37	\$1,100	\$324	\$1,424
Fast Food	1,000 ft <sup>2</sup>	2.86	4.76	\$5,344	\$4,168	\$9,511
Gas Station/Convenience Store	1,000 ft <sup>2</sup>	0.28	0.28	\$520	\$243	\$763
Grocery Store	1,000 ft <sup>2</sup>	0.32	0.32	\$603	\$282	\$886
Laundromat	Washer	0.71	0.33	\$1,336	\$292	\$1,628
Office	1,000 ft <sup>2</sup>	0.25	0.25	\$468	\$219	\$686
Restaurant	Seat	0.09	0.21	\$176	\$186	\$363
Retail	1,000 ft <sup>2</sup>	0.15	0.15	\$288	\$135	\$422
Schools	Students	0.07	0.07	\$125	\$58	\$183
Theater	Seat	0.007	0.007	\$13	\$6	\$19
Warehouse	1,000 ft <sup>2</sup>	0.11	0.11	\$197	\$92	\$289

\*Includes study related costs.

**Table 17**  
**Recommended Impact Fee, 2023-2027 – Moab City**

Customer Type	Total Impact Fee per Unit				
	2023	2024	2025	2026	2027
<b>Permanent Residential</b>					
Single Family	\$3,435	\$3,481	\$3,526	\$3,569	\$3,611
Multifamily, 2 Bedrooms or Larger	\$3,435	\$3,481	\$3,526	\$3,569	\$3,611
Multifamily, 1 Bedroom or Smaller	\$1,923	\$1,950	\$1,975	\$1,999	\$2,022
<b>Overnight Accommodations</b>					
Rental Unit with Kitchen, 2 Bedrooms or Larger	\$4,122	\$4,178	\$4,232	\$4,283	\$4,333
Rental Unit with Kitchen, 1 Bedroom or Smaller	\$3,435	\$3,481	\$3,526	\$3,569	\$3,611
Hotel/Motel (No Kitchen)	\$2,689	\$2,726	\$2,761	\$2,795	\$2,827
<b>Other</b>					
Auto Repair	\$554	\$562	\$569	\$576	\$582
Bakery	\$4,296	\$4,530	\$4,755	\$4,971	\$5,178
Bank	\$1,717	\$1,741	\$1,763	\$1,785	\$1,805
Beauty/Barber Shop	\$859	\$870	\$882	\$892	\$903
Campground	\$2,700	\$2,737	\$2,772	\$2,806	\$2,839
Car Wash - Auto	\$31,564	\$31,798	\$32,023	\$32,239	\$32,446
Car Wash - Wand	\$15,782	\$15,899	\$16,011	\$16,119	\$16,223
Commercial	\$528	\$536	\$543	\$549	\$556
Dry Cleaner	\$1,899	\$1,916	\$1,933	\$1,949	\$1,964
Fast Food	\$10,873	\$11,096	\$11,309	\$11,515	\$11,712
Gas Station/Convenience Store	\$954	\$967	\$980	\$992	\$1,003
Grocery Store	\$1,108	\$1,123	\$1,138	\$1,151	\$1,165
Laundromat	\$2,241	\$2,257	\$2,272	\$2,286	\$2,300
Office	\$859	\$870	\$882	\$892	\$903
Restaurant	\$390	\$400	\$409	\$419	\$427
Retail	\$528	\$536	\$543	\$549	\$556
Schools	\$229	\$232	\$235	\$238	\$241
Theater	\$24	\$24	\$24	\$25	\$25
Warehouse	\$362	\$366	\$371	\$376	\$380

\*Includes study related costs.

**Table 18**  
**Recommended Impact Fee, 2023-2027 – Other Agencies**

Customer Type	Total Impact Fee per Unit				
	2023	2024	2025	2026	2027
<b>Permanent Residential</b>					
Single Family	\$2,746	\$2,764	\$2,763	\$2,780	\$2,778
Multifamily, 2 Bedrooms or Larger	\$2,746	\$2,764	\$2,763	\$2,780	\$2,778
Multifamily, 1 Bedroom or Smaller	\$1,537	\$1,548	\$1,547	\$1,557	\$1,556
<b>Overnight Accommodations</b>					
Rental Unit with Kitchen, 2 Bedrooms or Larger	\$3,295	\$3,317	\$3,315	\$3,336	\$3,334
Rental Unit with Kitchen, 1 Bedroom or Smaller	\$2,746	\$2,764	\$2,763	\$2,780	\$2,778
Hotel/Motel (No Kitchen)	\$2,150	\$2,164	\$2,163	\$2,177	\$2,175
<b>Other</b>					
Auto Repair	\$443	\$446	\$446	\$448	\$448
Bakery	\$5,360	\$5,453	\$5,447	\$5,535	\$5,523
Bank	\$1,373	\$1,382	\$1,381	\$1,390	\$1,389
Beauty/Barber Shop	\$686	\$691	\$691	\$695	\$695
Campground	\$2,159	\$2,173	\$2,172	\$2,186	\$2,184
Car Wash - Auto	\$23,079	\$23,172	\$23,166	\$23,253	\$23,242
Car Wash - Wand	\$11,540	\$11,586	\$11,583	\$11,627	\$11,621
Commercial	\$422	\$425	\$425	\$428	\$427
Dry Cleaner	\$1,424	\$1,431	\$1,431	\$1,437	\$1,436
Fast Food	\$9,511	\$9,600	\$9,594	\$9,677	\$9,667
Gas Station/Convenience Store	\$763	\$768	\$767	\$772	\$772
Grocery Store	\$886	\$892	\$891	\$897	\$896
Laundromat	\$1,628	\$1,634	\$1,633	\$1,639	\$1,639
Office	\$686	\$691	\$691	\$695	\$695
Restaurant	\$363	\$367	\$366	\$370	\$370
Retail	\$422	\$425	\$425	\$428	\$427
Schools	\$183	\$184	\$184	\$185	\$185
Theater	\$19	\$19	\$19	\$19	\$19
Warehouse	\$289	\$291	\$291	\$293	\$292

\*Includes study related costs.

### **Calculation of Non-Standard Impact Fees**

The calculations above have been based on a limited number of defined customer classes. The Impact Fee Enactment should include a provision that allows for calculation of a fee for customers and situations that vary from those outlined above. Calculating an impact fee for a non-standard user should be based on the methodology established in the September 21, 2016 technical memorandum referenced previously. Once appropriate values for flow and treatment ERUs have been established for the customer, the corresponding impact fee can be calculated using the values per ERU in Tables 13 and 14.

### **ADDITIONAL CONSIDERATIONS - 11-36a-304(2)**

#### **MANNER OF FINANCING - 11-36a-304(2)(a-e)**

As part of this Impact Fee Analysis, it is important to consider how each facility has been or will be paid for. Potential infrastructure funding includes a combination of different revenue sources.

#### **User Charges**

Because infrastructure must generally be built ahead of growth, there often arises situations in which projects must be funded ahead of expected impact fee revenues. In some cases, the solution to this issue will be bonding. In others, funds from existing user rate revenue will be loaned to the impact fee fund to complete initial construction of the project and will be reimbursed later as impact fees are received. Interfund loans should be considered in subsequent accounting of impact fee expenditures.

#### **Special Assessments**

Where special assessments exist, the impact fee calculation must take into account funds contributed. No special assessments currently exist in the Moab City wastewater system.

#### **Pioneering Agreements**

Where pioneering agreements exist, the impact fee calculation must take into account payback requirements under each pioneering agreement. No pioneering agreements currently exist in the Moab City wastewater system.

#### **Bonds**

Costs contained in the IFFP included bonding for several capital projects. Where City financial plans identify bonding will be required to finance impact fee eligible improvements, the portion of bond cost and interest expense attributable to future growth has been added to the calculation of the impact fee.

#### **General Taxes**

If taxes are used to pay for infrastructure, they should be accounted for in the impact fee calculation. Specifically, any contribution made by property owners through taxes should be credited toward their available capacity in the system. In this case, no taxes are proposed for the construction of infrastructure.

**Federal and State Grants and Donations**

Impact fees cannot reimburse costs funded or expected to be funded through federal grants and other funds that the City has received for capital improvements without an obligation to repay. Grants and donations are not currently contemplated in this analysis. If grants become available for constructing facilities, impact fees will need to be recalculated and an appropriate credit given. Any existing infrastructure funded through past grants has been removed from the system cost.

**DEDICATION OF SYSTEM IMPROVEMENTS - 11-36a-304(2)(f)**

Developer exactions are not the same as grants. If a developer constructs a system improvement or dedicates land for a system improvement identified in this IFFP, or dedicates a public facility that is recognized to reduce the need for a system improvement, the developer may be entitled to an appropriate credit against that particular developer's impact fee liability or a proportionate reimbursement.

If the value of the credit is less than the development's impact fee liability, the developer will owe the balance of the liability to the City. If the recognized value of the improvements/land dedicated is more than the development's impact fee liability, the City may be required to reimburse the difference to the developer.

It should be emphasized that the concept of impact fee credits pertains to system level improvements only. Developers will be responsible for the construction of project improvements (i.e. improvements not identified in the impact fee facilities plan) without credit against the impact fee.

**EXTRAORDINARY COSTS - 11-36a-304(2)(g)**

The Impact Fees Act indicates the analysis should include consideration of any extraordinary costs of servicing newly developed properties. In cases where one area of potential growth may cost significantly more to service than other growth, a separate service area may be warranted. No areas with extraordinary costs have been identified as part of this analysis.

**TIME-PRICE DIFFERENTIAL - 11-36a-304(2)(h)**

Utah Code allows consideration of time-price differential in order to create fairness for amounts paid at different times. To address time-price differential, this analysis includes a conversion to present value cost for future expenditures. In the case of future construction costs, it has been assumed that the return rate on investment will be roughly equivalent to construction inflation and current construction estimates have been used in the calculation of impact fees. Per the requirements of the Code, existing infrastructure cost is based on actual historical costs without adjustment.

**IMPACT FEE CERTIFICATION - 11-36a-306(2)**

This report has been prepared in accordance with Utah Code Title 11, Chapter 36a (the “Impact Fees Act”), which prescribes the laws pertaining to the imposition of impact fees in Utah. The accuracy of this IFFP relies in part upon planning, engineering, and other source data, provided by the City and its designees.

In accordance with Utah Code Annotated, 11-36a-306(2), Bowen Collins & Associates makes the following certification:

I certify that the attached 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 of 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
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.



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Keith J. Larson, P.E.

**APPENDIX A**  
**TECHNICAL MEMORANDUM # 1**  
**RESIDENTIAL EQUIVALENT STUDY**



# TECHNICAL MEMORANDUM # 1

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**TO:** Rebecca Davidson  
Moab City

**COPIES:** File

**FROM:** Keith Larson P.E.  
Jeff Beckman P.E.  
Bowen, Collins & Associates  
154 East 14000 South  
Draper, Utah 84020

**DATE:** September 21, 2016

**PROJECT:** Sewer Rate Study

**SUBJECT:** Residential Equivalent Study

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## INTRODUCTION

Bowen Collins & Associates (BC&A) has been retained by Moab City (City) to do a study on equivalent residential units (ERUs) for the City. An ERU is the typical water use amount for a single family residence measured in gallons per day or gallons per month. This represents the average flow and strength of wastewater for a residential connection to the City.

The purpose of this study is to create a basis for the City to relate flow from larger non-residential customers to the flow of an average residential connection or ERU. By defining the flow of all the different customer types in terms of ERUs, the City will be able to equally allocate the costs of service in the sewer system to the various system users. This memorandum examines the basis of an ERU in the City and proposes a method of ERU calculation for different customer types.

## ERU DEFINITION

The definition of an ERU should be defined based on the average characteristics of a single family residential connection. Based on water use records for 2016, the average residential connection had indoor water use of approximately 4,400 gallons during the peak month of the year. Historically, the City has used an expected domestic wastewater concentration of 300 mg/L when calculating Biological Oxygen Demand (BOD) loading and 280 mg/L when calculating Total Suspended Solids (TSS) loading.

Based on this information, the following definitions and equations are proposed to calculate the number of ERUs for different customer types. To accurately reflect the impact of customers on both collection and treatment facilities, ERUs will be defined in terms of both flow and strength. Fractional ERU values are rounded up to the next whole number.

*ERU Definition Based on Flow*

(1)  $1 \text{ ERU}_{\text{flow}} = 4,400 \text{ gal/month}$

*ERU Definition Based on BOD*

(2)  $1 \text{ ERU}_{\text{BOD}} = 300 \text{ mg/L} \times (8.345 \times 10^{-6} \text{ lbs L/mg gal}) \times 4,400 \text{ gal/month}$

$1 \text{ ERU}_{\text{BOD}} = 11.0 \text{ lbs/month}$

*ERU Definition Based on TSS*

(3)  $1 \text{ ERU}_{\text{TSS}} = 280 \text{ mg/L} \times (8.345 \times 10^{-6} \text{ lbs L/mg gal}) \times 4,400 \text{ gal/month}$

$1 \text{ ERU}_{\text{TSS}} = 10.3 \text{ lbs/month}$

*Equation to Calculate ERU Value Based on Flow*

(4)  $\# \text{ of ERU}_{\text{flow}} = \frac{\text{Customer Flow gal/month}}{4,400 \text{ gal/month per RE}}$

*Equation to Calculate ERU Value Based on BOD*

(5)  $\# \text{ of ERU}_{\text{BOD}} = \frac{\text{BOD}_{\text{conc}} \text{ mg/L} \times (8.345 \times 10^{-6}) \times \text{Cust. Flow gal/month}}{11.0 \text{ lbs/month per ERU}}$

*Equation to Calculate ERU Value Based on TSS*

(6)  $\# \text{ of ERU}_{\text{TSS}} = \frac{\text{TSS}_{\text{conc}} \text{ mg/L} \times (8.345 \times 10^{-6}) \times \text{Customer Flow gal/month}}{10.3 \text{ lbs/month per ERU}}$

*Equation to Calculate Number of Treatment ERUs Based on Cost Weighted Average of: Flow, BOD, & TSS*

(7)  $\# \text{ of Treatment ERU}_{\text{Wt Ave}} = (\text{ERU}_{\text{flow}} \times 33.3\%) + (\text{ERU}_{\text{BOD}} \times 33.3\%) + (\text{ERU}_{\text{TSS}} \times 33.3\%)$

The cost weighted average approach described above takes the estimated percentage spent by the City on treatment based on total flow, BOD, and TSS and calculates a weighted ERU value. For this study, costs have been divided evenly between the three categories<sup>1</sup>.

<sup>1</sup> To develop a more refined estimate of actual costs would require a full cost-of-service analysis of the detailed design of the new treatment plant and its subsequent operation costs. Since this data will not be available for several years, the costs have been approximated as shown. These are believed to be relatively accurate estimates based on costs as observed at other established plants. A cost analysis of the Central Valley Water Reclamation Facility in Salt Lake City, Utah calculated costs at 30% flow, 31% BOD, and 39% TSS. A similar analysis of the Timpanogos Wastewater Treatment Plant in Pleasant Grove, Utah calculated costs at 56% flow, 24% BOD, and 20% TSS. While costs will vary from plant to plant depending on the treatment process used and the quality of wastewater being received, the estimate contained here seems reasonable in the absence of additional data.

**CUSTOMER ERU CATEGORIES**

Based on the City’s current customer billing types, BC&A would propose ten different customer categories for defining ERUs as identified in Table 1.

**Table 1  
Proposed ERU Customer Categories**

<b>Customer Category</b>	<b>Notes</b>
Residential – Single Family	Includes typical single family residential along with trailers, town homes, duplexes, and large multifamily (see below).
Residential – Multifamily	Includes all apartments and condos up to a maximum size of 1,500 square feet per unit. All larger multifamily to be grouped with single family residential.
Overnight Accommodations	Any overnight accommodations with sewer service including hotels, motels, and bed & breakfasts.
Commercial/Retail	
Office	
Restaurant	Any business whose primary function is to prepare and serve food (including fast food).
Schools	
Gas Station/Convenience Store	
RV/Campground	
Other	Any development that is not adequately represented by one of the categories above. Could include medical, churches, car washes, laundromats, etc.

**ERU CATEGORY CALCULATIONS**

For the proposed customer categories listed above, BC&A has developed a recommended definition for both Flow ERUs and Treatment ERUs as summarized in Table 2. Definitions for Flow ERUs in this table are based on historic flow data as available from 2016 water use records for Moab City customers. Flow equivalency has been based on estimated peak month indoor water use as approximated from April 2016 water use.

Because water quality data is not readily available for the various Moab City customer categories, Treatment ERUs have been based on data collected as part of a detailed water quality study completed by BC&A for Mt. Olympus Improvement District completed in 2012. Historical data used to assemble the results are contained in Appendix A.

**Table 2  
Proposed ERU Definitions by Customer Category**

<b>Customer Type</b>	<b>Flow Only Definition 1 ERU =</b>	<b>Treatment Definition 1 ERU =</b>
Residential – Single Family	1 residence	1 residence
Residential – Multifamily	1.8 units	1.8 units
Overnight Accommodations	1.2 units	1.2 units
Commercial/Retail	6,500 ft <sup>2</sup>	6,500 ft <sup>2</sup>
Office	4,000 ft <sup>2</sup>	4,000 ft <sup>2</sup>
Restaurant	10.6 Seats	4.7 Seats
Schools	15 Students	15 Students
Gas Station/Convenience Store	3,600 ft <sup>2</sup>	3,600 ft <sup>2</sup>
RV/Campground	By Study	By Study
Other	By Study	By Study

It is recommended that the definitions proposed in Table 2 be used to calculate the number of Flow and Treatment ERUs in the Moab, Spanish Valley Water & Sewer Improvement District, and other systems. This can be accomplished as outlined in Equation (8).

*Equation to Calculate Number of ERUs Based on ERU Definition*

$$(8) \text{ Number of ERUs} = \frac{\text{Customer Facility Size (ft}^2, \text{ \# seats, etc.)}}{\text{ERU Definition}}$$

**Moab Historical Water Use by Customer Category (2016)**

**Residential – Single Family**

	Connections	Units	Quantity (Peak Month) - kgals	Peak Month Indoor Water consumption kgals	Peak Month Indoor Water consumption gpd	ERUs
1 Residential	1365	1368	6019.2	4.40	144.7	1368.0
2 Residential	11	18	79.2	4.40	144.7	18.0
Trailer Courts	12	349	1490.5	4.27	140.4	338.8
Trailer Court/House	1	3	30.0	10.00	328.8	6.8
Trailer Court/2 Apts/House	2	22	108.0	4.91	161.4	24.5
County Residential	12	12	52.8	4.40	144.7	12.0
<b>Total</b>	<b>1403</b>	<b>1772</b>	<b>7779.741787</b>	<b>4.39</b>	<b>144.3</b>	<b>1768.1</b>

**Residential – Multifamily**

House/Apartments	8	16	39.1	2.4	80.4	8.9
Apartments	77	398	972.9	2.4	80.4	221.1
<b>Total</b>	<b>85</b>	<b>414</b>	<b>1012</b>	<b>2.4</b>	<b>80.4</b>	<b>230.0</b>

**Overnight Accommodations**

Hotel/Motel/B&B	64	2393.1	8774.9	3.7	120.5	1994.3
Bed & Breakfast 52.94	2	2	2.0	1.0	32.9	0.5
Restaurant Correction	-5	-5	-64.9	-13.0	-426.7	-14.8
<b>Total</b>	<b>61</b>	<b>2390.142857</b>	<b>8711.957143</b>	<b>3.6</b>	<b>119.8</b>	<b>1980.0</b>

**Commercial/Retail**

Business/House	6	11	104.0	9.5	310.8	23.6
Business	138	138	3277.2	23.7	780.8	744.8
Business - 4 month water usage	6	7	22.3	3.2	104.6	5.1
County Business	1	1	6.0	6.0	197.3	1.4
2 Commercial	1	2	2.0	1.0	32.9	0.5
Restaurant Correction	-9	-9	-132.2	-14.7	-482.9	-30.0
RV/Campground Correction	-3	-3	-626.1	-208.7	-6861.4	-142.3
<b>Total</b>	<b>140</b>	<b>147</b>	<b>2653.209368</b>	<b>-180.0</b>	<b>-5918.0</b>	<b>603.0</b>

**Office**

Office Space Rental	24	24	556.0	23.2	761.6	126.4
Restaurant Correction	-4	-4	-57.8	-14.5	-475.1	-13.1
<b>Total</b>	<b>20</b>	<b>20</b>	<b>498.2</b>	<b>24.9</b>	<b>819.0</b>	<b>113.2</b>

**Restaurant**

Restaurant/Bar	23	23	1461.0	63.5	2088.4	332.0
Restaurant/Bar Billed Under Other Categories	20	20	281.3	14.1	462.4	63.9
<b>Total</b>	<b>43</b>	<b>43</b>	<b>1742.3</b>	<b>40.5</b>	<b>1332.1</b>	<b>396.0</b>

**Schools**

School	7	7	97.0	13.9	455.6	22.0
School - 4 month winter usage	6	6	31.0	5.2	169.9	7.0
<b>Total</b>	<b>13</b>	<b>13</b>	<b>128</b>	<b>9.8</b>	<b>323.7</b>	<b>29.1</b>

**Gas Station/Convenience Store**

Gas Station/Convenience Store	6	6	411.4	68.6	2254.4	93.5
Restaurant Correction	-2	-2	-26.4	-13.2	-434.0	-6.0
<b>Total</b>	<b>4</b>	<b>4</b>	<b>385.0</b>	<b>96.3</b>	<b>3164.6</b>	<b>87.5</b>

**RV/Campground**

RV/Campground Billed Other Categories	3	3	626.1	208.7	6861.4	142.3
<b>Total</b>	<b>3</b>	<b>3</b>	<b>626.1</b>	<b>208.7</b>	<b>6861.4</b>	<b>142.3</b>

**Other**

Church	1	1	1.0	1.0	32.9	0.2
Church - 4 months Winter Usage	8	8	57.0	7.1	234.2	13.0
Govt - 4 month winter usage	3	3	10.0	3.3	109.6	2.3
Medical Office	4	4	21.0	5.3	172.6	4.8
Hospital	3	3	431.0	143.7	4723.3	98.0
<b>Total</b>	<b>19</b>	<b>19</b>	<b>520</b>	<b>27.4</b>	<b>899.8</b>	<b>118.2</b>

**Totals**

<b>Residential – Single Family</b>	<b>1403</b>	<b>1772</b>	<b>7779.741787</b>	<b>4.4</b>	<b>144.3</b>	<b>1768.1</b>
<b>Other</b>	<b>388</b>	<b>3053.142857</b>	<b>16276.79508</b>	<b>5.3</b>	<b>175.3</b>	<b>3699.3</b>
<b>Total</b>	<b>1791</b>	<b>4825.142857</b>	<b>24056.53687</b>	<b>5.0</b>	<b>163.9</b>	<b>5467.4</b>

**SVW&SID Historical Water Use by Customer Category (2016, including committed but not yet connected)**

**Residential – Single Family**

	Connections	Units	Quantity (Peak Month) - kgals	Peak Month Indoor Water consumption kgals	Peak Month Indoor Water consumption gpd	ERUs
Residential	1851	1851	8144.4	4.4	144.7	1851.0
Trailer Court	8	112.0	493	4.4	144.7	112.0
Total	1859	1963.0	8637.4	4.4	144.7	1963.0

**Residential – Multifamily**

All	16	135	330	2.4	80.4	75.0
Total	16	135	330	2.4	80.4	75.0

**Overnight Accommodations**

All	6	135.5	497	3.7	120.5	113.0
Total	6	135.5	497	3.7	120.5	113.0

**Commercial/Retail**

All	60	60	414.25	6.9	227.0	94.1
Total	60	60	414.25	6.9	227.0	94.1

**Office**

All	17	17	170.4	10.0	329.5	38.7
Total	17	17	170.4	10.0	329.5	38.7

**Restaurant**

All	3	3	83	27.7	909.6	18.9
Total	3	3	83	27.7	909.6	18.9

**Schools**

All	2	2	95	47.5	1561.6	21.6
Total	2	2	95	47.5	1561.6	21.6

**Gas Station/Convenience Store**

All	3	3	410	136.7	4493.2	93.2
Total	3	3	410	136.7	4493.2	93.2

**RV/Campground**

All	7	430	938	2.2	71.7	213.2
Total	7	430	938	2.2	71.7	213.2

**Other**

All	25	25	334.6	13.4	440.0	76.0
Total	25	25	334.6	13.4	440.0	76.0

**Totals**

Residential – Single Family	1859	1963.045455	8637.4	4.4	144.7	1963.0
Other	139	810.5454545	3272.25	4.0	132.7	743.7
Total Connections	1998	2773.590909	11909.65	4.3	141.2	2706.7

**APPENDIX B**  
**PLANT RECONSTRUCTION COST ESTIMATE**

## Moab Water Reclamation Facility

### Overall Project Costs

Updated: September 2023

	Project	Cost	Comment
	<b>WRF</b>		
1	Facilities Master Plan Update	\$ 47,000	Complete
2	Preliminary Design	\$ 165,000	Complete
3	WRF Final Design	\$ 492,000	In Process
4	Site Preparation Construction	\$ 800,000	Estimate
5	WRF Construction Estimate	\$ 9,400,000	Includes \$900,000 contingency (Const. Cost = \$8.5 million)
6	Construction Observation	\$ 600,000	Estimated 6% of Construction Costs
7	City Legal and Administration	\$ 50,000	Estimate
7	Loan Origination Costs	\$ 100,000	Estimate from State
	<b>Pipelines</b>		
11	Outfall Construction Estimate	\$ 750,000	Includes \$100,000 contingency (Const Cost - \$650,000)
12	Outfall Final Design & CMS	\$ 100,000	Estimate 12% of Estimated Construction + \$15k Evaluation
13			
14			
	Original Estimate - Plant Costs	\$ 12,504,000	
	Actual Project Costs (As of Sep 2023)	\$ 15,510,700	

### Moab Contribution

	Agency	Amount	Comment
1	Moab	\$ 47,000	Paid for Facilities Master Plan
2	Preliminary Design	\$ 165,210	Paid for Preliminary Design
3	WRF Final Design	\$ 648,385	Paying for Final Design
4	Site Prep Project	\$ 360,000	Paid for by Moab
5	City Admin.	\$ 100,000	
	<b>Total Moab</b>	\$ 809,895	

\$1,320,595

### SVW&SID Contribution

	Agency	Amount	Comment
1	Cash Down	\$ 800,000	
2			
3			
	<b>Total GWSSA</b>	\$ 800,000	

Total Project Costs	\$ 15,510,700
Total Contribution	\$ 1,609,895
Loan Amount	\$ 14,200,000

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