CITY OF

SARATOGA SPRINGS

DRINKING WATER IMPACT FEE FACILITY PLAN

(HAL Project No.: 360.07.410)

NOVEMBER 2021

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Project Engineer

HANSEN ALLEN & LUCE INC
ENGINEERS

NOVEMBER 2021

IMPACT FEE CERTIFICATION

The Utah Impact Fee Act (Chapter 11-36a of the Utah Code) 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IFFP is modified or amended, or if assumptions presented in this analysis change substantially, this certification is no longer valid.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 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 (Chapter 11-36a of the Utah Code) by identifying demands placed on the existing drinking 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 Drinking Water System IFFP prepared in 2017 to address changes in conditions and assumptions that result in a reduction in the proposed drinking water impact fee. The Drinking Water System Master Plan and Capital Facility Plan have also been updated to support this analysis.

The **significant change** in this update includes:

1. A reduction of the proposed source capacity level of service by 25 gallons per day (gpd) per equivalent residential connection (ERC) from 400 gpd to 375 gpd per ERC.
2. A reduction in the proposed equalization storage level of service from 400 gallons per ERC to 267 gallons per ERC.
3. A reduction in the level of service for required water rights from 400 gpd (0.45 acre-feet per year) per ERC to 267 gpd (0.3 acre-feet per Year) per ERC. As a result of this reduction of level of service, the proposed drinking water **impact fees are reduced.**
4. The proposed emergency storage level of service is changed from 100,000 gallons per storage tank to 100 gallons per ERC. This is not a functional change, but merely a change in the expression of the level of service.
5. The method of calculating impact fees (impact fee unit) is proposed to be changed from International Plumbing Code water supply fixture units to service meter sizes.

Consistent with the last impact fee update, no remaining capacity of groundwater source is available for future growth. It is assumed all future source will be provided by Central Utah Water Conservancy District (CUWCD). There are developers with drinking water groundwater capacity credit with the City that have not paid impact fees. For this reason, there are two drinking water impact fees. One impact fee is for those with groundwater capacity credit which includes cost for available drinking water well capacity. The other drinking water impact fee does not include cost for drinking water well source capacity.

The impact fee **service area** is the drinking water system service area, which includes the current city boundary. The existing system served about 9,850 connections at the beginning of 2020. Projected **growth** adds 6,647 equivalent connections in the next 10 years for a total of 16,497 connections or equivalent.

There are two **components** to the drinking water impact fee. The first component is indoor water capacity which includes: well source capacity (for those who have drinking water groundwater credit), storage, and source conveyance. The second component is fire flow.

The resulting fee is $2,208 per typical single-family connection for those with well water credits. The fee is $1,771 per typical single-family connection for those acquiring source water from CUWCD.

The impact fee for a typical single-family residential connection requiring a ¾" water lateral, using well water, and requiring a 1,500 gpm fire flow would have an impact fee of **$2,485** (see the following table). This includes $2,208 for indoor water capacity and $277 for fire flow capacity. This is a reduction from the current impact fee of $2,531.

TOTAL PROPOSED IMPACT FEE PER TYPICAL SINGLE-FAMILY CONNECTION WITH WELL WATER

Component	Per Typical Residential Connection
Indoor Water	$2,208
Fire Flow	$277
Total (source capacity from well water)	**$2,485**

The typical single-family residential connection requiring a ¾" water lateral, purchasing source water capacity from CUWCD, and requiring a 1,500 gpm fire flow would have an impact fee of **$2,048** (see the following table). This includes $1,771 for indoor water capacity and $277 for fire flow capacity. This is a reduction from the current impact fee of $2,190.

TOTAL PROPOSED IMPACT FEE PER TYPICAL SINGLE-FAMILY CONNECTION WITH WHOLESALE WATER

Component	Per Typical Residential Connection
Indoor Water	$1,771
Fire Flow	$277
Total (source capacity from CUWCD)	**$2,048**

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 drinking water facilities will be required to provide an adequate water system that meets the City's level of service for indoor water use.

The City has recognized the importance to plan for increased demands on its drinking water system from new development as a result of the rapid growth. A Drinking Water Impact Fee Facilities Plan (IFFP) update was required to address changes in conditions and assumptions that result in a reduction in the proposed drinking water impact fee. The Capital Facility Plan has 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 drinking 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 Culinary Water System IFFP prepared in 2017.

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 drinking water facilities identified in the City's master planning efforts. Each facility's capacity was evaluated in accordance with the new level of service to determine the appropriate share between existing demand and future demands. This approach was used 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. The following analyses were performed to meet the study's objectives:

1) Identify the existing and proposed City drinking 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 existing system;
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

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

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 Drinking 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 for the 20-year planning range including maintenance, repair, and replacement, as well as growth-related project recommendations. The recommendations made within the Drinking Water System Master Plan are in compliance with current City policies, State Division of Drinking Water minimum sizing requirements, and standard engineering practices.

A hydraulic model of the drinking water system was prepared to aid in the analyses performed to complete the Drinking Water System Master Plan. The model was used to assess existing performance and 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 DRINKING WATER SYSTEM

2.1 General

The purpose of this section is to provide information regarding the existing drinking water system, identify the current and proposed level of service, and analyze the remaining capacity of the existing system's facilities. 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 drinking water system is comprised of a pipe network, water storage facilities, and water sources. These facilities are found within three separate pressure zones. Figure 2-1 is located at the end of this section and illustrates the existing water system that services the entire City.

2.2 Pressure Zones

Currently, the drinking water distribution system serving Saratoga Springs has three pressure zones. Zone 2 and 3 are split north and south as they are not interconnected. The pressure zones were designed to provide pressures between 40 and 120 psi.

2.3 Existing City Secondary Water System

To preserve drinking water sources, the City has a secondary water system that provides outdoor irrigation. The secondary system is master planned to be an independent system, but currently the secondary water system can be supplemented by excess capacity in the drinking water system. Separate drinking water and secondary water pipelines exist in all developments. However, a few isolated developments currently rely on the drinking water system to provide storage and source water to the secondary 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. A Secondary Water System Master Plan was prepared in conjunction with the Drinking Water System Master Plan. Both the Drinking Water System Master Plan and the Secondary Water System Master Plan were analyzed with no sharing of capacity for future projections. It was assumed for all calculations that no secondary water system facilities are being supplemented by drinking water system capacity. Additional information regarding the secondary water system may be found in Secondary Water System Master Plan, IFFP.

2.4 Existing Equivalent Residential Connections

Water demands from non-residential water users, such as commercial, industrial, and institutional, have been converted to an Equivalent Residential Connection (ERC) for analytical purposes. The use of ERCs is a common engineering practice to describe the entire system's

usage based upon a common unit of measurement. An ERC is equal to the average demand of one single-family residential connection. Using ERCs for analysis allows for allocating existing and future demands over non-residential land uses. The City used methodology developed by the Utah Division of Drinking Water (DDW) to determine the total ERCs. Consistent with DDW, the City calculated the average residential water usage per residential customer by dividing the annual residential usage by the total number of residential connections. Residential use is defined by DDW as including drinking, washing, sanitation and lawn watering at a primary residence. Residential connections are defined by DDW as single-family homes, duplexes, fourplexes, condominiums, multi-family homes, apartments or similar dwelling facilities. Residential connections include all units whether they are privately owned or not.

After calculating an average residential water usage per residential customer, the remaining usage including commercial, industrial and institutional, was divided by the average residential water usage per residential customer to determine an equivalent residential connection value for the remaining usage. The total number of ERC's is then calculated as the sum of the residential connections plus the number of equivalent residential connections calculated using the remaining usage.

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 accompanied drinking water usage for 2020. 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	Drinking Water Usage 2020 (acre-ft)	Type of School
Harvest Elementary	2105 N Providence Dr	1.37	Elementary School
Riverview Elementary	273 Aspen Hills Blvd	0.81	Elementary School
Thunder Ridge Elementary	264 N 750 W	0.78	Elementary School
Sage Hills Elementary	3033 W Swainson Ave	0.90	Elementary School
Saratoga Shores Elementary	1415 S Parkside Dr	3.13	Elementary School
Springside Elementary	694 S Highpoint Dr	0.10	Elementary School
Lake Mountain Middle School	1058 S Old Farm Rd	2.56	Junior High School
Vista Heights Middle School	484 Pony Express Pkwy	2.34	Junior High School
West Lake High School	99 N 200 W	5.68	High School
Lakeview Academy	527 W 400 N	1.02	Charter
Horizon Special Needs School	682 W 210 N, Marie Way	0.34	Charter
Mountain Sunrise Academy	1802 E 145 N	0.16	Charter

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

Each school will directly result in the need for additional improvements to public facilities. Analysis of the category of school (elementary school, junior high school, high school, charter school) and the average past usage for each school determined the appropriate impact fee for schools based on the average lateral size required for each category. Future elementary schools will be charged for a 2-inch lateral, future junior high schools will be charged for a 3-inch lateral, future high schools will be charged for a 6-inch lateral, and future charter schools will be charged for a 2-inch lateral.

2.6 Level of Service

The level of service provided by the drinking water system has been established by the City to provide a reasonable supply of indoor water, fire suppression capacity, and water rights to assure that the system does not run out of water. This level of service establishes the sizing criteria for the City's distribution network (pipelines), source, storage facilities, and water rights for the Drinking Water System. Each level of service criteria has been described below:

Well Source Capacity: The capacity each well must be able to provide to the drinking water system.

Pump Station Source Capacity: The capacity each pump station must be able to provide to the drinking water system.

Wholesale Indoor Water Source Capacity: The capacity each wholesale connection must be able to provide to the drinking water system physically and by contracted volume.

Indoor Water Storage Capacity: Defined as equalization storage by DDW, indoor water storage capacity is the volume of a storage tank which stores water during periods of low demand and releases the water during periods of high demand.

Emergency Storage: Emergency storage as defined by DDW is the storage tank volume which provides water during emergency situations, such as pipeline failures, major trunk main failures, equipment failures, electrical power outages, water treatment facility failures, source water supply contamination, or natural disasters.

Pipe Capacity: The capacity of pipelines need to be sufficient to convey water to the end user without causing low pressures at the user connection during normal operation.

Minimum Fire Flow: The minimum allowable fire flow as determined by the local fire marshal.

Maximum Fire Flow: The maximum fire flow the system is designed to supply as determined by the local fire marshal.

Fire Suppression Storage Capacity: Defined as fire suppression storage by DDW, fire suppression storage capacity is the storage tank volume allocated to fire suppression activities. It is generally determined by the requirements of the local fire marshal, expressed in gallons, and determined by the product of a minimum flowrate in gpm and required time expressed in minutes

Water Rights Yearly Volume: The maximum water right annual volume amount allowed.

Since the 2017 Culinary Water System IFFP and IFP, the City has changed the proposed level of service to more accurately match the requirements provided by the Utah Division of Drinking

Water and the actual demand experienced by the drinking water system. The old and new level of service standards are provided below:

Indoor Water Supply

Level of Service Criteria	Old	New
Well Source Capacity	400 gpd per ERC plus 400 gpd per ERC for redundancy	375 gpd per ERC plus 375 gpd per ERC for redundancy
Pump Station Source Capacity	400 gpd per ERC plus 400 gpd per ERC for redundancy	375 gpd per ERC plus 375 gpd per ERC for redundancy
Wholesale Indoor Water Source Capacity	400 gpd per ERC	375 gpd per ERC
Indoor Water Storage Capacity	400 gal per ERC	267 gal per ERC
Emergency Storage Capacity	100,000 gal per storage tank	100 gal per ERC
Pipe Capacity	40 psi minimum during peak day demand conditions and 30 psi minimum during peak instantaneous conditions	40 psi minimum during peak day demand conditions and 30 psi minimum during peak instantaneous conditions

Well and pump station sources require more capacity than source supplied by a wholesale connection because it cannot be assumed that pumps run 100% of the time. Also, redundant pumps are required to provide source when primary pumps fail. Wholesale connections rely on the redundancy provided by the wholesaler and do not rely on mechanical facilities maintained by the City.

Fire Suppression

- Minimum Fire Flow: 1,500 gpm for 2 hours (180,000 gallons) as directed by the Fire Marshall from the International Fire Code (IFC), issued by the International Code Council.
- Maximum Fire Flow: 4,000 gpm for 4 hours (960,000 gallons) as directed by the Fire Marshall from the IFC.
- Fire Suppression Storage Capacity: As required by the Fire Marshall (see Table 2-4 for a summary of fire suppression storage by pressure zone)
- Minimum Pressure: 20 psi residual during peak day + fire flow event

Water Rights

Level of Service Criteria	Old	New
Yearly Volume	400 gpd per ERC (0.45 ac-ft per ERC)	267 gpd per ERC (0.3 ac-ft per ERC)

2.7 Methodology Used to Determine Existing System Capacity

The method for determining the remaining capacity in the system for indoor water supply was based on the defined level of service in terms of ERC's. Each component of the drinking water system was allotted a capacity in terms of ERC's. The components include: Source (wells, wholesale connections, and pump stations), Source Conveyance (transmission pipelines and facilities), Storage (tanks and associated transmission lines), Fire Suppression, and Water Rights. Each component was also assigned a number of existing ERC's currently using each component. The difference between the ERC's capacity and ERC's existing demand for each component is the remaining capacity. For example, to calculate the remaining capacity for source in ERC's, the required source conveyance for existing users in ERC's is subtracted from the capacity of the wells and CUWCD in ERC's. For storage, the required storage for existing users in ERC's is subtracted from the capacity of the tanks in ERC's to calculate the remaining capacity for storage in ERC's.

A hydraulic model was developed for the purpose of assessing system operation and capacity. For pipelines, the capacity in ERC's is estimated by the flow capacity of the pipe at a velocity of 5 feet per second subtracted by the minimum fire flow requirement of 1,500 gpm and dividing the remainder by 375 gpd per ERC. The transmission pipelines out of Tanks 4, 5, 6, 7, and 8 down to the first intersection include a fire flow capacity of 2,000 gpm and larger based on the fire flow assumed from these tanks. Capacity, demand, and remaining capacity is presented in the following paragraphs for each component of the drinking water system.

2.8 Water Source and Remaining Capacity

Drinking water source primarily comes from groundwater wells. However, the City has also begun using Central Utah Water Conservancy District (CUWCD) to provide drinking water source. There is additional physical groundwater and water right capacity remaining, but this is mostly in the form of water right credit owned by developers. An assessment of available water rights and physical groundwater capacity of drinking water quality is limited. Once the capacity is gone, all future drinking water source and water rights will be from CUWCD.

All current wells, located on the eastern border of the City, are actively used throughout the year on a rotating basis. The active wells are equipped with either submersible or vertical turbine pumps. These wells provide the well source capacity level of service of 375 gpd/ERC for indoor water use and 375 gpd/ERC for redundancy. Two CUWCD connections provide the wholesale source capacity level of service of 375 gpd/ERC for indoor water use. Although each connection will provide up to 3,000 gpm at buildout, CUWCD capacity is restricted by the amount of purchased water the City has available each year.

Several of the drinking water wells are producing half capacity due to groundwater and well conditions. Because of the lack of excess redundancy capacity available to supplement the secondary water system, CUWCD water needed to be purchased earlier than planned. Table 2-3 summarizes the information for each well and the two existing CUWCD connections. An ERC count was not allocated to specific wells or CUWCD connections as all sources are in the same zone.

TABLE 2-3
EXISTING WATER SOURCES

Name	Capacity (gpm)	Existing Demand (gpm)	Remaining Capacity (gpm)
Well No. 1	1,000	-	-
Well No. 2	1,020	-	-
Well No. 3	1,750	-	-
Well No. 4	1,000	-	-
Well No. 6	1,100	-	-
CUWCD Connection #1	3,000	-	-
CUWCD Connection #2	3,000	-	-
TOTAL	**11,870**	**2,565**	**9,305**

The City operates pump stations to move water from a lower zone to a higher zone. These pump stations provide the water source to the upper zones and therefore must meet the pump station source capacity level of service of 375 gpd/ERC for indoor use and 375 gpd/ERC for redundancy. Table 2-4 is a summary of the pump station information for drinking water demands in units of ERC's. Table 2-5 is a summary of the pump station information for drinking water demands in gallons per minute (GPM).

TABLE 2-4
EXISTING PUMP STATION SUMMARY BY ERC

Zone	Name	Capacity (ERC)	Existing Demand (ERC)	Remaining Capacity (ERC)
2 South	PS 1 (Grandview)	4,808	3,492	1,315
2 North	PS 2 (Harvest Hills)	1,923	2,269	3,500
	Crossroads Blvd	3,846		
3 North	PS 3 (Harvest Moon)	2,403	296	4,415
	PS 5 (Talus Ridge)	2,307		
3 South	PS 4 (Fox Hollow)	8,365	198	8,167

TABLE 2-5
EXISTING PUMP STATION SUMMARY BY GPM

Zone	Name	Capacity (gpm)	Existing Demand (gpm)	Remaining Capacity (gpm)
2 South	PS 1 (Grandview)	2,500	1,816	684
2 North	PS 2 (Harvest Hills)	1,000	1,180	1,820
	Crossroads Blvd	2,000		
3 North	PS 3 (Harvest Moon)	1,250	154	2,296
	PS 5 (Talus Ridge)	1,200		
3 South	PS 4 (Fox Hollow)	4,350	103	4,247

2.9 Storage Facilities and Remaining Capacity

Saratoga Springs currently operates eight buried concrete water storage tanks. Each pressure zone has at least one tank to provide storage. Storage requirements are determined on a per zone basis. Some fire flow is shared between zones through pressure-reducing valves (PRV's) used to transfer water from a higher zone to a lower zone during fire events or high peak demands. The total storage capacity is 14.35 million gallons (MG). All tanks are in good condition.

The storage level of service is 267 gallons of storage per ERC for equalization storage, and 100 gallons of storage per ERC for emergency storage. The fire flow storage requirements were provided by the Fire Marshall as per IFC. The amount of fire suppression storage was assigned

to each tank based on available capacity for fire storage in the tank, the amount of fire flow in the pressure zone or zones the tank can serve, and the capacity of the transmission lines from the tank to where the largest fire flows are required. The required fire storage capacity and existing capacity for each pressure zone is found in Table 2-6. The capacity of each tank was analyzed in respect to the zone it serves. It was assumed that storage in upper pressure zones could assist in providing a portion of the required fire flow demand to a lower zone. Table 2-7 is a summary of the storage facility information. Capacity calculations are shown in Table 2-7 for each tank and account for fire suppression storage volumes.

TABLE 2-6
EXISTING FIRE SUPPRESSION STORAGE BY ZONE

Zone	Fire Flow (GPM)*	Fire Duration (hours)	Fire Storage (MG)	Existing Fire Storage in Zone (MG)	Existing Fire Storage from Upper Zones (MG)
1	4,000	4	0.96	0.72	0.24
2 North	3,000	3	0.54	0.30	0.24
2 South	4,000	4	0.96	0.68	0.28
3 North	2,000	2	0.48	0.48	-
3 South	2,000	2	0.24	0.24	-
Total	**-**	**-**	**3.18**	**2.42**	**0.76**

*Fire flow requirements are based on largest required fire flow in each zone.

The following are assumptions for fire flow storage at each tank:

- Tank 1—The recommended fire flow for Zone 1 is 4,000 gpm for 4 hours, or 0.96 MG. Tank 1 supplies about 1,000 gpm, or 0.24 MG. The remainder was assigned to Tanks 5 and 3.
- Tank 5—The recommended fire flow for Zone 1 is 4,000 gpm for 4 hours, or 0.96 MG. Tank 5 supplies about 2,000 gpm, or 0.48 MG. The remainder was assigned to Tanks 1 and 3.
- Tank 3—The recommended fire flow for Zone 2 North is 3,000 gpm for 3 hours, or 0.54 MG. Tank 3 supplies 0.30 MG. The remainder was assigned to Tank 4 and Tank 8. Tank 3 may also supply fire flow to Zone 1.
- Tank 2—The recommended fire flow for Zone 2 South is 4,000 gpm for 4 hours, or 0.96 MG. Tank 2 supplies about 850 gpm, or 0.20 MG. The remainder was assigned to Tanks 6 and 7.

- Tank 6—The recommended fire flow for Zone 2 South is 4,000 gpm for 4 hours, or 0.96 MG. Tank 6 supplies about 2,000 gpm, or 0.48 MG. The remainder was assigned to Tanks 2 and 7.
- Tank 4—The recommended fire flow for Zone 3 North is 2,000 gpm for 2 hours, or 0.48 MG. Half of the requirement (1,000 gpm or 0.24 MG) was assigned to Tank 4. Tank 4 may also supply fire flow to Zone 2 North.
- Tank 7—The recommended fire flow for Zone 3 South is 2,000 gpm for 2 hours, or 0.48 MG. Half of the requirement (1,000 gpm or 0.24 MG) was assigned to Tank 7. Tank 7 may also supply fire flow to Zone 2 South.
- Tank 8—The recommended fire flow for Zone 3 North is 2,000 gpm for 2 hours, or 0.48 MG. Half of the requirement (1,000 gpm or 0.24 MG) was assigned to Tank 8. Tank 8 may also supply fire flow to Zone 2 North or Zone 1.

TABLE 2-7
EXISTING STORAGE TANK SUMMARY

Zone	Total Capacity (MG)	Fire Storage (MG)	Demand Storage (MG)	Emergency Storage (MG)	Remain. Capacity (MG)	Total Capacity (ERC)	Remain. Capacity (ERC)
1	0.75	0.24	0.37	0.14	0	1,390	0
	3.0	0.48	0.72	0.27	1.53	6,866	4,169
2 N	2.0	0.30	0.53	0.20	0.97	4,632	2,643
2 S	1.0	0.20	0.43	0.16	0.21	2,180	572
	3.0	0.48	0.35	0.13	2.04	6,866	5,559
3 N	1.2	0.24	0.05	0.02	0.89	2,616	2,425
	1.4	0.24	0.03	0.01	1.12	3,161	3,052
3 S	2.0	0.24	0.05	0.02	1.69	4,796	4,605
Total	**14.35**	**2.42**	**2.53**	**0.95**	**8.45**	**32,507**	**23,025**

2.10 Water Rights and Remaining Capacity

The City owns a total of 12,376 acre-feet of water rights that can be used between its drinking and secondary water systems. The existing drinking water right demand at the proposed level of service of 0.3 acre-feet per ERC is 2,946 acre-feet. The existing supply of water rights attributed to the drinking water system are 5,184 acre-feet. The existing remaining capacity in the drinking water system is 1,988 acre-feet. This excess capacity is water right credits owned by various developers within the City that previously deeded the water rights to the City in exchange for the credits. It is recommended that the City not collect impact fees for water rights in the drinking water system for the next ten years. Rather than paying impact fees to the City for new drinking water rights, new developments can utilize the credit they own, or if they do not have a credit,

they can purchase a water right credit held by others or work with the City to contract CUWCD water. All water right volumes are annual diversions in acre-feet.

2.11 Distribution System

Pipe diameters in the drinking water distribution system range from 8 inches to 30 inches, with the majority being 8 inches within subdivisions. The larger pipes in the system were provided as transmission lines to deliver water from sources and storage tanks and fire flow scenarios. All pipes 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 for pipes up to 24 inches. Figure 2-1 illustrates the existing distribution pipelines. The capacity of the distribution system is assumed to be accounted for in the source, storage, and fire flow capacities since the pipeline sizes include a component of each.

2.12 Capital Facilities to Meet System Deficiencies

The existing drinking water system meets the current level of service. There are no existing deficiencies.