**ORDINANCE NO. 14-7 (4-29-14)**

**ORDINANCE AND IMPACT FEE ENACTMENT ADOPTING A SECONDARY WATER IMPACT FEE FACILITIES PLAN, SECONDARY WATER IMPACT FEE ANALYSIS, AND SECONDARY WATER SERVICE AREAS, AND ENACTING SECONDARY WATER IMPACT FEES IN THE CITY OF SARATOGA SPRINGS; PROVIDING FOR THE CALCULATION AND COLLECTION OF SUCH FEES; PROVIDING FOR APPEAL, MEDIATION, ARBITRATION, ACCOUNTING, AND SEVERABILITY OF THE SAME; AND OTHER RELATED MATTERS**

**WHEREAS,** on February 15, 2011 the City mailed notice to affected entities and to the development community of its intent to update its Capital Facilities Plan for Secondary water facilities and to amend its secondary water facilities impact fees

**WHERAS,** on August 1, 2011 the City properly noticed its intent to update its Capital Facilities Plan and to create an Impact Fee Facilities Plan for Secondary water facilities and to amend its secondary water facilities impact fees;

**WHEREAS,** on July 28, 2011 Saratoga Springs, Utah mailed the same notice to all affected entities;

**WHEREAS**, the City properly noticed a January 2012 kickoff meeting to begin the process to analyze secondary water impact fees;

**WHEREAS,** the City mailed individual notice of the kickoff meeting to 36 state and local governments, private development entities, and private home owners' associations;

**WHEREAS**, City consultants, City officials, representatives of other government entities, and interested private citizens attended the kickoff meeting;

**WHEREAS**, on February 8, 2012 City staff met with interested members of the development community to address growth assumptions that would form the foundation for the Impact Fee Facilities Plan and Analysis;

**WHEREAS,** on April 3, 2012, City staff convened a follow up meeting with the development community to address proposed growth assumptions;

**WHEREAS,** on June 4, 2013 the City properly noticed a public meeting to discuss the current and proposed levels of service for Secondary water facilities, the extent of excess secondary water facilities capacity to serve new growth, and the capital facilities that would be required to serve new growth in the impact fee expenditure period;

**WHEREAS**, on June 11, 2013, the City of Saratoga Springs, Utah held a public meeting to discuss the current and proposed levels of service for Secondary water facilities, the extent of

excess Secondary water facilities capacity to serve new growth, and the capital facilities that would be required to serve new growth in the impact fee expenditure period;

**WHEREAS**, on June 12, 2013, the City emailed copies of a DRAFT Secondary Water Impact Fee Facilities Plan and Analysis to affected entities and to the development community representatives and posted the same to the Public Notice Website;

**WHEREAS,** on July 11, 2013 the City properly noticed its intention to prepare a Secondary water impact fee facilities plan;

**WHEREAS,** on August 7, 2013 the City properly noticed its intention to prepare a Secondary water impact fee analysis;

**WHEREAS,** on April 18, 2014 the City properly posted a copy of the executive summary of and the certified Secondary Water Impact Fee Facilities Plan and Analysis;

**WHEREAS,** on April 18, the City properly noticed its intent to adopt the certified Secondary Water Impact Fee Facilities Plan and Analysis as well as its intent to hold a public hearing and possibly adopt this Ordinance;

**WHEREAS,** Saratoga Springs is a fourth class city of the State of Utah, authorized and organized under the provisions of Utah law and is authorized pursuant to the Impact Fee Act, Utah Code § 11-36a-101 *et seq.* to adopt Secondary water facilities impact fees; and

**WHEREAS,** the City has caused a Secondary Water Impact Fee Facilities Plan and Impact Fee Analysis to be prepared by Hansen, Allen and Luce to assess the level of Secondary water facility service that is currently provided to existing residents, the excess capacity in the existing Secondary water facilities infrastructure that is available to accommodate new growth without diminishing the current level of service and the elements and cost of additional Secondary water facilities that will be required to maintain the current level of service as projected growth occurs in the impact fee expenditure period and to recommend a valid Secondary water facilities impact fee based on the Impact Fee Facilities Plan; a copy of the Impact Fee Facilities Plan prepared by Hansen, Allen and Luce Secondary Water is attached hereto as exhibit "A"; and

**WHEREAS,** Hansen, Allen and Luce certified its work as compliant with Utah Code § 11-36a-306 on April 2, 2014; and

**WHEREAS,** on April 18, 2014, a full copy of the Secondary Water Impact Fee Facilities Plan, Secondary Water Impact Fee Analysis and impact fee enactment or ordinance, along with an executive summary of the Secondary Water Impact Fee Facilities Plan and Secondary Water Impact Fee Analysis that was designed to be understood by a lay person, were made available to the public at the Saratoga Springs public library, posted on the City's website, and the Public Notice Website; and

**WHEREAS,** on April 16, 2014, the Provo Daily Herald published notice of the date, time, and place of the first public hearing to consider the Impact Fee Facilities Plan, Impact Fee Analysis, and this Impact Fee Enactment or Ordinance; and

**WHEREAS,** on April 29, 2014, the City Council held a public hearing regarding the proposed and certified Secondary Water Impact Fee Facilities Plan, Secondary Water Impact Fee Analysis, and this Secondary Water Impact Fee Ordinance; and

**WHEREAS,** after careful consideration and review of the comments at the public hearing and the comments of the Participants, the Council has determined that it is in the best interest of the health, safety, and welfare of the inhabitants of Saratoga Springs to:

1. adopt the Impact Fee Facilities Plan for Secondary water Facilities as proposed;
2. adopt the Secondary Water Impact Fee Analysis as proposed;; and
3. enact this Ordinance to:
    a. amend its current Secondary Water impact fees;
    b. provide for the calculation and collection of such fees;
    c. authorize a means to consider and accept an independent fee calculation for atypical development requests;
    d. provide for an appeal process consistent with the Impact Fees Act;
    e. update its accounting and reporting method;
    f. all in a manner that is consistent with the Impact Fees Act.

**NOW, THEREFORE, BE IT ORDAINED** by the Saratoga Springs City Council as follows:

## SECTION I – IMPACT FEE FACILITIES PLAN AND ANALYSIS: SECONDARY WATER

The Secondary Water Impact Fee Facilities Plan and Analysis attached hereto as Exhibit A is hereby adopted.

## SECTION II – ENACTMENT

The following amendments, which are shown as underlines and strikethroughs, to Chapter 7.03 of the City Code are hereby made:

**Chapter 7.03. Secondary Water Impact Fee.**

**7.03.01. Definitions.**
**7.03.02. Findings and Purpose.**
**7.03.03.** ~~Adoption of Capital Facilities Plan~~Establishment of Secondary Water Service Area**.**
**7.03.04. Adoption and Imposition of** Secondary Water **Impact Fee.**
~~**7.03.05. Service Area Established.**~~
~~**7.03.06. Other Impact Fees Remain Unaffected.**~~

~~7.03.07. Time of Collection.~~
7.03.~~08~~05. Use of Secondary Water Impact Fees.
7.03.~~09~~06. Adjustments
7.03.~~10~~07. Accounting, Expenditure, and Refunds.
7.03.~~11~~08. Impact Fee Challenges and Appeals.
7.03.~~12~~09. Severability.

**7.03.01. Definitions.**

As used in this Chapter the following terms shall have the meanings herein set out:

1. **"City"** means the City of Saratoga Springs and its incorporated boundaries.

2. **"Development Activity"** or **"new development"** means any construction or expansion of a building, structure, or use, any change in use of a building or structure, or any changes in the use of land that creates additional demand and need for Public Facilities.

3. **"Equivalent Residential** Connection~~Unit~~**" or "ERC"** means that measure of impact on ~~certain~~ public facilities equal to the impacts of one typical single -family detached dwelling unit. For Secondary Water, an ERC equals .16 irrigated acres.

4. **"Secondary Water Impact Fees"** means the Secondary Water Impact Fees adopted and imposed by this Chapter on Development Activity within the City.

5. **"Secondary Water Public Facilities"** means the following capital facilities that have a life expectancy of ten or more years and are owned or operated by or on behalf of the City as well as water rights for Secondary water owned by or on behalf of the City.

~~5.~~6.**Utah Impact Fees Act"** means Utah Code ~~Chapter~~ 11-36a
~~6. **"Impact Fees"** means the Impact Fees adopted and imposed by this Chapter on Development Activity within the City and as allowed by Utah Code Chapter 11-36a.~~
~~7. **"New Capital Facilities Plan"** means the capital facilities plan prepared by City Staff and Gilson Engineering for secondary water facilities and adopted by the City council in this Chapter.~~
~~8. **"Public Facilities"** covered by this Chapter means the following capital facilities that have a life expectancy of ten or more years and are owned or operated by or on behalf of the City: secondary water facilities.~~
~~9.~~7.~~**"Service Area"** means the service area formally adopted by the City Council in this Chapter.~~

(Ord. 14-7; Ord. 11-9; Ord. 05-22)

**7.03.02. Findings and Purpose.**

The City Council hereby finds and determines:

1. There is a need to establish a secondary water facilities impact fee for a single service area to maintain the level of service for secondary water proposed in the Secondary Water Impact Fee Facilities Plan and Analysis.

2. The 2014 Secondary Water Facilities Impact Fee Plan and Analysis identify the:

   a. projected development activity in the City through 2020,
   b. level of service for secondary water facilities that serve existing residents;
   c. excess secondary water facilities capacity that is available to serve new growth in the existing infrastructure;
   d. proposed level of service for the City, which does not raise the existing level of service for current residents;
   e. additional capital facilities that are required to maintain the proposed secondary water level of service without burdening existing residents with costs of new development activity; and
   f. maximum fee justified by the study.

~~1. As the result of the City being a relatively new and rapidly growing city, there are very limited existing public facilities and new development will create the need for the Public Facilities as set out in the New Capital Facilities Plan~~

~~2. There is a need for Public Facilities for new development which have not been constructed and are required to be consistent with the City's General Plan and to protect the public's health, safety, and welfare~~

~~3. The rapid and continuing growth of the City necessitates the imposition and collection of the Impact Fees that require new development to pay its fair share of the costs of providing the Public Facilities occasioned by the demands and needs of the Development Activity at service levels necessary to promote and preserve the public health, safety, and welfare.~~

~~4. The New Capital Facilities Plan establishes the estimated costs for providing the Public Facilities covered by this Chapter, identifies the impact on the needs for those Public Facilities by Development Activity, demonstrates how the impacts on the need for the applicable Public Facilities are reasonably related to the Development Activity, estimates the proportionate share of the costs of the needed Public Facilities related to new development, and identifies how the Impact Fees set out in the New Capital Facilities Plan and adopted by this Chapter were determined.~~

~~5. The Impact Fees established by this Chapter are reasonably related to the costs of providing such Public Facilities necessitated by anticipated future growth within the City and are consistent with requirements of the Utah Impact Fees Act.~~

(Ord. 14-7; Ord. 11-9; Ord. 05-22)

**7.03.03. Establishment of Secondary Water Service Area~~Adoption of Capital Facilities Plan~~.**

~~The City Council hereby approves and adopts the new Capital Facilities Plan and the analysis reflected therein and the methodology used for calculation of the Impact Fees imposed by this Chapter for the Public Facilities covered by this Chapter.~~

The City Council hereby approves and establishes the City Wide Secondary Water Service Area for which the Secondary Water Impact Fee herein provided will be imposed.

(Ord. 14-7; Ord. 11-9; Ord. 05-22)

**7.03.04. Adoption and Imposition of Secondary Water Impact Fees.**

~~The City Council hereby approves and imposes and levies on all Development Activity the Impact Fee for secondary water as follows: $1,800 per ERU.~~

1. A Secondary Water Impact Fee for all new development activity shall be calculated as the sum of three components, as follows:

| Type | Per ERC |
|---|---|
| Source | $2017 |
| Storage | $1478 |
| Water Rights | $2263 |
| Planning | $24 |
| Total | $5782 |

2. The City shall accept payment for the Water Rights component of the secondary water impact fee as follows:
   a. $2263 per ERC;
   b. surrender of an equivalent pre-paid water right credit; or
   c. dedication of an equivalent City-approved leased or deeded water right

(Ord. 14-7; Ord. 11-9; Ord. 05-22)

~~**7.03.05. Service Area Established.**~~

~~The entire area of the City and any area outside of the City covered by the new Capital Facilities Plan which may hereafter be annexed into the City or serviced by any Public Facility are hereby designated as one service area with respect to secondary water facilities.~~

~~(Ord. 11-9; Ord. 05-22)~~

~~**7.03.06. Other Impact Fees Remain Unaffected.**~~

~~The previously adopted impact fees established for storm drainage and wastewater collection shall remain unaffected by this Chapter and shall remain subject to the impact fee ordinances by which they were adopted.~~

~~(Ord. 11-9; Ord. 05-22)~~

~~**7.03.07. Time of Collection.**~~

~~The Impact Fees imposed by this Chapter shall be paid prior to and as a condition of the issuance of a building permit for any Development Activity.~~

~~(Ord. 11-9; Ord. 05-22)~~

**7.03.~~08~~05. Use of Secondary Water Impact Fees.**

~~The Impact Fees collected by the City shall be used solely to:~~

~~1. pay for the Public Facilities provided for by this Chapter and the new Capital Facilities Plan by the City;~~

~~2. reimburse the City for a Development Activity's share of Public Facilities already constructed by the City; and~~

~~3.~~1. ~~reimburse developers who have constructed Public Facilities where those Public Facilities are beyond that needed to meet the demands of the developers Development Activities.~~

The Secondary Water Impact Fees collected by the City shall be used as provided in the Secondary Water Impact Fee Facilities Plan and Analysis.

(Ord. 14-7; Ord. 11-9; Ord. 05-22)

**7.03.~~09~~06. Adjustments.**

~~The City may adjust the Impact Fees imposed by this Chapter as necessary in order to:~~

~~1. respond to unusual circumstances in specific cases;~~

~~2. ensure that the Impact Fees are imposed fairly;~~

~~3. adjust the amount of the Impact Fees to be imposed on a particular development based upon studies and data submitted by the developer that are approved by the City Council; and~~

~~4. allow credits as approved by the City Council for dedication of land for, improvements to, or construction of Public Facilities providing services to the City at large, provided such facilities are identified in the New Capital Facilities Plan and are required by the City as a condition of approving the development or Development Activity.~~

1. The City shall adjust the calculation of all, or any component, of the Secondary Water impact fees imposed by this Chapter as necessary to:
   a. respond to unusual circumstances in specific cases;
   b. ensure that the impact fees are imposed fairly; and
   c. adjust the amount of the Impact Fees to be imposed on a particular development based upon studies and data submitted by the developer that are approved by the City Council.

2. The City Council shall allow a proportionate credit against, or proportionate reimbursement from, impact fees for the:
   a. dedication of land for a System Improvement; and

b. full or partial construction of a:

i. System Improvement identified in the Secondary Water Impact Fee Facilities Plan; or

ii. publicly accepted and dedicated capital improvement that will offset the need for a System Improvement.

(Ord. 14-7; Ord. 11-9; Ord. 05-22)

**7.03.~~10~~07. Accounting, Expenditures, and Refunds.**

The City shall account for, expend, and refund Secondary Water Impact Fees ~~collected pursuant to~~in accordance with this Chapter ~~in accordance with~~and the Utah Impact Fees Act.

(Ord. 14-7; Ord. 11-9; Ord. 05-22)

**7.03.~~11~~08. Impact Fee Challenges and Appeals.**

~~1. Any person or entity residing in or owning property within a service area and any organization, association, or corporation representing the interests of persons or entities owning property within a service area, may file a declaratory judgment action challenging the validity of the Impact Fees after filing an appeal with the City Council as provided in Subsection (4) of this Section.~~

~~2. Any person or entity required to pay an Impact Fee who believes the fee does not meet the requirements of law may file a written request for information with the City.~~

~~3. Within two weeks of the receipt of the request for information, the City shall provide the person or entity with the written analysis required by the Utah Impact Fee Act and with any other relevant information relating to the Impact Fees. The City may charge for all copies provided for in response to such a request in an amount set out in the City's Consolidated Fee Schedule.~~

~~4. Within thirty days after paying an Impact Fee, any person or entity who has paid the fee and wishes to challenge the fee shall file a written appeal with the City Council by delivering a copy of such appeal with the City Manager setting forth in detail all grounds for the appeal and all facts relied upon by the appealing party with respect to the fee being appealed.~~

~~a. Upon receipt of an appeal, the City Council shall thereafter schedule a hearing on the appeal at which time all interested persons will be given an opportunity to be heard. The City Council shall schedule the appeal hearing and thereafter render its decision on the appeal no later than thirty days after the challenge to the impact fee is filed.~~

~~b. Any person or entity who has failed to comply with the administrative appeal remedies established by this Section may not file or join an action challenging the validity of any Impact Fee.~~

~~c. Within ninety days of a decision upholding an Impact Fee by the City Council or within 120 days after the date the challenge to the impact fee was filed, whichever is earlier, any party to the appeal who is adversely affected by the City Council's decision may petition the Fourth Judicial District Court for Utah County for~~

~~review of the decision. In the event of a petition to the Fourth Judicial District Court, the City shall transmit to the reviewing court the record of its proceedings including its minutes, findings, orders and, if available, a true and correct transcript of its proceedings.~~

~~i. If the proceeding was tape recorded, a transcript of that tape recording is a true and correct transcript for purposes of this Subsection.~~

~~ii. If there is a record:~~

~~1. the court's review is limited to the record provided by the City; and~~

~~2. the court may not accept or consider any evidence outside the City's record unless that evidence was offered to the City Council and the court determines that it was improperly excluded by the City Council.~~

~~iii. If there is an inadequate record, the court may call witnesses and take evidence.~~

~~iv. The court shall affirm the decision of the City Council if the decision is supported by substantial evidence in the record.~~

~~v.~~i. ~~The court may award reasonable attorneys' fees and costs to the prevailing party in any action brought under this Section.~~

1. Any person required to pay an Impact Fee who believes the fee does not meet the requirements of the Impact Fees Act or this Chapter may file a written request for information with the City.

2. The City shall provide the person with a copy of the Impact Fee Facilities Plan and Analysis for Secondary water, the specific calculation staff used to calculated the Secondary water Impact Fee for the person, if applicable, and any other relevant information relating to the Impact Fees. The City may charge for all copies provided for in response to such a request in an amount set out in the City's Consolidated Fee Schedule.

3. At any time prior to thirty days after paying an Impact Fee, the person required to pay an Impact Fee and wishes to challenge the fee may request a third party advisory opinion in accordance with UCA §13-43-205.

4. Within thirty days after paying an Impact Fee, any person who has paid the fee and wishes to challenge the fee shall file:
   a. a written appeal with the City Hearing Examiner;
   b. a request for arbitration; or
   c. an action in district court.

5. The written appeal shall be delivered to the City Manager and shall set forth in detail all grounds for the appeal and all facts relied upon by the appealing party with respect to the fee being appealed.
   a. Upon receipt of an appeal, the City Hearing Examiner shall schedule a hearing and shall consider all evidence presented by the appellant, as well as all evidence presented by staff. The City Hearing Examiner shall schedule the appeal hearing

and thereafter render its written findings of fact, conclusions of law and decision no later than thirty days after the challenge to the impact fee is filed.

b. Within ninety days of a decision upholding an Impact Fee by the City Hearing Examiner or within 120 days after the date the challenge to the impact fee was filed, whichever is earlier, the person who filed the appeal may petition the Fourth Judicial District Court for Utah County for review of the Hearing Examiner's decision. In the event of a petition to the Fourth Judicial District Court, the City shall transmit to the reviewing court the record of its proceedings including its minutes, findings, orders and, if available, a true and correct transcript of its proceedings.

i. If the proceeding was tape recorded, a transcript of that tape recording is a true and correct transcript for purposes of this Subsection.

ii. If there is an adequate record, the:

A. court's review is limited to the record provided by the City; and

B. court may not accept or consider any evidence outside the City's record unless that evidence was offered to the City Hearing Examiner and the court determines that it was improperly excluded by the City Hearing Examiner.

iii. If there is an inadequate record, the court may call witnesses and take evidence.

iv. The court shall affirm the decision of the City Council if the decision is supported by substantial evidence.

6. If the request is for arbitration, both the City and the person requesting arbitration shall comply with UCA § 11-36a-705.

~~2.~~7. Within thirty days after paying an Impact Fee, the state, a school district or a charter school may alternatively submit a written request for mediation to the City Manager.

a. Both the City and the specified public agency shall comply with UCA §11-36a-704.

(Ord. 14-7; Ord. 11-9; Ord. 05-22)

**7.03.~~12~~09. Severability.**

If any section, subsection, sentence, clause, or portion of this Chapter is, for any reason, held invalid or unconstitutional by a court of competent jurisdiction, the remainder of this Chapter shall not be affected thereby and shall remain in effect and be enforced to the extent permitted by law.

(Ord. 11-9; Ord. 05-22)

## SECTION III – AMENDMENT OF CONFLICTING ORDINANCES

If any ordinance, resolution, policy or map of the City heretofore adopted is inconsistent herewith it is hereby amended to comply with the provisions hereof. If it cannot be amended to comply with the provisions hereof, the inconsistent provision is hereby repealed.

## SECTION IV – EFFECTIVE DATE

This ordinance shall take effect upon publication and 90 days after its passage by a majority vote of the Saratoga Springs City Council.

## SECTION V – SEVERABILITY

If any section, subsection, sentence, clause, phrase, or portion of this ordinance is, for any reason, held invalid or unconstitutional by any court of competent jurisdiction, such provision shall be deemed a separate, distinct, and independent provision, and such holding shall not affect the validity of the remaining portions of this ordinance.

## SECTION VI – PUBLIC NOTICE

The Saratoga Springs City Recorder is hereby ordered, in accordance with the requirements of Utah Code §§ 10-3-710—711, to:

a. deposit a copy of this ordinance in the office of the City Recorder; and
b. publish notice as follows:
   i. publish a short summary of this ordinance for at least one publication in a newspaper of general circulation in the City; or
   ii. post a complete copy of this ordinance in three public places within the City.

**ADOPTED AND PASSED** by the City Council of the City of Saratoga Springs, Utah, this 29 day of April, 2014.

Signed: _____
Jim Miller, Mayor

Attest: _____
Lori Yates, City Recorder

4.29.14
Date

**VOTE**

| | |
|---|---|
| Shellie Baertsch | X |
| Rebecca Call | X |
| Michael McOmber | X |
| Bud Poduska | X |
| Stephen Willden | X |

City of SARATOGA SPRINGS CORPORATE SEAL 1892 STATE OF UTAH

CITY OF

SARATOGA SPRINGS

# SECONDARY WATER CAPITAL FACILITY PLAN, IMPACT FEE FACILITIES PLAN AND ANALYSIS

(HAL Project No.: 360.02.100)

APRIL 2014

HANSEN ALLEN & LUCE inc
ENGINEERS

# CITY OF SARATOGA SPRINGS

# SECONDARY WATER CAPITAL FACILITY PLAN,

# IMPACT FEE FACILITY PLAN AND ANALYSIS

**(HAL Project No.:360.02.100)**

**Steven C. Jones, P.E.**

**Project Engineer**

**APRIL 2014**

# IMPACT FEE CERTIFICATION

**IFFP Certification**
Hansen, Allen & Luce, Inc. certifies that the Impact Fee Facilities Plan (IFFP) prepared for the secondary 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.

**IFA Certification**
Hansen, Allen & Luce, Inc. certifies that the Impact Fee Analysis (IFA) prepared for the secondary 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;
    d. offsets costs with grants or other alternate sources of payment; and
3. complies in each and every relevant respect with the Impact Fees Act.

**Hansen, Allan & Luce, Inc. makes this certification with the following caveats**:

1. All of the recommendations for implementation of the IFFP made in the IFFP documents or in the IFA documents are followed by City Staff and elected officials.
2. If all or a portion of the IFFP or IFA are modified or amended, this certification is no longer valid.
3. All information provided to Hansen, Allen & Luce, Inc. is assumed to be correct, complete, and accurate. This includes information provided by the City as well as outside sources.

HANSEN, ALLEN & LUCE, INC.

**CITY OF SARATOGA SPRINGS**
**SECONDARY WATER CAPITAL FACILITY PLAN**

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# SECTION 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 open space 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. A Secondary Water Capital Facilities Plan (CFP) and Impact Fee Facilities Plan (IFFP) were requested by the City in order to prepare an Impact Fee Analysis (IFA). Hansen Allen and Luce, Inc. (HAL) was retained by the City to prepare this Secondary Water CFP and IFFP. This report was prepared in conjunction with Zions Bank Public Finance (Zions). Growth projections for Saratoga Springs were made by evaluating the history of building permit issuance over the last decade. The City experienced rapid growth at the beginning of 2000 followed by a cooling period from 2007 to 2010 with growth rebounding rapidly in the last few years. The City has conservatively projected growth for the near future with stronger growth occurring in about 6 years due to the planned development of the LDS Church property.

## 1.2 Purpose

The purpose of the IFFP component of this report 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 the new demands. The IFFP portion of this report projects the need for new growth-related facilities for the 10-year planning range contemplated by the Impact Fees Act. The CFP portion of this report is more comprehensive. It provides the basis for the Impact Fee Facilities Plan (IFPP) as well as identifies all Capital Facilities required of the Secondary Water System for the 20-year planning range including maintenance, repair, replacement, as well as growth related additions.

This report identifies those items that the Utah Code specifically requires for an IFFP along with facilities required by existing deficiencies in the system. The IFFP is required to identify the following:

1. Demands placed upon existing facilities by new development activity; and
2. 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) Project growth in water demands attributable to new development within the existing system;
8) 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;
9) Establish construction phasing of proposed capital facilities;
10) Prepare detailed cost estimates for each proposed project;
11) Determine if proposed projects will provide capacity for growth beyond the IFFP planning period
12) Separate and identify infrastructure costs to maintain the proposed level of service for existing residents versus infrastructure costs to provide an 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 City's current Secondary Water Master Plan provided the framework for the CFP by identifying the existing secondary water facilities and proposed water improvements that would accommodate current and future demands. Assumptions made within this report are in order with current City policies and standard engineering practices.

An updated existing hydraulic model of the Secondary Water System was prepared by HAL to aid in the analyses performed to complete the Secondary Water System Capital Facilities 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 as growth occurs.

# SECTION 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.

Saratoga Springs' existing Secondary Water System is comprised of a pipe network, water storage ponds, and water supply sources. The system is Master Planned to be an independent system, but is currently supplemented by excess capacity in the Culinary Water System. Separate culinary water and secondary water pipelines exist in all developments. Some developments, however, rely on the Culinary Water System to provide storage and source water to the secondary water pipelines. Some secondary water pipes in the small isolated systems were not modeled in the Secondary Water System model because the Culinary Water System is supplying all demand source and storage in these areas. Secondary Water System demands on the Culinary Water System are modeled in the Culinary Water System model. As the excess capacity in the Culinary 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 culinary demands. For both the Culinary Water System CFP and the Secondary Water System CFP each system was 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 Culinary Water System capacity. Figure 2-1 illustrates the existing secondary water system. This section summarizes the City's current level of service, water demands, existing system facilities and existing system capacity available for new growth.

## 2.2 Pressure Zones

Currently, the secondary water distribution system serving Saratoga Springs has three pressure zones, though the zones are split between the north and south as they are not interconnected yet. Zone 3 areas of the City currently use culinary sources and storage. Pressure zones are identified on Figure 2-1.

## 2.3 Existing Secondary Meters

The secondary system currently has individual meters on approximately 10% of connections. These connections representing 10% of the City correlated well with the overall City demands and with data from other water systems along the Wasatch Front. The City does not bill residents according to water use. Instead bills are a flat rate for secondary water. However the existing meters are read each month. The information provided by the existing meters provided a great deal of information regarding water use. The water use information was utilized to

understand how much water is used by residents in the Secondary Water System and to compare the existing use to the level of service. Table 2-1 is a summary of residential secondary water meter data for the three complete years available for this analysis. Table 2-2 is a summary of average residential secondary water use per typical residence and per irrigated acre. The typical residential use includes irrigated area outside of the parcel including park strips and neighborhood parks. Average irrigated acres of the typical residence was obtained by reviewing existing development requirements and measuring existing irrigated area in existing developments using an aerial photo in GIS. The average irrigated acres per residence was also confirmed by randomly selecting seven residences and delineating the irrigated area using a GIS parcel layer and an aerial photo.

**Table 2-1**
**Summary of Residential Secondary Water Meter Data by Year**

| | 2008 | 2009 | 2010 |
|---|---|---|---|
| **Number of Residential Meters with Data** | 221 | 242 | 243 |
| **Average Yearly Water Use per Meter** (acre-feet) | 0.57 | 0.62 | 0.68 |
| **Average Peak Month Water Use per Meter** (acre-feet) | 0.18 | 0.20 | 0.22 |
| **Average Peak Month Water Use Per Meter** (gpd) | 1,867 | 2,133 | 2,285 |
| **Average Peak Month Water Use Per Meter** (gpm) | 1.30 | 1.48 | 1.59 |

**Table 2-2**
**Summary of Residential Secondary Water Use**

| | PER RESIDENCE | PER IRRIGATED ACRE |
|---|---|---|
| **Average Irrigated Area** (acres) | 0.24 | NA |
| **Average Yearly Water Use** (acre-feet) | 0.97 | 4.46 |
| **Average Peak Month Water Use** (acre-feet) | 0.31 | 1.42 |
| **Average Peak Month Water Use** (gpd) | 3,292 | 14,965 |
| **Average Peak Month Water Use** (gpm) | 2.29 | 10.39 |
| **Estimated Average Peak Day Water Use** (gpm) | 2.53 | 11.50 |

## 2.4 Equivalent Residential Connection

Water demands produced by non-residential water users, such as schools, commercial, industrial, or civic have been converted to an equivalent residential connection (ERC) for analysis purposes. An ERC is equal to the average water demand of one residential connection (0.75 ac-ft per year). The method of using ERC's for analysis is for allocating existing and future demands over non-residential land uses. An ERC quantifies the ratio of non-residential water demands relative to an equivalent residential level of service demand. These ratios may be utilized to establish an equitable cost of service for a non-residential water user.

An ERC is defined as 0.75 acre-feet of secondary water per year, which is consistent with the volume of water rights the City requires for new development. It is recommended that the City consider using irrigated acres instead of ERC. It is also recommended that the City change the way irrigated acres and the percentage of land irrigated is defined for residential development. Currently the City defines an ERC as having 0.25 irrigated acres based on 90% of the total area being irrigated with 2.0 acre-feet per irrigated acre. It is recommended that the City consider changing the percentage of net irrigated areas to 64% of land being developed. This is consistent with actual data and changes the acre-feet per irrigated acre to 3.13. It is recommended that the percentage of irrigated acres for multi-family and non-residential developments remain based on actual landscaped area. It is also recommended that the percentage of irrigated acres remain at 90 percent for land used for irrigated open space and parks.

The total number of existing irrigated acres as of this analysis is 1,214 acres or 3,800 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 Level of Service

The level of service as provided by the Secondary Water System has been established by the City to be the standards required to provide outdoor watering for a typical residence. Table 2-3 is a comparison of the actual existing use and the level of service for the Secondary Water System per irrigated acre. Table 2-4 is the same comparison per typical residential connection. The proposed level of service represents the historic level of service the system has been designed to serve, but is not as high as the existing level of service, measured by metered use. As seen from actual use data, city residents have been using more water than the system was designed for. Although the proposed level of service provides for less capacity than a typical resident is currently using, the proposed level of service represents the capacity needed to irrigate turf in Saratoga Springs, when one factors in the poor water quality of available secondary water in the City, and other unavoidable system losses. Secondary water sources

within Saratoga Springs are high in dissolved salts, which require residents to use more water than the state outdoor irrigation average to maintain irrigated landscaping.

Proposing a level of service at the existing level of service would promote waste and would unnecessarily increase the cost of the Secondary Water System.

Much of the waste in the current system results from unmetered connections and flat rate billing. It is recommended that the City consider retrofitting existing connections with secondary meters and bill for secondary water used. The City should modify the secondary water rate schedule to reduce waste through inadvertent use. The City should implement other conservation measures, such as staggered irrigation schedules to encourage citizens further to reduce secondary water use.

**Table 2-3**
**Level of Service Comparison (Per Irrigated Acre)**

| | Saratoga Springs 2011 Actual | Proposed Level of Service |
|---|---|---|
| **Average Yearly Demand** (Source Volume) ac-ft/yr per irrigated acre | 4.46 | **3.13** |
| **Peak Day Demand** (Source Flow) gpm/irrigated-acre | 11.50 | **7.50** |
| **Peak Instantaneous Demand** (Transmission) gpm/irrigated-acre | 23.00 | **15.00** |
| **Storage** gal/irrigated-acre | 8,011 | **9,216** |

**Table 2-4**
**Level of Service Comparison (Per Typical Single Family Connection)**

| | Saratoga Springs 2011 Actual | Proposed Level of Service |
|---|---|---|
| **Irrigated Acres** | 0.22 | **0.24** |
| **Average Yearly Demand** (Source Volume) ac-ft/yr per connection | 0.97 | **0.75** |
| **Peak Day Demand** (Source Flow) gpm/connection | 2.53 | **1.8** |
| **Peak Instantaneous Demand** (Transmission) gpm/connection | 5.06 | **3.6** |
| **Storage** gal/connection | 1,762 | **2,213** |

## 2.6 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 and pump stations), Storage (reservoirs and associated transmission lines), Transmission (main transmission lines not directly associated with source or storage), 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 in is subtracted from the capacity of the reservoirs in to calculate the remaining capacity for storage.

In addition to the level of service presented in the tables below, 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. It was determined, in general, that flows above 5 fps produced unacceptable pressure fluctuations.

HAL developed a hydraulic model for Saratoga Springs to assess its current system operation and capacity. The model calculated a capacity for each pipe line by estimating the flow capacity of each pipe at a velocity of 5 fps divided by the peak instantaneous demand of 15 gpm per irrigated acre.

## 2.7 Water Source & Remaining Capacity

Saratoga Spring's current secondary water sources are provided by groundwater wells and canal shares. The existing peak summer demands require the northern system to be supplemented by the culinary system through connections with backflow prevention. 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. An operation and maintenance memorandum for wells is included within Appendix B and includes suggestions to increase the wells sustainability. As seen in Table 2-5 there is no remaining capacity in the secondary sources. Demand is higher than supply. Culinary water is used to make up the remaining existing capacity needed.

**Table 2-5**
**Existing Secondary Water Sources**

| Name | Capacity (gpm) | Total Capacity (Irr-acre) | Remaining Capacity | Notes: |
|---|---|---|---|---|
| Well No. 1 | 800 | 106.7 | 0 | Zone 2 South Source |
| Well No. 2 | 0 | 0 | 0 | Sunrise Meadows Well |
| Well No. 3 | 500 | 66.7 | 0 | Zone 2 North Source |
| Well No. 4 | 800 | 106.7 | 0 | Zone 2 North Source |
| Well No. 5 | 3,500 | 466.7 | 0 | Zone 2 South Source |
| ULDC Canal | 1,100 | 146.7 | 0 | Zone 1 South Canal Source – Pump Station 1 & Pond 3 |
| Spring Creek Canal | 0 | 0 | 0 | |
| **Total** | 6,700 | 893.5 | 0 | |

## 2.8 Distribution System & Remaining Capacity

Pipe diameters range from 6-inches to 24-inches, with the majority being 6 inches within the individual subdivision developments. The larger pipes in the system were provided as transmission lines to deliver water from storage ponds during peak scenarios and to deliver water from sources. All pipes are in good condition as they have been constructed within the last 15 years. The City's current standard is to utilize Ductile Iron Pipe (DIP) for pipe diameters of 12-inches and larger.

## 2.9 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 44.7 acre-feet. All ponds were constructed in the last 15 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. Overall the City has 366 irrigated acres of remaining capacity.

**Table 2-6**
**Existing Storage Pond Summary**

| Service Zone | Pond ID | Capacity (Acre-feet) | Total Capacity (Irr-acre) | Remaining Capacity (Irr-acre) | Remaining Capacity (ERC) |
|---|---|---|---|---|---|
| Zone 1 South | Pond 1 (Grandview Blvd) | 2.1 | 74.2 | 0 | 0 |
| Zone 2 South | Pond 2 (The Villages) | 1.5 | 53.0 | 0 | 0 |
| Zone 1 South | Pond 3 (Church Pond) * | NA | NA | 0 | 0 |
| Zone 2 North | Pond 4 (Sunrise) * | NA | NA | 0 | 0 |
| Zone 1 North | Pond 5 (Loch Lomond) * | NA | NA | 0 | 0 |
| Zone 2 North | Pond 6 (Harvest Hills) | 3.1 | 109.6 | 0 | 0 |
| Zone 2 South | Pond 7 (Israel Canyon) | 38.0 | 1,343.2 | 366 | 2,288 |
| **Total** | | 44.7 | 1,580.0 | 366 | 2,288 |

*Storage/staging pond for pump station.

## 2.10 Pump Stations

The Fox Hollow Pump Station will provide source to the Zone 3 South Zone when a Zone 3 pond has been constructed. Until development proceeds in the new zone and a pond is constructed the pump station will not be operational. The capacity of the Fox Hollow Pump Station is 4,350 gpm (3,625 ERC).

## 2.11 Water Rights & Remaining Capacity

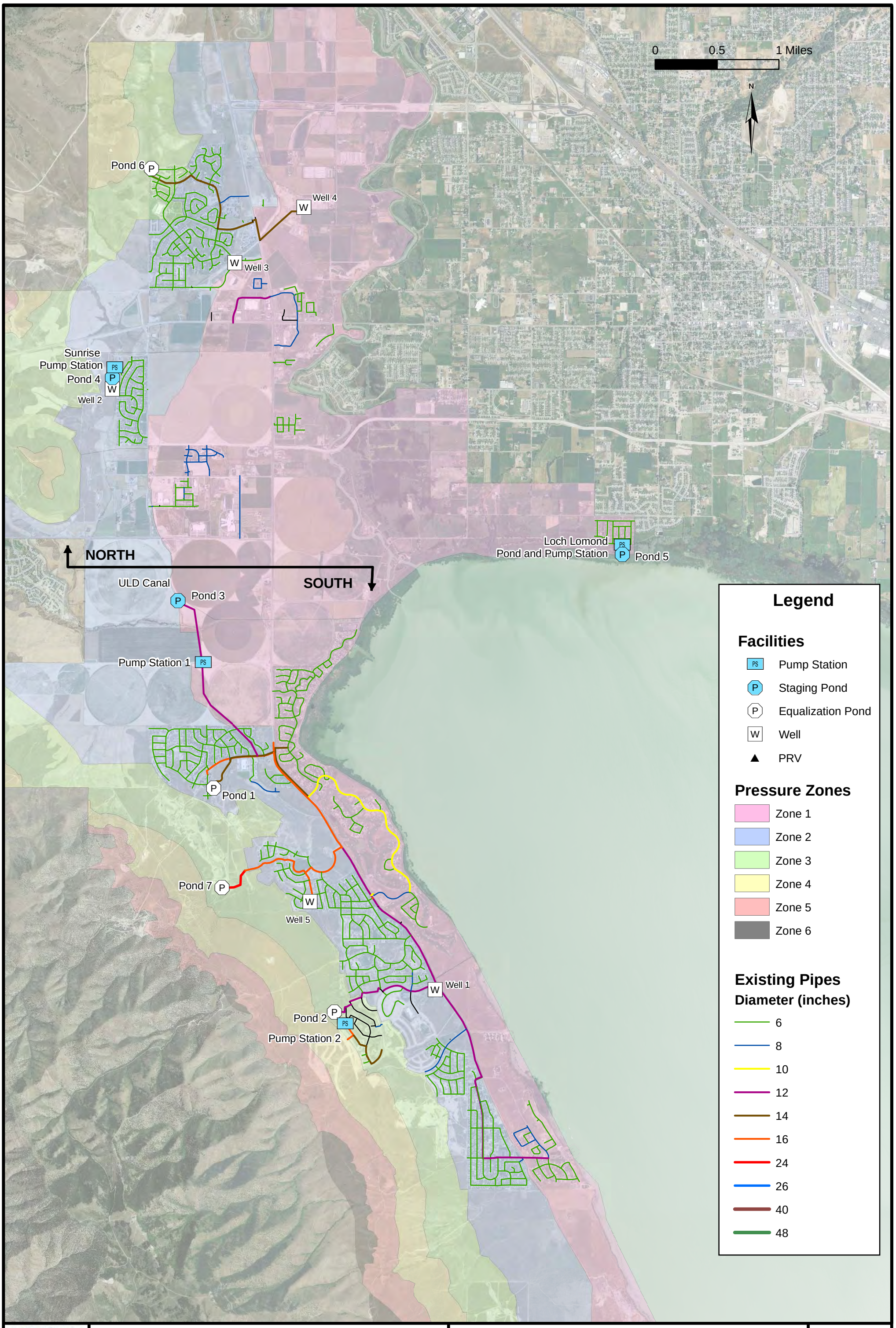
The City owns a total of 4,733 acre-feet of water rights attributed to the Secondary Water System. The existing demand at the proposed level of service of 3.13 acre-feet per irrigated acre is 4,586 acre-feet. Both the 4,733 acre-feet of water rights owned and the 4,586 acre-feet existing demand includes 786 acre-feet of water rights that were given to the City in exchange for development credit agreements for future development. Subtracting 4,586 from 4,733 leaves a remaining capacity available for future development of 147 acre-feet, which is in addition to the existing development credit.

## 2.12 Capital Facilities to Meet System Deficiencies

Combined with the culinary 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 can be supplemented by excess capacity in the Culinary Water System. Separate culinary water and secondary water pipelines exist in all developments. However, a few isolated developments currently rely on the Culinary Water System to provide storage and source water to the secondary water pipelines. As the excess capacity in the Culinary Water System is needed for future growth, Secondary Water System facilities will be constructed to increase the capacity of the Secondary Water System. A Culinary Water System CFP was prepared in conjunction with the Secondary Water System CFP. For both the Culinary Water System CFP and the Secondary Water System CFP each system was 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 Culinary Water System capacity. Additional information regarding the Culinary Water System may be found in Culinary Water System CFP.

The City has several capital projects planned to improve existing system operation and provide capacity for future growth. The City is also planning to install meters at each secondary connection to reduce over watering and conserve source capacity. For this reason the proposed level of service requirements are less than the existing level of service. The capital projects are presented in the CFP Section. Only projects that add capacity for future growth are eligible to be included in the calculation of the impact fee. Projects that are not impact fee related have costs provided in the CFP Section for City budgeting purposes only.




HANSEN ALLEN & LUCE inc ENGINEERS

**SARATOGA SPRINGS SECONDARY WATER SYSTEM**

**EXISTING SYSTEM**

**FIGURE 2-1**

# SECTION 3
# CAPITAL FACILITIES REQUIRED BY NEW DEVELOPMENT

## 3.1 General

The purpose of this section is to identify the secondary facilities that are required, to meet the demands placed on the system by future development for the IFFP 10-year planning period and the CFP 20-year planning period. Proposed facility capacities were sized to adequately meet the 20-year growth projections and were compared to current master planned facilities. A detailed design analysis will be required before construction of the facilities to ensure that the location and sizing is appropriate for the actual growth that has taken place since this CFP was developed. Specific projects with costs are presented in Section 4.

## 3.2 Growth Projections

Growth projections for Saratoga Springs were made by evaluating the history of building permit issuance over the last decade as summarized in Table 3-1.

**Table 3-1**
**Residential Building Permit History**

| Year | Annual Residential Permits | Annual Growth |
|---|---|---|
| 2000 | 169 | 63.1% |
| 2001 | 483 | 110.5% |
| 2002 | 369 | 40.1% |
| 2003 | 437 | 33.9% |
| 2004 | 383 | 22.2% |
| 2005 | 656 | 31.1% |
| 2006 | 658 | 23.8% |
| 2007 | 489 | 14.3% |
| 2008 | 193 | 4.9% |
| 2009 | 186 | 4.5% |
| 2010 | 232 | 5.4% |
| 2011 | 464 | 10.3% |

The City experienced rapid growth at the beginning of 2000 followed by a cooling period from 2007 to 2010 with growth rebounding rapidly in the last few years. The City has conservatively projected growth for the near future with stronger growth occurring in about 6 years due to the

projected development of the LDS Church property within City boundaries. Total growth projections for the City are summarized in Table 3-2.

**Table 3-2**
**Growth Projections**

| Year | Total Projected ERCs | Total Projected Irrigated Acres | Annual Growth |
|---|---|---|---|
| 2012 | 5,059 | 1,214 | - |
| 2013 | 5,430 | 1,303 | 7.3% |
| 2014 | 5,812 | 1,395 | 7.0% |
| 2015 | 6,194 | 1,486 | 6.6% |
| 2016 | 6,576 | 1,578 | 6.2% |
| 2017 | 7,377 | 1,770 | 12.2% |
| 2018 | 7,986 | 1,916 | 8.3% |
| 2019 | 8,671 | 2,081 | 8.6% |
| 2020 | 9,541 | 2,290 | 10.0% |
| 2021 | 10,207 | 2,449 | 7.0% |
| 2022 | 10,877 | 2,610 | 6.6% |
| 2023 | 11,616 | 2,787 | 6.8% |
| 2024 | 12,401 | 2,976 | 6.8% |
| 2025 | 13,235 | 3,176 | 6.7% |
| 2026 | 14,124 | 3,389 | 6.7% |
| 2027 | 15,066 | 3,615 | 6.7% |
| 2028 | 16,068 | 3,856 | 6.7% |
| 2029 | 17,141 | 4,113 | 6.7% |
| 2030 | 18,270 | 4,384 | 6.6% |
| 2031 | 18,826 | 4,518 | 3.0% |

## 3.3 Methodology

Future water demands were based on the growth projections converted into irrigated acreage projections. The demands were added incrementally by year to the facility analysis. A 20-year solution was identified for the year a facility reaches capacity. A hydraulic model was developed for the purpose of assessing the system operation and capacity with future demands added to the system. The model was used to identify problem areas in the system and to identify the most efficient way to make improvements to transmission pipelines, sources, pumps, and storage facilities.

Currently the Culinary Water System supplements the Secondary Water System, as needed, during peak demands in portions of the City. Future culinary water demands require the secondary water system demand to be removed from a Culinary Water System facility, triggering a project required for the Secondary Water System but not the Culinary Water System.

The future system was evaluated in the same manner as the existing system, by modeling (1) Peak Instantaneous Demands and (2) Peak Day Demands.

## 3.4 Future Water Source

The future system will continue to utilize groundwater sources and canal sources for secondary water. The Central Water Project (CWP) provided by Central Utah Water Conservancy District (CUWCD) should allow the City access to the CWP in 2014. If the City elects to use this water, it would be possible to postpone the cost of drilling new wells. As an option for future sources, the City's Well 7 and Well 8 could be used in the culinary system once the CWP water is available. The City also may utilize shallow wells and canal shares to provide source water for the secondary system.

Future growth projections require the City to provide additional secondary water sources. The CFP analysis utilized the proposed level of service requiring that the system's water sources are capable of meeting a peak day demand of 7.5 gpm per irrigated acre.

The following are source projects selected to meet the source requirements for future growth:

- Zone 2 North Source – Re-equip the existing Sunrise Well to boost directly into Zone 2 North and provide a secondary source to the Sunrise Development and additional source to Zone 2 North, alleviating dependence on the culinary source.

- Zone 2 South Source – Utilize Welby Canal for additional source in Zone 2 South. The project also includes the booster pump, a turnout pond and filter station.

- Zone 1 North Source – Utilize the Welby Canal for additional source in Zone 1 North. The project includes a booster pump, turnout pond, and filter station.

### 3.5 Future Secondary Water Storage

Based upon the City level of service, the water system must supply a minimum of 9,216 gallons per irrigated acre or 1,475 gallons per ERC. The future 20-year ERCs projection requires a number of storage facilities to supply storage to future pressure zones. The following storage facilities are anticipated to meet future demands:

- Zone 2 North Storage – Expand existing Pond #6 by 6.5 acre-feet.
- Zone 1 North Storage – Zone 1 North Pond with a capacity of 13 acre-feet.
- Zone 3 North Storage – Zone 3 North Pond with a capacity of 11 acre-feet.
- Zone 3 South Storage – Zone 3 South Pond with a capacity of 12 acre-feet.
- Zone 2 South Storage – Zone 2 South Pond with a capacity of 10 acre-feet.
- Zone 2 North Storage – Zone 1 North Pond (Saratoga Heights) with a capacity of 12 acre-feet.
- Zone 4/5 South Storage – Zone 4/5 South Pond with a capacity of 16 acre-feet.

### 3.6 Future Zone Pumping

Future zone pumping requirements were evaluated to model the peak day future demands. All zones are or are planned to be directly connected to ponds that supply flows above the peak day demand. All zone pumping meets the 7.5 gpm per irrigated acre (1.2 gpm/ERC) level of service standard. The growth model required new pump stations to provide water to existing and future zones. Zone pumping in the lower pump stations must have capacity to provide source to the zone above. These pump stations do not include the pump stations required to lift from canal sources as these were determined to be part of a source project. The required pump stations are shown below:

- Zone 3 North Pump Station – Pump Station for the new Zone 3 North (2100 gpm @ 200 HP).
- Zone 4/5 South Pump Station – Pump Station for the new Zones 4 and 5 South (1000 gpm @ 200 HP).

### 3.7 Future Transmission Piping

Future transmission lines would need to be constructed to allow for future growth in the undeveloped areas of the City and to connect existing isolated systems together. The model was used to determine the most efficient way to keep waterline velocities and pressures within the criteria limits with added future demands. The level of service selected for pipelines was a peak instantaneous demand of 15.0 gpm per irrigated acre or 2.4 gpm per ERC. Pipelines are considered at capacity when velocities reach 5 fps at peak instantaneous demand using the extended period hydraulic model representing the system as a whole under typical peak

demand conditions. The majority of the waterline projects are required to connect sources to storage tanks and to connect the existing and future areas of the system. These transmission lines are described below:

- Zone 2 North Transmission Line – 12-inch line connecting the Sunrise secondary system to the Harvest Hills Zone 2 system to supply more secondary source.

- Zone 2 South Transmission Line – 14-inch line for Zone 2 Source Project that will connect Welby Source to existing system.

- Zone 1 North Transmission Line – 24-inch line from new Zone 1 Storage to the zone boundary and then a 14-inch line to Redwood Road.

- Zone 3 North Transmission Line – 16-inch line connecting the proposed pump station to the proposed storage pond.

- Zone 3 South Transmission Line – 16-inch line connecting the proposed pump station to the proposed storage pond.

- Zone 2 North Transmission Line – 16-inch line connecting the proposed Saratoga Heights Pond to the existing system.

- Zone 4/5 North Transmission Line – 16-inch line interconnecting the proposed tank and pump station to the existing water lines.

- Zone 1 Transmission Line – 16-inch line interconnecting the existing culinary wells to the secondary system directly for use when the CWP project provides excess culinary source.

### 3.8 Future Water Rights

Water rights need to be acquired for future growth in the undeveloped areas of the City. The City owns a total of 4,733 acre-feet of water rights attributed to the Secondary Water System. This includes water rights that were given to the City in exchange for development credit agreements. The existing demand at the proposed level of service of 3.13 acre-feet per irrigated acre is 4,586 acre-feet, which includes 786 acre-feet of developer credit. Developer credit is water rights given to the City before the development is actually built. Subtracting 4,586 from 4,733 leaves a remaining capacity available for future development of 147 acre-feet. With an assumed additional demand of 3,584 acre-feet by 2022, the City will need to acquire 3,437 acre-feet by then. By the year 2031 the City will need to have acquired an additional 5,970 acre-feet of secondary water rights or about 600 acre-feet per year.

- 3,437 acre-feet of water rights by the year 2022.

- 5,970 acre-feet of water rights or contract through CUWCD by the year 2031.

# SECTION 4
# CAPITAL FACILITY PLAN, PHASING & COST ESTIMATES

## 4.1 General

The purpose of this section is to provide a detailed list of the proposed Capital Facilities to meet both existing deficiencies and also future growth in the Secondary Water System. Table 4-1 provides a complete list of the CFPs. Also included in the list is the anticipated year of construction based upon current City budgeting and need for the project. The actual phasing of projects will be dependent on actual growth and the location of the growth. The years shown are only a guide for the City and may be revised at any time as the need arises. Figure 4-1 details the locations of each project.

## 4.2 Cost Estimating

Cost estimates were prepared for each project and are shown in Table 4-1. Table 4-2 provides a summary of the costs associated with existing deficiencies versus projects required to meet future growth demands.

Unit costs for the construction cost estimates are based on master planning level engineering. Sources used to estimate construction costs include:

- “Means Heavy Construction Cost Data, 2013"
- Price quotes from equipment suppliers
- Recent construction bids for similar work along the Wasatch Front

Costs include construction, land acquisition, planning and engineering. All costs are presented in 2013 dollars. Recent price and economic trends indicate that future costs are difficult to predict with certainty. Engineering cost estimates given in this study should be regarded as conceptual level as appropriate for use as a planning guide. Only during final design can a definitive and more accurate estimate be provided. A cost estimate calculation for each project is provided in Appendix A.

**TABLE 4-1**
**CAPITAL IMPROVEMENT PROJECTS**

| TYPE & YEAR | MAP ID | RECOMMENDED PROJECT | Existing Deficiency Cost | New Growth Cost |
|---|---|---|---|---|
| Storage – Growth Project **2013** | 1 | Zone 2 North Storage – Expand Pond #6 adding 5.9 acre*feet of capacity. The cost includes acquiring property. | $0 | $656,000 |
| Source – Growth & Deficiency Project **2013** | 2 | Zone 2 North Source – Install 5,200 feet of 12-inch transmission line from the Sunrise Development to the Harvest Hills Development. The transmission line will provide additional secondary source to Harvest Hills. Equip the Sunrise Well to provide water source capacity to Zone 2 North. | $420,000 | $290,000 |
| Transmission – Existing Deficiency **2015** | 2a | Zone 2 North Transmission – Modeling and City observations show low pressures during peak demands along Winter Wheat Way. A 10-inch line through City open space (550 feet) would increase pressures for the area. | $46,000 | $0 |
| Source – Growth Project **2013** | 3 | Zone 2 South Source - Install 5,400 feet of 14-inch transmission line through non-developed property to existing Zone 2 lines. Construct a filter station, 200 HP & 2,000 gpm Booster Pump Station and modify an existing pond at the Welby Jacob Canal. | $0 | $1,817,000 |
| Storage & Source – Growth Project **2016** | 4 | Zone 1 North Storage/Source – Construct a new 13 acre*feet pond west of the Welby Jacob Canal to support new growth in Zone 1. The project also includes a turnout at the canal with a receiving pond, a filter station and a small booster pump station (3,000 gpm) to lift from the receiving pond to the storage pond. | $0 | $2,886,000 |

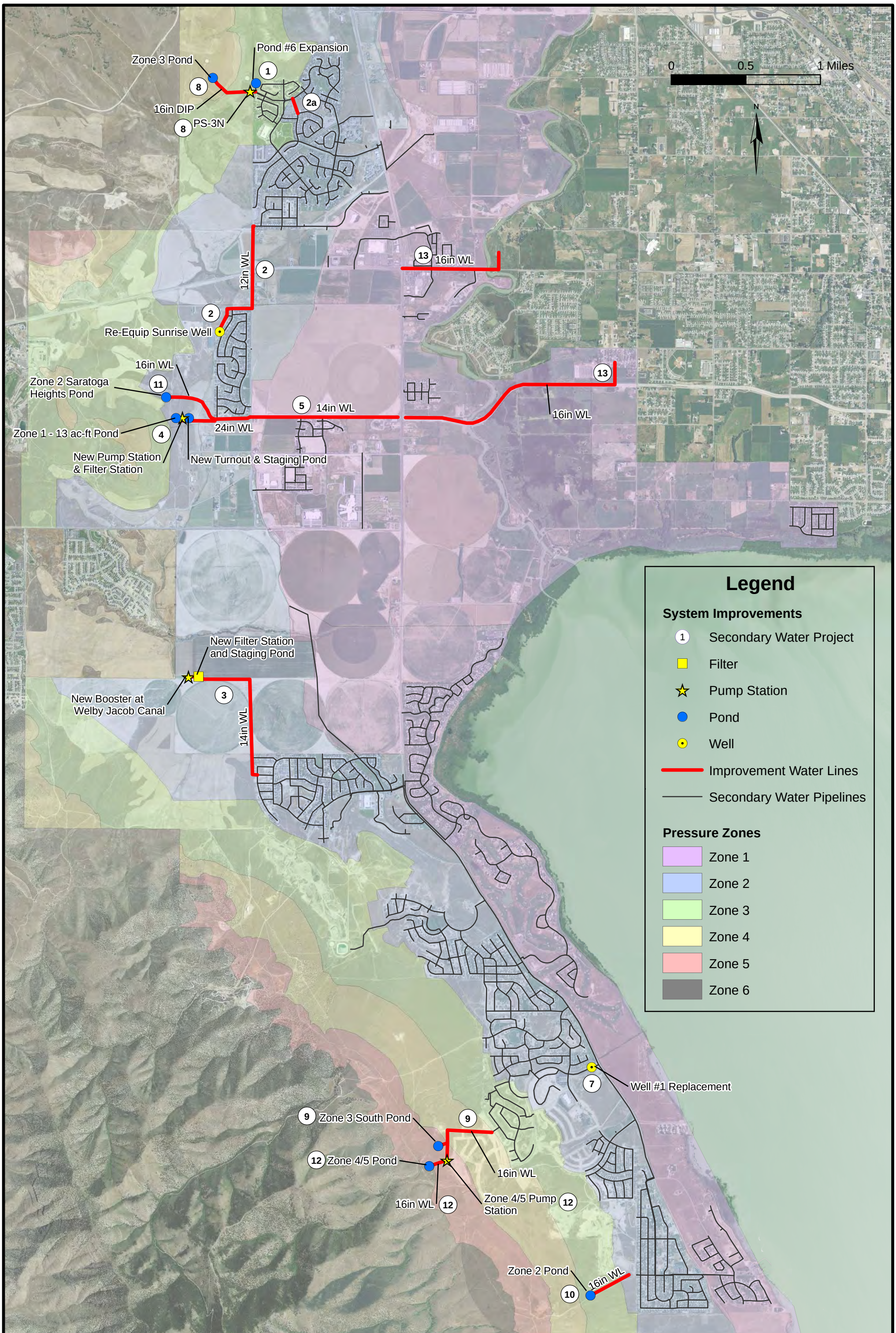
| TYPE & YEAR | MAP ID | RECOMMENDED PROJECT | Existing Deficiency Cost | New Growth Cost |
|---|---|---|---|---|
| Transmission – Growth Project **2017** | 5 | Zone 1 North Source/Storage – Provide source to new portions of Zone 1 in anticipation of growth. The project includes 2,600 feet of 24-inch transmission line from the pond to the top of the zone and then 5,300 feet of 14-inch line along 400 N to Redwood Road to connect the source and storage added in the Map ID 4 Zone 1 North storage/source project. | $0 | $1,481,000 |
| Source – Existing Deficiency **2013 & 2016** | 6 | Installation of secondary meters for each connection throughout the City. The meters will assist in appropriate billing of customers and also deter water waste by over irrigating. | $2,774,000 | $0 |
| Source – Existing Deficiency **2020** | 7 | Replacement of Well #1 in the Zone 2 South Zone. The City has reported that the well may fail in the upcoming years. Budget and a project were identified to drill a new well in the vicinity with a new pump station. | $1,860,000 | $0 |
| Source & Storage – Growth Project **2021** | 8 | The Zone 3 North Source and Storage – Added growth projections identify the need to build a pump station and storage pond in Zone 3 that currently utilizes Culinary Water for outdoor irrigation. The project includes an 11 acre*feet pond, a 200 HP (2,100 gpm) pump station and 3,200 feet of 16-inch transmission line from the pump station to the pond. | $0 | $2,768,000 |
| Water Rights – Growth Project **2022** | - | The City will need to acquire an additional 3,437 acre-feet of water rights to meet anticipated demand growth by the year 2022. | $0 | $10,352,000 |

| TYPE & YEAR | MAP ID | RECOMMENDED PROJECT | Existing Deficiency Cost | New Growth Cost |
|---|---|---|---|---|
| Source – Growth Project **2022** | - | Source – Added growth projections identify the need add additional source. The project includes two new wells and a pump station (400 irrigated acres of source capacity) | $0 | $3,060,000 |
| Source & Storage – Growth Project **2023** | 9 | The Zone 3 South Source and Storage – Added growth projections identify the need to connect the Fox Hollow Pump Station to a storage pond for the new Zone 3 South Zone. The project includes a 12 acre*feet pond and 3,500 feet of 16-inch transmission line from the pump station to the pond. | $0 | $2,400,000 |
| Storage – Growth Project **2026** | 10 | Growth will require the construction of a new Zone 2 South pond with a capacity of 10 acre*feet. A 16-inch transmission line will be required to connect the pond to the existing system. | $0 | $1,692,000 |
| Storage – Growth Project **2026** | 11 | Growth will require the construction of a new Zone 2 North pond near Saratoga Heights. The project includes a 12 acre*feet pond with 2,500 feet of 16-inch transmission line from the existing system to the pond. | $0 | $2,328,000 |
| Transmission, Storage & Source – Growth Project **2026** | 12 | Growth in the South Zones 4 & 5 will require new storage, source and transmission projects for secondary water. The project includes a duel Zone 4/5 pond with a capacity of 16 acre*feet, a 200 HP (1,000 gpm) pump station and a 16-inch transmission line from the Zone 3 system to the new storage pond. | $0 | $4,104,000 |

| TYPE & YEAR | MAP ID | RECOMMENDED PROJECT | Existing Deficiency Cost | New Growth Cost |
|---|---|---|---|---|
| Transmission – Growth Project **2026** | 13 | Construct approximately 11,500 feet of 16-inch transmission line from the existing well fields to Redwood Road. The lines are necessary to provide additional source to the secondary system in Zone 1. | $0 | $2,208,000 |
| Water Rights – Growth Project **2031** | - | The City will need to acquire an additional 5,970 acre-feet of water rights to meet anticipated demand growth from the year 2023 through 2031. This is about 650 acre-feet per year or about $2,000,000 a year. (This assumes the City decides not to use CUWCD water other than for the SLR development) | $0 | $17,982,000 |
| **TOTAL** | | | **$5,100,000** | **$54,024,000** |

**TABLE 4-2**
**CAPITAL IMPROVEMENT PROJECT SUMMARY**

| TYPE | DESCRIPTION | TOTAL COST |
|---|---|---|
| Existing Deficiency Projects | Projects required for the system that are necessary to eliminate existing deficiencies. | $5,100,000 |
| Growth Projects Through 2022 | Projects to resolve system deficiencies placed on the system by new growth through the year 2022. These projects may be impact fee projects or projects directly funded by the developer. | $23,310,000 |
| Growth Projects Beyond 2022 | Projects to resolve system deficiencies placed on the system by new growth beyond the year 2022. These projects may be impact fee projects or projects directly funded by the developer. | $30,714,000 |
| **TOTAL** | | **$59,124,000** |




HANSEN ALLEN & LUCE inc ENGINEERS

**SARATOGA SPRINGS SECONDARY WATER SYSTEM**

**CAPITAL FACILITY PLAN IMPROVEMENTS**

**FIGURE 4-1**

# SECTION 5
# IMPACT FEE FACILITY PLAN AND ANALYSIS

## 5.1 General

This section relies on the data presented in the previous sections to present a proposed impact fee based on the appropriate proportion of cost of projects planned in the next 10 years to increase capacity for new growth and an appropriate buy-in cost of available existing excess capacity previously purchased by the City.

The following data on the Secondary Water System facilities are presented in previous sections: Growth projections, Definition of the proposed level of service, Existing and future anticipated demand, Existing and excess capacity, Capital facilities analysis to determine projects required to resolve existing deficiencies and projects required in the next ten to twenty years to accommodate anticipated growth.

The Secondary Water System facility projects planned in the next 10 years to increase capacity for new growth included within the impact fee are presented. Also included in this section are the possible revenue sources that the City may consider to fund the recommended projects. The impact fee components are then presented with the proposed fee.

## 5.2 Impact Fee Facilities

The facilities presented in Table 5-1 are essential to maintain the proposed level of service while accommodating future growth. The table lists the project and the number of ERC's that the project will accommodate. All projects have sufficient capacity for the 10-year growth projections. There is no excess capacity in 2022 with the addition of these 10-year growth projects. The facility sizing was based on City planning data and modeling. All projects have a design life greater than 10-years, as required by the Impact Fee Act.

**TABLE 5-1**
**IMPACT FEE FACILITY PROJECTS FOR UPCOMING 10-YEARS**

| TYPE & PHASING YEAR | MAP ID | RECOMMENDED PROJECT | COST |
|---|---|---|---|
| Storage – **2013** | 1 | Zone 2 North Storage – Addition of 230 irrigated acres to the Zone 2 North area. | $656,000 |
| Source – **2013** | 2 | Zone 2 North Source – Addition of 49.0 irrigated acres source capacity to the Zone 2 North area. | $290,000 |

| TYPE & PHASING YEAR | MAP ID | RECOMMENDED PROJECT | COST |
|---|---|---|---|
| Source – **2013** | 3 | Zone 2 South Source - Addition of 266.7 irrigated acres source capacity to the Zone 2 South area. | $1,817,000 |
| Storage & Source – **2016** | 4 | Zone 1 North Storage/Source – Addition of 459.5 irrigated acres storage capacity ($1,471,860) and 400 source irrigated acres to the Zone 1 North area ($1,414,140). | $2,886,000 |
| Storage & Source – **2017** | 5 | Zone 1 North Source/Storage – Transmission pipelines to add source and storage to the Zone 1 North area by connecting to the source and storage added in the Map ID 4 Zone 1 North storage/source project. ($740,500 to storage capacity and $740,500 to source capacity). | $1,481,000 |
| Source & Storage – **2021** | 8 | The Zone 3 North Source and Storage – Added growth projections identify the need to build a pump station and storage pond in Zone 3 that currently utilizes Culinary Water for outdoor irrigation. The project includes an 11 acre-feet pond (388 irrigated acres of storage capacity, $1,909,920) and a 200 HP pump station (280 irrigated acres of source capacity, $858,080) | $2,768,000 |
| Source – **2022** | - | Source – Added growth projections identify the need add additional source. The project includes two new wells and a pump station (400 irrigated acres of source capacity) | $3,060,000 |
| Water Rights – **2022** | - | The City will need to acquire an additional 3,437 acre-feet of water rights to meet anticipated demand growth by the year 2022. (1,098 irrigated acres of water right capacity at $3,012 per acre-foot) | $10,352,000 |
| | | **TOTAL** | **$23,310,000** |

Table 5-2 is a summary of the impact fee facility projects for the upcoming 10-years organized by project type. There is a total of $8,179,720 attributed to source with a capacity of 1,396 irrigated acres, a total of $4,778,280 for storage with a capacity of 1,077.5 irrigated acres, and a total of $10,352,000 for water rights with a capacity of 1,098 irrigated acres. Anticipated costs for planning are also included as well as anticipated cost for financing for a total cost of $29,085,748. See Appendix A for information on cost estimating.

**TABLE 5-2**
**SUMMARY OF IMPACT FEE FACILITY PROJECTS FOR UPCOMING 10-YEARS**

| PROJECT TYPE | PROJECT COST | FINANCING COST | TOTAL COST |
|---|---|---|---|
| **SOURCE** | $8,179,720 | $3,557,558 | $11,737,278 |
| **STORAGE** | $4,778,280 | $2,078,190 | $6,856,470 |
| **WATER RIGHTS** | $10,352,000 | $0 | $10,352,000 |
| **PLANNING** | $140,000 | $0 | $140,000 |
| **TOTAL COST** | **$23,450,000** | **$5,635,748** | **$29,085,748** |

## 5.3 Revenue Options

Revenue options for the recommended projects, in addition to use fees, could include the following options: general obligation bonds, revenue bonds, State/Federal grants and loans, and impact fees. In reality, the City may need to consider a combination of these funding options. The following discussion describes each of these options.

### General Obligation Bonds through Property Taxes

This form of debt enables the City to issue general obligation bonds for capital improvements and replacement. General Obligation (G.O.) Bonds would be used for items not typically financed through the Water Revenue Bonds (for example, the purchase of water source to ensure a sufficient water supply for the City in the future). G.O. bonds are debt instruments backed by the full faith and credit of the City which would be secured by an unconditional pledge of the City to levy assessments, charges or ad valorem taxes necessary to retire the bonds. G.O. bonds are the lowest-cost form of debt financing available to local governments and can be combined with other revenue sources such as specific fees, or special assessment charges to form a dual security through the City's revenue generating authority. These bonds are supported by the City as a whole, so the amount of debt issued for the water system is limited to a fixed percentage of the real market value for taxable property within the City. For growth related projects this type of revenue places an unfair burden on existing residents as they had previously paid for their level of service.

### Revenue Bonds

This form of debt financing is also available to the City for utility related capital improvements. Unlike G.O. bonds, revenue bonds are not backed by the City as a whole, but constitute a lien against the water service charge revenues of a Water Utility. Revenue bonds present a greater risk to the investor than do G.O. bonds, since repayment of debt depends on an adequate revenue stream, legally defensible rate structure /and sound fiscal management by the issuing jurisdiction. Due to this increased risk, revenue bonds generally require a higher interest rate than G.O. bonds, although currently interest rates are at historic lows. This type of debt also has very specific coverage requirements in the form of a reserve fund specifying an amount, usually expressed in terms of average or maximum debt service due in any future year. This debt service is required to be held as a cash reserve for annual debt service payment to the benefit of bondholders. Typically, voter approval is not required when issuing revenue bonds. For growth related projects this type of revenue places an unfair burden on existing residents as they had previously paid for their level of service.

### State/Federal Grants and Loans

Historically, both local and county governments have experienced significant infrastructure funding support from state and federal government agencies in the form of block grants, direct grants in aid, interagency loans, and general revenue sharing. Federal expenditure pressures and virtual elimination of federal revenue sharing dollars are clear indicators that local government may be left to its own devices regarding infrastructure finance in general. However, state/federal grants and loans should be further investigated as a possible funding source for needed water system improvements.

It is also important to assess likely trends regarding federal / state assistance in infrastructure financing. Future trends indicate that grants will be replaced by loans through a public works revolving fund. Local governments can expect to access these revolving funds or public works trust funds by demonstrating both the need for and the ability to repay the borrowed monies, with interest. As with the revenue bonds discussed earlier, the ability of infrastructure programs to wisely manage their own finances will be a key element in evaluating whether many secondary funding sources, such as federal/state loans, will be available to the City.

### Impact Fees

An impact fee is a one-time charge to a new development for the purpose of raising funds for the construction of improvements required by the new growth and to maintain the current level of service. Impact fees in Utah are regulated by the Impact Fee Statute and substantial case law. Impact fees are a form of a development exaction that requires a fee to offset the burdens created by the development on existing municipal services. Funding the future improvements required by growth through impact fees does not place the burden on existing residents to provide funding of these new improvements.

**User Fees**

Similar to property taxes on existing residents, User Fees to pay for improvements related to new growth related projects places an unfair burden on existing residents as they had previously paid for their level of service.

## 5.4 Impact Fee Unit Calculation

Currently, the City assigns non-residential development an ERC value based on irrigated acres that is performed when the new development is plated or when a building permit is issued, whichever one comes first. Irrigated acres are the recommended unit for calculating the impact fee. The proposed level of service defines a typical single family residence uses 0.24 irrigated acres which is also defined as one ERC. The typical residential secondary water use includes irrigated area in park strips and parks in the development.

It is recommended that the City have three components to the impact fee for secondary water system facilities—source, storage, and water rights. Each component is discussed separately in the following paragraphs. The major distribution pipelines are sized closely proportionate to the source and storage projects so are included in the source and storage units.

**Source Impact Fee Unit**

The proposed level of service for source in the Secondary Water System is 7.5 gpm per irrigated acre (see Section 1). The total demand by the year 2022 at the proposed level of service is 2,610 irrigated acres. The existing secondary water source demand for the system is 1,214 irrigated acres. Subtracting the existing demand of 1,214 irrigated acres from the total demand at 2022 of 2,610 irrigated acres leaves an additional demand of **1,396 irrigated acres needed by 2022 (**see Table 5-3).

**TABLE 5-3**
**SOURCE NEEDED BY 2022**

| | Irrigated Acres | gpm |
|---|---|---|
| Predicted Demand in 2022 at the Proposed Level of Service | 2,610 | 19,575 |
| Existing Demand at the Proposed Level of Service | 1,214 | 9,105 |
| **Additional Demand Capacity needed by 2022** | **1,396** | **10,470** |

The Secondary Water system has an existing source capacity of 893.5 irrigated acres. Subtracting the existing demand of 1,214 irrigated acres from the existing capacity of 893.5

irrigated acres leaves a deficiency of 320.5 irrigated acres (see Table 5-4). Currently the Culinary Water System supplements the Secondary Water System with excess source capacity in the Culinary Water System. Capital Improvement Projects with Map ID 2 and 7 in Table 4-1 are planned to resolve this deficiency as the additional source in the Culinary Water System is needed. The Map ID 2 and 7 projects are not eligible to be included in the impact fee because they resolve existing deficiencies. The Map ID 2 project reequips the existing Sunrise Well and adds source transmission which will cost an estimated $710,000 and is estimated to add 60 irrigated acres of source capacity. The Map ID 7 project is to replace existing Well 1 which is estimated to cost $1,860,000 and is estimated to add 260 irrigated acres of source capacity. Both of these projects will be funded through existing funds and user fees.

**TABLE 5-4**
**SOURCE EXCESS CAPACITY**

| | Irrigated Acres | gpm |
|---|---|---|
| Existing Source Capacity | 893.5 | 6,701 |
| Existing Demand at the Proposed Level of Service | 1,214 | 9,105 |
| **Excess Capacity (Deficiency)** | **(320.5)** | **(2,404)** |

No excess source capacity leaves **1,396 acre-feet of source capacity needing to be added to the system by 2022 for new growth (see Table 5-5)**.

**TABLE 5-5**
**SOURCE CAPACITY TO BE BUILT FOR NEW GROWTH**

| | Irrigated Acres | gpm |
|---|---|---|
| Additional Demand Capacity needed by 2022 | 1,396 | 10,470 |
| Excess Capacity | 0 | 0 |
| **Capacity to be built by 2022 for new growth** | **1,396** | **10,470** |

The Impact Fee Facilities for Upcoming 10-Years with Map ID 2,3,4,5 and 8 in the Table 5-1 are planned to add 1,407 irrigated acres of source capacity to the Secondary Water System by 2022. With a total cost of the source capacity Impact Fee Facilities for the Upcoming 10-Years

of $11,737,278 (see Table 5-2) and an added capacity of 1,407 irrigated acres, the resulting **proposed impact fee per irrigated acre is $8,408 or $2,017 an ERC** (see Table 5-6). This leaves no excess capacity in 2022.

**TABLE 5-6**
**PROPOSED SOURCE IMPACT FEE**

| | Irrigated Acres | ERC |
|---|---|---|
| Total Cost of Source Capacity Projects | $11,737,278 | $11,737,278 |
| Added Capacity for New Growth | 1,396 | 5,818 |
| **Proposed Source Impact Fee** | **$8,408** | **$2,017** |

**Storage Impact Fee Unit**

The proposed level of service for storage in the Secondary Water System is 9,216 gallons per irrigated acre (see Section 1). The total demand by the year 2022 at the proposed level of service of 9216 is 2,610 irrigated acres. The existing secondary water storage demand for the system is 1,214 irrigated acres. Subtracting the existing demand of 1,214 irrigated acres from the total demand at 2022 of 2,610 irrigated acres leaves an additional demand of **1,396 irrigated acres needed by 2022 (**see Table 5-7).

**TABLE 5-7**
**STORAGE NEEDED BY 2022**

| | Irrigated Acres | Acre-Feet |
|---|---|---|
| Predicted Demand in 2022 at the Proposed Level of Service | 2,610 | 73.8 |
| Existing Demand at the Proposed Level of Service | 1,214 | 34.3 |
| **Additional Demand Capacity needed by 2022** | **1,396** | **39.5** |

The Secondary Water system has an existing storage capacity of 1,580 irrigated acres. Subtracting the existing demand of 1,214 irrigated acres from the existing capacity of 1,580

irrigated acres leaves an excess capacity of **366 irrigated acres available for new development** (see Table 5-8).

**TABLE 5-8**
**STORAGE EXCESS CAPACITY**

| | Irrigated Acres | Acre-Feet |
|---|---|---|
| Existing Source Capacity | 1,580 | 44.7 |
| Existing Demand at the Proposed Level of Service | 1,214 | 34.3 |
| **Excess Capacity (Deficiency)** | **366** | **10.4** |

Subtracting the excess storage capacity of 366 irrigated acres from the additional demand needed by 2022 of 3,584 acre-feet leaves **3,437 acre-feet needing to be purchased by 2022** (see Table 5-9).

**TABLE 5-9**
**STORAGE CAPACITY TO BE BUILT FOR NEW GROWTH**

| | Irrigated Acres | Acre-Feet |
|---|---|---|
| Additional Demand Capacity needed by 2022 | 1,396 | 39.5 |
| Excess Capacity | 366 | 10.4 |
| **Capacity to be built by 2022 for new growth** | **1,030** | **29.1** |

The Impact Fee Facilities for Upcoming 10-Years with Map ID 1, 4, and 8 in the Table 5-1 are planned to add 1,077.5 irrigated acres of storage capacity to the Secondary Water System by 2022. The storage capacity projects have a total cost of $6,856,470 (see Table 5-2) and a total capacity of 1,113.5 irrigated acres. The resulting **proposed impact fee per irrigated acre is $6,158 or $1,478 an ERC** (see Table 5-10).

**TABLE 5-10**
**PROPOSED STORAGE IMPACT FEE**

| | Irrigated Acres | ERC |
|---|---|---|
| Total Cost of Source Capacity Projects | $6,856,470 | $6,856,470 |
| Added Capacity for New Growth | 1,113.5 | 4,640 |
| **Proposed Storage Impact Fee** | **$6,158** | **$1,478** |

**Water Right Impact Fee Unit**

The proposed level of service for water rights is 3.13 acre-feet per irrigated acre which is less than the existing level of service of 4.46 acre-feet per irrigated acre. The total demand by the year 2022 at the proposed level of service is 8,170 acre-feet. The existing secondary water right demand for the system is 4,586 acre-feet. This includes 786 acre-feet of water rights that were given to the City in exchange for development credit agreements for future development. It is assumed this credit will be used by the year 2022 for the anticipated growth. Subtracting the existing demand of 4,586 acre-feet from the total demand at 2022 of 8,170 acre-feet leaves an additional demand of **3,584 acre-feet needed by 2022 (**see Table 5-11).

**TABLE 5-11**
**WATER RIGHTS NEEDED BY 2022**

| | Irrigated Acres | Acre-Feet |
|---|---|---|
| Predicted Demand in 2022 at the Proposed Level of Service | 2,610 | 8,170 |
| Existing Demand at the Proposed Level of Service | 1,465 | 4,586 |
| **Additional Demand Capacity needed by 2022** | **1,145** | **3,584** |

The City owns a total of 4,733 acre-feet of water rights attributed to the Secondary Water System. Again, this includes the 786 acre-feet of water rights that were given to the City in exchange for development credit agreements. Subtracting the existing demand of 4,586 acre-feet from the 4,733 acre-feet of total water rights owned leaves an excess capacity of **147 acre-feet available for new development (**see Table 5-12).

**TABLE 5-12**
**WATER RIGHTS EXCESS CAPACITY**

| | Irrigated Acres | Acre-Feet |
|---|---|---|
| Water Rights Owned | 1,512 | 4,733 |
| Existing Demand at the Proposed Level of Service | 1,465 | 4,586 |
| **Excess Capacity** | **47** | **147** |

Subtracting the excess capacity of owned water rights of 147 acre-feet from the additional demand needed by 2022 of 3,584 acre-feet leaves **3,437 acre-feet needing to be purchased by 2022** (see Table 5-13). The average price the City has paid for water rights in the last 5 years has been about $3,012 per acre-foot. This would provide a price of **$9,428 per irrigated acre or $2,263 per ERC.**

**TABLE 5-13**
**WATER RIGHTS TO BE PURCHASED**

| | Irrigated Acres | Acre-Feet |
|---|---|---|
| Additional Demand Capacity needed by 2022 | 1,145 | 3,584 |
| Excess Capacity | 47 | 147 |
| **Total to be purchased by 2022** | **1,098** | **3,437** |

It is recommended that the City accept the water right impact fee in one of three ways: Payment of $9,428 per irrigated acres for water rights the City has available for new development, use of developer credit, or Deed the City a water right approved by the City Attorney.

### 5.5 Impact Fee Summary

Adding the proposed Secondary Water System impact fee units together, the total proposed impact fee would be $23,739 per irrigated acre. A typical single family residential connection requiring 0.24 irrigated acres would have an impact fee of **$5,782** with water rights or $3,519

without water rights (see Table 5-14). This includes $2,017 for source capacity, $1,478 for storage capacity, $24 for planning, and $2,263 for water rights.

**TABLE 5-14**
**TOTAL PROPOSED IMPACT FEE PER IRRIGATED ACRE AND TYPICAL SINGLE FAMILY RESIDENT**

| | Per Irrigated Acre | Per ERC |
|---|---|---|
| Source | $8,408 | $2,017 |
| Storage | $6,158 | $1,478 |
| Planning | $100 | $24 |
| Water Rights | $9,428 | $2,263 |
| **Total** | **$24,094** | **$5,782** |

# Appendix A

# Cost Estimates

**City of Saratoga Springs Capital Facility Plan**
**Secondary Water Recommended Improvements**
**Preliminary Engineers Cost Estimates**

| Year | | Item | Unit | Unit Price | Quantity | Total Price |
|---|---|---|---|---|---|---|
| ***2013*** | ***SW 1.*** | ***Zone 2 North Storage - Expand Pond #6*** | | | | |
| | | Purchase Additional Property | Acre | $ 50,000 | 1.5 | $ 75,000 |
| | | Construct Pond Facility - Additional 6.5 ac*ft | AC*FT | $ 72,500 | 6.5 | $ 471,250 |
| | | | | | Engineering & Admin. (10%) | $ 54,625 |
| | | | | | Contingency (10%) | $ 54,625 |
| | | | | | **Total for Zone 2 North Storage - Expand Pond #6** | **$ 656,000** |
| ***2013*** | ***SW 2.*** | ***Zone 2 North Source - Sunrise Well to Harvest Hills*** | | | | |
| | | Re-equip Sunrise Well | LS | $ 150,000 | 1 | $ 150,000 |
| | | Furnish & Install 12" DIP Water Line | LF | $ 85 | 5200 | $ 442,000 |
| | | | | | Engineering & Admin. (10%) | $ 59,200 |
| | | | | | Contingency (10%) | $ 59,200 |
| | | | | | **Total for Zone 2 North Source - Sunrise Well to Harvest Hills** | **$ 710,000** |
| ***2015*** | ***SW 2a.*** | ***Zone 2 North Transmission - Winter Wheat Way*** | | | | |
| | | Furnish & Install 10" PVC Water Line | LF | $ 70 | 550 | $ 38,500 |
| | | | | | Engineering & Admin. (10%) | $ 3,850 |
| | | | | | Contingency (10%) | $ 3,850 |
| | | | | | **Total for Zone 2 North Transmission - Winter Wheat Way** | **$ 46,000** |
| ***2013*** | ***SW 3.*** | ***Zone 2 South Source Project*** | | | | |
| | | 14" Transmission Line from Welby to Ex Lines | LF | $ 110 | 5400 | $ 594,000 |
| | | Filter Station | LS | $ 300,000 | 1 | $ 300,000 |
| | | Zone 2 Booster (200 HP & 2000 gpm) w/ VFD | LS | $ 350,000 | 1 | $ 350,000 |
| | | Existing Pond Modification | LS | $ 120,000 | 1 | $ 120,000 |
| | | Land Acquisition | Acre | $ 100,000 | 1.5 | $ 150,000 |
| | | | | | Engineering & Admin. (10%) | $ 151,400 |
| | | | | | Contingency (10%) | $ 151,400 |
| | | | | | **Total for Zone 2 South Source Project** | **$ 1,817,000** |
| ***2016*** | ***SW 4.*** | ***Zone 1 North Source & Storage*** | | | | |
| | | Construct New Pond - PR 11 - 13 AC*FT | AC*FT | $ 95,000 | 13 | $ 1,235,000 |
| | | Zone Storage Land Acquisition (PR-11) | Acre | $ 100,000 | 3 | $ 300,000 |
| | | Turnout at Welby Jacob Canal w/ Pond | LS | $ 120,000 | 1 | $ 120,000 |
| | | Filter Station | LS | $ 400,000 | 1 | $ 400,000 |
| | | Booster Pump to PR 11 (50 HP & 3000 gpm) w/ VFD | LS | $ 350,000 | 1 | $ 350,000 |
| | | | | | Engineering & Admin. (10%) | $ 240,500 |
| | | | | | Contingency (10%) | $ 240,500 |
| | | | | | **Total for Zone 1 North Source & Storage** | **$ 2,886,000** |
| ***2017*** | ***SW 5.*** | ***Zone 1 North Transmission*** | | | | |
| | | Furnish & Install 24" DIP | LF | $ 220 | 2600 | $ 572,000 |
| | | Furnish & Install 14" DIP | LF | $ 125 | 5300 | $ 662,500 |
| | | | | | Engineering & Admin. (10%) | $ 123,450 |
| | | | | | Contingency (10%) | $ 123,450 |
| | | | | | **Total for Zone 1 North Transmission** | **$ 1,481,000** |
| ***2013*** | ***SW 6.*** | ***Installation of Secondary Meters*** | | | | |
| ***2016*** | | Furnish and Install 1" Secondary Meters | EA | $ 350 | 1421 | $ 497,350 |
| | | Furnish and Install 1-1/2" Secondary Meters | EA | $ 650 | 27 | $ 17,550 |
| | | Furnish and Install 2" Secondary Meters | EA | $ 850 | 50 | $ 42,500 |
| | | Furnish and Install 3" Secondary Meters | EA | $ 3,000 | 6 | $ 18,000 |
| | | Furnish and Install Meters in Harvest Hills (627) | EA | $ 505,000 | 1 | $ 505,000 |
| | | Furnish and Install Meters in Sunrise Meadows (177) | EA | $ 151,000 | 1 | $ 151,000 |
| | | Furnish and Install Meters in South City (1860) | EA | $ 1,245,000 | 1 | $ 1,245,000 |
| | | | | | Admin. & Construction Observation (2%) | $ 49,528 |
| | | | | | Contingency (10%) | $ 247,640 |
| | | | | | **Total for Installation of Secondary Meters** | **$ 2,774,000** |

**City of Saratoga Springs Capital Facility Plan**
**Secondary Water Recommended Improvements**
**Preliminary Engineers Cost Estimates**

| Year | | Item | Unit | Unit Price | Quantity | Total Price |
|---|---|---|---|---|---|---|
| ***2020*** | ***SW 7.*** | ***Zone 2 Source - Well #1 Replacement*** | | | | |
| | | New Well | LS | $ 1,000,000 | 1 | $ 1,000,000 |
| | | New Pump Station | LS | $ 500,000 | 1 | $ 500,000 |
| | | New Connection to Transmission Line | LS | $ 50,000 | 1 | $ 50,000 |
| | | | | | Engineering & Admin. (10%) | $ 155,000 |
| | | | | | Contingency (10%) | $ 155,000 |
| | | | | | **Total for Zone 2 Source - Well #1 Replacement** | **$ 1,860,000** |
| ***2021*** | ***SW 8.*** | ***Zone 3 North - Pump Station and Storage*** | | | | |
| | | 16" DIP Transmission Line from PS to Storage | LS | $ 160 | 3200 | $ 512,000 |
| | | Zone 3 Pump Station (200 HP & 2,100 gpm) | LS | $ 450,000 | 1 | $ 450,000 |
| | | Zone 3 Storage (11 Ac*ft) | AC*FT | $ 95,000 | 11 | $ 1,045,000 |
| | | Land Acquisition | Acre | $ 100,000 | 3 | $ 300,000 |
| | | | | | Engineering & Admin. (10%) | $ 230,700 |
| | | | | | Contingency (10%) | $ 230,700 |
| | | | | | **Total to Zone 3 North - Pump Station and Storage** | **$ 2,768,000** |
| ***2022*** | | ***Source - Wells*** | | | | |
| | | New Well | LS | $ 1,000,000 | 1 | $ 1,000,000 |
| | | New Well | LS | $ 1,000,000 | 1 | $ 1,000,000 |
| | | New Pump Station | LS | $ 500,000 | 1 | $ 500,000 |
| | | New Connection to Transmission Line | LS | $ 50,000 | 1 | $ 50,000 |
| | | | | | Engineering & Admin. (10%) | $ 255,000 |
| | | | | | Contingency (10%) | $ 255,000 |
| | | | | | **Total for Source - Wells** | **$ 3,060,000** |
| ***2026*** | ***SW 10.*** | ***Zone 2 South - Storage*** | | | | |
| | | 16" DIP Transmission Line to Storage | LS | $ 160 | 1000 | $ 160,000 |
| | | Land Acquisition | Acre | $ 100,000 | 3 | $ 300,000 |
| | | Zone 2 South Storage PR-17 (10 Ac*ft) | AC*FT | $ 95,000 | 10 | $ 950,000 |
| | | | | | Engineering & Admin. (10%) | $ 141,000 |
| | | | | | Contingency (10%) | $ 141,000 |
| | | | | | **Total to Zone 2 South - Storage** | **$ 1,692,000** |
| ***2026*** | ***SW 11.*** | ***Zone 2 North -Saratoga Heights Storage*** | | | | |
| | | 16" DIP Transmission Line to Storage | LS | $ 160 | 2500 | $ 400,000 |
| | | Land Acquisition | Acre | $ 100,000 | 4 | $ 400,000 |
| | | Zone 2 North Storage (12 Ac*ft) | AC*FT | $ 95,000 | 12 | $ 1,140,000 |
| | | | | | Engineering & Admin. (10%) | $ 194,000 |
| | | | | | Contingency (10%) | $ 194,000 |
| | | | | | **Total to Zone 2 North -Saratoga Heights Storage** | **$ 2,328,000** |
| ***2026*** | ***SW 12.*** | ***Zone 4 & 5 South - Pump Station and Storage*** | | | | |
| | | 16" DIP Transmission Line from PS to Storage | LS | $ 160 | 5000 | $ 800,000 |
| | | Zone 4 & 5 Pump Station (1000 gpm, 200 HP) | LS | $ 650,000 | 1 | $ 650,000 |
| | | Zone 4/5 Storage (16 Ac*ft) | LS | $ 95,000 | 16 | $ 1,520,000 |
| | | Land Acquisition | Acre | $ 100,000 | 4.5 | $ 450,000 |
| | | | | | Engineering & Admin. (10%) | $ 342,000 |
| | | | | | Contingency (10%) | $ 342,000 |
| | | | | | **Total to Zone 4 & 5 South - Pump Station and Storage** | **$ 4,104,000** |
| ***2026*** | ***SW 13.*** | ***Zone 1 - Transmission*** | | | | |
| | | 16" DIP Trans. Line from Well Fields to Redwood | LS | $ 160 | 11500 | $ 1,840,000 |
| | | | | | Engineering & Admin. (10%) | $ 184,000 |
| | | | | | Contingency (10%) | $ 184,000 |
| | | | | | **Total to Zone 1 - Transmission** | **$ 2,208,000** |

Appendix 4:

DEBT

Future Debt

Proposed Series 2014 Water Bond - Secondary Water

| Year | Principal | Coupon | Interest | Net DS |
|---|---|---|---|---|
| 2014 | - | 0.00% | - | - |
| 2015 | 470,000 | 2.00% | 252,459 | 722,459 |
| 2016 | 350,000 | 2.00% | 369,650 | 719,650 |
| 2017 | 360,000 | 2.00% | 362,550 | 722,550 |
| 2018 | 365,000 | 3.00% | 353,475 | 718,475 |
| 2019 | 380,000 | 3.00% | 342,300 | 722,300 |
| 2020 | 390,000 | 3.00% | 330,750 | 720,750 |
| 2021 | 405,000 | 5.00% | 314,775 | 719,775 |
| 2022 | 425,000 | 5.00% | 294,025 | 719,025 |
| 2023 | 450,000 | 5.00% | 272,150 | 722,150 |
| 2024 | 470,000 | 5.00% | 249,150 | 719,150 |
| 2025 | 490,000 | 4.00% | 227,600 | 717,600 |
| 2026 | 515,000 | 4.00% | 207,500 | 722,500 |
| 2027 | 535,000 | 4.00% | 186,500 | 721,500 |
| 2028 | 555,000 | 4.00% | 164,700 | 719,700 |
| 2029 | 580,000 | 4.00% | 142,000 | 722,000 |
| 2030 | 600,000 | 4.00% | 118,400 | 718,400 |
| 2031 | 625,000 | 4.00% | 93,900 | 718,900 |
| 2032 | 650,000 | 4.00% | 68,400 | 718,400 |
| 2033 | 680,000 | 4.00% | 41,800 | 721,800 |
| 2034 | 705,000 | 4.00% | 14,100 | 719,100 |
| | $ 10,000,000 | | $ 4,406,184 | $ 14,406,184 |

Proposed Series 2016 Water Bond - Secondary Water

| Year | Principal | Coupon | Interest | Net DS |
|---|---|---|---|---|
| 2017 | 236,591 | 5.00% | 143,103 | 379,694 |
| 2018 | 236,591 | 5.00% | 143,103 | 379,694 |
| 2019 | 236,591 | 5.00% | 143,103 | 379,694 |
| 2020 | 236,591 | 5.00% | 143,103 | 379,694 |
| 2021 | 236,591 | 5.00% | 143,103 | 379,694 |
| 2022 | 236,591 | 5.00% | 143,103 | 379,694 |
| 2023 | 236,591 | 5.00% | 143,103 | 379,694 |
| 2024 | 236,591 | 5.00% | 143,103 | 379,694 |
| 2025 | 236,591 | 5.00% | 143,103 | 379,694 |
| 2026 | 236,591 | 5.00% | 143,103 | 379,694 |
| 2027 | 236,591 | 5.00% | 143,103 | 379,694 |
| 2028 | 236,591 | 5.00% | 143,103 | 379,694 |
| 2029 | 236,591 | 5.00% | 143,103 | 379,694 |
| 2030 | 236,591 | 5.00% | 143,103 | 379,694 |
| 2031 | 236,591 | 5.00% | 143,103 | 379,694 |
| 2032 | 236,591 | 5.00% | 143,103 | 379,694 |
| 2033 | 236,591 | 5.00% | 143,103 | 379,694 |
| 2034 | 236,591 | 5.00% | 143,103 | 379,694 |
| 2035 | 236,591 | 5.00% | 143,103 | 379,694 |
| 2036 | 236,591 | 5.00% | 143,103 | 379,694 |
| Total | $ 4,731,829 | | $ 2,862,055 | $ 7,593,884 |

# Saratoga Springs, Utah

$10,000,000 Water Revenue and Refunding Bonds

Series April 29, 2014

(Refund Series 2005, 2006, and 2009)

## Total Issue Sources And Uses

**Dated 04/29/2014 | Delivered 04/29/2014**

| | Refund 2005 | Refund 2006 | Refund 2009 | New Money | Issue Summary |
|---|---|---|---|---|---|
| **Sources Of Funds** | | | | | |
| Par Amount of Bonds | $1,215,000.00 | $1,850,000.00 | $640,000.00 | $6,295,000.00 | $10,000,000.00 |
| Reoffering Premium | 126,255.90 | 192,534.55 | 67,408.75 | 296,627.65 | 682,826.85 |
| Transfers from Prior Issue DSR Funds | 105,938.39 | 183,400.95 | - | - | 289,339.34 |
| Transfers from Prior Issue BCF Funds | - | 156,166.00 | - | - | 156,166.00 |
| **Total Sources** | **$1,447,194.29** | **$2,382,101.50** | **$707,408.75** | **$6,591,627.65** | **$11,128,332.19** |
| **Uses Of Funds** | | | | | |
| Deposit to Project Construction Fund | - | - | - | 6,350,000.00 | 6,350,000.00 |
| Deposit to Escrow Fund | 1,412,558.40 | 2,338,872.53 | 692,646.61 | - | 4,444,077.54 |
| Gross Bond Insurance Premium | 7,624.74 | 11,607.89 | 3,877.85 | 48,920.44 | 72,030.92 |
| Total Underwriter's Discount (0.550%) | 6,682.50 | 10,175.00 | 3,520.00 | 34,622.50 | 55,000.00 |
| Underwriter's Counsel | - | - | - | 47,000.00 | 47,000.00 |
| Rating Agency Fee | 4,374.00 | 6,660.00 | 2,304.00 | 22,662.00 | 36,000.00 |
| Financial Advisor | 4,071.46 | 6,199.35 | 2,144.64 | 21,094.55 | 33,510.00 |
| Surety Bond | 3,511.60 | 5,346.87 | 1,849.73 | 18,193.81 | 28,902.01 |
| Bond Counsel | 3,037.50 | 4,625.00 | 1,600.00 | 15,737.50 | 25,000.00 |
| Miscellaneous | - | - | - | 20,590.00 | 20,590.00 |
| Local Counsel | - | - | - | 5,000.00 | 5,000.00 |
| Travel | 425.25 | 647.50 | 224.00 | 2,203.25 | 3,500.00 |
| Additional Cost of Issuance 1 | - | - | - | 3,400.00 | 3,400.00 |
| Trustee & Counsel Fees | - | - | - | 2,000.00 | 2,000.00 |
| Trustee Origination | - | - | - | 2,000.00 | 2,000.00 |
| Rounding Amount | 4,908.84 | (2,032.64) | (758.08) | (1,796.40) | 321.72 |
| **Total Uses** | **$1,447,194.29** | **$2,382,101.50** | **$707,408.75** | **$6,591,627.65** | **$11,128,332.19** |

# Appendix B

# Well Operation and Maintenance Memorandum

# Memorandum



**DATE:** August 20, 2012
**TO:** Jeremy Lapin, P.E.
Saratoga Springs City
**FROM:** William Bigelow, P.E.
**PROJECT:** Wells Evaluation
**SUBJECT:** Operations and Maintenance Recommendations

The purpose of this memo is to provide recommended O&M activities that Saratoga Springs City may consider as a general guideline for all of the City's wells. The underlying assumption of these recommendations is that preventative maintenance is less costly in the long run than emergency maintenance. The following outline shows the typical problems that the City has been having over the past several years, followed by general O&M recommendations.

## FREQUENT PROBLEMS

### Well Problems

1. Well casings and screens are developing holes from sanding and corrosion problems.
2. Wells are experiencing well screen collapse due to subsidence.
3. Biofouling is showing up in some wells, and it causes decreased well yields.

### Pumping System Problems

1. Pumps are failing early due to heavy sand production.
2. Pumps are wearing out due to heavy usage and short life expectancy (3450 RPM vs 1750 RPM pumps)

## RECOMMENDED SCHEDULED MAINTENANCE TASKS

### Well Maintenance

1. Collecting well data is the first step to maintaining wells.
2. Calculate the specific capacity of each well at least once each month.
3. Collect water level data for each well routinely even when the well is not in service.
4. At least annually, evaluate the specific capacity data for evidence of trends. If specific capacity has dropped more than 15%, investigate the cause.
5. Every time that the pump is pulled for maintenance, do the following:
    a. Video the well and look for evidence of holes, screens/perforations plugging or biofouling.

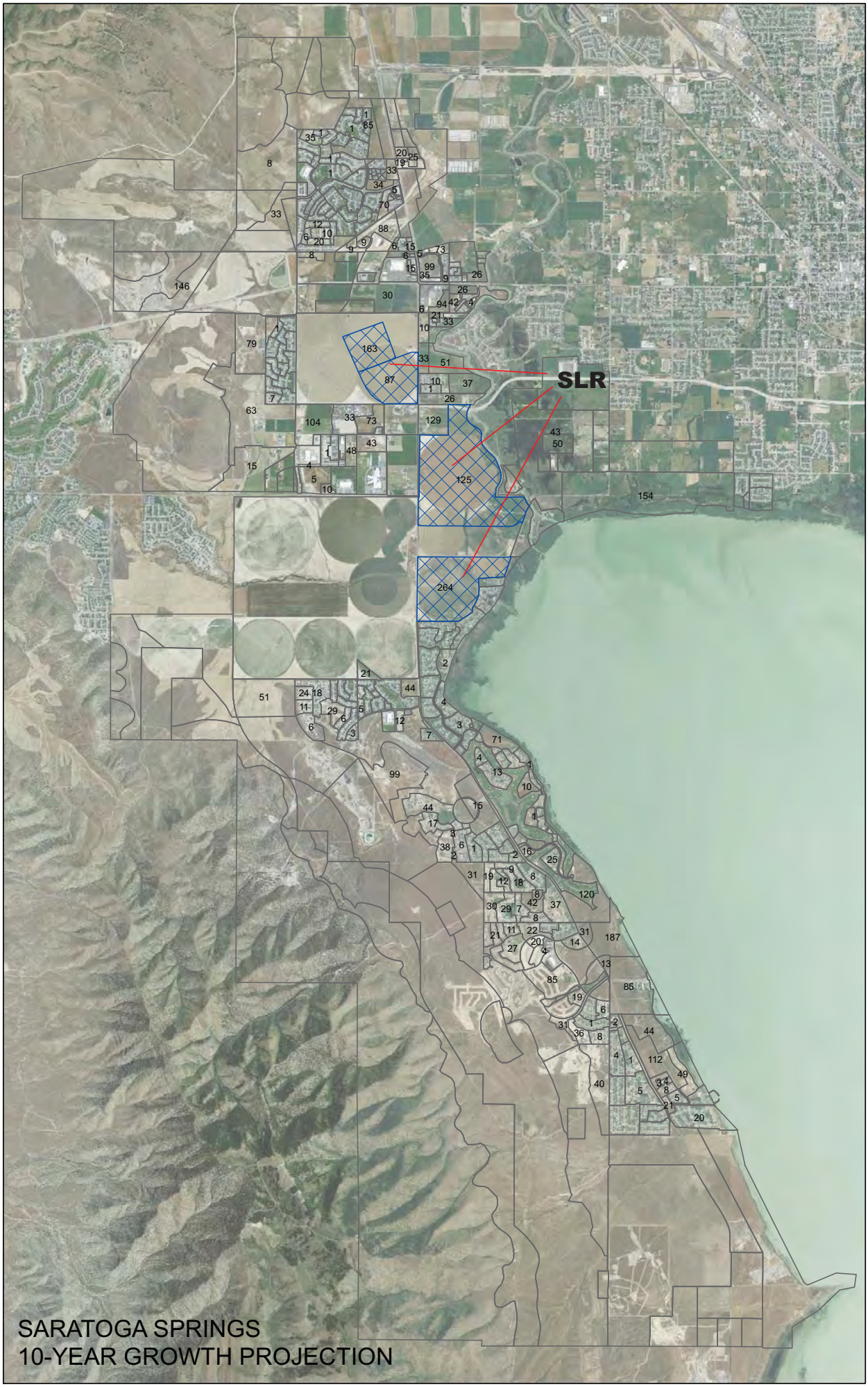
b. If the well casing needs it, perform scrubbing or brushing to remove rust, scale and biofouling or clogging.
c. If specific capacity has dropped more than 15%, evaluate whether well re-development or chemical treatment is needed.
d. If sanding has been an issue, perform aggressive well re-development and gravel pack replenishment to reduce or eliminate sanding. This may take a considerable effort in some wells.
e. If biofouling is an issue, consider performing chemical treatment to restore the original specific capacity.
f. If water quality is excessively poor, consider investigating drilling deeper for better water quality or abandoning the well and planning to drill another well where the water quality is better.

**Pump Maintenance**

1. Collecting pump performance is the first step to maintaining pumps.
2. Record as a minimum the following parameters every day when the well is in operation: flow rate, system pressure, amps, and water level.
3. Listen and feel for a change in the pumping system's sound or vibration.
4. Pull every well pump for preventive maintenance every 8 – 10 years if the pump has not been pulled prior to this time. Have the pump disassembled and checked for problems and clearances. If recommended, rebuild or replace the pump.
5. When ordering a new pump, perform a life cycle cost analysis to select the lowest cost pump over the long run.
6. Compare current operating data with previous operating data for evidence of trends.
    a. If flow is decreasing and amperage is increasing, this could indicate that the pump bearings may be starting to fail.
    b. If flow is decreasing and amperage is also decreasing, the pump impellers may be worn.
    c. If water level and flow are decreasing, the well screen/perforations may be clogged or biofouled or the aquifer water level may be dropping.

# Appendix C

# Misc. Supporting Data




SARATOGA SPRINGS
10-YEAR GROWTH PROJECTION

| WR Number | Amount Purchased (Acre-Ft) | Amount Paid | Cost per AF | Purchase Date | Use | Seller |
|---|---|---|---|---|---|---|
| **CULINARY PURCHASES** | | | | | | |
| 53-1686 | 150 | $450,000.00 | $3,000.00 | 4/22/2010 | Culinary | L & V Properties |
| 53-1686 | 75 | $225,000.00 | $3,000.00 | 6/2/2010 | Culinary | L & V Properties |
| 53-1686 | 225 | $675,000.00 | $3,000.00 | 5/12/2011 | Culinary | L & V Properties |
| 54-623 | 100 | $350,000.00 | $3,500.00 | 2007 | Culinary | Jeff Neilson |
| 54-623 | 100 | $275,000.00 | $2,750.00 | 2/17/2010 | Culinary | Jeff Neilson |
| 54-623 | 39.25 | $113,825.00 | $2,900.00 | 12/20/2011 | Culinary | Jeff Neilson |

| | | | |
|---|---|---|---|
| **Total** | **689.25** | **$2,088,825.00** | **$3,030.58** |

| WR Number | Amount Purchased (Acre-Ft) | Amount Paid | Cost per AF | Purchase Date | Use | Seller |
|---|---|---|---|---|---|---|
| **SECONDARY PURCHASES** | | | | | | |
| 54-1088 | 15.488 | $54,208.00 | $3,500.00 | 9/13/2007 | Secondary | Darrell & Chris Wendel |
| 59-5851 | 4.59 | $8,000.00 | $1,742.92 | 3/6/2008 | Secondary | Delvin & Ren Wells |
| 59-5851 | 18.36 | $32,000.00 | $1,742.92 | 3/6/2008 | Secondary | Gwenda W. Arnold |
| 59-5851 | 41.31 | $72,000.00 | $1,742.92 | 3/6/2008 | Secondary | Mervyn and De Arnold |
| 55-1849 | 112.59 | $337,770.00 | $3,000.00 | 7/29/2009 | Secondary | Hal J. Scott Family Trust |
| 55-1849 | 37.53 | $112,590.00 | $3,000.00 | 7/28/2009 | Secondary | Summit Exchange Service |
| 54-1227 | 3.672 | $12,852.00 | $3,500.00 | 7/28/2009 | Secondary | Idona Christensen |
| 54-1227 | 3.672 | $12,852.00 | $3,500.00 | 7/28/2009 | Secondary | Kerkman Fmaily Trust |
| 54-1227 | 36.72 | $128,852.00 | $3,500.00 | 7/5/2012 | Secondary | Kerkman Fmaily Trust |
| 54-1227 | 7.344 | $25,204.00 | $3,500.00 | 7/5/2012 | Secondary | Steadman Family Trust |
| 54-1227 | 3.672 | $12,852.00 | $3,500.00 | 7/5/2012 | Secondary | Bernell Kerkman |
| 54-1227 | 3.672 | $12,852.00 | $3,500.00 | 7/5/2012 | Secondary | Craig Kerkman |
| 54-1227 | 3.672 | $12,852.00 | $3,500.00 | 7/5/2012 | Secondary | Julia Kerkman |
| 54-1227 | 3.672 | $12,852.00 | $3,500.00 | 7/5/2012 | Secondary | Hazelann Griffiths |