

C I T Y O F



SARATOGA SPRINGS

**SECONDARY WATER
IMPACT FEE FACILITY PLAN**

(HAL Project No.: 360.07.410)

NOVEMBER 2021

CITY OF SARATOGA SPRINGS

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Steven C. Jones, P.E.

Project Engineer



NOVEMBER 2021

IMPACT FEE CERTIFICATION

The Utah Impact Fee Act requires certifications for the Impact Fee Facilities Plan (IFFP). Hansen, Allen & Luce provides these certifications with the understanding that the recommendations in the IFFP are followed by City Staff and elected officials. If all or a portion of the IFFP are modified or amended, or if assumptions presented in this analysis change substantially, this certification is no longer valid. All information provided to Hansen, Allen & Luce, Inc. is assumed to be correct, complete, and accurate.

IFFP Certification

Hansen, Allen & Luce, Inc. certifies that the Impact Fee Facilities Plan (IFFP) prepared for the drinking water system:

1. includes only the costs of public facilities that are:
 - a. allowed under the Impact Fees Act; and
 - b. actually incurred; or
 - c. projected to be incurred or encumbered within six years after the day on which each impact fee is paid;
2. does not include:
 - a. costs of operation and maintenance of public facilities;
 - b. costs for qualifying public facilities that will raise the level of service for the facilities, through impact fees, above the level of service that is supported by existing residents;
 - c. an expense for overhead, unless the expense is calculated pursuant to a methodology that is consistent with generally accepted cost accounting practices and the methodological standards set forth by the federal Office of Management and Budget for federal grant reimbursement; and
3. complies in each and every relevant respect with the Impact Fees Act.

HANSEN, ALLEN & LUCE, INC.

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IMPACT FEE SUMMARY

The **purpose** of the Impact Fee Facilities Plan (IFFP) is to comply with the requirements of the Utah Impact Fees Act by identifying demands placed on the existing secondary water system by new development and by identifying the means by which the City will meet these new demands. This analysis is an update to the Secondary Water System IFFP prepared in 2017 to address changes in conditions and assumptions that result in an increase in the proposed secondary water impact fee. The Secondary Water System Master Plan and Capital Facility Plan have also been updated to support this analysis.

The most significant **change** in this update is increased project costs. The City has constructed projects costing over \$15 million to increase the capacity of the secondary water system. These projects added capacity to the system which has almost entirely been used by the new growth that has come into the system since 2017. The actual project costs have come in higher than the projected cost for these improvements identified in the previous IFFP. This has resulted in increased projected costs for future projects in this IFFP.

The secondary water system impact fee **service area** is the current city boundary. The existing system irrigated about 2,397 acres at the beginning of 2020. Projected **growth** adds 1,370 irrigated acres in the next 10 years for a total of 3,767 irrigated acres.

The three **components** of the secondary water impact fee are source, storage, and water rights. All capacities and costs are summarized into these components. The main transmission pipelines convey source and storage capacity to the developments, so each pipeline project has a calculated source and storage component assigned.

The City assigns irrigated area in acres to new development based on actual irrigated acres when the new development is platted or when a building permit is issued, whichever one comes first. Irrigated acres are the recommended **fee unit** for calculating the impact fee. The typical single-family residential secondary water use includes irrigated area in park strips and parks in the development which for the purposes of this study is assumed to be 0.24 acres.

It is proposed that the **level of service** for the secondary water system not change from the previous IFFP. The level of service is an annual volume of 3.13 acre-feet per irrigated acre while maintaining a pressure of at least 30 pounds per square inch (psi) at all connections under all peak flow conditions. Peak flow conditions are defined per irrigated acre as 7.5 gallons per minute (gpm) for Peak Day Average Flow (source flow capacity) and 15.0 gpm for Peak Instantaneous Flow Capacity (pipe flow capacity). Also, a level of service for storage volume per irrigated acre of 9,216 gallons is used to maintain the minimum pressure of 30 psi at all connections.

The secondary water system has no existing deficiencies. The costs calculated for the capacity required for growth in the next 10 years comes from the proportional historical buy-in costs of **excess capacity** and new projects required entirely to provide capacity for the new development.

The following table is a summary of the proposed impact fee per irrigated acre. The table also has the impact fee per typical single-family residential connection for reference based on 0.24 acres of irrigation. The proposed impact fee is an increase from the current impact fee of \$31,030 per irrigated acre.

**PROPOSED IMPACT FEE PER IRRIGATED
ACRE AND TYPICAL SINGLE-FAMILY CONNECTION**

COMPONENT	Per Irrigated Acre	Per Typical Residential Connection
Source	\$16,167	\$3,880
Storage	\$12,390	\$2,973
Water Rights	\$10,979	\$2,634
Total	\$39,536	\$9,487

CHAPTER 1 INTRODUCTION

1.1 Background

The City of Saratoga Springs has experienced tremendous growth since the early 2000's that has transformed the once largely agricultural community into an urbanized region of northern Utah County. Residential and commercial developments are being established at a rapid pace with additional undeveloped land available for future growth. As this growth continues additional secondary water facilities will be required to provide an adequate water system that meets the City's current level of service for outdoor watering.

The City has recognized the importance to plan for increased demands on its Secondary Water System from new development as a result of the rapid growth. The Secondary Water System Master Plan and Capital Facility Plan have also been updated to support this analysis.

1.2 Purpose

The purpose of the IFFP is to comply with the requirements of the Utah Impact Fees Act by identifying demands placed on the existing Secondary Water System by new development and by identifying the means by which the City will meet these new demands. This analysis is an update to the Secondary Water System IFFP prepared in 2017 was necessary due to significant growth in the City and increases in project costs. This report projects the need for new growth-related facilities for the 10-year planning range.

This report identifies those items that the Utah Impact Fees Act specifically requires including demands placed upon existing facilities by new development activity and the proposed means by which the municipality will meet those demands. In preparing this report a systematic approach was utilized to evaluate the existing and planned secondary water facilities identified in the City's master planning efforts. Each facility's capacity was evaluated in accordance with the selected level of service to determine the appropriate share between existing demand and future demands. This approach was taken in order to determine the "proportional share" of improvement costs between existing users and future development users. The basis for this report was to provide proposed project costs and the fractional cost associated with future development to be used within the impact fee analysis. The following analyses were performed to meet the study's objectives:

- 1) Identify the existing and proposed City secondary water facilities;
- 2) Identify the existing level of service for the system;
- 3) Identify a proposed level of service for the system;
- 4) Identify if any deficiencies are present in the existing system utilizing the proposed level of service;
- 5) Identify any excess capacity in the existing system facilities using the proposed level of service;

- 6) Identify the phasing of new development and the appropriate facilities needed to support the development;
- 7) Identify public facilities for which an impact fee may be charged or required for a school district or charter school if the local political subdivision is aware of the planned location of the school district facility or charter school;
- 8) Project growth in water demands attributable to new development within the existing system;
- 9) Determine projects required by the new water demands to provide the proposed level of service to future development without compromising the level of service provided to existing residents;
- 10) Establish construction phasing of proposed capital facilities;
- 11) Prepare detailed cost estimates for each proposed project;
- 12) Determine if proposed projects will provide capacity for growth beyond the IFFP planning period;
- 13) Separate and identify infrastructure costs to maintain the proposed level of service for existing residents versus infrastructure costs to provide capacity at the proposed level of service for future development, and then identify and subtract the proportionate cost of any excess capacity for growth that is projected to occur beyond the 10 year planning window for the IFFP.

1.3 Impact Fee Collection

Impact fees enable local governments to finance public facility improvements necessary to service new developments without burdening existing development with capital facility construction costs that are exclusively attributable to growth.

An impact fee is a one-time charge on new development to pay for that portion of a public facility that is required to support that new development.

In order to determine the appropriate impact fee, the cost of the facilities associated with future development must be proportionately distributed. As a guideline in determining the “proportionate share”, the fee must be found to be roughly proportionate and reasonably related to the impact caused by the new development.

1.4 Master Planning

The Secondary Water System Master Plan and Capital Facility Plan have also been updated to support this analysis. The master plan for the City’s drinking water system is more comprehensive than the IFFP. It provides the basis for the IFFP as well as identifies all Capital Facilities required of the Drinking Water System for the 20-year planning range including maintenance, repair, replacement, as well as growth related project recommendations. The recommendations made within the master plan report are in compliance with current City policies and standard engineering practices.

A hydraulic model of the secondary water system was prepared to aid in the analyses performed to complete the Secondary Water System Master Plan. The model was used to assess existing performance, level of service, to establish a proposed level of service and to confirm the effectiveness of the proposed capital facility projects to maintain the proposed level of service over the next 10 years.

CHAPTER 2 EXISTING SECONDARY WATER SYSTEM

2.1 General

The purpose of this section is to provide information regarding the existing Secondary Water System, identify the current level of service, identify a proposed level of service and analyze the capacity of the existing system's facilities to meet the proposed level of service. Public facilities including existing and future school districts and charter school developments were also identified. Specific impact fees for these public facilities have been included in the impact fee analysis.

Saratoga Springs' existing Secondary Water System is comprised of a pipe network, water storage ponds, and water sources. The system is master planned to be an independent system, but is currently supplemented by excess capacity in the drinking water system. As the excess capacity in the drinking water system is needed for future growth, Secondary Water System facilities will be constructed to increase the capacity of the Secondary Water System, thus freeing up capacity for future drinking water demands. For both the Drinking Water System Master Plan and the Secondary Water System Master Plan each system was analyzed with no sharing of capacity for future projections. Figure 2-1 illustrates the existing secondary water system.

2.2 Pressure Zones

Currently, the secondary water distribution system serving Saratoga Springs has three pressure zones, though the upper two pressure zones are split between the north and south as they are not interconnected yet. Only Zone 1 is currently interconnected. Pressure zones are identified on Figure 2-1.

2.3 Secondary Meters

The secondary system currently has individual meters at all connections. The City bills residents according to water use. Before the meters were installed in 2014, most connections used water in excess of the City's adopted level of service. The recently installed meters along with a fee schedule that promotes conservation of water have led to residents using close to the selected level of service.

2.4 Irrigated Acreage

Outdoor water demands are based on irrigated acreage. Irrigated acre is the unit used for the Secondary Water System Impact Fee. For typical single-family residential developments, irrigable acreage is 64% of the land being developed. The amount of irrigated acres for multi-family and non-residential developments are based on actual landscaped areas. The percentage of irrigated acres is 90 percent for land used for irrigated open space and parks. For new development Title 19 of City Code defines the amount of landscaped area for each land use type.

Data in this report is presented by impact fee unit (irrigated acres) and also typical single-family residential connection for reference. A typical single-family residential connection is defined in this report as 0.24 irrigated acres which includes the proportional amount per residence of irrigated area outside of the parcel including park strips and neighborhood parks.

The total number of existing irrigated acres as of this analysis is 2,397 acres, which requires an annual irrigation volume of 7,502.6 acre-feet. This includes all development that has been platted and assumes the recommended irrigated acres of 64% of land developed and 3.13 acre-feet per irrigated acre. It is the City's policy to receive impact fees and water rights at plat recordation for the secondary water system. Therefore, the existing system provides capacity for these recorded developments whether or not building permits have been issued.

2.5 School Related Infrastructure

As part of the noticing and data collection process for this plan, information was gathered regarding existing and future school district and charter school development. Where the City is aware of the planned location of a school, required public facilities to serve the school have been included in the impact fee analysis. Table 2-1 shows the existing schools and the irrigated acreage of each school. Table 2-2 shows the best available information regarding planned schools. Each table will be updated as additional schools are planned and constructed.

**TABLE 2-1
EXISTING SCHOOLS**

School Name	Location / Address	Irrigated Acreage	Type of School
Harvest Elementary	2105 N Providence Dr	6.09	Elementary School
Riverview Elementary	273 Aspen Hills Blvd	7.46	Elementary School
Thunder Ridge Elementary	264 N 750 W	*NA	Elementary School
Sage Hills Elementary	3033 W Swainson Ave	2.44	Elementary School
Saratoga Shores Elementary	1415 S Parkside Dr	*NA	Elementary School
Springside Elementary	694 S Highpoint Dr	4.83	Elementary School
Lake Mountain Middle School	1058 S Old Farm Rd	19.85	Junior High School
Vista Heights Middle School	484 Pony Express Pkwy	*NA	Junior High School
West Lake High School	99 N 200 W	12.31	High School
Lakeview Academy	527 W 400 N	2.30	Charter
Horizon Special Needs School	682 W 210 N, Marie Way	*NA	Charter
Mountain Sunrise Academy	1802 E 145 N	1.45	Charter

*Irrigated acreage is not applicable because Alpine School District provides all secondary water to school.

**TABLE 2-2
PLANNED SCHOOLS**

School Name	Location / Address
Planned Junior High	Parcel 58:023:0274
Planned Charter School	Wildflower Development; Parcel 58:033:0544
Planned Elementary School	Mt Saratoga Development; Parcel 58:034:0737
Planned Elementary School	Jordan Promenade Development; Parcel 58:035:0112
Planned High School	Parcel 58:041:0234
Harbor Point Elementary	Parcel 16:003:0043

Currently, Alpine School District provides secondary water to four schools located in Saratoga Springs.

Currently, Saratoga Springs provides secondary water to eight schools located within the city limits. Each existing and new school connected to the Saratoga Springs secondary water system directly results in the need for additional improvements to public facilities. Therefore, impact fees for new schools will be calculated based on the irrigated acreage served by the Saratoga Springs secondary water system.

2.6 Level of Service

The level of service for the secondary water system is an annual volume of 3.13 acre-feet per irrigated acre while maintaining a pressure of at least 30 pounds per square inch (psi) at all connections under all peak flow conditions. Peak flow conditions have been defined per irrigated acre as 7.5 gpm for Peak Day Average Flow (source flow capacity) and 15.0 gpm for Peak Instantaneous Flow Capacity (pipe flow capacity). Also, a level of service for storage volume per irrigated acre of 9,216 gallons is used to maintain the minimum pressure of 30 psi at all connections. Table 2-3 is the level of service for the Secondary Water System per irrigated acre. Table 2-4 is the same per typical residential connection. The level of service represents the historic level of service the system has been designed to serve and is consistent with recent measured use. The level of service also represents the capacity needed to irrigate turf in Saratoga Springs and accounts for factors such as the quality of water available to the City and unavoidable system losses. Secondary water sources within Saratoga Springs are high in dissolved salts, which require residents to use more water than other areas of the state.

**TABLE 2-3
LEVEL OF SERVICE (PER IRRIGATED ACRE)**

Average Yearly Demand (Source Volume) ac-ft/yr per irrigated acre	3.13
Peak Day Demand (Source Flow) gpm/irrigated-acre	7.50
Peak Instantaneous Demand (Transmission) gpm/irrigated-acre	15.00
Storage gal/irrigated-acre	9,216

**TABLE 2-4
LEVEL OF SERVICE (PER TYPICAL RESIDENTIAL CONNECTION)**

Irrigated Acres	0.24
Average Yearly Demand (Source Volume) ac-ft/yr per connection	0.75
Peak Day Demand (Source Flow) gpm/connection	1.8

Peak Instantaneous Demand (Transmission) gpm/connection	3.6
Storage gal/connection	2,213

2.7 Methodology Used to Determine Existing System Capacity

The method for determining the remaining capacity in the system was based on the proposed level of service in terms of irrigated acres. Each component of the secondary water system was assessed a capacity in terms of irrigated acres. The components include the following: Source (wells, pump stations and transmission lines), Storage (reservoirs and associated transmission lines), and Water Rights. Each component was also assigned a number of existing irrigated acres currently using each component. The difference between the capacity and existing demand for each component is the remaining capacity. For example, to calculate the remaining capacity for source in irrigated acres, the required source for existing users in irrigated acres is subtracted from the capacity of the wells in irrigated acres. For storage, the required storage for existing users is subtracted from the capacity of the reservoirs to calculate the remaining capacity for storage.

In addition to the level of service presented in the tables above, pipelines are considered at capacity when velocities reach 5 feet per second (fps) at peak instantaneous demand using the extended period hydraulic model representing the system as a whole under typical peak demand conditions. In the engineering industry, it is generally recognized that flows above 5 fps produced unacceptable pressure losses.

2.8 Water Source & Remaining Capacity

Saratoga Springs is currently adding additional water sources to their system to keep up with increasing demands. The projects contained in this report will reduce the need of the secondary system to borrow water from the drinking water system in areas where the secondary system is not yet connected. In the coming years, the secondary system will become self-sustaining and will not need to borrow capacity from the drinking water system. The canal source capacity is represented by the capacity of pump stations at the canals. Table 2-5 summarizes the information of each secondary source.

**TABLE 2-5
EXISTING SECONDARY WATER SOURCES**

Name	Flow Capacity (gpm)	Capacity (IA)	Notes:
Well No. 1	800	106.7	Currently needs to be replaced
Well No. 2	900	120	Sunrise Meadows Well
Well No. 3	500	66.7	Zone 2 North Source
Well No. 4	800	106.7	Zone 2 North Source
Well No. 5	3,500	466.7	Zone 2 South Source
Church Booster – ULDC	1,100	146.7	Tickville Wash Pump Station
Marina PS	4,000	533.3	Zone 2 South Source
400 N. - ULDC PS	5,000	666.7	Zone 1 North Source
Total	16,600	2,213.5	

2.9 Distribution System & Remaining Capacity

Pipe diameters range from 6 inches to 30 inches, with the majority being 6 inches within subdivisions. The larger pipes in the system serve as transmission lines to deliver water from storage ponds during peak scenarios and to deliver water from sources. All pipes have been constructed in the last 20 years and are in good condition. The City's current standard allows for Ductile Iron Pipe (DIP) for pipe diameters of 24 inches and larger and Polyvinyl Chloride (PVC) pipe is allowed for pipes up to 24 inches.

2.10 Storage Facilities & Remaining Capacity

Saratoga Springs currently operates four water storage ponds serving the City. Storage requirements are determined on a per irrigable acre basis. The total storage capacity is 71.6 acre-feet. All ponds were constructed in the last 20 years and are in good condition.

The capacity of each pond was analyzed in respect to the zone it serves. The storage was analyzed as requiring 9,216 gallons per irrigable acre. Table 2-6 summarizes the storage facility information. Some of the ponds are not used for equalization but for pump operation. These ponds do not have usable equalization capacity. The capacity of each pressure zone is summarized in Table 2-7. Currently, there is an overall excess capacity of 3.8 ac-ft of storage.

**TABLE 2-6
EXISTING STORAGE POND SUMMARY**

Service Zone	Pond ID	Capacity (Acre-feet)
Zone 1 South	Pond 1 (Grandview Blvd)	2.1
Zone 2 South	Pond 2 (The Villages)	1.5
Zone 2 North	Pond 3 (Harvest Hills)	9.0
Zone 1 South	Pond 4 (Church Pond) *	10.0
Zone 2 North	Pond 5 (Sunrise) *	NA
Zone 1 North	Pond LL (Loch Lomond) *	NA
Zone 2 South	Pond 6 (Israel Canyon)	38.0
Zone 3 South	Pond 7 (Fox Canyon)	4.0
Zone 1 North	Pond 8 (Evans Lane)	17.0
Total		71.6

*Storage/staging pond for pump station.

**TABLE 2-7
EXISTING STORAGE SUMMARY BY ZONE**

Service Zone	Irrigated Acreage	Storage Requirement (ac-ft)	Existing Capacity (ac-ft)	Surplus (+) (ac-ft)
Total	2,397	67.8	71.6	+3.8

2.11 Water Rights & Remaining Capacity

The City owns a total of 12,376 acre-feet of water rights based on diversion that can be used between their drinking and secondary water systems. The existing demand at the proposed level of service of 3.13 acre-feet per irrigated acre is 7,503 acre-feet. The existing supply of water rights attributed to the secondary water system are 7,987 acre-feet. This leaves a surplus in capacity of 484 acre-feet. Also, the City has collected water right impact fees over the last few years which the City is working on purchase agreements to buy water rights when change applications have been approved. All water right volumes are annual diversions in acre-feet.

2.12 Capital Facilities to Meet System Deficiencies

Combined with the drinking water system, the existing Secondary Water System meets the proposed level of service. The secondary system is master planned to be an independent system, but currently the Secondary Water System is supplemented by excess capacity in the Drinking Water System to serve isolated areas of the system. Secondary Water System facilities will be constructed to connect all the isolated areas of the Secondary Water System. A Drinking Water System Master Plan was prepared in conjunction with the Secondary Water System Master Plan. For both the Drinking Water System Master Plan and the Secondary Water System Master Plan each system was analyzed with no sharing of capacity for future projections. It was assumed no secondary water system facilities are being supplemented by Drinking Water System capacity. Additional information regarding the drinking water system may be found in Drinking Water System Master Plan.

The City has several capital projects planned to improve existing system operation and provide capacity for future growth. The capital projects are presented in the Master Plan. Only projects that add capacity for future growth in the next 10 years are eligible to be included in the calculation of the impact fee.

