ORDINANCE NO. 14-19 (7-15-14)

ORDINANCE ADOPTING A SEWER IMPACT FEE FACILITIES PLAN, SEWER COLLECTION FACILITIES IMPACT FEE ANALYSIS, SEWER COLLECTION FACILITIES SERVICE AREAS AND A SEWER COLLECTION FACILITIES IMPACT FEES ENACTMENT 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 Sewer Collection facilities and to amend its Sewer Collection 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 Plans for Sewer Collection facilities and to amend its sewer 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 sewer collection facilities impact fees as well as other impact fee qualified facilities;

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, in addition to City Consultants, City Officials and representatives of other Government entities, two 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 all advertised Impact Fee Facilities Plans 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 Sewer Collection facilities, the extent of excess sewer 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 Sewer collection facilities, the extent of

excess sewer collection 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 Sewer Collection 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 Sewer collection impact fee facilities plan;

WHEREAS, on August 7, 2013 the City properly noticed its intention to prepare a Sewer collection facilities impact fee analysis;

WHEREAS, on July 3, 2014 the City properly posted a copy of the executive summary of and the certified Sewer Collection Impact Fee Facilities Plan and Analysis;

WHEREAS, on July 3, 2014, the City properly noticed its intent to adopt the certified Sewer Collection 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 Sewer Collection facilities impact fees; and

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

WHEREAS, Bowen Collins certified its work as compliant with Utah Code § 11-36a-306 on May 29, 2014; and

WHEREAS, the City has caused a Sewer Collection Facilities Impact Fee Analysis to be prepared by Zions' Public Finance;

WHEREAS, Zions' Public Finance has identified a maximum Sewer Collection facilities impact fee based on the Sewer Collection Impact Fee Facilities Plan; a copy of the Sewer Collection Impact Fee Facilities Plan prepared by Zions' Public Finance dated June 19, 2014 is attached hereto as exhibit "B"; and

WHEREAS, on July 3, 2014, a full copy of the Sewer Collection Impact Fee Facilities Plan, the Sewer Collection Impact Fee Analysis, the Sewer Collection Impact Fee Enactment, along with an executive summary of the Sewer Collection Impact Fee Facilities Plan and Analysis that was prepared in a manner 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 July 5, 2014, the Provo Daily Herald published notice of the date, time, and place of the first public hearing to consider the Sewer Collection Facilities Impact Fee Facilities Plan, Analysis, and Enactment; and

WHEREAS, on July 15, 2014, the City Council held a public hearing regarding the proposed and certified Sewer Collection Impact Fee Facilities Plan, Sewer Collection Impact Fee Analysis, and a draft of this Sewer Collection Facilities 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 Sewer Collection Impact Fee Facilities Plan for Sewer Collection Facilities as proposed;
2. adopt the Sewer Collection Impact Fee Analysis as proposed;; and
3. enact this Ordinance to:
    a. amend its current Sewer Collection 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 Council as follows:

SECTION I – IMPACT FEE FACILITIES PLAN AND ANALYSIS: SEWER COLLECTION FACILITIES

The Sewer Collection Impact Fee Facilities Plan and Analysis attached hereto as Exhibits A and B is hereby adopted.

SECTION II – ENACTMENT

The following amendments to Chapter 7.05 of the City Code are hereby made:

Chapter 7.05. ~~Wastewater~~ Sewer Collection Facilities **Impact Fee.**

Sections:

7.05.01. **Definitions.**
7.05.02. **Findings and Purpose.**
7.05.03. **Establishment of** ~~North Special~~ Sewer Collection Facilities **Service Areas.**
~~**7.05.04. Renaming of South Special Service Area=.**~~
7.05.~~05~~04. **Adoption and Imposition of** ~~Adjusted Wastewater~~Sewer Collection Facilities **Impact Fees.**
~~**7.05.06. Stacked Unit, Multi-Family Residential Dwellings.**~~
7.05.~~07~~05. **Use of** ~~Adjusted Wastewater~~Sewer Collection Facilities **Impact Fees.**
7.05.~~08~~06. **Adjustments.**
7.05.~~09~~07. **Accounting, Expenditure, and Refunds.**
7.05.~~10~~08. **Impact Fee Challenges and Appeals.**
7.05.~~11~~09. **Severability.**

7.05.01. 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.

~~1.~~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" or "ERC"** means that measure of impact on public facilities equal to the impact of one typical primary residential single-family detached dwelling unit. For Sewer Collection Facilities, an ERC equals 40 water supply fixture units (WSFU).

~~2.~~4. **"Sewer Collection Facilities Impact Fees"** means the Sewer Collection Facilities Impact Fees adopted and imposed by this Chapter on Development Activity within the City.

~~3. **"North Special Service Area"** means the sewer Special Service Area formally adopted by the City Council in Ordinance 05-3 for adjusted wastewater impact fees that covers the entire City except for the portion of the City included in the previously existing sewer Special Service Area.~~

~~4.~~5. **"~~Public~~ Sewer Collection 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:~~ identified in the 2014 Sewer Collection Impact Fee Facilities Plan dated May 29, 2014.

~~a. public roadways and roadway facilities including roads, bridges and traffic signals;~~
~~b. storm drainage facilities;~~
~~c. culinary water facilities;~~
~~d. secondary water facilities (water for outside use);~~
~~e. wastewater collection (but not treatment) facilities;~~
~~f. parks, recreation facilities, trails and open space; and~~
~~g. public safety facilities.~~

~~5. **"South Special Service Area"** means the sewer Special Service Area originally established by the City Council in Ordinance 00-0713-01 that covers all of the City, except for the portion of the City being included in the North Special Service Area adopted by the City Council in Ordinance 05-3, including the subdivision plats for Lake Mountain Estates and Pelican Bay.~~

6. **"Utah Impact Fees Act"** means Utah Code 11-36a.

7. **"Water Supply Fixture Unit" or "WSFU"** means the International Plumbing Code ("IPC") fixture count method developed to predict water use for various fixture types. Each fixture type is assigned a load value in water supply fixture units (WSFU).

~~7. **"Wastewater Impact Fee"** means the wastewater impact fees adopted and imposed on Development Activity within the North and South Special Service Areas pursuant to Ordinances 00-0713-01 and 05-3.~~

~~8. The definitions set out in the Impact Fee Ordinance adopted on April 13, 1999, shall apply as those terms are used in this Chapter.~~

(Ord. 14-19; Ord. 11-9; Ord. 05-3; Ord. 00-0713-01)

7.05.02. Findings and Purpose.

The City Council hereby finds and determines:

1. There is a need to establish a ~~wastewater~~ sewer collection facilities impact fee for ~~the North Special Service Area and South Special Service Area in order to continue~~ four separate service areas in the City to maintain the level of service for sewer collection facilities proposed in the 2014 Sewer Collection Impact Fee Facilities Plan and Analysis.~~currently enjoyed by Saratoga Springs residents regarding the existing sewer facilities and the improvements as set out in the Analysis Supporting the Adjusted Wastewater Impact Fee.~~

~~2. Establishing the North Special Service Area and South Special Service Area and establishing wastewater impact fees for those area.~~

~~3. The analyses and studies identify the need for the wastewater impact fees for the North and South Special Service Areas and demonstrate why the impact fees for those areas are fair in light of the circumstances relating to the need for sewer facilities to serve the North and South Special Service Areas.~~

2. The 2014 Sewer Collection Facilities Impact Fee Plan and Analysis identify the:
   a. projected development activity in the City through 2020;
   b. level of service for sewer collection facilities that serve existing residents;
   c. excess sewer collection 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 sewer collection level of service without burdening existing residents with costs of new development activity; and the
   f. maximum fee that is legally justified by the study.

(Ord. 14-19; Ord. 11-9; Ord. 05-3; Ord. 00-0713-01)

7.05.03. Establishment of ~~North Special~~ Sewer Collection Facilities Service Areas.

The City Council hereby approves and establishes ~~the North Special Service Area for which the Adjusted Wastewater Impact Fee herein provided will be imposed.~~ four sewer collection facilities service areas and acknowledges a fifth area of the city with no sewer collection facilities in place and no facilities planned for construction with public funds through 2020. The ~~North Special Service Area shall include all land in the City not included in the South Special Service Area.~~sewer service areas are depicted on exhibit C.

(Ord. 14-19; Ord. 11-9; Ord. 05-3; Ord. 00-0713-01)

~~**7.05.04. South Special Service Area.**~~

~~The City Council hereby changes the name and designation of the Special Service Area established in Ordinance No. 00-0713-01 to the South Special Service Area in order to help distinguish that Special Service Area from the North Special Service Area being established by this Ordinance. Per Ordinance No. 00-0713-01, the South Special Service Area shall include the approved subdivision plats for Lake Mountain Estates and Pelican Bay.~~

~~(Ord. 11-9; Ord. 05-3; Ord. 00-0713-01)~~

7.05.~~05~~04. Adoption and Imposition of ~~Wastewater~~ Sewer Collection Facilities Impact Fees.

1. A Sewer Collection Impact Fee for all new development activity shall be calculated as a multiple of water supply fixture units, in each service area, with the minimum residential connection (ERC) equal to 40 water supply fixture units.

a. North Service Area-Posey sewer collection impact fee = $1020 per ERC;
b. South Service Area sewer collection impact fee = $642 per ERC;
c. Harbor Bay North Service Area sewer collection impact fee = $1987 per ERC;
d. Harbor Bay South Service Area sewer collection impact fee = $3580 per ERC

2. The sewer collection facilities impact fee for new non-residential development activity shall be calculated by dividing the number of water supply fixture units proposed by the approved building plans by 40 water supply fixture units and then by multiplying that number by the impact fee per ERC that has been imposed in the service area in which the development activity will occur:

wsfu ÷ 40 wsfu x Service Area Sewer Collection Impact Fee (per ERC)

(Ord. 14-19, Ord. 11-9; Ord. 00-0713-01)

~~1. **North Special Service Area.** The City Council hereby approves and imposes and levies on all Development Activity in the North Special Service Area the Wastewater Impact Fee in the amount of $1,200 per residential connection. In adopting the Wastewater Impact Fee for the North Special Service Area, the City Council hereby adopts the Analysis Supporting the Wastewater Impact Fee, the analysis reflected therein and the methodology used for the calculation of the Wastewater Impact Fee imposed for the North Special Service Area by this Chapter.~~

~~(Ord. 11-9; Ord. 05-3)~~

~~2. **South Special Service Area.** The City Council hereby approves and imposes and levies on all Development Activity in the Special Service Area, other than Development Activity by owners of SSD Reserved Connections, the Wastewater Impact Fee in the amount of $1,200 per residential connection. In adopting the Wastewater Impact Fee, the City Council hereby adopts the justification for the Wastewater Impact Fee, the analysis reflected therein and the methodology used for the calculation of the Adjusted Wastewater Impact Fee imposed by this Chapter.~~

~~(Ord. 11-9; Ord. 00-0713-01)~~

~~**7.05.06. Stacked Unit, Multi-Family Residential Dwellings.**~~

~~Impact fees for stacked unit, multi-family residential dwelling units shall be computed at 0.5 Equivalent Residential Units (ERUs) per individual dwelling unit in a building.~~

~~(Ord. 11-9; Ord. 10-3)~~

7.05.~~07~~05. Use of ~~Wastewater~~ Sewer Collection Facilities Impact Fees.

The ~~Wastewater~~ Sewer Collection Facilities Impact Fees collected by the City ~~in the North and South Special Service Areas~~ shall be used as provided in ~~the Analyses and Studies Supporting~~

~~the Wastewater Impact Fee and as provided in the City's Impact Fee Chapter.~~2014 Sewer Collection Impact Fee facilities Plan and Analysis.

(Ord. 14-19; Ord. 11-9; Ord. 05-3; Ord. 00-0713-01)

7.05.~~08~~06. Adjustments.

1. At the time an impact fee is charged, ~~The~~the City ~~may~~ shall adjust the calculation of all, or any component, of the Sewer Collection Facilities impact fees imposed by this Chapter as necessary in order 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.~~; and~~

2. At the time an impact fee is charged, ~~allow credits as approved by the~~~~The~~the City Council ~~for~~ shall allow credit against, or proportionate reimbursement from, impact fees for the:
   a. dedication of land for~~, improvements to,~~ a System Improvement; and
   b. full or partial construction of:
      i. ~~Public Facilities providing services to the City at large, provided such facilities are~~ System Improvements identified in the ~~Capital~~ Sewer Collection Impact Fee Facilities Plan; or ~~Facilities Plan and are required by the City as a condition of approving the development or Development Activity.~~
      ~~i.~~ii. publicly accepted and dedicated capital improvement that will offset the need for a System Improvement.

(Ord. 14-19; Ord. 11-9; Ord. 05-3; Ord. 00-0713-01; Ord. 99-0413-1)

7.05.~~09~~07. Accounting, Expenditure, and Refunds.

The City shall account for, expend and refund ~~Wastewater~~ Sewer Collection Impact Fees in accordance with this Chapter and the Utah Impact Fees Act.

(Ord. 14-19; Ord. 11-9; Ord. 05-3; Ord. 00-0713-01; Ord. 99-0413-1)

7.05.~~10~~08. Impact Fee Challenges and Appeals.

~~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.~~

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

2. ~~Within two weeks of the receipt of the request for information, the~~The City shall provide the person ~~or entity~~ with a copy of the ~~written analysis required by the Utah~~Sewer Collection Impact Fee ~~Act~~ Facilities Plan, the specific calculation staff used to calculate the Sewer Collection Impact Fee for the person, if applicable, 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.

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 ~~or entity~~ who has paid the fee and wishes to challenge the fee shall file:

   a. a written appeal with the City Hearing Examiner;~~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.~~
   b. A request for arbitration;
   ~~a.~~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 tehe fee being appealed.
   ~~b.~~a. Upon receipt of an appeal, the City ~~Council~~ Hearing Examiner shall ~~thereafter~~ schedule a ~~public~~ hearing ~~on the appeal at which time~~and shall consider all ~~interested persons will be given an opportunity to be heard.~~evidence presented by the appellant, as well as all evidence presented by staff. The City ~~Council~~ Hearing Examiner shall schedule the appeal hearing and thereafter render its written findings of fact, conclusions of law, and decision ~~on the appeal~~ no later than thirty days after the challenge to the impact fee is filed.
   ~~c. 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.~~
   ~~d.~~b. Within ninety days of a decision upholding an Impact Fee by the City ~~Council~~ Hearing Examiner or within 120 days after the date the challenge to the impact fee was filed, whichever is earlier, ~~any party~~the person who filed 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 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. ~~the~~ court's review is limited to the record provided by the City; and

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

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

6. If the request is for arbitration, both the City and the person requesting arbitration shall comply with UCA § 11.36a.705.

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. 14-19; Ord. 11-9; Ord. 05-3; Ord. 00-0713-01; Ord. 99-0413-1)

7.05.~~11~~09. Severability.

If any section, subsection, sentence, clause, or portion of this Chapter is, for any reason, held to be 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. 14-19; Ord. 11-9; Ord. 05-3; Ord. 00-0713-01)

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 a short summary of this ordinance for at least one publication in a newspaper of general circulation in the City.

ADOPTED AND PASSED by the City Council of the City of Saratoga Springs, Utah, this 15 day of July, 2014.

Signed: _____
Jim Miller, Mayor

Attest: _____
Lori Yates, City Recorder

7-15-14
Date

VOTE

Shellie Baertsch	Aye
Rebecca Call	Aye
Michael McOmber	Aye
Bud Poduska	Aye
Stephen Willden	Aye

City of SARATOGA SPRINGS CORPORATE SEAL STATE OF UTAH

City of Saratoga Springs

Sewer Capital Facilities Plan

Project No. 305-11-01

Prepared by:

Bowen Collins
& Associates, Inc.
CONSULTING ENGINEERS

May 2014

Saratoga Springs
Sewer Capital Facilities Plan

Prepared for:

CITY OF

SARATOGA SPRINGS

Prepared by:

Bowen, Collins & Associates
154 East 14000 South
Draper, UT 84020

Bowen Collins
& Associates, Inc.
CONSULTING ENGINEERS

LICENSED PROFESSIONAL ENGINEER
29 MAY 2014
343787
KEITH J.
LARSON
STATE OF UTAH

May 2014

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EXECUTIVE SUMMARY
IMPACT FEE FACILITIES PLAN

INTRODUCTION

The City of Saratoga Springs retained Bowen Collins & Associates (BC&A) to prepare a wastewater impact fee facilities plan following the requirements of Section 11-36a of Utah code. The primary purpose of this plan is to summarize the cost of projects needed to meet existing and future users' needs for the City's wastewater collection system and to identify those improvements that qualify to be used in the calculation of impact fees.

PROJECTED WASTEWATER SYSTEM GROWTH

To assemble and calibrate a hydraulic model of the City's wastewater collection system, it is necessary to project how wastewater flows will increase in the future. Based on the projected growth and development expected in the City, the projected sewer production for the City is summarized in Table ES-1.

Table ES-1
Population and Design Sewer Flow Projections

Year	ERCs	Design Sewer Flow (mgd)
2012	5,059	1.29
2013	5,430	1.38
2014	5,812	1.48
2015	6,194	1.58
2016	6,576	1.68
2017	7,377	1.88
2018	7,986	2.04
2019	8,671	2.21
2020	9,541	2.43
2021	10,207	2.60
2022	10,877	2.77

EVALUATION CRITERIA AND LEVEL OF SERVICE

In evaluating the performance of the collection system, it is necessary to first define the required level of service for the various components of the system. The level of service used to evaluate system needs is the same for both existing and future customers and is summarized in Table ES-2.

Table ES-2
Evaluation Criteria for System Level of Service

Criteria	Value
Design Sewer Flow Allowance per ERC including I&I (gpd)	255
Design Flow Peaking Factor	2.5
Maximum Allowable Depth to Diameter Ratio for Peak Flow conditions	0.80
Maximum Velocity in Force Mains (ft/sec)	7.0
Maximum Distance Between Force Main Cleanouts (ft)	1,200
Maximum Allowable Peak Flow to Pump Capacity Ratio at Lift Stations	0.85
Maximum Cycles Per Hour at Lift Station (as a result of wet well volume)	6

RECOMMENDED SYSTEM IMPROVEMENTS

The City can be separated into two service areas, a south area (currently served by the Inlet Park Lift Station), and a north area (currently served by the Posey Lift Station). Projects for each service area required in the next 10 years to satisfy level of service standards as defined above are summarized in Tables ES-3 and ES-4. To satisfy the requirements of state law, the tables also provide a breakdown of the capital facility projects and the percentage of the project costs attributed to existing and future users. It will be noted that a few projects have been included in both tables because they benefit both service areas. For these projects, total costs have been divided between the two service areas based on the projected growth within the planning window.

Table ES-3
Impact Fee Facilities Plan, South Service Area - Costs Required for Future Growth

Project No.	Year of Project (FYE)	Project Description	Estimated Total Cost	Percent to Existing	Percent to 10-year Growth	Percent to Growth Beyond 10 Years	Cost to Existing	Cost to 10-year Growth	Cost to Growth Beyond 10 Years
SS-S1.1	2014	River Crossing Phase 1, Alignment & Preliminary Design Study*	$49,154	7.9%	9.5%	82.6%	$3,874	$4,691	$40,588
SS-S1.2	2018	River Crossing Trunk Phase 2, Bridge or Siphon*	$565,760	7.9%	9.5%	82.6%	$44,590	$53,999	$467,171
SS-S1.3	2018	River Crossing Trunk Phase 3, Outfall*	$1,801,486	7.9%	9.5%	82.6%	$141,984	$171,942	$1,487,561
SS-S2.1	2014	Inlet Park Trunk Phase 1, Near Lift Station	$1,399,000	0.0%	16.2%	83.8%	$0	$227,132	$1,171,868
SS-S2.2	2015	Inlet Park Trunk Phase 2, Golf Course Main	$1,654,000	12.6%	12.9%	74.5%	$208,218	$213,386	$1,232,397
SS-L1	2015	Lift Station 1 Pump Upgrade	$300,000	0.0%	11.9%	88.1%	$0	$35,644	$264,356
SS-S4.1	2022	700 South Trunk –First Half	$4,650,600	0.0%	2.0%	98.0%	$0	$92,528	$4,558,072
Totals			**$10,420,000**				**$398,665**	**$799,321**	**$9,222,014**

*Where indicated, projects benefit both south and north service areas. Project costs divided based on projected growth in each area during the planning window.

Table ES-4
Impact Fee Facilities Plan, North Service Area - Costs Required for Future Growth

Project No.	Year of Project (FYE)	Project Description	Estimated Total Cost	Percent to Existing	Percent to 10-year Growth	Percent to Growth Beyond 10 Years	Cost to Existing	Cost to 10-year Growth	Cost to Growth Beyond 10 Years
SS-S1.1	2014	River Crossing Phase 1, Alignment & Preliminary Design Study*	$50,846	7.9%	9.5%	82.6%	$4,007	$4,853	$41,986
SS-S1.2	2018	River Crossing Trunk Phase 2, Bridge or Siphon*	$585,240	7.9%	9.5%	82.6%	$46,126	$55,858	$483,257
SS-S1.3	2018	River Crossing Trunk Phase 3, Outfall*	$1,863,514	7.9%	9.5%	82.6%	$146,872	$177,862	$1,538,780
SS-N1	2018	North Trunk	$9,546,000	9.6%	7.2%	83.3%	$912,945	$683,841	$7,949,215
SS-N2	2020	200 West Trunk	$2,351,000	0.0%	3.1%	96.9%	$0	$72,824	$2,278,176
Totals			**$14,396,600**				**$1,109,950**	**$995,237**	**$12,291,413**

*Where indicated, projects benefit both south and north service areas. Project costs divided based on projected growth in each area during the planning window.

EXISTING CAPACITY AVAILABLE TO SERVE NEW GROWTH

In addition to using capacity in the new projects contained in the impact fee facility plan, future growth will also utilize a portion of excess capacity in existing facilities. To calculate the percentage of existing capacity to be used by future growth, BC&A examined the model results in each facility paid for by the City. The calculated percentage of existing capacity used by growth during the 10 year planning window in facilities paid for by the City is as shown in Tables ES-5 and ES-6 below. Table ES-5 includes facilities paid for directly by the City. In addition to these facilities, the City has also recently paid for the remaining capacity in some facilities constructed by developers that have historically been subject to a pioneering agreement. Table ES-6 includes the future capacity to be used in association with these recent reimbursement agreements.

Table ES-5
Existing Facility Capacity Used by Growth

Project ID	Project Description	Percent to Existing	Percent to 10-year Growth	Percent to Growth Beyond 10 Years
SAR.016	Inlet Park Sewer Force Main	27.4%	26.8%	45.9%
SAR.017	Inlet Park Lift Station	58.1%	41.9%	0.0%
SAR.019	Sewer Line between 6800 North (400 South) and Entrance to SSD	25.7%	25.1%	49.2%
SAR.104	Smiths Sewer Outfall*	9.3%	40.1%	50.6%
SAR.126	Inlet Park Lift Station Upgrade	58.1%	41.9%	0.0%
SAR.151A	Extend Posey Force Mains to TSSD	68.5%	31.5%	0.0%
SAR.151B	Posey Lift Station Upgrade	68.5%	31.5%	0.0%
SAR.207	Harbor Bay Park Lift Station Upgrade	11.9%	5.3%	82.8%
SAR.266	TSSD Meter Station	8.8%	8.7%	82.6%

*For components with multiple facilities, a weighted average was developed of available capacity used by future growth.

Table ES-6
Reimbursement Agreement Capacity Used by Growth

Project ID	Project Description	Percent to 10-year Growth	Percent to Growth Beyond 10 Years
RA.1	Inlet Park SSD Reimbursement Agreement*	66.7%	33.3%
RA.2	Inlet Park Lakeview Reimbursement Agreement*	23.6%	76.4%

*For components with multiple facilities, a weighted average was developed of available capacity used by future growth.

CHAPTER 1
INTRODUCTION AND BACKGROUND

INTRODUCTION

The City of Saratoga Springs has retained Bowen Collins & Associates (BC&A) to prepare a capital facilities plan for the City's wastewater collection system. The primary purpose of this Sewer Capital Facilities Plan is to provide recommended improvements to resolve existing and projected future deficiencies in the City of Saratoga Springs wastewater collection system based on the City's adopted General Plan. As part of this process, this report will also include an Impact Fee Facilities Plan following the requirements of Section 11-36a of Utah code.

SCOPE OF SERVICES

The general scope of this project involved a thorough analysis of the City of Saratoga Spring's sewer system and its ability to meet the present and future wastewater needs of its residents. As part of this project, BC&A completed the following tasks:

Task 1: Updated existing and future sewer service requirements based on Saratoga Springs growth, its General Plan, and projected growth patterns.

Task 2: Used a calibrated hydraulic sewer model to simulate operation of existing facilities under current development conditions.

Task 3: Used the hydraulic sewer model to simulate operation of facilities with recommended improvements under changes to projected future conditions to identify the impacts of future development on sewer facilities.

Task 4: Used the hydraulic sewer model to evaluate alternative improvements that would resolve the system deficiencies identified in Tasks 2 and 3.

Task 5: Prepared a capital facility plan report to document the analytical procedures used in completing the study and summarize the conclusions reached.

Task 6: Developed an impact fee facilities plan for City budgeting and planning purposes.

Task 8: Conducted progress and coordination meetings as required to keep City staff involved and informed of progress and activities.

This document is a working document. Some of the recommended improvements identified in this report are based on the assumption that development and/or potential annexation will occur in a certain manner. If future growth or development patterns change significantly from those assumed and documented in this report, the recommendations may need to be revised.

AUTHORIZATION

Saratoga Springs contracted the services of BC&A to prepare this Sanitary Sewer System Capital Facilities Plan in November of 2011. The initial draft facility plan study and associated report were completed December 2012. The final plan was completed in May 2014.

IMPACT FEE FACILITIES PLAN CERTIFICATION

The analysis contained in this report has been prepared based on growth and system information provided by the City of Saratoga Springs. Based on the data and growth assumptions provided and assuming the City follows the improvement plan outlined in this report, BC&A certifies that, to the best of our knowledge and in accordance with Section 11-36a-306, this impact fee facilities plan:

1. Includes only the costs for qualifying 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 for operation or 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 every other relevant respect with the Impact Fees Act.

By Keith J. Larson

PROJECT STAFF

The project work was performed by the BC&A team members listed below. Team member's roles on the project are also listed. The project was completed in BC&A's Draper, Utah office. Questions may be addressed to Keith Larson, Project Manager at (801) 495-2224.

Jason Luettinger	Principal-In-Charge
Keith Larson	Project Manager
Andrew McKinnon	Project Engineer
Angela Hansen	Word Processing

CHAPTER 2
EXISTING SYSTEM DESCRIPTION

SERVICE AREA

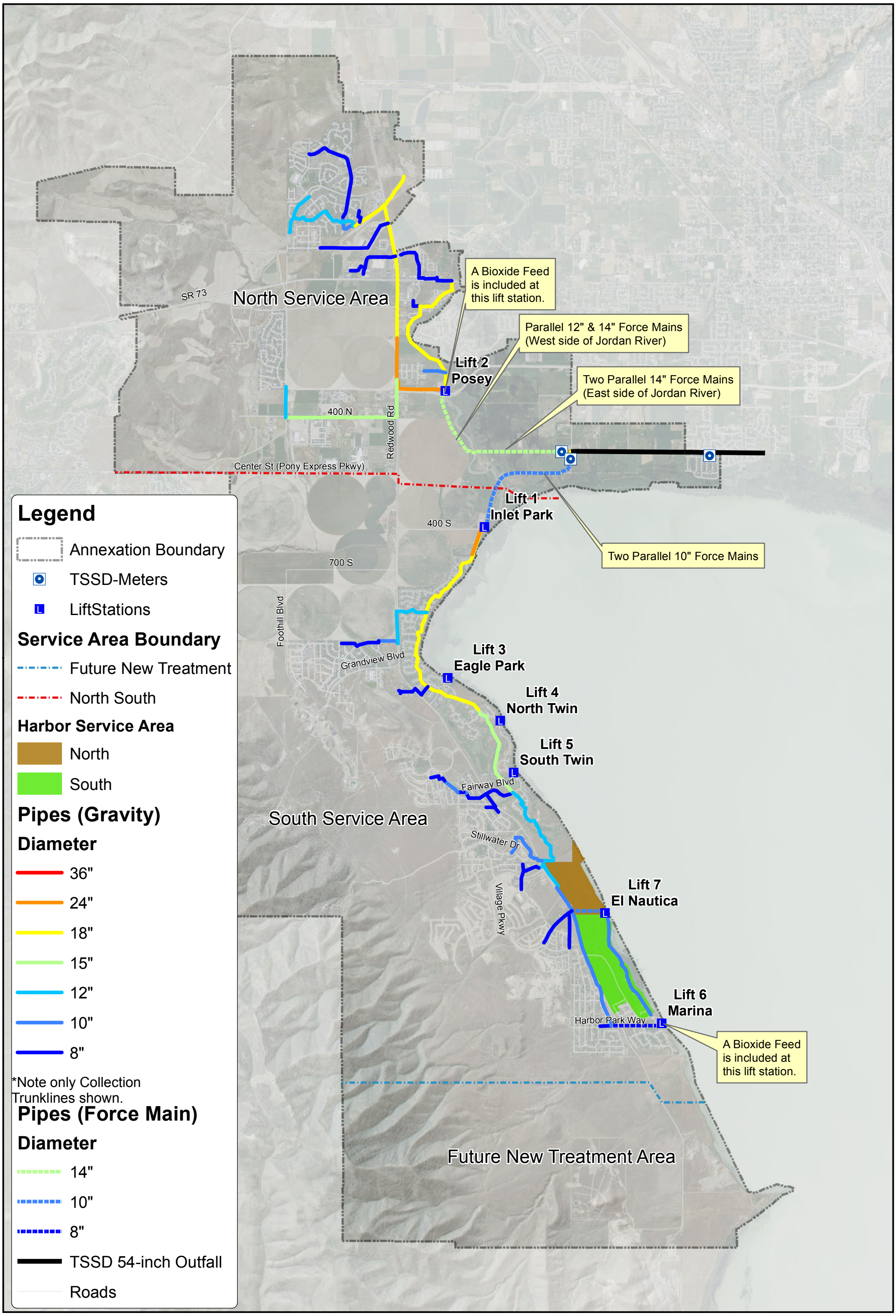
The City of Saratoga Springs, which first incorporated in 1997, is bounded to the west by the Lake Mountains and Eagle Mountain City and to the east and northeast by Utah Lake and Lehi City. Figure 2-1 shows the approximate planning extent of Saratoga Springs along with the City's major collection system components. The topography of the majority of the City slopes west to east toward either Utah Lake or the Jordan River. For the purposes of this report, it has been assumed that the future service area of the City's wastewater collection system will be limited to the annexation boundaries of the City as shown in Figure 2-1.

For the purpose of impact fees, the City's overall service area has been divided into three major impact fee areas (with two additional subareas). These impact fee areas are shown in Figure 2-1, and they include the following:

- North Service Area – Through the middle of the City is a major sewer trunk line owned by Eagle Mountain. The size and depth of this trunk line effectively blocks Saratoga Springs sewer drainage facilities from moving from one side of the City to the other. As a result, the City essentially operates two separate systems until their combination point at the TSSD outfall at the east end of the City. The north portion of this area will be identified in this report as the North Service Area.
- South Service Area – Most of the area south of the Eagle Mountain trunk line has been identified as the South Service Area. Within this area are two subareas that must be considered for impact fee purposes. This includes the North and South Benefited Areas of the Harbor Bay Lift Station. These areas are functionally part of the South Service area but include additional reimbursement agreements that affect development that falls within the areas. A detailed figure identifying these subareas and their associated facilities has been included in the appendix of this report.
- Future Treatment Service Area – As part of previous master plans, it was decided that the City collection system would only extend to the south as far as the service area of the Marina Lift station. All areas to the south of this boundary will be served by a future treatment plant. As a result, development in this service area will be exempt from impact fees, but will need to develop plans for conveyance and treatment on its own.

EXISTING FACILITIES

Saratoga Springs was incorporated in December of 1997. As a relatively new City, much of its existing infrastructure was built by developers as part of individual developments. This infrastructure was then turned over to the City as the developments were incorporated into the City. Because of how the system was constructed, much of the sewer collection infrastructure currently owned by the City still has obligations to be paid to the developer who built the infrastructure as new development connects to the facilities. These obligations, referred to as



Bowen Collins & Associates, Inc.
CONSULTING ENGINEERS

SARATOGA SPRINGS
SEWER CAPITAL FACILITIES PLAN

EXISTING COLLECTION SEWER TRUNKS & LIFT STATIONS

NORTH: NORTH

SCALE: 0 2,000 4,000 Feet

FIGURE NO. 2-1

P:\Saratoga Springs\2011 Capital and Impact Fee Facilities Plans\4.0 GIS\4.1 Projects\SewerMaps\Figure 2-1 - Existing Facilities.mxd amckinnon 1/15/2014

pioneering agreements, will need to be considered in detail as part of the impact fee analysis prepared for the sewer collection system.

LIFT STATIONS

The City's entire sewer production is treated at the Timpanogos Wastewater Treatment Plant (WWTP), which is owned by the Timpanogos Special Services District (TSSD). This plant is located near the northeast corner of Utah Lake at a slightly higher elevation than the shoreline of the lake that runs the length of much of the City. As a result, much of the City's service area must be pumped to gravity pipelines that flow to the treatment plant.

The Posey Lift Station collects flow from the north end of the City while the Inlet Park Lift Station collects flow from the south end. Both of these lift stations pump through force mains to discharge into a TSSD 54-inch main at approximately 7350 North 9550 West (Lehi City address system). There are five other smaller lift stations that discharge into the City's Inlet Park sewer trunk main. This trunk begins at Harbor Park Way and Redwood Road and flows north to the Inlet Park Lift Station. Table 2-1 summarizes some of the characteristics of each lift station. Lift station capacity is based on the reliable capacity of each station. Reliable capacity is defined as the capacity with one pump out of service (e.g. for a pump station with three pumps, reliable capacity is the capacity of two pumps running with one standby).

Table 2-1
Existing Public Lift Stations

Lift Station	Address[a]	Impeller Size	Wet Well Volume[c] (gallons)	Pump Count & Motor Size (HP)	Design Flow (gpm)	Design Head (ft)
1 – Inlet Park	400 S. Saratoga Rd	14"	4,600	3 – 40	1,600[b]	68
2 – Posey	Pioneer Crossing, Jordan River	15"	5,200	3[d] – 50	2,000[b]	83
3 – Eagle Park	1448 S. Cottonwood Lane	4"	2,500	2[d] – 7 ½	110	N/A
4 – North Twin	1800 S. Centennial Blvd	4"	2,500	2 – 7 ½	110	N/A
5 – South Twin	2170 S. Centennial Blvd	4"	2,500	2 – 7 ½	110	N/A
6 – Marina	275 E. Cascade Court	4"	2,500	2[d] – 25	350	140
7 – El Nautica	100 W. 3000 S. (Harbor Bay)	6"	3,500	3 – 20	550[b]	140

[a] Addresses are approximate
[b] Estimated capacity with two pumps running
[c] Values shown represent approx. effective wet well volume based on as-built drawings and wet well level settings
[d] Lift stations indicated include provisions to add an additional pump on the existing manifold

All of the City's lift stations are connected to the City's SCADA system. The SCADA system currently provides real time data collection at each station for items such as pump status and wet well level. The SCADA does not yet include the capability for remote operation, but the City plans to add this in the future. The planned collection areas for each of the smaller lift stations (Lift Stations 3 through 7) have been delineated and are included in this report in the appendix.

COLLECTION SYSTEM

Table 2-2 lists the recorded length of pipe in the City's collection system as documented in the City's geographic database as of December 2011.

Table 2-2
Saratoga Springs Collection System Pipe Lengths

Gravity Mains		
Diameter (in)	**Length (ft)**	**Length (mi)**
4	982	0.19
6	3,482	0.66
8	119,424	22.62
10	5,592	1.06
12	9,480	1.80
14	8,243	1.56
15	3,174	0.60
18	11,652	2.21
24	1,542	0.29
36	59	0.01
54	9,247	1.75
Total	**172,877**	**32.74**
Pressure Force Mains		
4	982	0.19
6	3,482	0.66
8	2,499	0.47
10	12,685	2.40
14	8,243	1.56
Total	**27,891**	**5.28**
Total All Pipes	**200,768**	**38.02**

It should be noted that because of the rapid growth in the City, there are some portions of the existing collection system that have not yet been inventoried as part of the City's geographic database. The City is currently in the process of collecting data to complete the inventory of its sewer manholes and sewer mains as part of its asset management program. As it moves forward, the City is also requiring developers to submit manhole and sewer main data in a compatible geographic database and format to aid in the collection of asset management data. It should be emphasized that those areas with missing manhole and pipeline data consist strictly of smaller diameter collection piping for individual project level improvements. As a result, none of the data remaining to be collected is necessary for the completion of this study. All the data required to evaluate larger diameter system level improvements is included in the City's geographic database.

METERING STATIONS

At the downstream end of the collection system, the City's sewer flow is metered before being discharged into TSSD's 54-inch trunk line. Table 2-3 summarizes the characteristics of the three existing metering stations serving the City. All of these metering stations are owned and operated by TSSD.

Table 2-3
TSSD Sewer Metering Stations for Saratoga Springs

Meter Station	Address	Size	Count	Type
Inlet Park	145 North Saratoga Road	10"	2	Electromagnetic
Posey	145 North Saratoga Road	14"	2	Electromagnetic
Loch Lomond	575 W 145 North	10"	1	Radar

TREATMENT

All of the City's wastewater is treated at the Timpanogos Wastewater Treatment Plant (WTP). TSSD is responsible for all capacity and treatment requirements from the discharge point of the Posey and Inlet Park lift stations and the TSSD's WTP. However, Saratoga Springs does operate and maintain Bioxide feed systems at the Posey and Marina lift stations.

Bioxide Feed Systems

To mitigate the corrosion and odor concerns, the City implemented bioxide treatment in coordination with TSSD in 2008. This consisted of working with Siemens Water Technologies to design and implement a Bioxide storage and feed system to minimize the production of hydrogen sulfide in the wastewater at the Posey and Marina lift stations. Each Bioxide tank is equipped with two pumps, one that provides a continuous feed and another that is on a timer providing increased dosing during peak flows. Table 2-4 provides the current dosing rates and the data provided by TSSD on measured hydrogen sulfide levels.

Table 2-4
Saratoga Springs Bioxide Feed Systems

	Bioxide Tank Volume	Siemens Recommended Bioxide Dosing	Measured Bioxide Dosing 6-5-2012	Low TSSD measured H_2S gas	High TSSD measured H_2S gas	Target H_2S levels
Posey Lift Station	4,500 gal	48 gal/day	45 - 49 gal/day	11 ppm	76 ppm	4 ppm
Marina Lift Station	6,000 gal	96 gal/day	91 - 97 gal/day	4 ppm	20 ppm	4 ppm

Three additional strategies are being implemented to address TSSD's concerns and to provide better data to the City so that the hydrogen sulfide issue can be better managed in the future:

1. An odor logger was purchased so that hydrogen sulfide levels at various locations in the system can be monitored and Bioxide levels adjusted accordingly to maintain reduced levels of gas.
2. A fresh water source will be provided at Posey so that one of the force mains can be filled with water and shut down, eliminating the need to switch lines and preventing clogging in the inactive line. There is an 18-inch culinary line about 50 feet north of the property and easements will be needed to extend a lateral to the lift station property. Currently the force mains are switched approximately every 3 months.
3. The type of Bioxide has been switched from ammoniated Bioxide (Bioxide-AQ) to chlorinated Bioxide (Bioxide-71). Siemens has informed the City that the chlorinated Bioxide will not only help reduce grease build up in the system, but will also provide a more immediate reduction in sulfide gas and will be effective at lower dosing.

CHAPTER 3
PROJECTED WASTEWATER SYSTEM GROWTH

In order to do any kind of future planning, it is necessary to project wastewater flows increases in the future. The purpose of this chapter is to project future wastewater flows associated with City growth.

EQUIVALENT RESIDENTIAL CONNECTIONS

Existing development in Saratoga Springs was quantified using an Equivalent Residential Connection (ERC). ERC's are a way to provide a common unit of measurement with which to combine residential and non-residential development to provide a development total for the City.

Residential development is generally assigned a value of one ERC for every dwelling unit. For non-residential development, the City assigns an ERC value based on a fixture count that is performed at the issuance of the Building Permit. The fixture count is based on the International Plumbing Code (IPC). Each fixture type is assigned a load value in water supply fixture units (wsfu). For example, a kitchen sink has a load factor of 1.4 wsfu based on how much water is used at a kitchen sink. A typical residential toilet has a load factor of 2.2 wsfu because a toilet uses more water than a kitchen sink. Once all the fixtures are identified, all the fixture units are added together for a total fixture unit count. The City also uses the IPC as the plumbing standard used for plan reviews and building inspections. The IPC fixture count method is used to size the water meter and sewer lateral.

For the evaluation of future growth, it has been assumed that the City will continue to use the IPC fixture unit count method to calculate ERCs. Based on historic City practice, a ¾-inch water meter is the minimum size allowed for a residential connection and all connections are considered to be at least one ERC. The maximum fixture count allowed for a ¾-inch residential water meter is 40. For fixture counts greater than 40, a larger meter will be required and a larger value of ERCs will be calculated. For example, a building with a fixture unit count of 87 would have an impact fee unit of 2.2 (87/40 = 2.2).

EXISTING DEVELOPMENT

At the beginning of 2012, the City's database had 5,059 ERC's. Of this, 4,865 of the total ERC's were associated with residential development, and 194 ERC's were associated with non-residential development. For the same period, the US Census Bureau estimated the population of the City to be 21,137 for an average household size of 4.34 people.

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
Building Permit History

Year	Annual Residential Permits	Annual Growth
2000	169	63.10%
2001	483	110.50%
2002	369	40.10%
2003	437	33.90%
2004	383	22.20%
2005	656	31.10%
2006	658	23.80%
2007	489	14.30%
2008	193	4.90%
2009	186	4.50%
2010	232	5.40%
2011	464	10.30%

Saratoga 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. Total growth projections for the City are summarized in Table 3-2.

Table 3-2
Growth Projections

Year	Total Projected ERCs	Annual Projected Growth Rate
2012	5,059	--
2013	5,430	7.33%
2014	5,812	7.03%
2015	6,194	6.57%
2016	6,576	6.17%
2017	7,377	12.18%
2018	7,986	8.26%
2019	8,671	8.58%
2020	9,541	10.03%
2021	10,207	6.98%
2022	10,877	6.56%

ESTIMATING EXISTING SEWER FLOWS

Utah Administrative Code R317-3-2 indicates that, "New sewer systems shall be designed on the basis of an annual average daily rate of flow of 100 gallons per capita per day (0.38 cubic meter per capita per day) unless there are data to indicate otherwise." A review of available flow monitoring data for the system would indicate a lower design flow rate is merited.

Although the City is still relatively young, it has a record of discharge flow rates at its main sewer outfall that has been collected by Timpanogos Special Service District (TSSD) since the City's inception. During the first several years of the City's existence, metered flow results vary significantly from month to month and year to year. This is believed to be the result of meter inaccuracies at the connection points to TSSD. In 2008, however, new meters were installed and consistent results have been observed since that time. For the purposes of establishing historic sanitary sewer flow rates, BC&A examined available TSSD records of average monthly flow from 2009 to 2011. The results of this analysis are summarized in Table 3-3.

Table 3-3
Historic Saratoga Springs Sewer Flows

	Metered Flow to TSSD (mgd)			Flow/ERC (gpd)		
	2009	**2010**	**2011**	**2009**	**2010**	**2011**
Jan	0.714	0.821	0.922	172.8	190.6	205.4
Feb	0.758	0.768	0.733	182.5	178.0	162.5
Mar	0.658	0.714	0.773	157.7	165.2	170.6
Apr	0.885	0.776	0.842	211.0	179.1	184.9
May	0.804	0.906	0.736	190.8	208.7	160.9
Jun	0.763	0.968	1.102	180.2	222.7	239.7
Jul	1.087	1.110	1.147	255.4	254.8	248.3
Aug	0.982	0.957	1.092	230.2	218.6	234.6
Sep	0.803	0.933	0.856	187.9	212.0	182.4
Oct	0.891	0.843	0.863	208.1	190.6	182.5
Nov	0.714	0.735	0.960	166.4	165.4	201.5
Dec	0.742	0.806	0.923	172.6	180.5	192.2

As can be seen in the table, flow varies slightly from month to month with peak flows observed in the summer months and lower flows observed in the winter. To meet treatment and conveyance requirements, the system must be designed to meet peak flows in the system. Based on these results, the observed historic peak month flow in Saratoga Springs is 255 gpd/ERC.

Based on this analysis, it is recommended that the projected unit flow rate for planning be based on the historic flow rate of 255 gpd/ERC. Table 3-4 summarizes the projected wastewater flow in Saratoga Springs based on projected growth as identified above and historic flow rates. Included in the table are annual projections for the next 10 years.

Table 3-4
ERC and Design Sewer Flow Projections

Year	ERCs	Design Sewer Flow (mgd)
2012	5,059	1.29
2013	5,430	1.38
2014	5,812	1.48
2015	6,194	1.58
2016	6,576	1.68
2017	7,377	1.88
2018	7,986	2.04
2019	8,671	2.21
2020	9,541	2.43
2021	10,207	2.60
2022	10,877	2.77

CHAPTER 4
HYDRAULIC MODELING

The Saratoga Springs sanitary sewer system was evaluated as part of this study using a hydraulic modeling computer program. A hydraulic computer model is a mathematical representation of the pipes, manholes, pumps, and wastewater flows found in the sewer collection system. Hydraulic computer models are useful because they allow the user to simulate operation of large, complex sewer systems and consider how future changes in flow will affect those systems.

AUTODESK STORM AND SANITARY ANALYSIS

The computer modeling software used in this study was Autodesk's Storm and Sanitary Analysis (ASSA). ASSA was chosen as the computer modeling software because of ability to simulate the full profile of sewer flows under gravity, pressure, and surcharging conditions and its availability as an extension of Autodesk's Civil 3D (a software system commonly owned by many municipalities).

GEOMETRIC MODEL DEVELOPMENT

There are two major types of data required to create a hydraulic model of a sewer system: geometric data and flow data. Geometric data consists of all information in the model needed to represent the physical characteristics of the system.

Modeled Pipelines

For the purposes of this study, it was only necessary to include the City's primary conveyance trunk lines as part of the hydraulic model. These system level improvements include those pipelines that serve more than a single development project and are consequently eligible for inclusion in impact fee calculations. In the future, the City could consider adding smaller, project level collection mains to the hydraulic model for inventory purposes. However, the more refined the analysis becomes, the more time, effort, and expense are needed to assemble and calibrate the model. Hence, it is important to consider the required accuracy and available budget when selecting sewer lines to model.

The major sewer mains included in the hydraulic model were shown in Figure 2-1 (see Chapter 2). The final selection of sewer lines included in this model was reviewed and approved by Saratoga Springs personnel.

Information on the physical characteristics of the pipes included in the model were collected and assembled by Saratoga Springs personnel. A basic framework for the model was developed using Saratoga Springs geographic information system (GIS) records. The City's GIS database included information on the diameter, length, and location of each pipe to be included in the model. Manhole rim elevations were collected by City survey crew. Inverts were based on measure downs collected by wastewater collection personnel.

Modeled Lift Stations

The four largest lift stations in the Saratoga Springs collection system were simulated as part of the hydraulic model. This includes the Posey, Inlet Park, El Nautica, and Marina lift stations. The three remaining existing lift stations serve relatively small service areas that are nearly built-out. Instead of modeling these three individual pump stations, their discharge flows were simply assigned as an inflow at their corresponding discharge manholes. Details for existing lift station characteristics were summarized in Chapter 2.

In addition to these existing lift stations, it is expected that at least one more future lift station will be required to service developable areas not currently serviced by any existing lift station.

FLOW MODEL DEVELOPMENT

The second type of data required by the hydraulic model is sewer flow into the pipes being modeled. Required information includes magnitude of flow, point of entry into the system, and a description of how flow varies with time (to establish peak demand and consider the effects of flow travel time in the system).

Sewer flows for existing and future conditions were calculated based on projections of ERCs as estimated in the City's general plan and land use projections. Existing flows were distributed to the nearest manholes in the hydraulic model. Future flows were distributed into the collection system based on the nearest available collection lines or future collection lines that will be installed. The location of future pipes are indicated as part of the system improvements discussed in Chapter 6.

A distribution of flow over time was accomplished using a composite diurnal curve as shown in Figure 4-1. Table 4-1 summarizes the ratio of flow to average day flow over 24 hours. Because of limited historical data for the City, this diurnal pattern was assembled by BC&A based on flow monitoring conducted in similar municipalities in Utah County. It estimates the average effect of all development including residential, commercial, and industrial demands. The curve includes a maximum peaking factor of 2.5 to match the required peaking factor for interceptor and outfall sewers in State of Utah requirements.

Figure 4-1
Diurnal Patterns Applied to Hydraulic Model

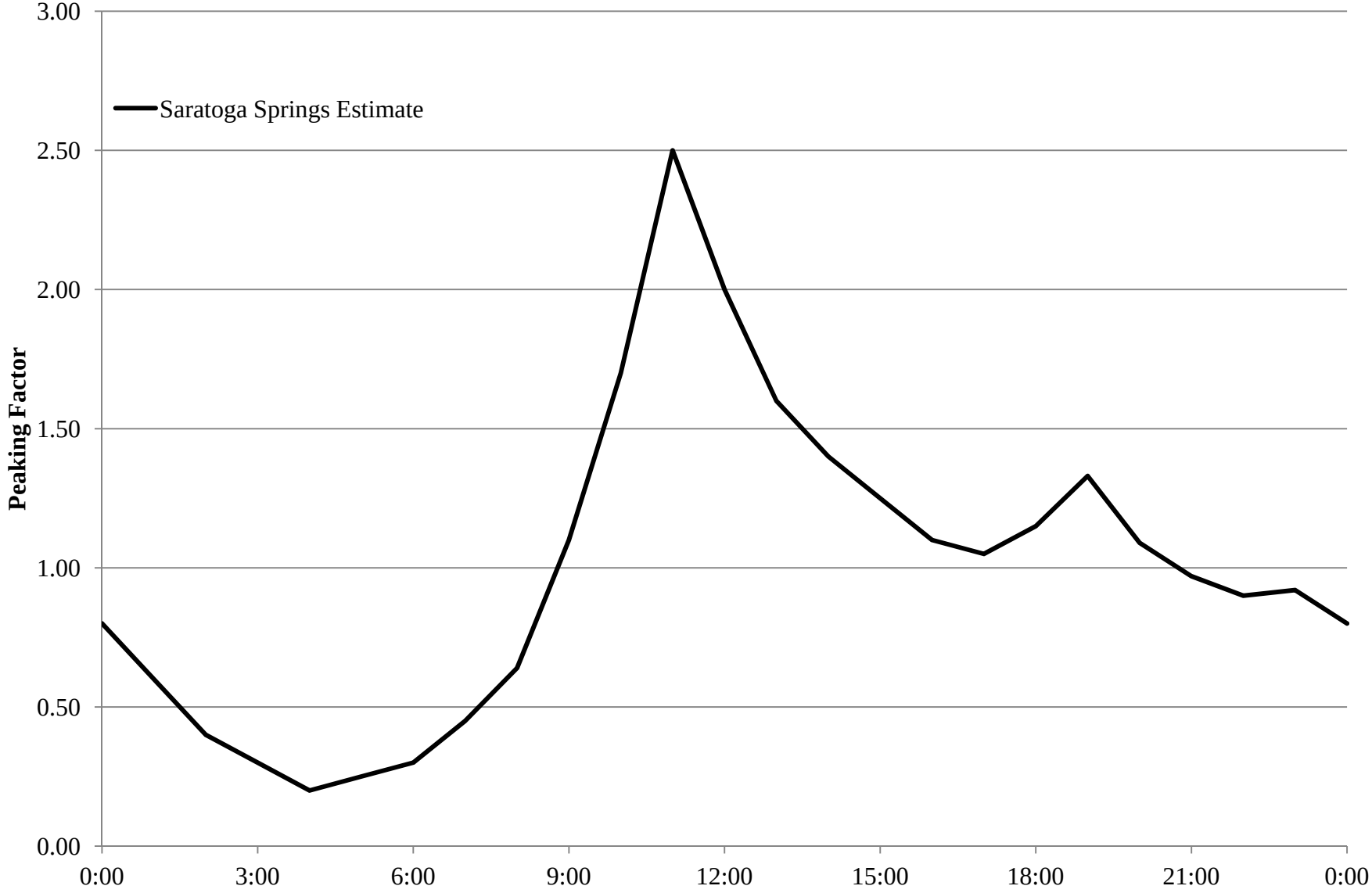


Table 4-1
Hydraulic Model Diurnal Pattern

Hour	Ratio of Average Day Flow
0	0.80
1	0.60
2	0.40
3	0.30
4	0.20
5	0.25
6	0.30
7	0.45
8	0.64
9	1.10
10	1.70
11	2.50
12	2.00
13	1.60
14	1.40
15	1.25
16	1.10
17	1.05
18	1.15
19	1.33
20	1.09
21	0.97
22	0.90
23	0.92
24	0.80

CHAPTER 5
SYSTEM EVALUATION

With the development and calibration of a hydraulic sewer model, it is possible to simulate sewer system operating conditions for both present and future conditions. The purpose of this chapter is to evaluate hydraulic performance of the collection system and identify potential hydraulic deficiencies.

EVALUATION CRITERIA AND LEVEL OF SERVICE

In evaluating the performance of the collection system, it is necessary to first define the required level of service for the various components of the system. This level of service is the same for both existing and future customers:

Sewer Main Level of Service

Saratoga Springs Engineering Standards and Specifications (adopted May 2004) require that all sewer mains be designed such that the peak daily flow depth in the pipe is less than or equal to 80 percent of the pipe's diameter. This design standard will be used as the level of service for system evaluation. Note that the hydraulic capacity of a pipe at 80 percent full (depth to diameter) is nearly equal to the capacity of the pipe at 100 percent full (a phenomenon related to increased friction as the depth in the pipe increases beyond 80 percent).

Force Main Level of Service

Saratoga Springs Engineering Standards and Specifications require that lift station force mains should be designed such that peak velocity through the force main does not exceed 7 ft/sec. By eliminating excessive pipeline velocities, this standard optimizes pump efficiency, limits potential for hydraulic surge issues, and maximizes the life of the force main. It is also required that all force mains have a minimum diameter of 6 inches and that the maximum distance between clean outs along the pipeline be no greater than 1,200 feet. This is to facilitate cleaning of the force mains using the City's jet truck equipment (max reach of approximately 600 feet).

Lift Station Level of Service

Based on industry standards and good design practice, it is recommended that peak daily flow to a lift station not exceed 85 percent of the lift station's hydraulic pumping capacity. Allowing for a modest amount of capacity above projected flows accounts for unknowns associated with flow projections and mechanical wear at each lift station. The minimum design level of service for lift stations has correspondingly been established at 15 percent higher than estimated peak flows at build-out.

The minimum wet well volume for lift stations should be large enough to prevent excessive cycling of lift station pumps. Based on manufacture recommendations for pump operation, the maximum number of cycles per hour should be six or less. Exceeding this value will

significantly shorten the lifespan of the lift station pumps. The number of cycles that will occur at a lift station can be calculated using one of the following two equations:

Equation 1: $V_{min} \geq \frac{60 \times Q_D(Q_P - Q_D)}{N \times Q_P}$ When $Q_D < 0.5 * Q_p$

Equation 2: $V_{min} \geq \frac{15 \times Q_P}{N}$ When $Q_D \geq 0.5 * Q_p$

Where:

N – Maximum number of cycles per hour
Q_D – Peak design flow into the wet well
Q_P – Pump capacity out of wet well

Table 5-1 lists a summary of the evaluation criteria used in this capital facilities plan.

Table 5-1
Evaluation Criteria for System Level of Service

Criteria	Value
Design Sewer Flow Allowance per ERC including I&I (gpd)	255
Design Flow Peaking Factor	2.5
Maximum Allowable Depth to Diameter Ratio for Peak Flow conditions	0.80
Maximum Velocity in Force Mains (ft/sec)	7.0
Maximum Distance Between Force Main Cleanouts (ft)	1,200
Maximum Allowable Peak Flow to Pump Capacity Ratio at Lift Stations	0.85
Maximum Cycles Per Hour at Lift Station (as a result of wet well volume)	6

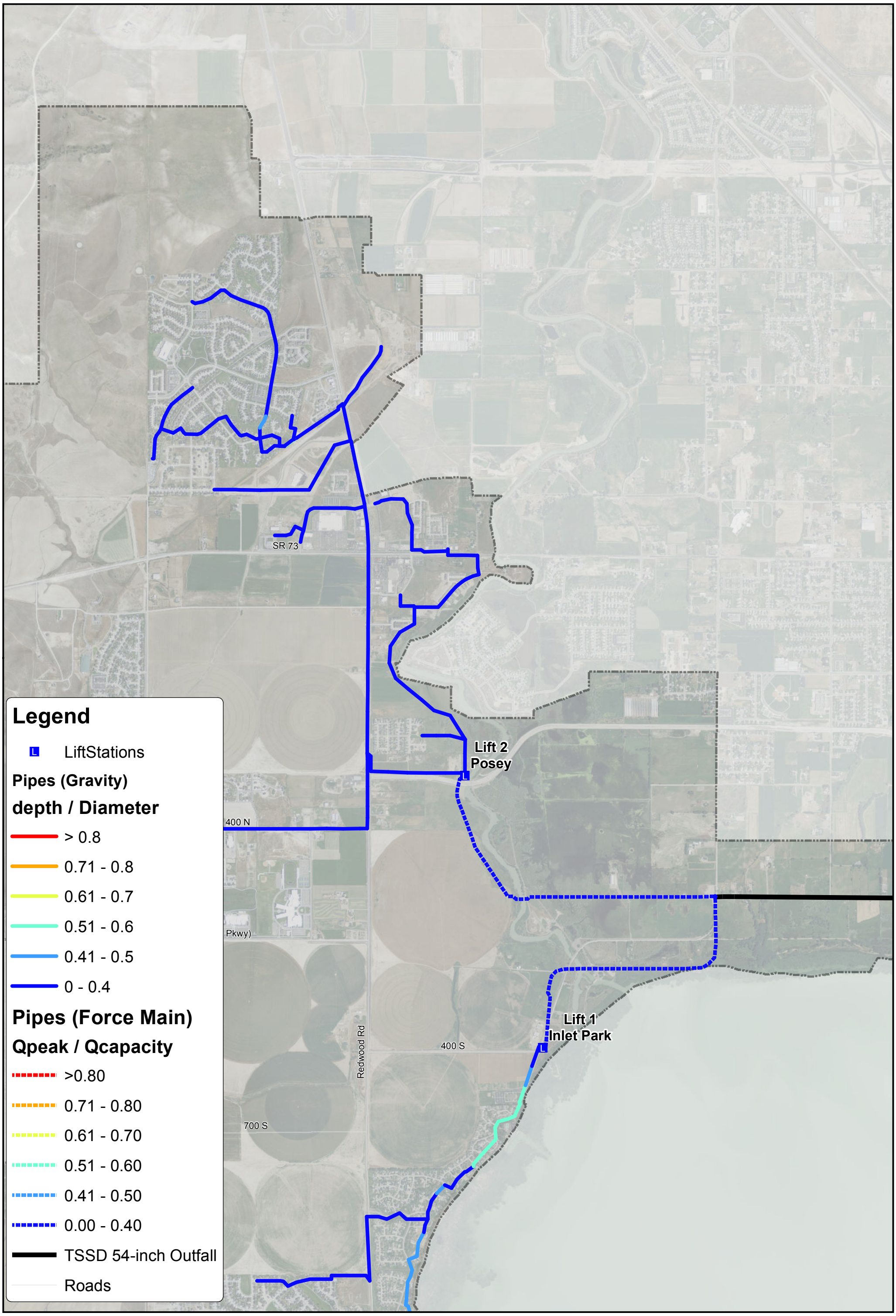
EXISTING COLLECTION SYSTEM ANALYSIS

Figures 5-1 and 5-2 show the performance of the sewer system under existing flow conditions. Pipes in the figures are color coded to show the ratio of peak flow depth in the pipe to the pipe's diameter. As can be seen in the figure, the existing collection system performs very well under current conditions. Based on the design flows defined above and the level of service adopted by the City, there no pipes that exceed the level of service adopted by the City.

All lift stations appear to have adequate capacity to convey peak flow under existing conditions. There are, however, some opportunities to optimize performance at a few of the lift stations through some projects as discussed in Chapter 6.

FUTURE COLLECTION SYSTEM ANALYSIS

For allocating future resources in this analysis, Saratoga Springs identified the location and magnitude of likely growth in the City for each of the next 20 years and at full buildout. From these projections, BC&A developed short term (growth expected to occur in the next 6 to 10 years), intermediate term (growth expected to occur in the next 20 to 25 years), and long-term



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SARATOGA SPRINGS
SEWER CAPITAL FACILITIES PLAN

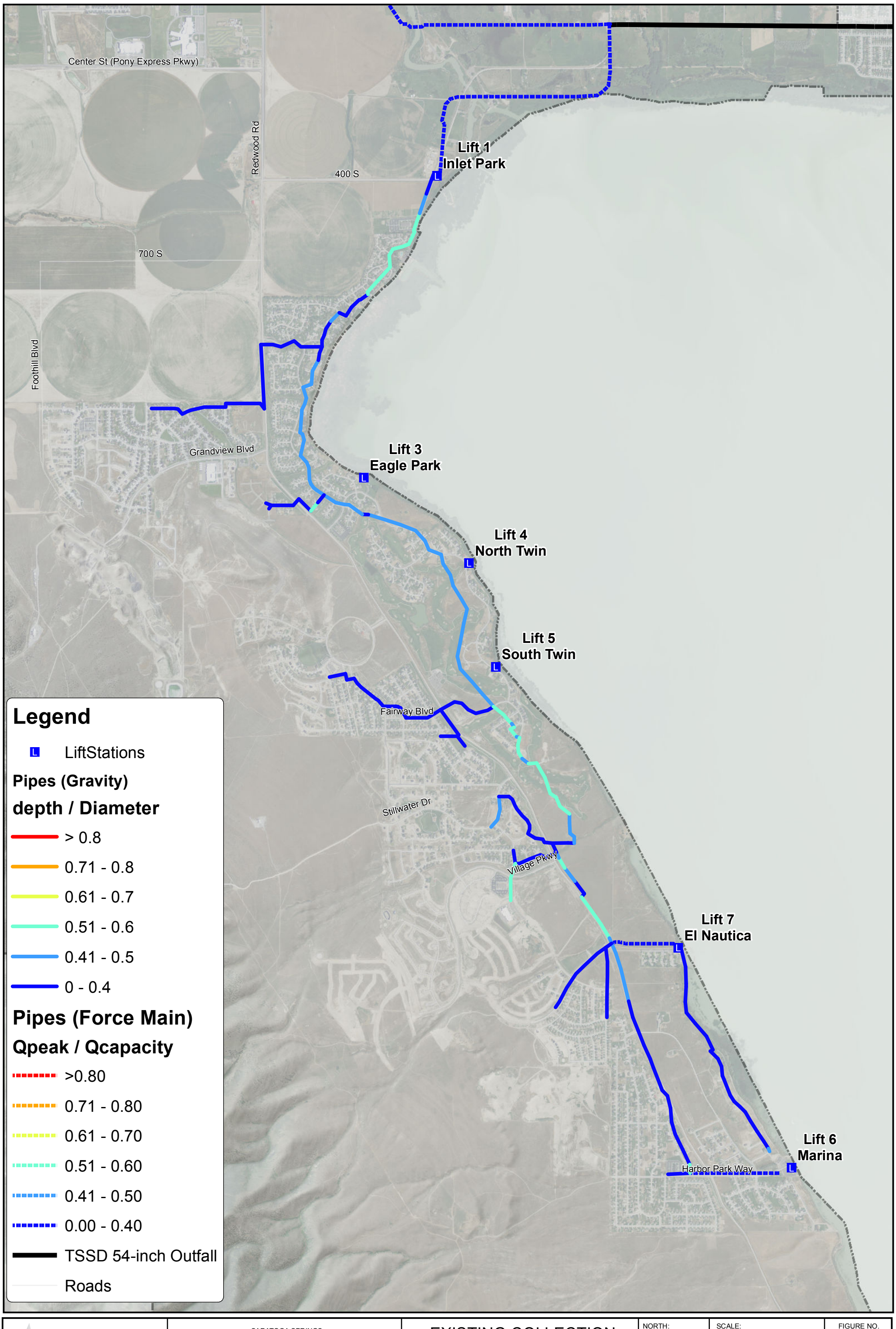
EXISTING COLLECTION SYSTEM CAPACITY NORTH

NORTH:

SCALE: 0 1,000 2,000 Feet

FIGURE NO. 5-1

P:\Saratoga Springs\2011 Capital and Impact Fee Facilities Plans\4.0 GIS\4.1 Projects\SewerMaps\Figure 5-1 - Existing Deficiencies.mxd amckinnon 1/15/2014



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SEWER CAPITAL FACILITIES PLAN

EXISTING COLLECTION SYSTEM CAPACITY SOUTH

NORTH:

SCALE: 0 1,000 2,000 Feet

FIGURE NO. 5-2

P:\Saratoga Springs\2011 Capital and Impact Fee Facilities Plans\4.0 GIS\4.1 Projects\SewerMaps\Figure 5-1 - Existing Deficiencies.mxd amckinnon 1/15/2014

(growth through buildout) collection system models. These models were used to calculate the effect of projected growth on the performance of the Saratoga Springs collection system.

Short Term Development Analysis

Figure 5-3 and 5-4 show the performance of the sewer system in the short term. These results represent the immediate needs of the system. As can be seen in the figures, most of the collection system in the City continues to perform well, even with the growth expected to occur in the short term. However, projected growth does result in a few pipelines in which design flows exceed level of service design standards. These pipes are primarily located along the Inlet Park sewer trunkline and include:

- Saratoga Drive, 800 S to 650 S – 18-inch sewer main
- Shirwood Drive – 12-inch sewer main

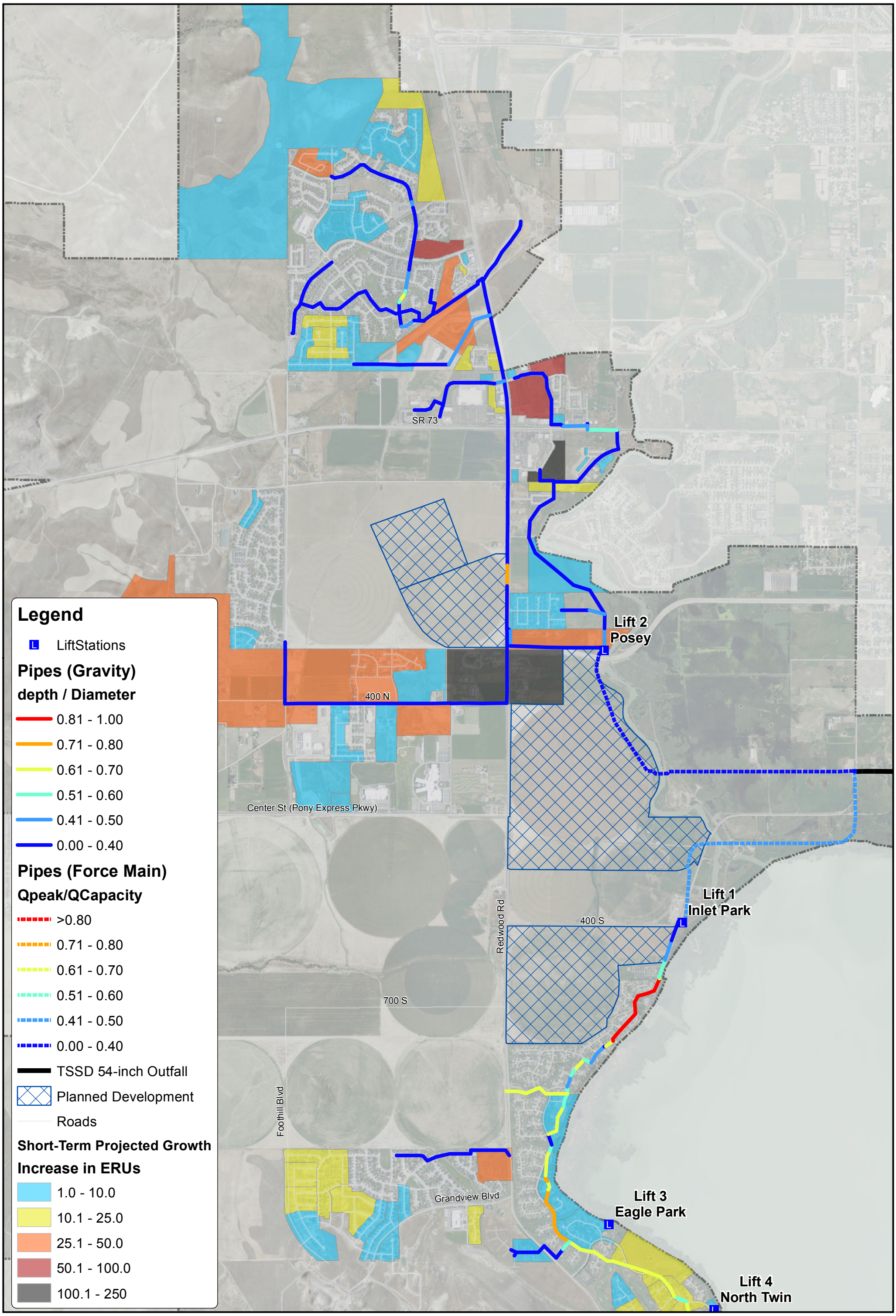
Projects to bring these pipelines up to the required level of service have been identified and described in Chapter 6.

Growth Beyond Short Term

With the additional future growth projected in Saratoga Springs, it is expected that a number of improvements will be required to meet buildout conditions in the City. Additional trunks will need to be constructed to new areas and some existing trunks will need to be replaced with larger diameter pipes. Because of the extent of the improvements required to meet growth beyond short-term conditions, discussion of these improvements has been divided into a separate section. Chapter 6 discusses conceptual improvements that will be needed to continue to serve growth in Saratoga Springs.

Lift Station Analysis

Table 5-2 indicates flow to the City's lift stations for the various levels of development. Flows in excess of the lift station's existing hydraulic capacity have been highlighted.



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SEWER CAPITAL FACILITIES PLAN

SHORT TERM COLLECTION SYSTEM CAPACITY NORTH

NORTH:

SCALE: 0 1,000 2,000 Feet

FIGURE NO. 5-3

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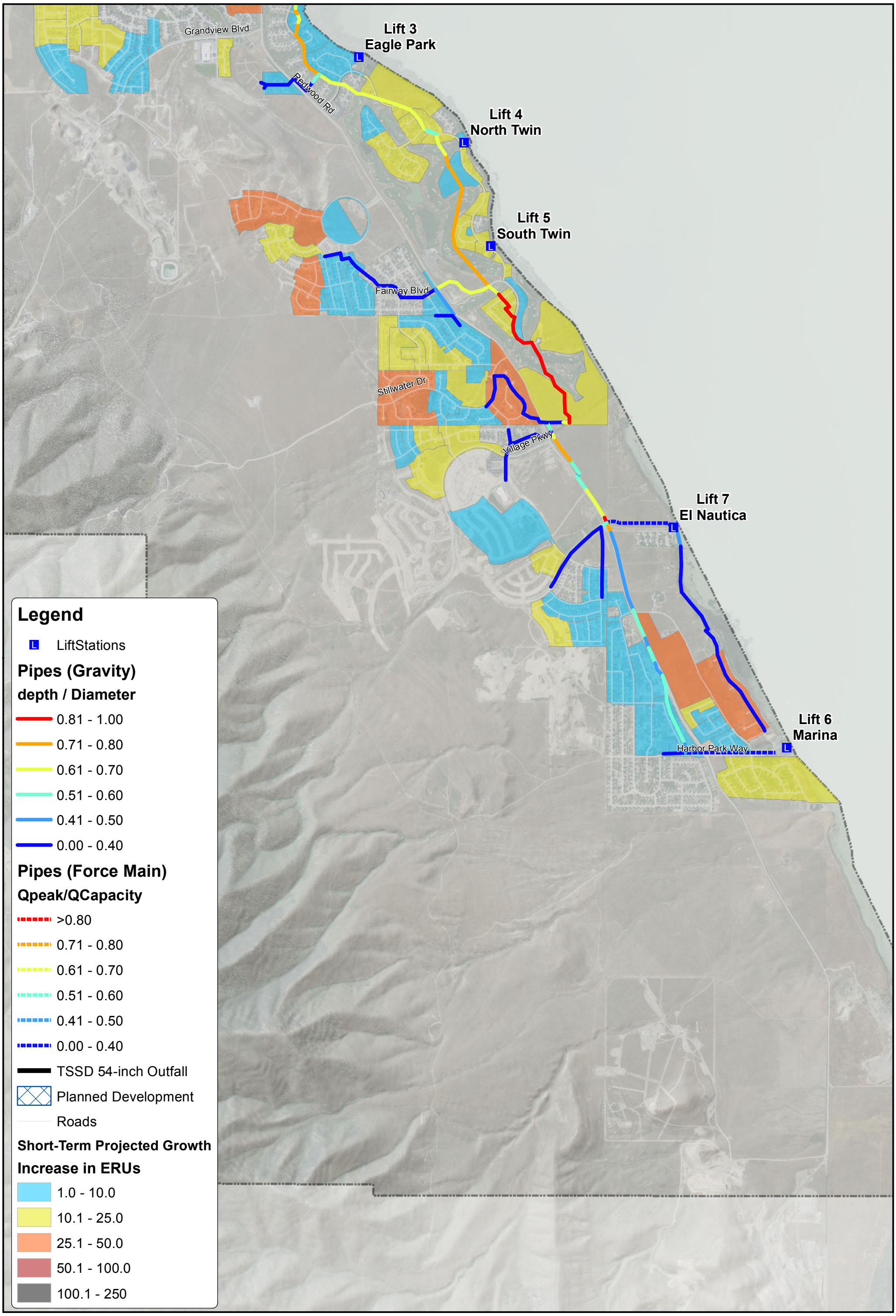

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SEWER CAPITAL FACILITIES PLAN

SHORT TERM COLLECTION SYSTEM CAPACITY SOUTH

NORTH:

SCALE: 0 1,000 2,000 Feet

FIGURE NO. 5-4

P:\Saratoga Springs\2011 Capital and Impact Fee Facilities Plans\4.0 GIS\4.1 Projects\SewerMaps\Figure 5-3 - Short Term Deficiencies.mxd amckinnon 1/15/2014

Table 5-2
Lift Station Evaluation at Various Development Conditions

Lift Station	Address[a]	Existing Hydraulic Capacity (gpm)	Design Peak Flow - Existing (gpm)	Design Peak Flow - Short Term (gpm)	Buildout Peak Flow (gpm)
1 – Inlet Park	400 S. Saratoga Rd	1,600	920	***1,800*** [d]	***3,600***
2 – Posey[b]	Pioneer Crossing, Jordan River	2,000[c]	1,028	***1,400*** [d]	***1,400***
3 – Eagle Park	1448 S. Cottonwood Lane	110[c]	26	30	30
4 – North Twin	1800 S. Centennial Blvd	110	16	32	45
5 – South Twin	2170 S. Centennial Blvd	110	12	16	16
6 – Marina	275 E. Cascade Court	350[c]	100	116	318
7 – El Nautica	100 W. 3000 S. (Harbor Bay)	550	2	31	370

[a] addresses are approximate
[b] the collection area to this lift station will ultimately be decreased by the construction of new gravity mains.
[c] Lift stations indicated include provisions to add an additional pump on the existing manifold
[d] Short-term peak flow based on the maximum flow experienced prior to the construction of new gravity outfall pipelines (see Project SS-S1, Chapter 6)

CHAPTER 6
BUILDOUT SYSTEM IMPROVEMENTS

The hydraulic model was used to evaluate various alternatives for servicing growth under projected buildout conditions. For the purposes of this report, buildout is defined as full development of all property in the service area at current planning densities as defined in the City's land use element of the General Plan. The following chapter describes the preferred conveyance option for meeting buildout flows.

SYSTEM IMPROVEMENT APPROACH

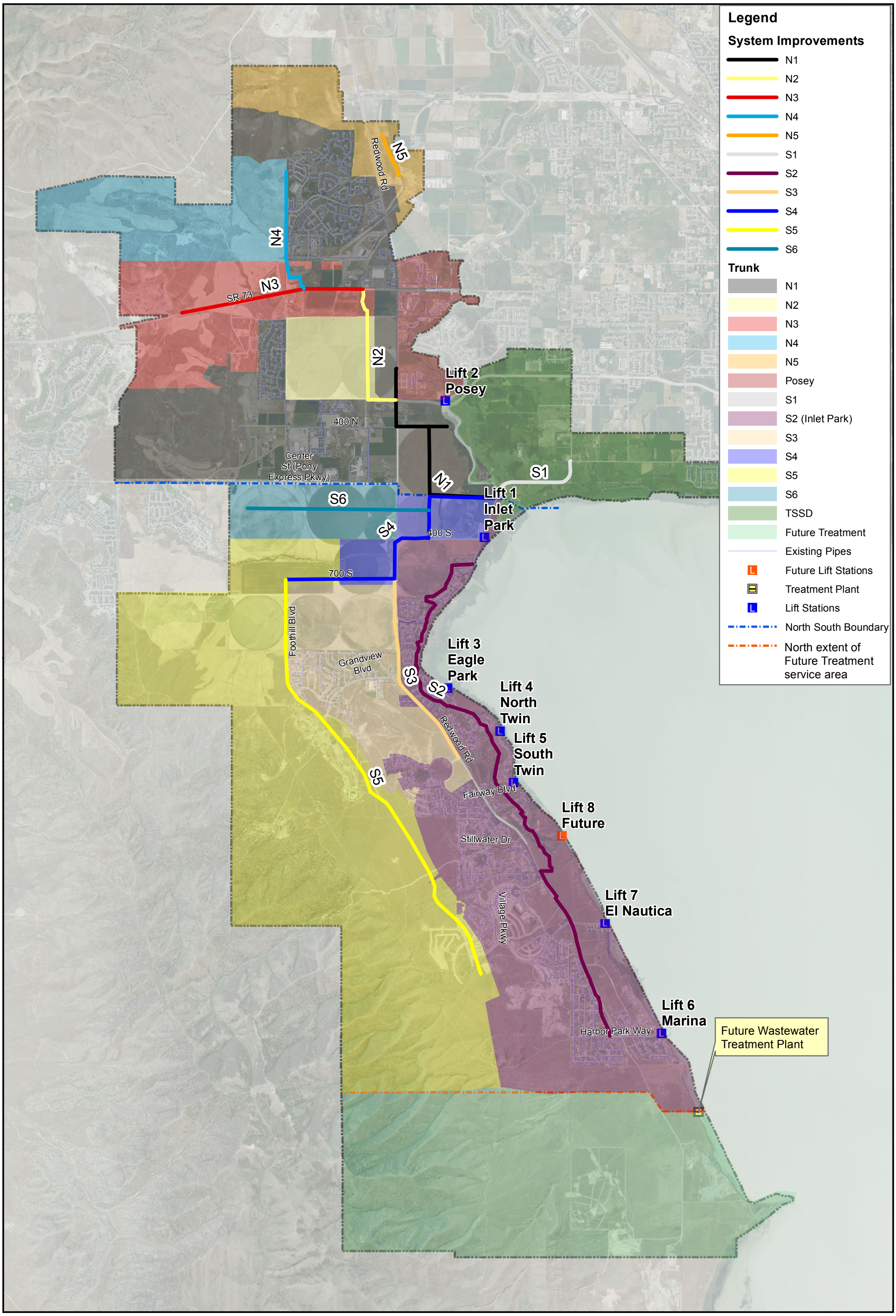
There are a number of different approaches that could be used to service future growth in Saratoga Springs. Prior to developing a recommended approach, BC&A and Saratoga Springs personnel examined previous master plan alternatives and several new alternatives identified during the course of this facilities plan. In developing a preferred conveyance alternative, several issues were considered:

- **Cost –** A primary goal in developing a preferred conveyance alternative was to minimize overall cost. The sizing and alignment of future pipelines were optimized to convey projected flows in the most efficient manner possible. Projects have also been phased to defer projects that are more expensive where possible to try to achieve the lowest present worth cost of improvements.
- **Maintenance and Reliability –** Facilitating maintenance and providing maximum reliability was another important goal in developing a preferred alternative. Based on experience, one of the best ways to accomplish this goal is to minimize reliance on future lift stations. Both lift stations and force mains are the source of frequent maintenance. Lift stations are also vulnerable to power interruption and mechanical failure. They also require ongoing electrical pumping costs that add to the overall cost of operating the system. The improvements recommended here include the construction of several new gravity mains that will allow as much of the City to be conveyed to TSSD by gravity as possible. This will significantly reduce the size of the collection areas currently served by the Inlet Park and Posey Lift Stations.
- **Disruption to Existing Residents –** Where possible, construction of new sewer mains through existing neighborhoods and paved roadways was avoided. By minimizing work in developed rights-of-way, disruption to traffic and residents can be minimized.

After considering these various issues, a preferred alternative for meeting future growth was identified as recommended below.

RECOMMENDED CONVEYANCE IMPROVEMENTS

Figure 6-1 shows the approximate location of improvements recommended to meet future growth in Saratoga Springs through buildout. It should be noted that proposed sizes for pipes have been estimated based on projected flow, estimated pipe slopes developed using 5-meter



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SARATOGA SPRINGS
SEWER CAPITAL FACILITIES PLAN

BUILD-OUT SYSTEM IMPROVEMENTS

NORTH:

SCALE: 0 1,750 3,500 Feet

FIGURE NO. 6-1

P:\Saratoga Springs\2011 Capital and Impact Fee Facilities Plans\4.0 GIS\4.1 Projects\SewerMaps\Figure 6-1 - Proposed Facilities.mxd amckinnon 1/15/2014

digital elevation data, and the State of Utah's minimum slope criteria for sanitary sewer mains. Once detailed design of sewer mains commences, the pipeline sizes should be reviewed with design pipe capacity based on the projected buildout flows in upstream sub-basins as discussed in Chapter 4. Also shown in Figure 6-1 is the approximate collection area associated with each major trunk line improvement. It should also be noted that collection basins and pipeline alignments shown are approximate based on current understanding of projected development patterns and future road alignments. As the time for completion of each project approaches, the City should review each collection area and pipeline alignment in detail to optimize the location and functionality of each improvement.

As discussed in Chapter 2, the City can be separated into three service areas, a south area (currently served by the Inlet Park Lift Station), a north area (currently served by the Posey Lift Station), and an area to be served by future treatment facilities at the far south end of the City. Because it will be its own system, no projects are identified for the future treatment service area. Projects for each of the other two service areas are described below.

South Service Area

SS-S1. River Crossing Trunk – A key component to the proposed improvement approach is the construction of a new gravity outfall across the Jordan River. This will allow flow to be conveyed across the Jordan River by gravity to the Timpanogos Special Service District connection. Once this line is completed, it will facilitate two major categories of improvements. First, it will allow new gravity lines to be constructed to service new development on higher elevation properties in the City (see Projects SS-S3 and SS-N1). Second, it will allow the length of the Inlet Park and Posey force mains to be significantly reduced and the existing force main siphons under the river to be eliminated.

Because this improvement is located at the very bottom of the system, it will need to have a very large capacity to meet project flows through buildout. To limit the required funding initially, it is recommended that this project be completed in phases. Initially, a single pipeline will be constructed (36-inch crossing of the Jordan River connected to a 36-inch outfall to the TSSD connection). When required for capacity, a second parallel pipeline will be added. Since this is such a critical component to the City's future system, it is also recommended that the City complete a more detailed preliminary design study to coordinate phasing and invert elevations with upstream pipelines.

It should be noted that this project will serve both the south and the north service areas. It has been included with the south improvements for convenience, but its costs will be divided between the service areas based on the percent of capacity used by each.

SS-S2. Inlet Park Sewer Trunk Upgrade – The existing Inlet Park Sewer Trunk that starts along Redwood Road at the south end of the City and continues north following the shoreline of Utah Lake will need to be upgraded to accommodate build-out

wastewater flows. There are no existing deficiencies along the sewer trunk, but there are two areas with projected deficiencies because of short-term growth (10-year growth). As growth continues into the future, additional sections of the pipeline will fall below level of service requirements. The Inlet Park lift station will eventually need to be upgraded and all of the trunk line will need to be upsized to accommodate future growth.

SS-S3. Redwood Road Trunk – A new trunk line is recommended along Redwood Road from 700 South to Ring Road. The purpose of this trunk line will be collect wastewater flows from west of Redwood Road and convey it by gravity to the new gravity trunk on 700 South (see Project S4). This trunk line does not extend any further south than Ring Road because this is the high point on Redwood Road. This precludes further collection by gravity along Redwood Road from properties to the south.

SS-S4. 700 South Trunk – A new trunk is recommended to be constructed from west to east at approximately 700 South. The purpose of this trunk line will be to connect all upstream gravity pipelines to the River Crossing Trunk (Project SS-S1). Once this pipeline and the River Crossing Trunk are completed, a large portion of the south service area will be able to bypass the Inlet Park Lift Station. Currently 100 percent of the south service area flows through the lift station. Once the recommended improvements are completed, the collection area for the Inlet Park Lift Station will be reduced to the area shown in Figure 6-1.

It should be noted that, as currently projected, development near this project (especially on property owned by PRI) may require the completion of this project prior to the completion of the River Crossing Trunk. If this is the case, this pipeline can temporarily be connected to the Inlet Park Lift Station until the River Crossing Trunk is completed. During the final design of this pipeline, great care should be taken to make sure the invert elevations of this pipeline are consistent with its ultimate goal of connecting to the River Crossing Trunk.

SS-S5. Foothill Trunk – A new trunk is recommended along the future Foothill Blvd to collect areas along the western edge of the City. Construction of this pipeline will allow all upstream areas to be conveyed by gravity to the new 700 South Trunk (Project SS-S4). As noted above, this will allow all the area served by this pipeline to bypass the Inlet Park Lift Station and flow by gravity to TSSD.

SS-S6. 200 South Trunk – A new trunk is recommended along the future 200 South roadway. Construction of this pipeline will allow all upstream areas to be conveyed by gravity to the new 700 South Trunk (Project SS-S4).

North Service Area

SS-N1. North Trunk – Similar to the south service area, one primary goal of the recommended improvements is to connect as much of the service area as possible

to pipelines that can drain by gravity. The key project to accomplish this in the north service area is SS-N1. This improvement would include a new gravity trunk line from the intersection of Redwood Road and Pioneer Crossing to the River Crossing Trunk. Once this pipeline and the River Crossing Trunk are completed, a large portion of the north service area will be able to bypass the Posey Lift Station. Currently 100 percent of the north service area flows through the lift station. Once the recommended improvements are completed, the collection area for the Posey Lift Station will be reduced to the area shown in Figure 6-1.

It should be noted that capturing the existing flow at the intersection of Redwood Road and Pioneer Crossing will require a relatively deep pipeline. During the detailed preliminary design study for the River Crossing Trunk (Project SS-S1), it is recommended that additional consideration be given to the alignment of Project SS-N1 to minimize pipeline depth and cost.

SS-N2. 200 West Trunk – A new trunk line will need to be constructed along 200 West to collect wastewater from future development. Creating capacity in a new trunk line along this corridor is more cost effective than upsizing the existing pipeline in Redwood Road.

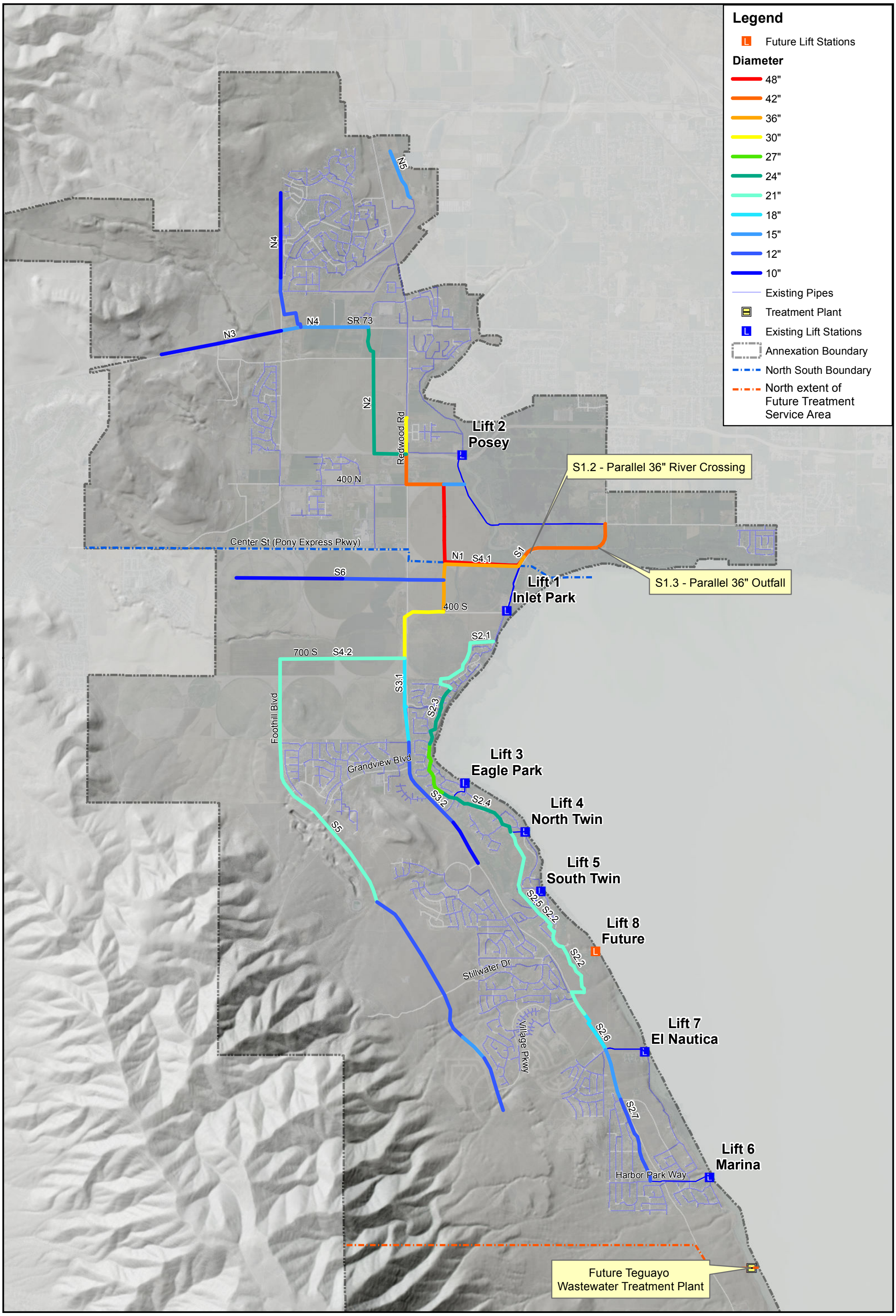
SS-N3. SR-73 Trunk – A new trunk line will need to be constructed along SR-73 to collect wastewater from future development in the area.

SS-N4. 800 West Trunk – A new trunk line is recommended along 800 West to collect wastewater from future development. The purpose of this trunk would be to collect areas that will develop west of the Mountain View Corridor. A new pipeline is recommended along this corridor to avoid surcharging existing pipelines in existing neighborhood sewer mains at buildout.

SS-N5. Canal Trunk – A sewer trunk line should be extended adjacent to the canal near Stagecoach Drive. This trunk line is intended to collect wastewater flow from areas at the north end of the City.

Figure 6-2 shows the diameter of the proposed improvements. Table 6-1 summarizes the cost of the proposed improvements in 2012 dollars. The estimated year of construction is also shown in the table. Note that development will be the primary motivation for most of the projects, and the timing of projects beyond the short-term planning window may be expedited or deferred depending on the rate of development.

It should be noted that costs contained in this chapter are total project costs and do not include any division between existing and future users. As described above, some of the recommended improvements identified in this plan will benefit existing users. A division of project costs between existing and future users based on proportionate share of capacity is contained in Chapter 7.



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SARATOGA SPRINGS
SEWER CAPITAL FACILITIES PLAN

BUILD-OUT SYSTEM IMPROVEMENT DIAMETERS

NORTH:

SCALE: 0 1,750 3,500 Feet

FIGURE NO. 6-2

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It should also be remembered that the collection system improvements identified in these two figures do not include any improvements for potential development at the south end of the City. The topography of Saratoga Springs is different from most other cities because of its location relative to Utah Lake. Conveying flow from the south end of the City to the outfall at the north end of Utah Lake is difficult because there is very little elevation difference between these locations. To cost effectively serve its residents and avoid an excessive number of lift stations, the City has established a policy to extend service on its existing system no further than the southern boundary of the Marina Lift Station. This boundary is shown in Figures 6-1 and 6-2. All properties south of this boundary should be served by a new wastewater treatment plant. As a result, any development that occurs in this area will not be subject to the sewer collection impact fees of the City but will be responsible for development of the new plant and corresponding collection system. A possible location for a future wastewater treatment plant is shown at the south end of the City in Figure 6-2. The final location of this plant along with layout of the corresponding collection system pipelines will need to be completed once development plans in this area become more established.

Table 6-1
Collection System Improvements

Project No.	Projects: Year of Project (Fiscal Year Ending)	Project Description	Estimated Total Cost (2012 Dollars)
Short Term Projects			
SS-S1.1	2014	River Crossing Trunk Phase 1, Alignment & Preliminary Design Study	$100,000
SS-S1.2	2018	River Crossing Trunk Phase 2, Suspended Sewer or Siphon	$1,151,000
SS-S1.3	2018	River Crossing Trunk Phase 3, Outfall	$3,665,000
SS-S2.1	2014	Inlet Park Trunk Phase 1, Near Lift Station	$1,399,000
SS-S2.2	2015	Inlet Park Trunk Phase 2, Golf Course Main	$1,654,000
SS-N1	2018	North Trunk	$9,546,000
SS-N2	2020	200 West Trunk	$2,351,000
SS-S4.1	2022	700 South Trunk Phase 1, First Half	$4,650,600
Short Term Total			**$24,516,600**
Intermediate Term Projects			
SS-S2.3	2023	Inlet Park Trunk Phase 3	$2,716,000
SS-S3.1	2024	Redwood Road Trunk Phase 1, First Half	$1,061,000
SS-S2.4	2025	Inlet Park Trunk Phase 4	$1,967,000
SS-S6	2026	200 South Trunk	$1,919,000
SS-S2.5	2027	Inlet Park Trunk Phase 5	$1,705,000
SS-N5	2028	Canal Trunk	$554,000
SS-2.6	2028	Inlet Park Trunk Phase 6	$1,537,000
SS-S4.2	2029	700 South Trunk Phase 2, Second Half	$1,731,000
SS-2.7	2030	Inlet Park Trunk Phase 7	$2,133,000
SS-S3.2	2031	Redwood Road Trunk Phase 2, Second Half	$1,357,000
Intermediate Total			**$16,680,000**
Long Term Projects			
SS-N3	2032+	Cedar Fort Road Trunk	$2,045,000
SS-N4	2032+	800 West Trunk	$1,388,000
SS-S5	2032+	Foothill Blvd Trunk	$6,279,000
SS-S1.4	2032+	River Crossing Trunk Phase 4, Parallel Outfall	$2,223,000
Long Term Total			**$11,935,00**
Totals			**$53,131,600**

LIFT STATION IMPROVEMENTS

Table 6-2 lists the future recommended wet well volume and hydraulic capacity of lift stations in Saratoga Springs at buildout.

Table 6-2
Required Capacity at Lift Stations

Lift Station	Address[1]	Existing Wet Well Volume (gallons)	Future Required Wet Well Volume (gallons)	Existing Hydraulic Capacity (gpm)	Future Required Hydraulic Capacity (gpm)
1 – Inlet Park	400 S. Saratoga Rd	4,600	***10,650***	1,600	***4,300***
2 – Posey	Pioneer Crossing, Jordan River	5,200	5,000	2,000[2]	*2,000*
3 – Eagle Park	1448 S. Cottonwood Lane	2,500	190	110[2]	75
4 – North Twin	1800 S. Centennial Blvd	2,500	280	110	100
5 – South Twin	2170 S. Centennial Blvd	2,500	210	110	100
6 – Marina	275 E. Cascade Court	2,500	930	350[2]	***370***
7 – El Nautica	100 W. 3000 S. (Harbor Bay)	3,500	1,100	550	*440*
8 – Future		--	160	--	75

[1] Addresses are approximate
[2] Lift stations indicated include provisions to add an additional pump on the existing manifold

It will be noted that improvements are recommended for the Inlet Park Lift Station. This may seem inconsistent with previously recommended projects to remove major portions of the City from this lift station collection area. However, this lift station upgrade is needed for the following reasons:

- **Inlet Park –** Even though Project SS-S4 will allow a significant portion of the City to bypass the Inlet Park Lift Station, there are still large areas of undeveloped land that exist within the remaining collection area of the lift station. To accommodate this future development, significant upgrades to both the wet well volume and capacity of the lift station will be required.

Table 6-3 lists the costs associated with lift station improvements recommended to meet future collection system needs at buildout.

Table 6-3
Lift Station Project Costs

Project No.	Project Description	Estimated Year of Construction	Estimated Cost (2012 Dollars)
SS-L1	Lift Station 1 Pump Upgrade (Inlet Park)	2018	$300,000
SS-L2	New Lift Station 8 Design/Construction	2023	$150,000
SS-L3	Lift Station 1 Wet Well Upgrade (Inlet Park)	2032+	$300,000
SS-L4	Lift Station 6 Pump Upgrade (Marina)	2032+	$150,000
	Total		**$1,350,000**

Saratoga Springs personnel also provided a list of lift station and collection system upgrades that are recommended to improve system operation. Table 6-4 lists the costs associated with these maintenance related projects.

Table 6-4
Maintenance Costs

Project No.	Project Description	Estimated Cost (2012 Dollars)
SS-M1	Lift Station 1 & 2 Grinders	$150,000
SS-M2	Lift Station 4 & 5 Bypass	$200,000
SS-M3	Lift Station 1 & 2 Electrical Work	$50,000
SS-M4	Lift Station Replacement Motors	$85,000
SS-M5	Lift Station 6 Replacement Generator	$30,000
SS-M6	New TV Truck	$175,000
SS-M7.1	Lift Station 1 Force Main Cleanouts	$79,000
SS-M7.2	Lift Station 2 Force Main Cleanouts	$40,000
SS-M8	Drive System Lift Station 1 and 2	$52,654
	Total	**$861,654**

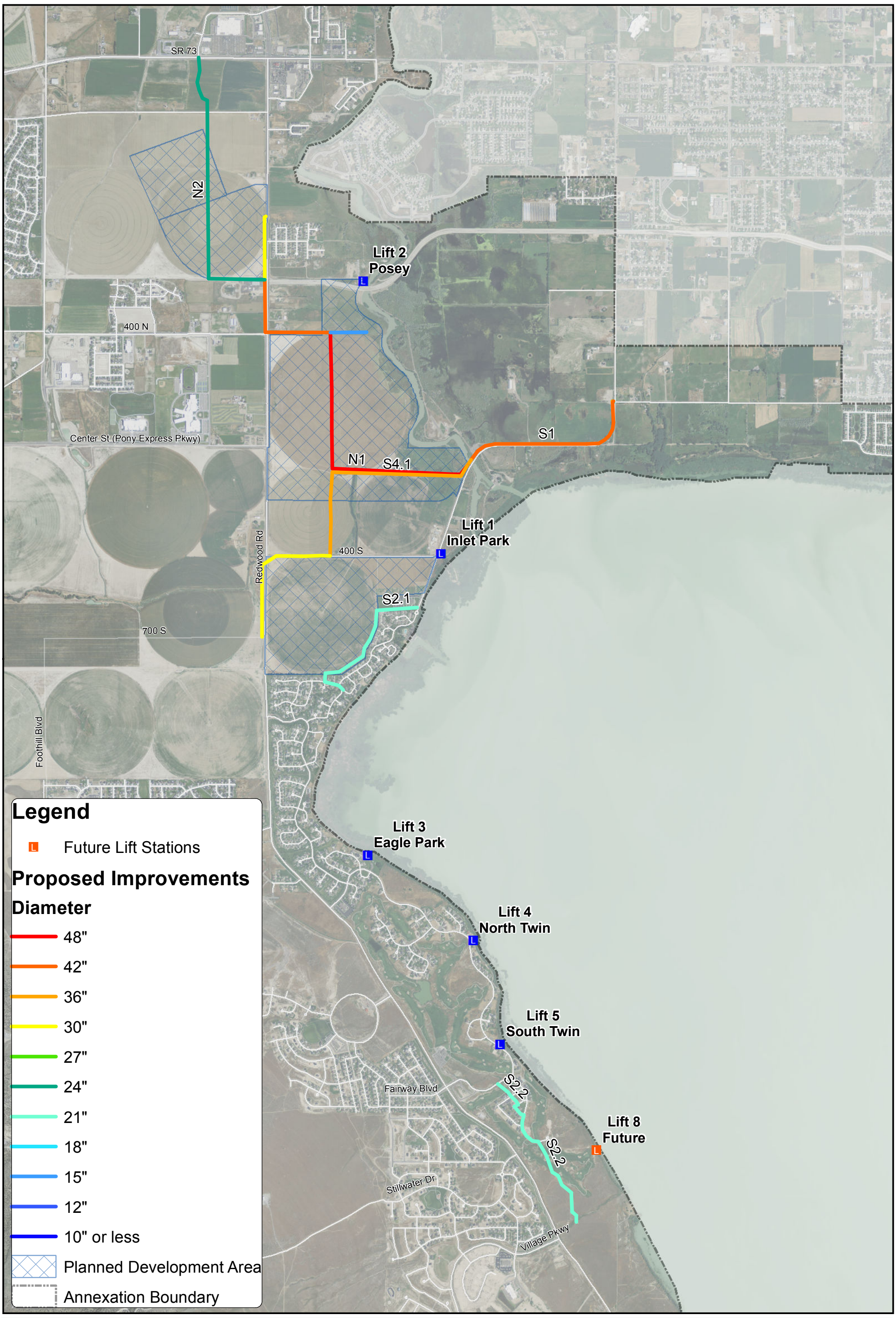
CHAPTER 7
IMPACT FEE FACILITIES PLAN

In the previous chapters, required improvements have been identified. Based on this information, it is now possible to identify those improvements that qualify to be used in the calculation of impact fees as outlined in Section 11-36a of the Utah Code.

10-YEAR IMPROVEMENT PLAN

Chapter 6 identified all capital facility projects needed to provide service to various parts of the City at projected buildout. Most of these projects will need to be constructed in phases as development occurs. Figure 7-1 shows the components of projects in Chapter 6 that will need to be constructed within the next ten years to address existing needs and meet the needs of growth during the next ten years. This information is also summarized in Tables 7-1 and 7-2. Table 7-1 includes all projects identified for the south service area of the City. Table 7-2 includes all projects identified for the north service area of the City. A more detailed breakdown of costs for the larger projects in the tables is contained in the appendix of this report. In accordance with the requirements of state law, those projects recommended in the capital facilities plan that fall outside of the 10-year planning window have not been included in the impact fee facilities plan shown as Tables 7-1 and 7-2.

It will be noted that a few projects have been included in both tables because they benefit both service areas. For these projects, total costs have been divided between the two service areas based on the projected growth within the planning window. Of the total 5,818 additional ERCs projected in the next ten years, 2,860 ERCs have been identified within the south service area (49.15 percent) and 2,958 ERCs within the north service area (50.85 percent).



Bowen Collins & Associates, Inc.
CONSULTING ENGINEERS

SARATOGA SPRINGS
SEWER CAPITAL FACILITIES PLAN

10-YEAR SYSTEM IMPROVEMENT DIAMETERS

NORTH:

SCALE: 0 1,000 2,000 Feet

FIGURE NO. 7-1

P:\Saratoga Springs\2011 Capital and Impact Fee Facilities Plans\4.0 GIS\4.1 Projects\SewerMaps\Figure 7-1 - 10-Year Plan.mxd amckinnon 1/15/2014

Table 7-1
Impact Fee Facilities Plan, South Service Area - Costs Required for Future Growth

Project No.	Year of Project (FYE)	Project Description	Estimated Total Cost	Percent to Existing	Percent to 10-year Growth	Percent to Growth Beyond 10 Years	Cost to Existing	Cost to 10-year Growth	Cost to Growth Beyond 10 Years
SS-S1.1	2014	River Crossing Phase 1, Alignment & Preliminary Design Study*	$49,154	7.9%	9.5%	82.6%	$3,874	$4,691	$40,588
SS-S1.2	2018	River Crossing Trunk Phase 2, Bridge or Siphon*	$565,760	7.9%	9.5%	82.6%	$44,590	$53,999	$467,171
SS-S1.3	2018	River Crossing Trunk Phase 3, Outfall*	$1,801,486	7.9%	9.5%	82.6%	$141,984	$171,942	$1,487,561
SS-S2.1	2014	Inlet Park Trunk Phase 1, Near Lift Station	$1,399,000	0.0%	16.2%	83.8%	$0	$227,132	$1,171,868
SS-S2.2	2015	Inlet Park Trunk Phase 2, Golf Course Main	$1,654,000	12.6%	12.9%	74.5%	$208,218	$213,386	$1,232,397
SS-L1	2015	Lift Station 1 Pump Upgrade	$300,000	0.0%	11.9%	88.1%	$0	$35,644	$264,356
SS-S4.1	2022	700 South Trunk –First Half	$4,650,600	0.0%	2.0%	98.0%	$0	$92,528	$4,558,072
Totals			**$10,420,000**				**$398,665**	**$799,321**	**$9,222,014**

*Where indicated, projects benefit both south and north service areas. Project costs divided based on projected growth in each area during the planning window.

Table 7-2
Impact Fee Facilities Plan, North Service Area - Costs Required for Future Growth

Project No.	Year of Project (FYE)	Project Description	Estimated Total Cost	Percent to Existing	Percent to 10-year Growth	Percent to Growth Beyond 10 Years	Cost to Existing	Cost to 10-year Growth	Cost to Growth Beyond 10 Years
SS-S1.1	2014	River Crossing Phase 1, Alignment & Preliminary Design Study*	$50,846	7.9%	9.5%	82.6%	$4,007	$4,853	$41,986
SS-S1.2	2018	River Crossing Trunk Phase 2, Bridge or Siphon*	$585,240	7.9%	9.5%	82.6%	$46,126	$55,858	$483,257
SS-S1.3	2018	River Crossing Trunk Phase 3, Outfall*	$1,863,514	7.9%	9.5%	82.6%	$146,872	$177,862	$1,538,780
SS-N1	2018	North Trunk	$9,546,000	9.6%	7.2%	83.3%	$912,945	$683,841	$7,949,215
SS-N2	2020	200 West Trunk	$2,351,000	0.0%	3.1%	96.9%	$0	$72,824	$2,278,176
Totals			**$14,396,600**				**$1,109,950**	**$995,237**	**$12,291,413**

*Where indicated, projects benefit both south and north service areas. Project costs divided based on projected growth in each area during the planning window.

PROJECT COST ATTRIBUTABLE TO FUTURE GROWTH

To satisfy the requirements of state law, Tables 7-1 and 7-2 provides a breakdown of the capital facility projects and the percentage of the project costs attributed to existing and future users. As defined in Section 11-36-304, the impact fee facilities plan should only include "the proportionate share of the costs of public facilities [that] are reasonably related to the new development activity." While most projects from the capital facilities plan outlined in previous chapters are required solely to meet future growth, some projects also provide a benefit to existing users.

For some projects, the division of costs between existing and future users is easy because 100 percent of the project costs can be attributed to one category or the other (e.g. infrastructure needed solely to serve new development can be 100 percent attributed to new growth). However, while there are no existing deficiencies in the system, there are some projects that will benefit existing users (e.g., no existing deficiency exists, but a new facility is being added that will be used to convey flow from both existing and future sources). A good example of this is the new river crossing and outfall to TSSD (Project SS-S1). In this case, existing flow is conveyed in force mains from the Posey and Inlet Park lift stations. These force mains have more than adequate capacity to convey existing flows. As a result, no existing deficiencies exist at this location. However, with the construction of a new pipeline for future growth, it makes little sense for the City to maintain three parallel pipelines through the area. As a result, this plan identifies installation of a new pipeline with adequate capacity for both existing and future flows and abandonment of the existing force mains through this area. In this type of situation, costs have been divided between the two categories based on the ratio of flow needed for each type of user. For example, if existing peak flow through a proposed facility will be 0.4 cfs but the ultimate capacity of the pipeline needs to be 1.0 cfs to meet new growth, 60 percent of the costs of the project have been assigned to future growth with 40 percent assigned to existing users.

It should be noted that Tables 7-1 and 7-2 do not include bond costs related to paying for impact fee eligible improvements. These costs should be added as part of the impact fee analysis.

It should also be noted that both Table 7-1 and 7-2 include the several phases of Project SS-S1. As explained in Chapter 6, this project will serve both services areas. As a result, the costs for the project have correspondingly been split between the two service areas based on proportionate flow in the pipeline.

PROJECT COST ATTRIBUTABLE TO 10-YEAR GROWTH

Included in Tables 7-1 and 7-2 is a breakdown of capacity associated with growth both at full build-out and through the next 10-years. Normally, it would be adequate to consider only the percentage of future growth through build-out. In the case of sewer improvements for Saratoga Springs, however, the impact fee facility plan includes several improvements located near the bottom of the collection system. As a result, these projects are required to accommodate large flows representing growth from the entire City. To evaluate most accurately the cost of providing service for growth during the next ten years, added consideration was given to evaluating the growth of flow projected for the next 10-years in each project.

As summarized in Tables 7-1 and 7-2, the total cost of future projects in the impact fee facility plan that are attributable to future growth is over $23 million. Of these costs, $1.8 million are attributable to growth in the next ten years.

EXISTING CAPACITY AVAILABLE TO SERVE NEW GROWTH

In addition to using capacity in new projects contained in the impact fee facility plan, future growth will also utilize a portion of excess capacity in existing facilities. To calculate the percentage of existing capacity to be used by future growth, BC&A examined the model results in each facility paid for by the City. Figures indicating the locations of facilities paid for by the City are located in the Appendix.

The method used to calculate excess capacity used by future flows is as follows:

- **Calculate Flows –** The peak flow in each facility was calculated in the model for both existing and future flows. The maximum capacity of each facility was also calculated.
- **Identify Available Capacity –** Where a facility has capacity in excess of projected flows at buildout, the available capacity in the facility was defined as the difference between existing flows and buildout flows. Where the facility has capacity less than projected flows at buildout, the available capacity in the facility was defined as the difference between existing flows and the facility's maximum capacity.
- **Calculate Percent of Excess Capacity Used in Remaining Facilities –** Where the future flow was less than the capacity of the facility, the percent of excess capacity being used in each facility was calculated by dividing the growth in flow in the facility (future flow less existing flow) by the total capacity (existing flow plus available capacity). Where future flow was more than the capacity of the facility, the percent of excess capacity being used in each facility was calculated by dividing the available remaining capacity in the facility by the total capacity.
- **Calculate Excess Capacity for the System as a Whole –** Each pipeline segment in the system has a different quantity of excess capacity to be used by future growth. To develop an estimate of excess capacity for projects containing multiple pipeline segments, the capacities of each of these pipelines and their contribution to the system as a whole must be considered. To do this, each pipeline must first be weighted based on its contribution to system. For this purpose, each pipeline has been weighted based on the product of its capacity and length (e.g., 100 gpm of capacity in a 4,000 ft pipeline contributes more to the system than 100 gpm of capacity in a 300 ft pipeline). The excess capacity in the system as a whole can then be calculated as the sum of the weighted capacity used by future growth divided by the sum of total weighted capacity in the system.

Based on the method described above, the calculated percentage of existing capacity used by growth during the 10 year planning window in facilities paid for by the City is as shown in Tables 7-3 and 7-4 below. Table 7-3 includes facilities paid for directly by the City. In addition to these facilities, the City has also recently paid for the remaining capacity in some facilities constructed by developers that have historically been subject to a pioneering agreement. Table 7-4 includes the

future capacity to be used in association with these recent reimbursement agreements. It will be noted that Table 7-4 does not include any capacity associated with existing use. This is because the City's payment in the reimbursement agreements was for remaining capacity only. All existing capacity in these facilities has already been paid for through past pioneering agreement. As a result, Table 7-4 calculates the percentage of available future capacity only.

Table 7-3
Existing Facility Capacity Used by Growth

Project ID	Project Description	Percent to Existing	Percent to 10-year Growth	Percent to Growth Beyond 10 Years
SAR.016	Inlet Park Sewer Force Main	27.4%	26.8%	45.9%
SAR.017	Inlet Park Lift Station	58.1%	41.9%	0.0%
SAR.019	Sewer Line between 6800 North (400 South) and Entrance to SSD)	25.7%	25.1%	49.2%
SAR.104	Smiths Sewer Outfall*	9.3%	40.1%	50.6%
SAR.126	Inlet Park Lift Station Upgrade	58.1%	41.9%	0.0%
SAR.151A	Extend Posey Force Mains to TSSD	68.5%	31.5%	0.0%
SAR.151B	Posey Lift Station Upgrade	68.5%	31.5%	0.0%
SAR.207	Harbor Bay Park Lift Station Upgrade	11.9%	5.3%	82.8%
SAR.266	TSSD Meter Station	8.8%	8.7%	82.6%

* For components with multiple facilities, a weighted average was developed of available capacity used by future growth.

Table 7-4
Reimbursement Agreement Capacity Used by Growth

Project ID	Project Description	Percent to 10-year Growth	Percent to Growth Beyond 10 Years
RA.1	Inlet Park SSD Reimbursement Agreement*	66.7%	33.3%
RA.2	Inlet Park Lakeview Reimbursement Agreement*	23.6%	76.4%

*For components with multiple facilities, a weighted average was developed of available capacity used by future growth.

APPENDIX

COST ESTIMATES

TECHNICAL MEMORANDUM

DATE: December 21, 2012

TO: Saratoga Springs

FROM: Keith Larson and Andrew McKinnon
Bowen, Collins & Associates
756 East 12200 South
Draper, Utah 84020

COPIES: File

PROJECT: Sewer Capital Facilities Plan

SUBJECT: Cost estimates

Two levels of cost estimates have been prepared for this project. For projects within the IFFP planning window, detailed cost estimates are attached to this memorandum. These estimates have been based on BC&A's database of recent bids for pipe projects along the Wasatch Front. The database includes extensive data on unit costs for smaller pipes and appurtenances along with some data for larger pipelines. A national cost estimating database for sewer pipes was also consulted to provide data for larger diameter pipes, and to confirm pipe costs for smaller pipes. The unit costs are based on August 2012 dollars with an ENR cost index of 9351.

For cost estimates of projects outside the IFFP planning window, project details are less certain. As a result, BC&A has grouped pipeline and appurtenances together for estimating purposes. This simplifies the valuation procedure for long-term projects without significantly compromising accuracy. Instead of uncertain estimates of the number of individual manholes along an existing pipeline or their approximate location on a future pipeline, using a combined valuation wraps the cost of manholes and other appurtenances at average spacing into the total pipe cost. Based on this research, the proposed valuation for long-term cost estimates is as summarized in Table 1.

Table 1
Proposed Pipeline Valuation

Pipe Diameter (in)	New Pipe ($/LF)	Replace Pipe ($/LF)	CIPP ($/LF)	Pavement Restoration ($/LF)
8	$173	$201	$49	$63
12	$179	$209	$55	$66
15	$190	$222	$61	$69
18	$216	$251	$76	$74
24	$246	$283	$99	$77
27	$308	$349	$148	$85
30	$345	$387	$185	$90
36	$394	$439	$222	$93
42	$542	$591	$308	$101
48	$600	$650	$345	$104
54	$690	$743	$394	$109
60	$730	$784	$431	$112
66	$800	$857	$481	$117
72	$887	$949	$567	$125
78	$955	$1,022	$653	$133

The table includes values for pipes under various conditions:

- **New Pipe –** This column represents the cost of installing a sewer pipe, complete in a new area. It includes excavation, pipe, stub outs for laterals, manholes, backfill, and traffic control. Because it is new pipe, there does not need to be bypass pumping, or reconnections to existing sewer lines.

- **Replace Pipe –** This column entails replacing an existing sewer pipe as part of a planned construction package. It includes everything in the new pipe column, but also includes bypass pumping and reconnections to existing sewer lines.

- **Cast in Place Pipe (CIPP) –** The City's most common form of pipeline rehabilitation is CIPP. Thus, it was deemed useful to include costs for this type of work. The costs for this category are based on estimates provided by two major companies that perform CIPP, along with bid results from various recently completed projects.

- **Pavement Restoration –** To be able to distinguish between pipes under pavement versus those outside pavement, asphalt restoration has not been included as part of the cost categories above. A separate number for pavement restoration is included in the table based on recent construction bids along the Wasatch Front.

Preliminary Cost Estimate

BOWEN COLLINS & Associates, Inc.
Consulting Engineers

Project SS-S1.2: River Crossing Trunk - Phase 2 *Date:* 1/15/2014
Owner: Saratoga Springs

No.	Item	Quantity	Units	Unit Cost	Cost
1					
2	Mobilization, Demobilization, Permits	1	LS	$23,000	$23,000
3	Utility Relocation/Reconstruction	1	LS	$2,000	$2,000
4	36-inch Pipeline - Installed	332	LF	$349	$115,709
5	Manholes	2	EA	$10,000	$20,000
6	Lateral Reconnections	0	EA	$1,000	$0
7	Bypass Pumping	0	LS	$0	$0
8	Misc. Surface Restoration (Concrete, landscaping, etc.)	1	LS	$9,000	$9,000
9	Asphalt and Base	71	SY	$47.25	$3,353
10	Bridge Crossing of Jordan River	1	LS	$780,000	$780,000
11	Misc. Unlisted Items	5%			$47,653
12					
13	**Construction Subtotal**				**$1,000,715**
14					
15	Engineering - Design	6%			$60,043
16	Engineering - Construction Management	6%			$60,043
17	Legal and Admin. (ROW, Financing, etc.)	3%			$30,021
18					
19	**Total Cost**				**$1,150,822**

Preliminary Cost Estimate

BOWEN COLLINS & Associates, Inc.
Consulting Engineers

Project SS-S1.3: River Crossing Trunk - Phase 3 *Date:* 1/15/2014
Owner: Saratoga Springs

No.	Item	Quantity	Units	Unit Cost	Cost
1					
2	Mobilization, Demobilization, Permits	1	LS	$391,000	$391,000
3	Utility Relocation/Reconstruction	1	LS	$194,000	$194,000
4	42-inch Pipeline - Installed	4,360	LF	$442	$1,925,526
5	Manholes	14	EA	$14,000	$196,000
6	Lateral Reconnections	0	EA	$1,000	$0
7	Bypass Pumping	1	LS	$24,000	$24,000
8	Misc. Surface Restoration (Concrete, landscaping, etc.)	1	LS	$150,000	$150,000
9	Asphalt and Base	5029	SY	$47.25	$237,617
10	Misc. Unlisted Items	5%			$155,907
11					
12	**Construction Subtotal**				**$3,274,050**
13					
14	Engineering - Design	6%			$196,443
15	Engineering - Construction Management	6%			$196,443
16	Legal and Admin. (ROW, Financing, etc.)	3%			$98,222
17					
18	**Total Cost**				**$3,765,158**

Preliminary Cost Estimate

BOWEN COLLINS & Associates, Inc.
Consulting Engineers

Project SS-S2.1: Inlet Park Trunk - Phase 1, Near Lift Station *Date:* 1/15/2014
Owner: Saratoga Springs

No.	Item	Quantity	Units	Unit Cost	Cost
1					
2	Mobilization, Demobilization, Permits	1	LS	$154,000	$154,000
3	Utility Relocation/Reconstruction	1	LS	$16,000	$16,000
4	21-inch Pipeline - Installed	3850	LF	$170	$656,310
5	Additional Costs Associated with Depth*	1	LS	$131,262	$131,262
6	Manholes	13	EA	$7,500	$97,500
7	Lateral Reconnections	0	EA	$1,000	$0
8	Bypass Pumping	1	LS	$12,000	$12,000
9	Misc. Surface Restoration (Concrete, landscaping, etc.)	1	LS	$59,000	$59,000
10	Asphalt and Base	693	SY	$47.25	$32,725
11	Misc. Unlisted Items	5%			$57,940
12					
13	**Construction Subtotal**				**$1,216,736**
14					
15	Engineering - Design	6%			$73,004
16	Engineering - Construction Management	6%			$73,004
17	Legal and Admin. (ROW, Financing, etc.)	3%			$36,502
18					
19	**Total Cost**				**$1,399,247**

* For depths exceeding 15 feet, add 20% to pipe install costs

Preliminary Cost Estimate

BOWEN COLLINS & Associates, Inc.
Consulting Engineers

Project SS-S2.2: Inlet Park Trunk - Phase 2, Golf Course Main *Date:* 1/15/2014
Owner: Saratoga Springs

No.	Item	Quantity	Units	Unit Cost	Cost
1					
2	Mobilization, Demobilization, Permits	1	LS	$154,000	$154,000
3	Utility Relocation/Reconstruction	1	LS	$40,000	$40,000
4	21-inch Pipeline - Installed	4,263	LF	$170	$726,794
5	Manholes	14	EA	$7,500	$105,000
6	Lateral Reconnections	11	EA	$1,000	$11,000
7	Bypass Pumping	1	LS	$124,000	$124,000
8	Misc. Surface Restoration (Concrete, landscaping, etc.)	1	LS	$118,000	$118,000
9	Asphalt and Base	1917	SY	$47.25	$90,599
10	Misc. Unlisted Items	5%			$68,470
11					
12	**Construction Subtotal**				**$1,437,862**
13					
14	Engineering - Design	6%			$86,272
15	Engineering - Construction Management	6%			$86,272
16	Legal and Admin. (ROW, Financing, etc.)	3%			$43,136
17					
18	**Total Cost**				**$1,653,542**

Preliminary Cost Estimate

BOWEN COLLINS & Associates, Inc.
Consulting Engineers

Project SS-N1: North Trunk *Date:* 1/15/2014

Owner: Saratoga Springs

No.	Item	Quantity	Units	Unit Cost	Cost
1					
2	Mobilization, Demobilization, Permits	1	LS	$1,014,000	$1,014,000
3	Utility Relocation/Reconstruction	1	LS	$68,000	$68,000
4	48-inch Pipeline - Installed	6,576	LF	$513	$3,374,753
5	42-inch Pipeline - Installed	2,812	LF	$442	$1,241,702
6	30-inch Pipeline - Installed	1,526	LF	$245	$374,472
7	Force Main Modification (12" & 14" - Installed	1,737	LF	$117	$202,638
8	Additional Costs Associated with Depth*	1	LS	$499,093	$499,093
9	Manholes	35	EA	$16,000	$560,000
10	Lateral Reconnections	11	EA	$1,000	$11,000
11	Bypass Pumping	1	LS	$48,000	$48,000
12	Misc. Surface Restoration (Concrete, landscaping, etc.)	1	LS	$390,000	$390,000
13	Asphalt and Base	2577	SY	$47.25	$121,782
14	Misc. Unlisted Items	5%			$395,272
15					
16	**Construction Subtotal**				**$8,300,711**
17					
18	Engineering - Design	6%			$498,043
19	Engineering - Construction Management	6%			$498,043
20	Legal and Admin. (ROW, Financing, etc.)	3%			$249,021
21					
22	**Total Cost**				**$9,545,818**

* For north half of project, depths exceed 15 feet. Add 20% to pipe install costs this section

Preliminary Cost Estimate

BOWEN COLLINS & Associates, Inc.
Consulting Engineers

Project SS-N2: 200 West *Date:* 1/15/2014
Owner: Saratoga Springs

No.	Item	Quantity	Units	Unit Cost	Cost
1					
2	Mobilization, Demobilization, Permits	1	LS	$269,000	$269,000
3	Utility Relocation/Reconstruction	1	LS	$28,000	$28,000
4	24-inch Pipeline - Installed	6722	LF	$192	$1,290,153
5	Manholes	22	EA	$7,500	$165,000
6	Lateral Reconnections	7	EA	$1,000	$7,000
7	Bypass Pumping	1	LS	$21,000	$21,000
8	Misc. Surface Restoration (Concrete, landscaping, etc.)	1	LS	$104,000	$104,000
9	Asphalt and Base	1330	SY	$47.25	$62,851
10	Misc. Unlisted Items	5%			$97,350
11					
12	**Construction Subtotal**				**$2,044,354**
13					
14	Engineering - Design	6%			$122,661
15	Engineering - Construction Management	6%			$122,661
16	Legal and Admin. (ROW, Financing, etc.)	3%			$61,331
17					
18	**Total Cost**				**$2,351,008**

Preliminary Cost Estimate

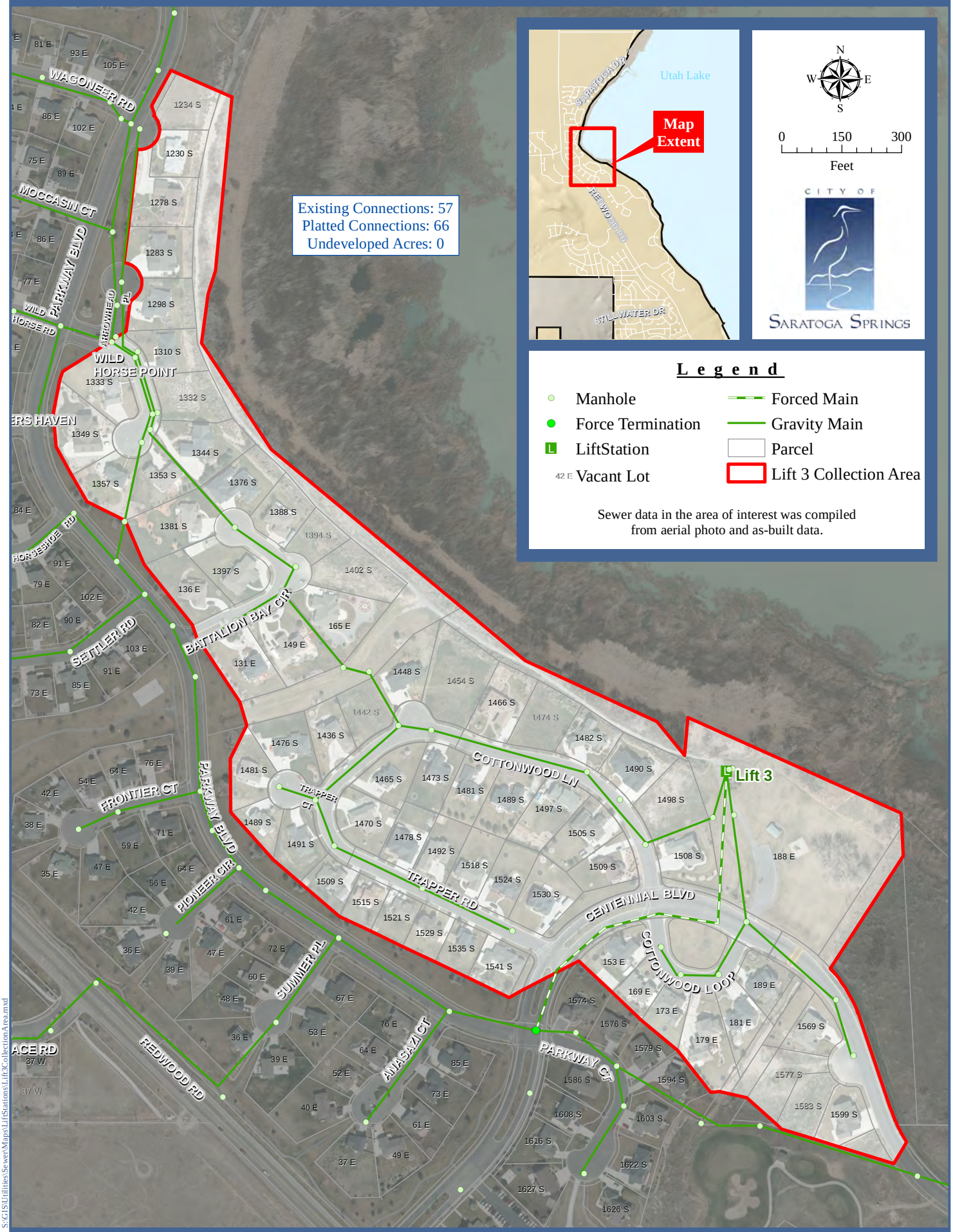
BOWEN COLLINS & Associates, Inc.
Consulting Engineers

Project SS-S4.1: 700 South - First Half *Date:* 1/15/2014
Owner: Saratoga Springs

No.	Item	Quantity	Units	Unit Cost	Cost
1					
2	Mobilization, Demobilization, Permits	1	LS	$552,000	$552,000
3	Utility Relocation/Reconstruction	1	LS	$28,000	$28,000
4	36-inch Pipeline - Installed	5,360	LF	$349	$1,868,012
5	30-inch Pipeline - Installed	3,405	LF	$245	$835,480
6	Manholes	28	EA	$10,000	$280,000
7	Lateral Reconnections	0	EA	$1,000	$0
8	Bypass Pumping	1	LS	$33,000	$33,000
9	Misc. Surface Restoration (Concrete, landscaping, etc.)	1	LS	$212,000	$212,000
10	Asphalt and Base	908	SY	$47.25	$42,898
11	Misc. Unlisted Items	5%			$192,570
12					
13	**Construction Subtotal**				**$4,043,960**
14					
15	Engineering - Design	6%			$242,638
16	Engineering - Construction Management	6%			$242,638
17	Legal and Admin. (ROW, Financing, etc.)	3%			$121,319
18					
19	**Total Cost**				**$4,650,554**

LIFT STATION COLLECTION AREAS

Sewer Lift 3 Collection Area



S:\GIS\Utilities\SewerMaps\LiftStations\Lift3CollectionArea.mxd

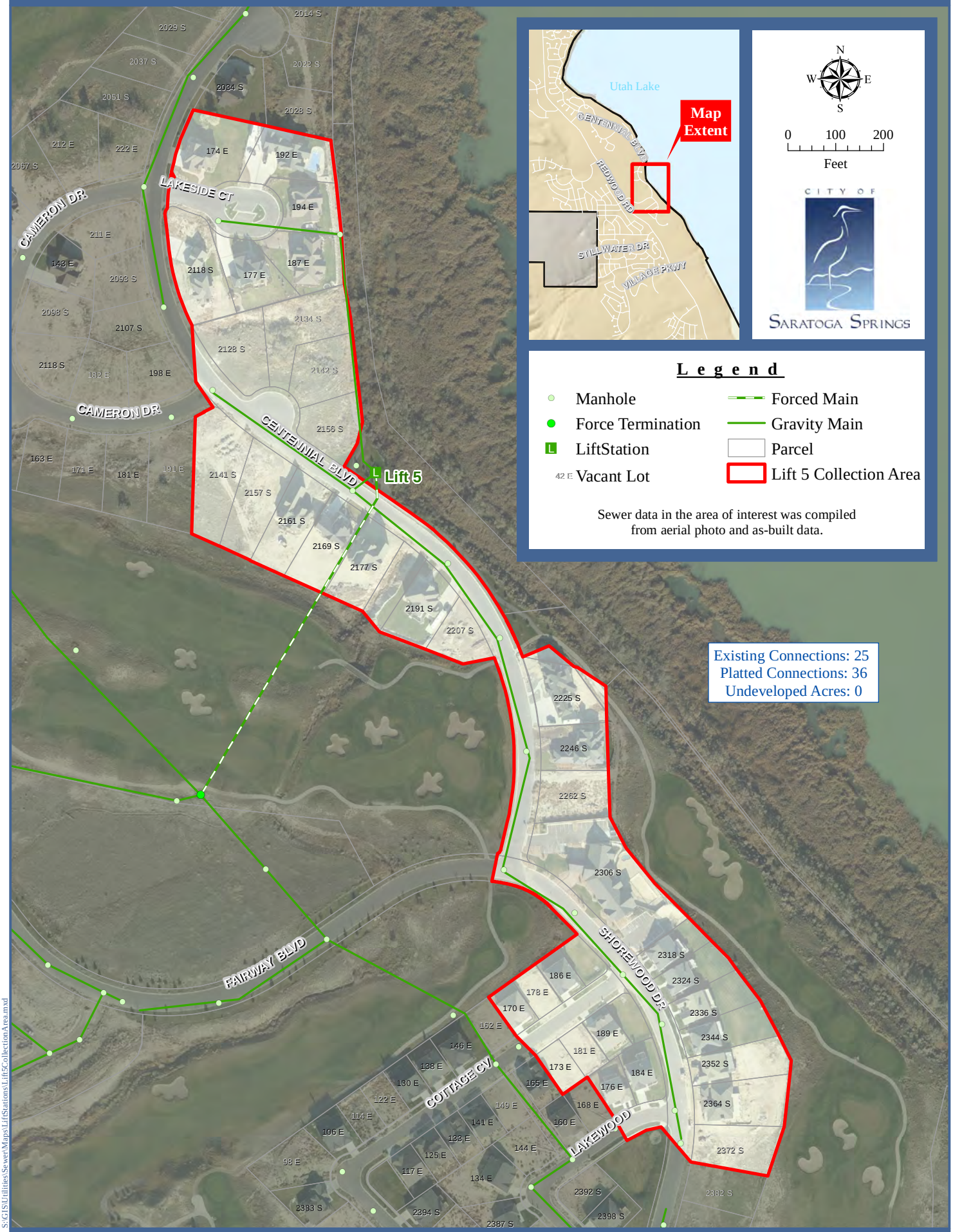
26 December 2012

Sewer Lift 4 Collection Area

S:\GIS\Utilities\Sewer\Maps\LiftStations\Lift4CollectionArea.mxd

26 December 2012

Sewer Lift 5 Collection Area



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26 December 2012

Sewer Lift 6 Collection Area

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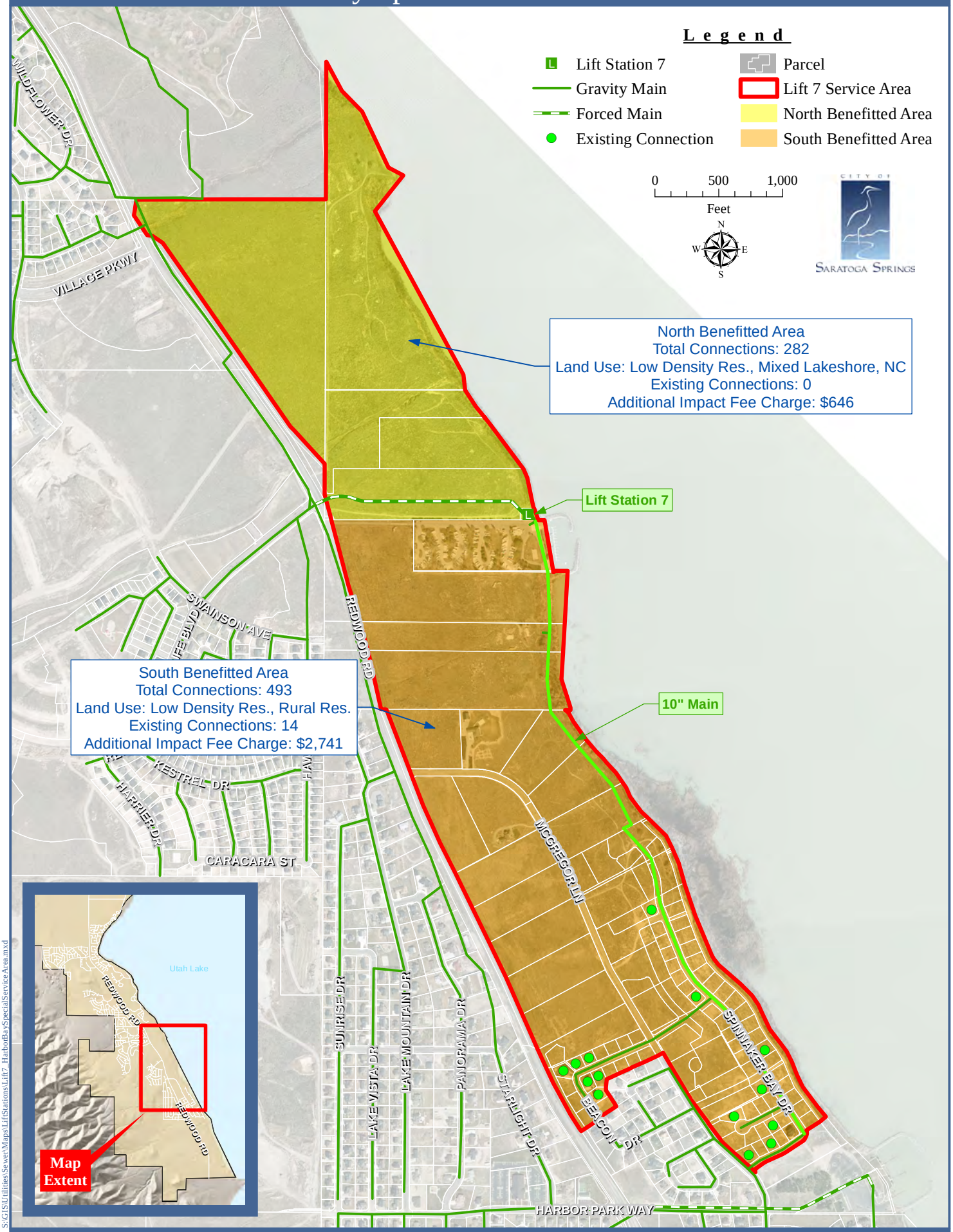
27 December 2012

Sewer: Lift 7 - Harbor Bay Special Service Area



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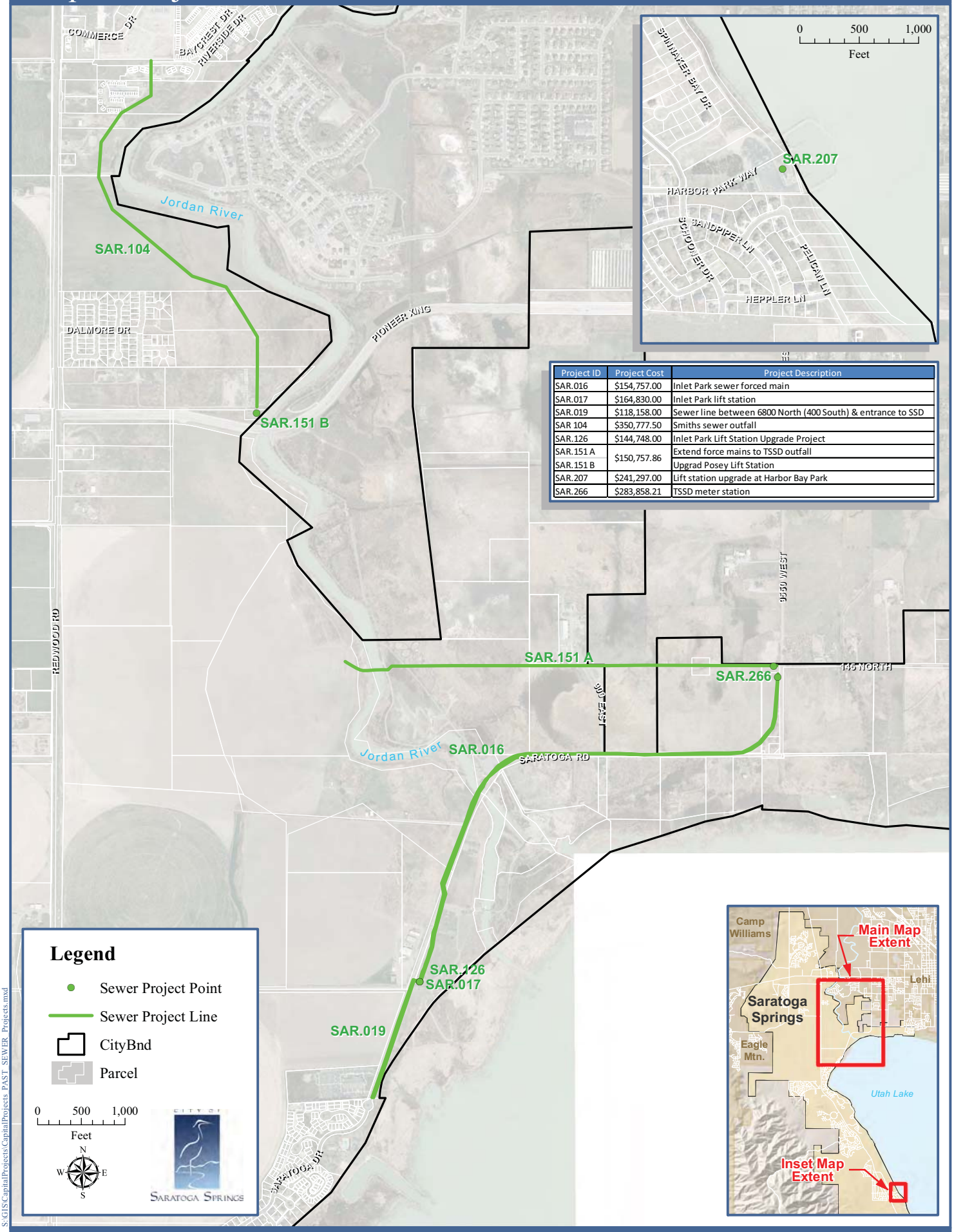
8 January 2014

EXISTING CITY FACILITIES

Capital Projects: Sewer



Project ID	Project Cost	Project Description
SAR.016	$154,757.00	Inlet Park sewer forced main
SAR.017	$164,830.00	Inlet Park lift station
SAR.019	$118,158.00	Sewer line between 6800 North (400 South) & entrance to SSD
SAR 104	$350,777.50	Smiths sewer outfall
SAR.126	$144,748.00	Inlet Park Lift Station Upgrade Project
SAR.151 A	$150,757.86	Extend force mains to TSSD outfall
SAR.151 B		Upgrad Posey Lift Station
SAR.207	$241,297.00	Lift station upgrade at Harbor Bay Park
SAR.266	$283,858.21	TSSD meter station

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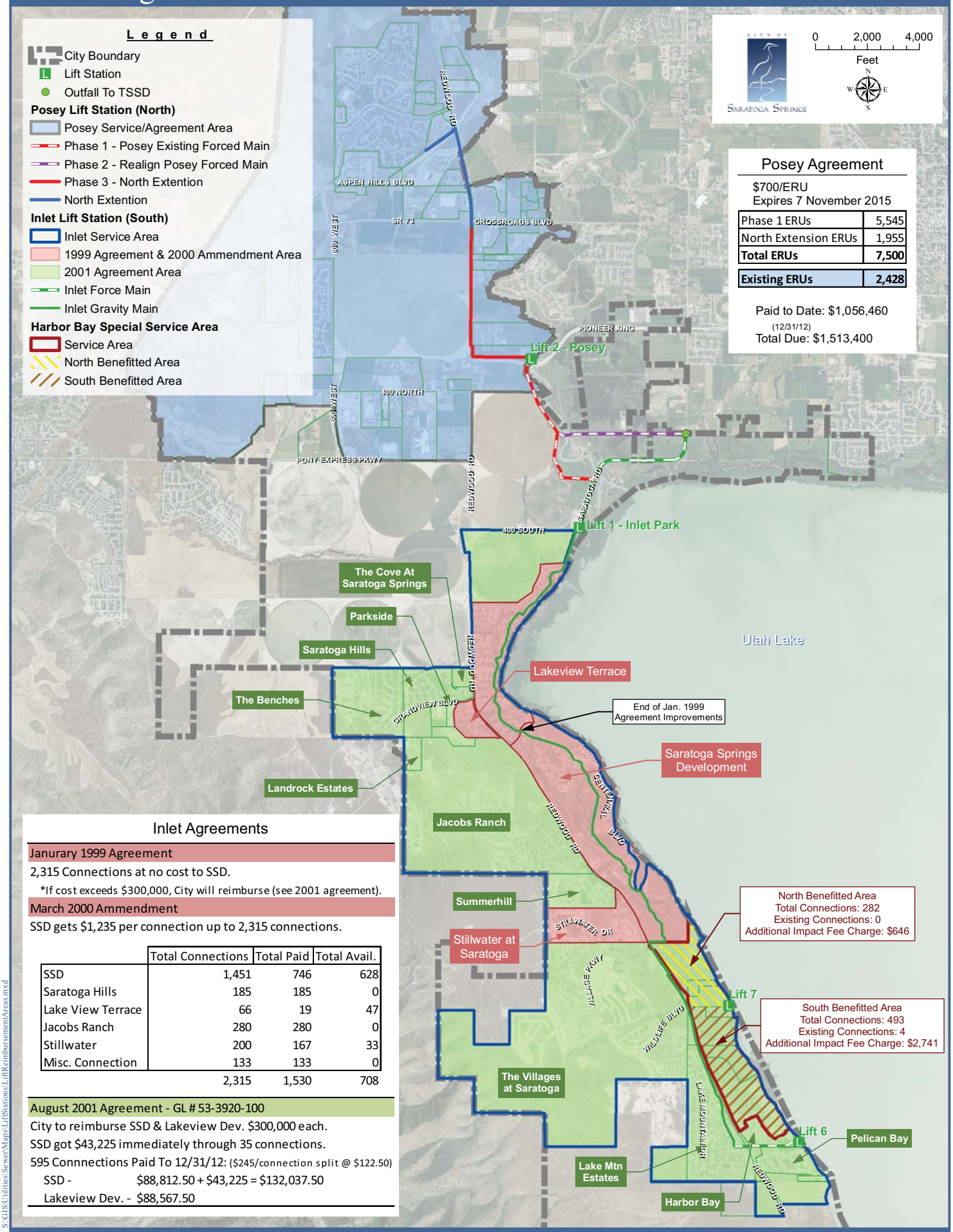
8 January 2014

Sewer Agreements Reimbursement Areas



Inlet Agreements

Janurary 1999 Agreement

2,315 Connections at no cost to SSD.

*If cost exceeds $300,000, City will reimburse (see 2001 agreement).

March 2000 Ammendment

SSD gets $1,235 per connection up to 2,315 connections.

	Total Connections	Total Paid	Total Avail.
SSD	1,451	746	628
Saratoga Hills	185	185	0
Lake View Terrace	66	19	47
Jacobs Ranch	280	280	0
Stillwater	200	167	33
Misc. Connection	133	133	0
	2,315	1,530	708

August 2001 Agreement - GL # 53-3920-100

City to reimburse SSD & Lakeview Dev. $300,000 each.

SSD got $43,225 immediately through 35 connections.

595 Connnections Paid To 12/31/12: ($245/connection split @ $122.50)

SSD - $88,812.50 + $43,225 = $132,037.50

Lakeview Dev. - $88,567.50

S:\GIS\Utilities\Sewer\Maps\LiftStations\LiftReimbursementAreas.mxd

13 May 2013

Salt Lake Area Office:
154 East 14000 South
Draper, Utah 84020
Phone: (801) 495-2224
Fax: (801) 495-2225

Boise Area Office:
776 East Riverside Drive
Suite 250
Eagle, Idaho 83616
Phone: (208) 939-9561
Fax: (208) 939-9571

Southern Utah Area Office:
20 North Main
Suite107
St. George, Utah 84770
Phone: (435) 656-3299
Fax: (435) 656-2190

Bowen Collins
& Associates, Inc.
CONSULTING ENGINEERS

SARATOGA SPRINGS, UTAH

SEWER IMPACT FEE ANALYSIS

PREPARED BY

ZIONS BANK PUBLIC FINANCE

JUNE 19, 2014

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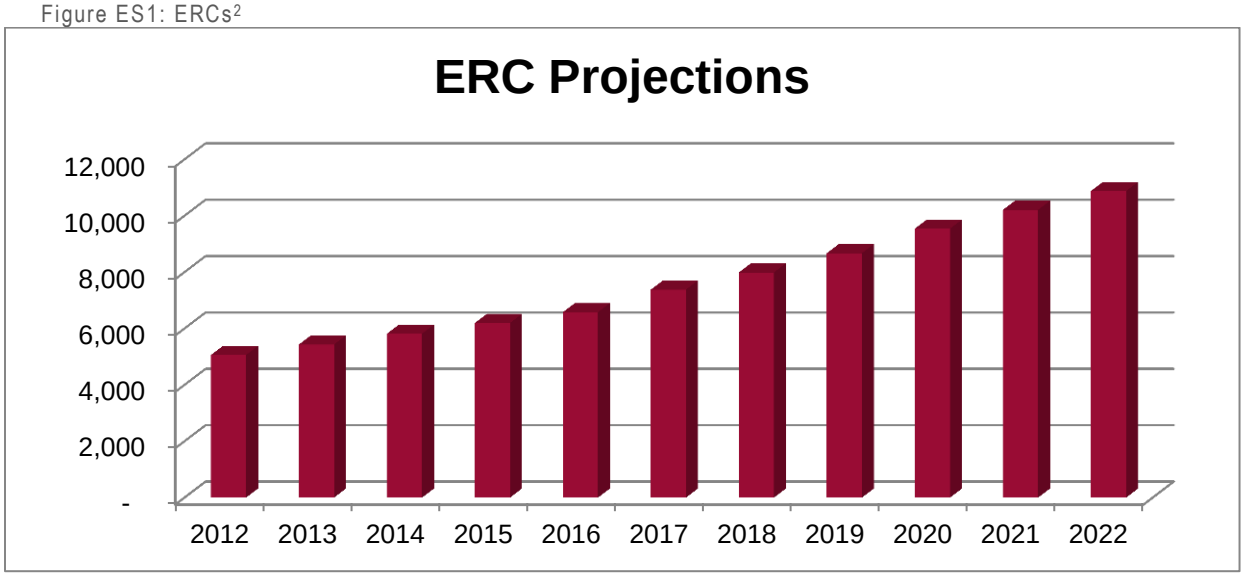
EXECUTIVE SUMMARY

Zions Bank Public Finance (Zions) is pleased to provide the City of Saratoga Springs (the City) with an update to the sanitary sewer collection system impact fees. The following pages summarize the document and tables included. The intent is to provide a concise discussion of the calculation and identification of the recommended maximum legal impact fee.

Growth and ERC Projections

In 2012 the City has a total of 5,059 sewer equivalent residential connection (ERCs)[1]. Residential ERCs can be based on population and 40 fixture unit count and easily calculated. In order to calculate the total number of existing ERCs Zions obtained from the City the existing number of residential and non-residential ERCs. The City used an internal database of historic fee schedules to provide the non-residential ERCs. The ERCs were provided by Bowen Cowen & Associates. The following table identifies the current and future ERCs City-Wide. The analysis considers growth over the next ten years. Between now and 2022, ERCs may increase by 5,818 to reach 10,877 by 2022. The Sewer Impact Fee will be broken into four service areas. Bowen Collins & Associates reports that development will occur in the north end of the City by 2,958 ERCs and the south end of the City will increase by 2,860 ERCs.

Figure ES1: ERCs[2]



Level of Service Definitions

Bowen Collins & Associates defined the City's level of service in the Capital Facilities Plan. The plans state the following:

Residential development is generally assigned a value of 1 ERC for every dwelling unit. For non-residential development, the City assigns an ERC value based on a fixture count that is performed at the issuance of the Building Permit. The fixture count is based on the International Plumbing Code (IPC), issued by the International Code Council as a method to predict peak water and sewer use by the number of water fixtures and the type of water fixtures a building has. Each fixture type is assigned a load value in water supply fixture units (wsfu). For example, a kitchen sink has a load factor of 1.4 wsfu based on how much water is used at a kitchen sink. A typical residential toilet has a load factor of 2.2 wsfu because a toilet uses more water than a kitchen sink. Once all the fixtures are identified, all the fixture units are added together for a total fixture unit count. The City also uses the IPC as the

[1] Table 3-1 Bowen Collins & Associates Capital Facilities Plan and Impact Fee Facilities Plan
[2] BC&A IFFP

plumbing standards used for plan reviews and building inspections. The IPC fixture count method is used to size the water meter and sewer lateral.

For the evaluation of future growth, it has been assumed that the City will continue to use the IPC fixture unit count method to calculate ERCs. Based on historic City practice, a ¾-inch water meter is the minimum size allowed for a residential connection and all connections are considered to be at least one ERC. The maximum fixture count allowed for a ¾-inch residential water meter is 40. For fixture counts greater than 40, a larger meter will be required and a larger value of ERCs will be calculated.

PROPORTIONATE SHARE ANALYSIS

The Impact Fees Act requires that the impact fee analysis estimate the proportionate share of the costs for existing capacity that will be recouped; and the costs of impacts on system improvements that are reasonably related to the new development activity.

Part of the proportionate share analysis is a consideration of the manner of funding existing public facilities. A City typically funds existing infrastructure through several different funding sources including:

- General Fund Revenues
- User Fees
- Grants
- Bond Proceeds
- Developer Exactions
- Impact Fees

In consideration of future capital improvements, the City will continue using similar funding sources; no grants are being considered or are available at this time. Using impact fees places a burden on future users that is equal to the burden that was borne in the past by existing users. (Utah Impact Fees Act, 11-36a-304(2) (c) (d))

Existing Infrastructure and Capacity to Serve New Growth (Buy-In Component)

The City provided Zions with a list of all City owned assets for the collection system. The documented expenditures of the facilities for the North Service Area (eligible for buy-in) is $74,530. The South Service Area totals $130,806 of impact fee eligible expenses. The costs for the City's reimbursements agreements are considered in the analysis. The City has paid out the SSD Inlet Park Lift Station and Sewer Main, the Benches Booster Station and the Benches Saratoga Road Collection Line Agreements. The buyout expense has been included in the analysis. As for other infrastructure, only the original costs of the improvements have been considered. See Appendix 3 for the detailed list of assets for the collection system. An analysis has been completed to identify the capacity to serve new growth. The methodology used by Bowen Collins & Associates in this analysis was to evaluate the capacity that new growth would demand on the existing system. A ten year window of growth was analyzed and the increase of 5,818 ERCs added between now and 2022 will benefit from existing system capacity. Bowen Collins & Associates has determined what percent capacity each existing asset has to serve 10-year growth. This has been built into the fee calculation.

Outstanding and Future Debt/Reimbursement Agreements

The City of Saratoga Springs is a relatively new, high growth city. To help fund the necessary infrastructure that came on quickly with development, the City entered into agreements with developers to fund the projects and provide reimbursement over time. The City has determined that it was best to pay off and settle many of these agreements in 2013. The City used impact fees to pay the agreements in totality. The remaining agreements outstanding are the Harbor Bay Lift Station Agreement in the South Service Area and the Posey Lift Agreement in the North. These agreements are financing mechanisms to purchase existing capacity. The details of these agreements are discussed in detail later and maps of the benefitted areas are included in the Appendix. Some of these agreements create separate service areas for financial reasons only.

It is proposed that the City issue future debt to fund the sewer utility in 2014 and in 2018. The debt service schedules and calculations of the percent impact fee qualifying can be found in Appendix 4 & 4.A of this document. An interest rate of 4% was used to calculate the total debt service schedules. The Series 2014 $5M bond is 14% (total) impact fee qualifying (99% to the SSA and 1% to the NSA) and the Series 2018 $25M bond is 7% total impact fee qualifying (14% to the SSA and 86% to the NSA). The percent related to growth is based on defining the projects built in the three year spending window from date of issuance, 2014 and 2018 respectively. There are different blends of projects built into each bond, thus you have a different amount that is growth related. Some projects constructed are repair and replacement related only. The 2014 bond has five projects being constructed, while the 2018 only has three. For details on the proportionate share of the bonds please see Appendix 4.There is further discussion about the debt in the body of this document.

Future Capital Improvements

Bowen Collins & Associates provided a list of capital projects to be constructed in the next ten years. The engineers identified the percent of the project that will serve growth through buildout and then a further breakdown of how much the capital project will benefit the 5,818 new ERCs to be added in the next ten years. The 2013 fiscal year total of capital improvements totals $25,678,254. The total impact fee qualifying future expense for the North Service Area is $995,238 and the South totals $799,322.

CALCULATED FEE

The impact fees have been calculated with all the above considerations for four service areas in addition to a Future Treatment Area. The collection fee in the four service areas is calculated per ERC. The Future Treatment Service Area will be exempt from impact fees, but will need to develop plans for conveyance and treatment on its own. The treatment component of Saratoga Springs' sewer utility (treatment fee) is provided by Timpanogos Special Service District (TSSD) and applies to all areas within the city boundary.

Figure ES2: Recommended Maximum Legal Collection Fee per ERC for Each Service Area

Saratoga Springs Impact Fee - North Service Area - Posey Lift Station

North Service Area - Posey	Cost	% Impact Fee Qualifying	% to Service Area	Impact Fee Qualifying Cost	ERUs to be Served	Cost per ERU
Collection Impact Fee						
IFFP Projects	$ 995,238	100%	100%	995,238	2,958	$ 336
Buy In - Existing Assets	206,388	100%	100%	206,388	2,958	70
Subtotal	**$ 1,201,626**	**100%**		**$ 1,201,626**		**$ 406**
Debt						
Posey Lift Station - Reimbursement Agreement	1,414,390	100%	100%	1,414,390	2,958	478
Proposed Series 2014 Debt Service	5,081,556	0%	1%	105	2,958	0
Proposed Series 2014 Bond Proceeds	(3,453,000)	0%	1%	(71)	2,958	(0)
Proposed Series 2018 Debt Service	24,595,436	6%	86%	1,251,046	2,958	423
Proposed Series 2018 Bond Proceeds	(16,713,000)	6%	86%	(850,106)	2,958	(287)
Subtotal	**$ 10,925,381**			**$ 1,815,363**		**$ 614**
Impact Fee Fund Balance Credit						
Impact Fee Fund Balance Credit	-	100%		-	2,958	-
Total Impact Fee Per ERU						**$ 1,020**

Saratoga Springs Impact Fee - South Service Area

South Service Area	Cost	% Impact Fee Qualifying	% to Service Area	Impact Fee Qualifying Cost	ERUs to be Served	Cost per ERU
Collection Impact Fee						
IFFP Projects	$ 799,322	100%	100%	$ 799,322	2,860	$ 279
Buy In - Existing Assets	797,902	100%	100%	797,902	2,860	279
Subtotal	**$ 1,597,224**	**100%**		**$ 1,597,224**		**$ 558**
Debt						
Proposed Series 2014 Debt Service	5,081,556	14%	99%	$ 697,220	2,860	$ 244
Proposed Series 2014 Bond Proceeds	(3,453,000)	14%	99%	(473,772)	2,860	(166)
Proposed Series 2018 Debt Service	24,595,436	1%	14%	47,096	2,860	16
Proposed Series 2018 Bond Proceeds	(16,713,000)	1%	14%	(32,003)	2,860	(11)
Subtotal	**$ 9,510,992**			**$ 238,541**		**$ 83**
Impact Fee Fund Balance Credit						
Impact Fee Fund Balance Credit	-	100%		-	2,860	-
Total Impact Fee Per ERU						**$ 642**

Saratoga Springs Impact Fee - South Service Area - Harbor Bay North Benefitted Area

South Service Area - Harbor Bay North Benefitted Area	Cost	% Impact Fee Qualifying	% to Service Area	Impact Fee Qualifying Cost	ERUs to be Served	Cost per ERU
Collection Impact Fee						
IFFP Projects	$ 799,322	100%	100%	$ 799,322	2,860	$ 279
Buy In - Existing Assets	797,902	100%	100%	797,902	2,860	279
Subtotal	**$ 1,597,224**	**100%**		**1,597,224**		**558**
Debt						
Reimbursement Agreement - Harbor Bay Lift Station NBA						$ 1,346
Proposed Series 2014 Debt Service	5,081,556	14%	99%	697,220	2,860	244
Proposed Series 2014 Bond Proceeds	(3,453,000)	14%	99%	(473,772)	2,860	(166)
Proposed Series 2018 Debt Service	24,595,436	1%	14%	47,096	2,860	16
Proposed Series 2018 Bond Proceeds	(16,713,000)	1%	14%	(32,003)	2,860	(11)
Subtotal	**$ 9,510,992**			**$ 238,541**		**$ 1,429**
Impact Fee Fund Balance Credit						
Impact Fee Fund Balance Credit	-	100%		-	2,860	-
Total Impact Fee Per ERU						**$ 1,987**

Figure ES2.A: Recommended Maximum Legal Collection Fee per ERC for Each Service Area

South Service Area - Harbor Bay South Benefitted Area	Cost	% Impact Fee Qualifying	% to Service Area	Impact Fee Qualifying Cost	ERUs to be Served	Cost per ERU
Collection Impact Fee						
IFFP Projects	$ 799,322	100%	100%	$ 799,322	2,860	$ 279
Buy In - Existing Assets	797,902	100%	100%	797,902	2,860	279
Subtotal	1,597,224	100%		1,597,224		**558**
Debt						
Reimbursement Agreement - Harbor Bay Lift Station SBA						$ 2,938
Proposed Series 2014 Debt Service	5,081,556	14%	99%	697,220	2,860	244
Proposed Series 2014 Bond Proceeds	(3,453,000)	14%	99%	(473,772)	2,860	(166)
Proposed Series 2018 Debt Service	24,595,436	1%	14%	47,096	2,860	16
Proposed Series 2018 Bond Proceeds	(16,713,000)	1%	14%	(32,003)	2,860	(11)
Subtotal	**$ 9,510,992**			**$ 238,541**		**$ 3,021**
Impact Fee Fund Balance Credit						
Impact Fee Fund Balance Credit	-	100%		-	2,860	**-**
Total Impact Fee Per ERU						**$ 3,580**

PROJECT OVERVIEW

Zions Bank Public Finance (Zions) is pleased to provide the City of Saratoga Springs (the City) with an update to the sanitary sewer impact fees. Saratoga Springs realizes that due to the age of its current analysis, as well as changes to the Impact Fees Act, required updates and review of the current impact fees as well as the facility planning are needed. The City is still growing rapidly and has many capital needs. The update to the analysis is an intensive collaborative effort that meets the needs of City Stakeholders and the City. The information used to create this fee analysis was provided by City staff, Zions Bank Public Finance and Bowen Collins & Associates.

The goal of the impact fee analysis is to calculate the maximum impact fee that may be assessed to new development and ensure the fee meets the requirements of the Impact Fees Act, Utah Code 11-36a-101 *et seq*. The sections and subsections of the impact fee analysis will directly address the following items, required by the code:

- Impact Fee Analysis Requirements (Utah Code 11-36a-304)
- Identify Existing Capacity to serve growth
    - Proportionate Share Analysis
- Identify the level of service
- Identify the impact of future development on exisitng and future improvements
- Calculated Fee (Utah Code 11-36a-305)
- Certification (Utah Code 11-36a-306)

IMPACT FEE ANALYSIS REQUIREMENTS

Service Area

For the purpose of impact fees, the City's overall service area has been divided into three major impact fee areas (with two additional subareas). These impact fee areas are shown in the Sewer IFFP and include the following:

North Service Area –Through the middle of the City is a major sewer trunk line owned by Eagle Mountain. The size and depth of this trunk line effectively blocks Saratoga Springs sewer drainage facilities from moving from one side of the City to the other. As a result, the City essentially operates two separate systems until their combination point at the TSSD outfall at the east end of the City. The north portion of his area will be identified in this report as the North Service Area.

South Service Area – Most of the area south of the Eagle Mountain trunk line has been identified as the South Service Area. Within this area are two subareas that must be considered for impact fee purposes. This includes the North and South Benefited Areas of the Harbor Bay Lift Station. These areas are functionally part of the South Service area but include additional reimbursement agreements that affect development that falls within the areas. A detailed figure identifying these subareas and their associated facilities has been included in the appendix of this report.

Future Treatment Service Area – As part of previous master plans, it was decided that the City collection system would only extend to the south as far as the service area of the Marina Lift station. All areas to the south of this boundary will be served by a future treatment plant. As a result, development in this service area will be exempt from impact fees, but will need to develop plans for conveyance and treatment on its own.

Growth and ERC Projections

The driving force of a sewer collection impact fee analysis is the Equivalent Residential Connection (ERC). The Impact Fee Facilities Plan defines an ERC as 40 fixture units[3]. Currently the City has 5,059 equivalent residential

[3] Page 3-1 Bowen Collins & Associates Capital Facilities Plan and Impact Fee Facilities Plan

connections. In the next ten years it is anticipated that the City will grow to 10,877[4] ERCs (an increase of 5,818 ERCs). The ERCs and the percent increase are displayed below.

Figure 1: ERCs

ERU Projections		% Increase
2012	5,059	
2013	5,430	7%
2014	5,812	7%
2015	6,194	6%
2016	6,576	6%
2017	7,377	11%
2018	7,986	8%
2019	8,671	8%
2020	9,541	9%
2021	10,207	7%
2022	10,877	6%

There will be significant growth expected within the City's boundaries and increase demand on the City's collection facilities that exist currently and will also require new projects to meet further demand. The area is growing at a very rapid pace. The growth projections in both population and ERCs can be found in the Appendix of this document.

The North Service Area will increase by 2,958 ERCs is ten years and the South will add 2,860 ERCs by 2022.

Level of Service Definitions

Residential development is generally assigned a value of 1 ERC for every dwelling unit. For non-residential development, the City assigns an ERC value based on a fixture count that is performed at the issuance of the Building Permit. The fixture count is based on the International Plumbing Code (IPC), issued by the International Code Council as a method to predict peak water and sewer use by the number of water fixtures and the type of water fixtures a building has. Each fixture type is assigned a load value in water supply fixture units (wsfu). For example, a kitchen sink has a load factor of 1.4 wsfu based on how much water is used at a kitchen sink. A typical residential toilet has a load factor of 2.2 wsfu because a toilet uses more water than a kitchen sink. Once all the fixtures are identified, all the fixture units are added together for a total fixture unit count. The City also uses the IPC as the plumbing standards used for plan reviews and building inspections. The IPC fixture count method is used to size the water meter and sewer lateral.

For the evaluation of future growth, it has been assumed that the City will continue to use the IPC fixture unit count method to calculate ERCs. Based on historic City practice, a ¾-inch water meter is the minimum size allowed for a residential connection and all connections are considered to be at least one ERC. The maximum fixture count allowed for a ¾-inch residential water meter is 40. For fixture counts greater than 40, a larger meter will be required and a larger value of ERCs will be calculated.

Therefore the City has defined the current level of service for this impact fee analysis as:

- Sewer: 40 fixtures units

[4] Page 3-2 Bowen Collins & Associates Capital Facilities Plan and Impact Fee Facilities Plan

Existing Infrastructure and Capacity to Serve New Growth (Buy-In Component)

Appendix 3 provides an expense report for the assets owned and operated by Saratoga Springs for collection/outfall lines and other assets. Included with the assets are the original dates of construction or acquisition and the original cost of the collection component of the sanitary sewer system. Pioneering Agreements are also financing elements that the City has used to fund existing capacity. The cost retired for the agreements as well as the fee outstanding per ERC has been included in the analysis. An analysis has been completed to identify the capacity to serve new growth. Bowen Collins & Associates has determined that the percent of existing capacity to serve 10-year growth and this amount, per asset, has been included in the IFA. Full details are found in Appendix 3 and Section H of this document.

Treatment

Timpanogos Special Service District provides the City treatment for the sewer utility (sewer treatment fee assessed).

Debt/Pioneering and Development Agreements

There are two proposed future bonds anticipated in this analysis. The capital projects defined in the Impact Fee Facilities Plan require other funding sources outside of rates and fees. The Series 2014 $3.4M bond is 14.1% (total) impact fee qualifying (99% to the SSA and 1% to the NSA) and the Series 2018 $16.7M bond is 7% total impact fee qualifying (14% to the SSA and 86% to the NSA). The percent related to growth is based on defining the projects built in the three year spending window from date of issuance, 2014 and 2018 respectively. There are different blends of projects built into each bond, thus you have a different amount that is growth related. Some projects constructed are repair and replacement related only. The 2014 bond has four projects being constructed, and the 2018 has four as well. The debt service schedules and calculations of impact fee qualifying percentages are found in Appendix 4 and 4.A of this document. The Debt Service calculations include a 4% interest rate and a 20 year term.

Posey Lift Agreement

The developers have agreed to a $700 reimbursement for the assets they have constructed in Saratoga Springs. The agreement and payment of the $700 per ERC will continue until March 31, 2020. This agreement includes the installed assets of a gravity sewer line and improvements and lift station from the Crossroads area to the TSSD sewer trunk line at Saratoga Road. The development also included a sewer line extension from the end of the gravity sewer line (discussed above) at the Four Corners to the entrance of the “Harvest Hills Planned Residential Community”. To fairly incorporate the fee across the ten year horizon, we determined the amount to be paid by the new ERCs the fee would be collected from now until the expiration date of the agreement ($1,414,389 = $700 x 2020 new ERCS) then spread the cost over the entire 10 yr. period.

Harbor Bay Lift Station

Impact fees are used to reimburse the developer for the Harbor Lift Station. The lift station benefits what is defined in the agreement as the Harbor Bay Service Area. The agreement identifies that the improvements only benefit this area and nowhere else. The agreement includes the following facilities at the following costs:

The documented costs total $578,335.80 for the Phases 4 & 5 of Harbor Bay Subdivision. The costs for the sewer outfall line from El Nautica to Harbor Bay totals $784,951.40 and the costs of the lift station totals $1,042,850.56.

The costs of the facilities were apportioned by the appropriate benefitted areas. All of the Harbor Bay Special Service Area will benefit from the Lift Station and Pressure Line. However, only the property south of the new lift station and the pressure line, defined as the “South Benefitted Area” will utilize the Gravity Line Phase I and II. Area north of the lift station will have to bear the cost of a future gravity line to connect to the lift station (detailed plans not identified at time of agreement). Therefore, there are additional costs for the South Benefitted Area.

- North Benefitted Area: $1,345.61 per ERC in addition to City’s Impact Fee, up to 282 units
- South Benefitted Area: $2,937.81 per ERC in addition to City’s Impact Fee

PROPORTIONATE SHARE ANALYSIS

The Impact Fees Act requires that the impact fee analysis estimate the proportionate share of the costs for existing capacity that will be recouped; and the costs of impacts on system improvements that are reasonably related to the new development activity.

Saratoga Springs continues to grow and there is still expansion in the area. The capital improvement plan clearly defines what projects are growth related, repair and replacement, or pipe upsizing (the upsizing may include some element of growth). The projects are detailed later in the Future Capital Projects section.

Part of the proportionate share analysis is a consideration of the manner of funding existing public facilities. Historically the City has funded existing infrastructure through several different funding sources including:

- General Fund Revenues
- User Rates
- Grants
- Bond Proceeds
- Developer Exactions
- Impact Fees

In calculating the buy-in component (for existing infrastructure capacity) of this analysis no grant funded infrastructure has been included. Once the grant funding projects have been removed, all remaining infrastructure has been funded by existing residents. In order to ensure fairness to existing users, impact fees are an appropriate means of funding future capital infrastructure. Using impact fees places a burden on future users that is equal to the burden that was borne in the past by existing users. (Utah Impact Fees Act, 11-36a-304(2) (c) (d))

Just as existing infrastructure has been funded through different means; it is required by the Impact Fees Act to evaluate all means of funding future capital. There are positive and negative aspects to the various forms of funding. It is important to evaluate each.

General Fund/User Rates
The general fund and user rates have both been funded in one form or another by existing users. It would be an additional burden to existing users to use this revenue source to fund future capital to meet the needs of future users. This is not an equitable policy and can place too much stress on the tight budgets of the general fund and other user rate funds. The sewer rates in Saratoga Springs are dedicated to payments on the public works building, operation and maintenance, repair and replacement and ensuring a stable reserve for maintaining a good credit rating.

Bond Proceeds
Based on lack of impact fee reserves and cash funding available for the sewer projects needed for the future, the City anticipates issuing debt for capital projects. It is important to note that it is anticipated the impact fees will fund the eligible portions of the proposed debt.

Property Taxes
It is true that property taxes may be a stable source of income. However, property taxes are not based on impact placed upon a system. Property taxes are based upon property valuation. Using property taxes to fund future capital again places too much burden on existing users and subsidizes growth. The financial audits for the City do not show a line item for property taxes as a revenue stream for sanitary sewer, thus any property taxes collected on the property being developed is not being used to fund infrastructure or operation and maintenance of the sewer system.

Impact Fees

Impact fees are a fair and equitable means of providing infrastructure for future development. They provide a rational nexus between the costs borne in the past and the costs required in the future. The Impact Fees Act ensures that future development is not paying any more than what future growth will demand. Existing users and future users receive equal treatment; therefore impact fees are the optimal funding mechanism for future growth related capital needs.

Developer Credits

If projects included in the Impact Fee Facilities Plan (or a project that will offset the demand for a system improvement that is listed in the IFFP) are constructed by developers, that developer is entitled to a credit against impact fees owed. (Utah Impact Fees Act, 11-36a-304(2) (f))

Other

In this particular analysis, there is also a credit for unspent impact fee revenues collected in the past. The current impact fee fund balance for sewer was credited against the fee.

Impact Fee Facilities Plan – Future Capital Projects

The Impact Fee Facilities Plan developed the following capital projects, helped determine the timing and identified what was growth related, and of that amount, how much of the total capacity will be realized in the next ten years (% Impact Fee Qualifying & Impact Fee Qualifying Cost).

Figure 2: Capital Projects

Project Name	Year to be Constructed	FY 2013 Cost	Total Construction Cost	% Impact Fee Qualifying	Impact Fee Qualifying Cost (Present Value)	Remaining Growth Related	Non Growth Related
South Service Area							
SS-S1.1 River Crossing Alignment & Preliminary Design Study*	2014	$ 49,154	$ 49,154	10%	$ 4,691	$ 40,588	$ 3,875
SS-S1.2 River Crossing Trunk Phase 2, Bridge or Siphon*	2018	565,760	565,760	10%	53,999	467,171	44,590
SS-S 1.3 River Crossing Trunk Phase 3, Outfall*	2018	1,801,486	1,801,486	10%	171,942	1,487,561	141,983
SS-S 2.1 Inlet Park Trunk Phase 1, Near Lift Station	2014	1,399,000	1,399,000	16%	227,132	1,171,868	-
SS-S 2.2 Inlet Park Trunk Phase 2, Golf Course Main	2015	1,654,000	1,654,000	13%	213,386	1,232,397	208,217
SS-L1 Lift Station 1 Pump Upgrade	2015	300,000	300,000	12%	35,644	264,356	-
SS-S4.1 700 South Trunk First Half	2022	4,650,600	4,650,600	2%	92,528	4,558,072	-
South Service Area Subtotal		***$ 10,420,000***	***$ 10,420,000***		***$ 799,322***	***$ 9,222,013***	***$ 398,665***
North Service Area							
SS-S1.1 River Crossing Alignment & Preliminary Design Study*	2014	$ 50,846	$ 50,846	10%	$ 4,853	$ 41,986	$ 4,007
SS-S1.2 River Crossing Trunk Phase 2, Bridge or Siphon*	2018	585,240	585,240	10%	55,858	483,257	46,125
SS-S 1.3 River Crossing Trunk Phase 3, Outfall*	2018	1,863,514	1,863,514	10%	177,862	1,538,780	146,872
SS-N 1.0 North Trunk	2018	9,546,000	9,546,000	7%	683,841	7,949,215	912,944
SS-N2 200 West Trunk	2020	2,351,000	2,351,000	3%	72,824	2,278,176	-
North Service Area Subtotal		***$ 14,396,600***	***$ 14,396,600***		***$ 995,238***	***$ 12,291,414***	***$ 1,109,948***
Ten Year Total		**$ 25,678,254**	**$ 25,678,254**		**$ 1,794,560**	**$ 21,513,427**	**$ 2,370,267**

CALCULATED FEE

The collection impact fees have been calculated with all the above considerations for the four service areas. The fee is calculated per a single ERC. The fees per ERC can be found in Figure 3. These tables can also be found in Appendix 5.

Figure 3: Recommended Maximum Legal Fee Collection Fee per ERC

Saratoga Springs Impact Fee - North Service Area - Posey Lift Station

North Service Area - Posey	Cost	% Impact Fee Qualifying	% to Service Area	Impact Fee Qualifying Cost	ERUs to be Served	Cost per ERU
Collection Impact Fee						
IFFP Projects	$ 995,238	100%	100%	995,238	2,958	$ 336
Buy In - Existing Assets	206,388	100%	100%	206,388	2,958	70
Subtotal	**$ 1,201,626**	**100%**		**$ 1,201,626**		**$ 406**
Debt						
Posey Lift Station - Reimbursement Agreement	1,414,390	100%	100%	1,414,390	2,958	478
Proposed Series 2014 Debt Service	5,081,556	0%	1%	105	2,958	0
Proposed Series 2014 Bond Proceeds	(3,453,000)	0%	1%	(71)	2,958	(0)
Proposed Series 2018 Debt Service	24,595,436	6%	86%	1,251,046	2,958	423
Proposed Series 2018 Bond Proceeds	(16,713,000)	6%	86%	(850,106)	2,958	(287)
Subtotal	**$ 10,925,381**			**$ 1,815,363**		**$ 614**
Impact Fee Fund Balance Credit						
Impact Fee Fund Balance Credit	-	100%		-	2,958	-
Total Impact Fee Per ERU						**$ 1,020**

Saratoga Springs Impact Fee - South Service Area

South Service Area	Cost	% Impact Fee Qualifying	% to Service Area	Impact Fee Qualifying Cost	ERUs to be Served	Cost per ERU
Collection Impact Fee						
IFFP Projects	$ 799,322	100%	100%	$ 799,322	2,860	$ 279
Buy In - Existing Assets	797,902	100%	100%	797,902	2,860	279
Subtotal	**$ 1,597,224**	**100%**		**$ 1,597,224**		**$ 558**
Debt						
Proposed Series 2014 Debt Service	5,081,556	14%	99%	$ 697,220	2,860	$ 244
Proposed Series 2014 Bond Proceeds	(3,453,000)	14%	99%	(473,772)	2,860	(166)
Proposed Series 2018 Debt Service	24,595,436	1%	14%	47,096	2,860	16
Proposed Series 2018 Bond Proceeds	(16,713,000)	1%	14%	(32,003)	2,860	(11)
Subtotal	**$ 9,510,992**			**$ 238,541**		**$ 83**
Impact Fee Fund Balance Credit						
Impact Fee Fund Balance Credit	-	100%		-	2,860	-
Total Impact Fee Per ERU						**$ 642**

Saratoga Springs Impact Fee - South Service Area - Harbor Bay North Benefitted Area

South Service Area - Harbor Bay North Benefitted Area	Cost	% Impact Fee Qualifying	% to Service Area	Impact Fee Qualifying Cost	ERUs to be Served	Cost per ERU
Collection Impact Fee						
IFFP Projects	$ 799,322	100%	100%	$ 799,322	2,860	$ 279
Buy In - Existing Assets	797,902	100%	100%	797,902	2,860	279
Subtotal	**$ 1,597,224**	**100%**		**1,597,224**		**558**
Debt						
Reimbursement Agreement - Harbor Bay Lift Station NBA						$ 1,346
Proposed Series 2014 Debt Service	5,081,556	14%	99%	697,220	2,860	244
Proposed Series 2014 Bond Proceeds	(3,453,000)	14%	99%	(473,772)	2,860	(166)
Proposed Series 2018 Debt Service	24,595,436	1%	14%	47,096	2,860	16
Proposed Series 2018 Bond Proceeds	(16,713,000)	1%	14%	(32,003)	2,860	(11)
Subtotal	**$ 9,510,992**			**$ 238,541**		**$ 1,429**
Impact Fee Fund Balance Credit						
Impact Fee Fund Balance Credit	-	100%		-	2,860	-
Total Impact Fee Per ERU						**$ 1,987**

Saratoga Springs Impact Fee - South Service Area - Harbor Bay South Benefitted Area

South Service Area - Harbor Bay South Benefitted Area	Cost	% Impact Fee Qualifying	% to Service Area	Impact Fee Qualifying Cost	ERUs to be Served	Cost per ERU
Collection Impact Fee						
IFFP Projects	$ 799,322	100%	100%	$ 799,322	2,860	$ 279
Buy In - Existing Assets	797,902	100%	100%	797,902	2,860	279
Subtotal	1,597,224	100%		1,597,224		**558**
Debt						
Reimbursement Agreement - Harbor Bay Lift Station SBA						$ 2,938
Proposed Series 2014 Debt Service	5,081,556	14%	99%	697,220	2,860	244
Proposed Series 2014 Bond Proceeds	(3,453,000)	14%	99%	(473,772)	2,860	(166)
Proposed Series 2018 Debt Service	24,595,436	1%	14%	47,096	2,860	16
Proposed Series 2018 Bond Proceeds	(16,713,000)	1%	14%	(32,003)	2,860	(11)
Subtotal	**$ 9,510,992**			**$ 238,541**		**$ 3,021**
Impact Fee Fund Balance Credit						
Impact Fee Fund Balance Credit	-	100%		-	2,860	**-**
Total Impact Fee Per ERU						**$ 3,580**

In accordance with Utah Code Annotated, 11-36a-306(2), Matthew Millis on behalf of Zions Bank Public Finance, makes the following certification:

I certify that the attached impact fee analysis:

1. includes only the cost of public facilities that are:
   a. allowed under the Impact Fees Act; and
   b. actually incurred; or
   c. projected to be incurred or encumbered within six years after the day on which each impact fee is paid;
2. does not include:
   a. costs of operation and maintenance of public facilities;
   b. cost of qualifying public facilities that will raise the level of service for the facilities, through impact fees, above the level of service that is supported by existing residents;
   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;
3. offset costs with grants or other alternate sources of payment; and
4. complies in each and every relevant respect with the Impact Fees Act.

Matthew Millis makes this certification with the following caveats:

1. All of the recommendations for implementations of the Impact Fee Facilities Plans ("IFFPs") made in the IFFP documents or in the impact fee analysis documents are followed in their entirety by Saratoga Springs staff and elected officials.
2. If all or a portion of the IFFPs or impact fee analyses are modified or amended, this certification is no longer valid.
3. All information provided to Zions Bank Public Finance, its contractors or suppliers is assumed to be correct, complete and accurate. This includes information provided by Saratoga Springs and outside sources. Copies of letters requesting data are included as appendices to the IFFPs and the impact fee analysis.

Dated: July 3, 2014

ZIONS BANK PUBLIC FINANCE

By Matthew Millis

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The notices found in this section were sent to the following parties on July 28th, 2011:

- AGRC
- Alpine School District
- Bureau of Reclamation
- Comcast
- Eagle Mountain City
- Governor's Office of Planning and Budget
- Lehi City
- MountainLand Association of Governments
- Questar Corporation
- Qwest Communications
- Rocky Mountain Power
- Timpanogos Special Service District
- Utah County Commission
- Utah County Public Works
- Utah Department of Transportation
- Utah Lake Distributing Canal Company
- Welby Jacobs Water Users Company

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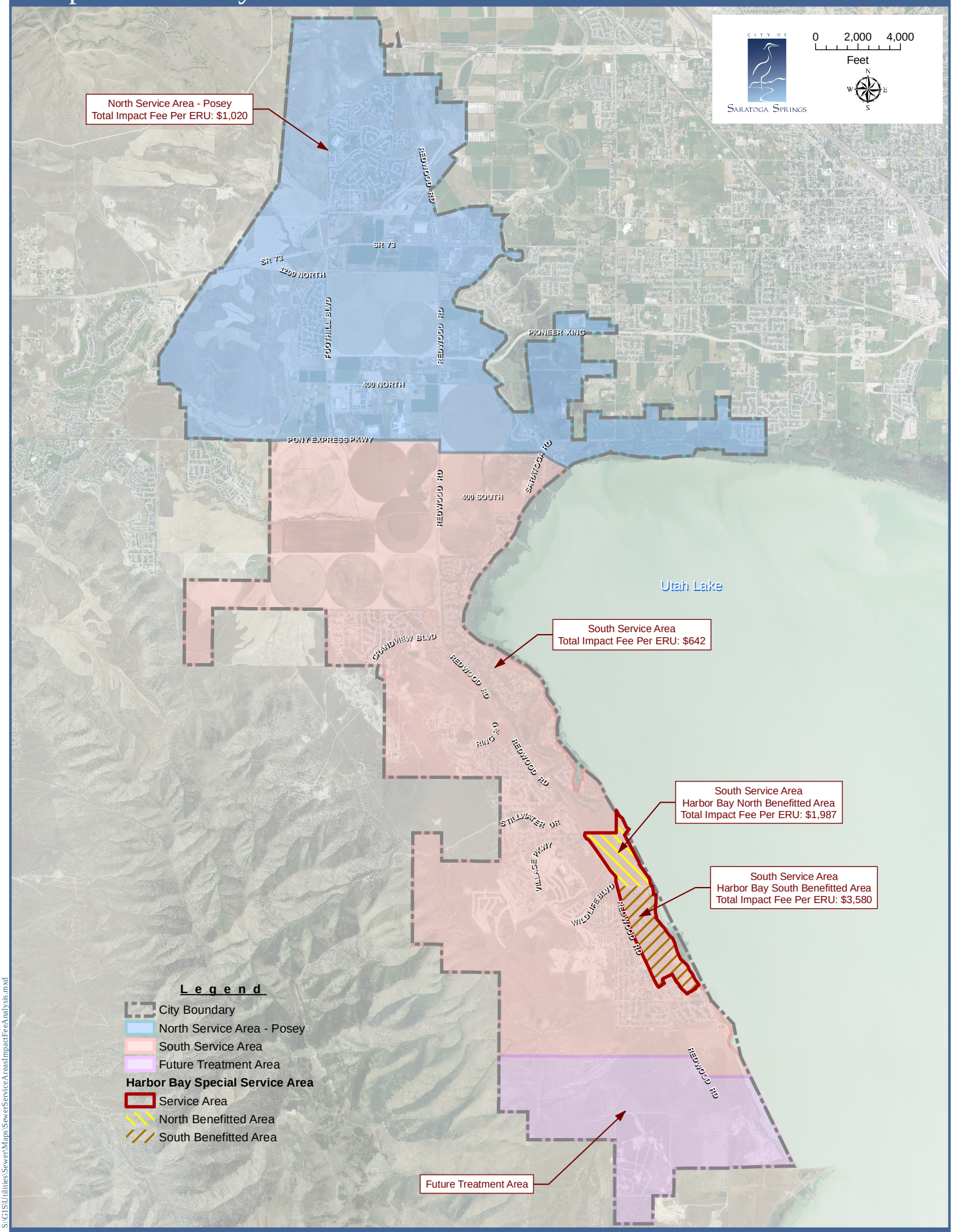
Impact Fee Analysis - Sewer Service Areas



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2 July 2014