



AMENDED CITY COUNCIL AGENDA

PUBLIC NOTICE is hereby given that the City Council of Spanish Fork, Utah, will hold a regular public meeting in the Council Chambers in the City Office Building, **40 South Main Street**, Spanish Fork, Utah, commencing at **6:00 p.m. on December 20, 2011.**

AGENDA ITEMS:

1. CALL TO ORDER, PLEDGE, OPENING CEREMONY, RECOGNITIONS:

- a. Pledge, led by invitation
- b. Recognition of Miss Spanish Fork Director
- c. Recognition of the Employee of the 2nd & 3rd Quarter

2. PUBLIC COMMENTS:

Please note: In order to be considerate of everyone attending the meeting and to more closely follow the published agenda times, public comment will be limited to three minutes per person. A spokesperson who has been asked by a group to summarize their concerns will be allowed five minutes to speak. Comments which cannot be made within these limits should be submitted in writing. The Mayor or Council may restrict the comments beyond these guidelines.

3. COUNCIL COMMENTS:

4. SPANISH FORK 101: Chris Thompson – Sidewalk Snow Removal

5. CONSENT ITEMS:

These items are considered by the City Council to be routine and will be enacted by a single motion. If discussion is desired on any particular consent item, that item may be removed from the consent agenda and considered separately.

- a. * Minutes of Spanish Fork City Council Meeting – [December 6, 2011](#)
- b. * [Spanish Fork Business Center Plat B Chappel Drive 1950 North Storm Water Design Development Agreement](#)
- c. * [Strawberry Water Users Association Crab Creek Transmission Pipeline Agreement Regarding SVP Lands.](#)

6. PUBLIC HEARING:

- a. * [Proposed Zone Change involving approximately 190 acres located north of US 6 on each side of Chappel Drive. The proposal would change the zoning from a combination of Industrial 1 and Shopping Center to a combination of Business Park and Commercial 2.](#)
- b. * [Transportation Element of the General Plan](#)

7. NEW BUSINESS:

- a. * [Economic Incentive Agreement with Costco](#)
- b. * [Ordinance #17-11 Amending Provisions of the City Purchasing System to Provide Better Efficiencies](#)
- c. * [Contract Award for Fairgrounds Arena Lighting](#)
- d. * [Fairgrounds Arena Change Order #1](#)
- e. * [Utility Master Plans](#)
- f. Independent Audit Report FY 2011

ADJOURN:

* Supporting documentation is available on the City's website www.spanishfork.org

Notice is hereby given that:

- In the event of an absence of a quorum, agenda items will be continued to the next regularly scheduled meeting.
- By motion of the Spanish Fork City Council, pursuant to Title 52, Chapter 4 of the Utah Code, the City Council may vote to hold a closed meeting for any of the purposes identified in that Chapter.
- This agenda is also available on the City's webpage at www.spanishfork.org

SPANISH FORK CITY does not discriminate on the basis of race, color, national origin, sex, religion, age or disability in the employment or the provision of services. The public is invited to participate in all Spanish Fork City Council Meetings located at 40 South Main St. If you need special accommodation to participate in the meeting, please contact the City Manager's Office at 804-4530.

Tentative Minutes
Spanish Fork City Council Meeting
December 6, 2011

Elected Officials Present: Mayor G. Wayne Andersen, Councilmembers Steve Leifson, Rod Dart, Richard Davis, Jens Nielson, Keir Scoubes.

Staff Present: Dave Oyler, City Manager; Seth Perrins, Assistant City Manager; Junior Baker, City Attorney; Dale Robinson, Parks & Recreation Director; Chris Thompson, Public Works Director; Kent Clark, City Recorder/Finance Director; Dave Anderson, Community Development Director; Dee Rosenbaum, Public Safety Director; Angie Warner, Deputy Recorder; Ryan Rhees, Spanish Oaks Golf Pro; Officer Tyler Beddoes; Officer Cory Grover; Officer Jason Harward; Lieutenant Brandon Anderson; Lieutenant Steve Adams.

Citizens Present: Steven Johnson, Brandon Gordon, Cary Hanks, Cambree Haskell, Sondi Haskell, Lindsay Stevens.

CALL TO ORDER, PLEDGE, RECOGNITION:

Mayor Andersen called the meeting to order at 6:00 p.m.

Councilman Nielson led in the pledge of allegiance.

Recognition of Logan Powell's Hero's

Mr. Powell told the story of the rescue of his son. Logan's heroes, the police officers and school staff were recognized.

Kye Miner – "Clean Out the Cabinet" Campaign

Ms. Kye Miner presented plaques to the Police Department, the City and Bill Summers from Macey's for having the "Clean Out the Cabinet" events.

PUBLIC COMMENTS:

Cary Hanks thanked the City staff that helped with the winter lights parade. They had 43 entries. There will be ribbon cuttings this Thursday at Valvoline Oil Change and South Valley Chiropractic. Also, Tabitha's Way is having a Christmas dinner on the 24th at the High Chaparral for the needy.

Councilman Dart thanked the Chamber of Commerce for all they do.

Mayor Andersen moved down to item "D" in new business to discuss the Golf Course Fees Proposal.

Golf Course Fees Proposal

Dale Robinson said it has been three seasons since we have had a fee increase. Spanish Oaks has teamed up with Gladstand Golf Course in Payson and went over numbers at the surrounding courses. Payson City just approved their new fee structure and they are the same as what is proposed tonight for Spanish Oaks.

Councilman Dart made a **motion** to **approve** the Golf Course Fees Proposal.

49 Councilman Leifson **seconded** and the motion **passed** all in favor.

50

51 **COUNCIL COMMENTS:**

52 Councilman Davis said just last week the North part of the state had a big wind storm. They
53 needed all the help they could get, so some of our electricians here at the City went up to help
54 restore power. Councilman Davis thanked those electricians for their help. Councilman Davis
55 reminded the public to attend the Festival of Lights.

56

57 Councilman Leifson spoke with the Electric Department Director and said it was great to see
58 everyone up there helping.

59

60 Councilman Scoubes said that on the 14th he will be attending the solid waste meeting.

61

62 Mayor Andersen said the rodeo committee attended the PRCA convention to schedule the rodeo
63 acts, fighters, etc. Mayor Andersen said the construction is starting on the new arena.

64

65 **CONSENT ITEMS:**

- 66 a. Minutes of Spanish Fork City Council Meeting – November 15, 2011
- 67 b. Chappel Drive Storm Drain Easement
- 68 c. DWR Permit for Spanish Fork Canyon Water Line
- 69 d. Airport Budget Audit for FY 2011
- 70 e. Airport Manager Contract Modification

71

72 Councilman Leifson made a **motion** to **approve** the consent items.

73 Councilman Nielson **seconded** and the motion **passed** all in favor.

74

75 **NEW BUSINESS:**

76 **Property Exchange with Banta Corporation**

77 Junior Baker stated that the RR Donnelly building has been empty for some time now. There is
78 some title work being done for a new owner. They discovered that the lift station that was there
79 was relocated but the deeds were never made to exchange the parcels.

80

81 Councilman Nielson made a **motion** to **approve** the Property Exchange with Banta Corporation
82 and sign the documents to exchange parcels.

83 Councilman Dart **seconded** and the motion **passed** all in favor.

84

85 **Resolution #11-10 Adopting Tax Compliance Procedures for Tax Exempt Governmental Bonds.**

86 Kent Clark explained that the City recently issued bonds for the water Crab Creek Line. The State
87 recommends the City to have a policy or resolution to abide by all the rules.

88

89 Councilman Davis made a **motion** to **approve** Resolution #11-10 Adopting Tax Compliance
90 Procedures for Tax Exempt Governmental Bonds.

91 Councilman Scoubes **seconded** and the motion **passed** all in favor with a roll call vote.

92

93 **Ordinance #16-11 Amending the Fire and Ambulance Retirement Ordinance**

94 Kent Clark presented the proposed ordinance with the following change:

95

4.08.040. Retirement Benefit.

96

*The retirement benefit provided to each qualified firefighter or ambulance crew
97 member shall be in the amount of \$100.00 per month through December 2011.*

98

Commencing January 2012, the monthly amount shall increase to \$103.00 and shall

99 *increase in January each year thereafter by the monthly amount of \$3.00 for a period of*
100 *ten years, until the retirement benefit amount reaches \$130.00 per month.*

101
102 Councilman Dart made a **motion** to **approve** Ordinance #16-11 Amending the Fire and Ambulance
103 Retirement Ordinance.

104 Councilman Leifson **seconded** and the motion **passed** all in favor with a roll call vote.

105
106 Councilman Scoubes made a **motion** to adjourn to Closed Session to discuss Land Purchase.
107 Councilman Davis **seconded** and the motion **passed** all in favor at 6:43 pm.

108
109 **ADJOURN**

110
111 **ADOPTED:**

Angie Warner, Deputy Recorder

DRIFT



Memo

To: Mayor and City Council
From: Chris Thompson, Public Works Director/City Engineer
Date: December 15, 2011
Re: Spanish Fork Business Center Plat B, Chappel Drive 1950 North Storm Water Design Development Agreement

Staff Report

The city has a situation where storm water from public streets is draining onto private land at the north end of Chappel Drive. Jamie Evans is proposing to construct a building at this location and worked out an agreement with the city capture city storm drain water with that of his development.

This agreement is to pay for the city portion of those costs. We recommend that the city council approve this storm drain agreement with Jamie Evans for the amount of \$22,987.

Attached: agreement



**SPANISH FORK BUSINESS CENTER PLAT B
CHAPPEL DRIVE 1950 NORTH STORM WATER DESIGN
DEVELOPMENT AGREEMENT**

This agreement is entered between JAMIE & TERRY EVANS (Evans) and SPANISH FORK CITY (City) for the purpose of designing and improving the storm drain facilities at the north end of Chappel Drive and the end of 1950 North associated with the improvements of Spanish Fork Business Center, Plat B.

WHEREAS, Evans is the owner of property in Spanish Fork, Utah, at the north end of Chappel Drive and has applied to develop said property, with a preliminary plat known as Spanish Fork Business Center, Plat B; and

WHEREAS, City is desirous of improving the existing storm drain system at the end of 1950 North to drain through proposed development and into a shared retention basin located north of the proposed development known as Spanish Fork Business Center, Plat B;

THEREFORE, the parties mutually agree to the following terms and conditions:

1. Evans shall install and improve all improvements associated with the development of Spanish Fork Business Center, Plat B, including the storm water drain facilities, which will serve more than the Evans property. Evans shall be responsible for all costs associated with said improvements.

2. City shall pay Evans \$8,242.00 for the following improvements: Installation of 290 feet of 12" storm drain and required inlet boxes located on the east side of Lot 1, Spanish Fork Business Center, Plat B, detailed on the Precorp II Site Plan. All improvements needed to stop the storm drainage at the east end of 1950 North from draining onto the property at the east end of 1950 North. Improvements include: 2 foot risers on the existing inlet boxes at the end of 1950 North and plugging the existing storm drain line draining to the east. Evans will provide, install, and compact all fill material required to stop the storm drainage from draining onto the property to the east.

3. A 0.65 acre foot storm water retention basin is required for both the existing storm drain at the end of Chappel Drive and 1950 North and the proposed development's storm drainage. Said retention basin shall require a 540 foot drainage ditch to be installed to collect storm water to drain into said retention basin.

4. Said retention basin and drainage ditch improvements shall cost \$19,660.00. City shall be responsible for \$14,745.00 (75% of costs associated with retention basin,

representing the portion of the cost which benefits property not owned by Evans). City shall pay owner \$14,745.00 for said improvements.

5. The total sum due of \$22,987.00 shall be paid to Evans within thirty (30) days of the execution of this agreement.

6. City agrees to realign or pay for the costs associated with the realignment of the existing irrigation ditch located at the north end of Chappel Drive upon the development of the property north of Spanish Fork Business Center, Plat B.

DATED this 20th day of December, 2011.

SPANISH FORK CITY by:

G. WAYNE ANDERSEN, Mayor

Attest:

KENT R. CLARK, Recorder

JAMIE EVANS

TERRY EVANS



Memo

To: Mayor and City Council
From: Chris Thompson, Public Works Director/City Engineer
Date: December 15, 2011
Re: Strawberry Water Users Association Crab Creek Transmission Pipeline Agreement
Regarding SVP Lands

Staff Report

The city needs a permit from the Bureau of Reclamation to install the Crab Creek Trunkline in the proposed alignment. This permit should also be signed by Strawberry Water Users Association. They have asked that the attached agreement be in place before they sign our permit. Junior Baker and myself have both reviewed the agreement and feel like it is acceptable.

There is no cost associated with the agreement. We recommend that the city council approve this Strawberry Water Users Association Crab Creek Transmission Pipeline Agreement Regarding Strawberry Valley Project Lands.

Attached: agreement



When recorded return to:
Strawberry Water Users Association
Attn.: General Manager
P. O. Box 70
Payson, UT 84651

Parcel No: 29:047:0011

**SPANISH FORK CITY
CRAB CREEK TRANSMISSION PIPELINE
AGREEMENT REGARDING SVP LANDS**

THIS AGREEMENT effective this ___ day of _____, 2011 by and between Spanish Fork City, a Utah municipality, (Spanish Fork) and Strawberry Water Users Association, a Utah non-profit corporation, (SWUA).

AGREEMENT PURPOSES

Spanish Fork is constructing a 24 inch diameter culinary water pipeline called the “Crab Creek Transmission Line.” A portion of the Crab Creek Transmission Line is to be located on Strawberry Valley Project (SVP) lands. The SVP is a project of the United States Bureau of Reclamation (Reclamation). SWUA has repaid the costs of the SVP, and is obligated to care for, operate and maintain the SVP lands in question for SVP purposes. Spanish Fork has approached Reclamation for an encroachment agreement. Reclamation has the authority to allow non-project uses of Reclamation project lands in a manner consistent with 43 U.S.C.A. § 387 and 43 CFR Part 429. Among other things, non-project uses of project lands must not be inconsistent with uses for the project for which the lands were acquired. Spanish Fork City has asked SWUA to approve the proposed Reclamation encroachment agreement for the Crab Creek Transmission Line, and SWUA has agreed is intended to memorialize the understanding of the parties regarding the described Spanish Fork City use of SVP lands.

AGREEMENT TERMS

In consideration of the mutual covenants described here, the parties agree as follows:

1. **Survey of As-Built Center of Pipeline.** Upon construction, Spanish Fork shall record a survey of the as-built centerline of the pipeline.

2. **Duty to Repair Damage Caused.** Spanish Fork will, without expense to SWUA, reasonably: (i) segregate all topsoil from other fill materials removed or disturbed; and (ii) within a reasonable time following construction and testing, refill and reshape and compact as reasonable all excavations, remove excess materials, grade and replace soil, reseed with existing forage, restore landscaping (Spanish Fork must replace by species but not caliber) and irrigation systems, restore fences and gates, and otherwise restore the land and personal property as near as reasonably possible to its pre-construction condition.

3. **Spanish Fork Duty to Maintain Worksite during Construction.** During construction or reconstruction, Spanish Fork will impose reasonable work hours and reasonable after hours restrictions on noise and light, reasonably minimize disruptions to SWUA, reasonably apply dust abatement on all access roads used for construction, take reasonable steps to close gates, provide reasonable temporary access, pick up all trash, maintain reasonable speeds on access roads, take reasonable steps to provide temporary fencing, and take other steps reasonable, necessary and customary to reasonably minimize disruption to the use and enjoyment of adjoining lands.

4. **Interference.** Notwithstanding anything written in this Agreement, no work performed by or for Spanish Fork on SVP lands will disrupt SWUA diversions or deliveries of water, or SWUA power generation, except as approved in writing by SWUA.

5. **Quality of Work.** Spanish Fork warrants that all work performed by or for Spanish Fork on SWUA or SVP lands will:

(i) comply with plans and specifications reasonably approved in writing by SWUA (SWUA has approved the current plans and specifications);

(ii) meet or exceed all applicable codes, ordinances, other legal requirements, and all applicable generally recognized written trade and industry standards and recommendations;

(iii) be performed by skilled, experienced, competent and properly licensed contractors and workers; and

(iv) be conducted in a timely, careful, safe, workmanlike and professional manner.

6. **Relocation Right of SWUA.** SWUA has the right, upon reasonable notice, to require Spanish Fork to relocate some or all of the 24 inch diameter pipe to accommodate SVP or SWUA uses. Relocation for SVP uses shall be at Spanish Fork's expense. Relocation for SWUA uses that are not SVP uses shall be at SWUA's expense.

7. **Termination.**

(a) The term if this agreement shall be the same as the Reclamation encroachment agreement.

(b) SWUA may, at its sole option, terminate this Agreement and Spanish Fork's right to use SVP lands for nonuse for a period of two (2) years.

(c) The following, as described in this Agreement, shall survive any termination of this Agreement:

- (i) Any Spanish Fork obligations to reimburse any costs incurred by the SWUA;
- (ii) All of Spanish Fork's obligations to remove Spanish Fork's improvements and make restoration;
- (iii) All of Spanish Fork's obligations to defend and indemnify SWUA and its officer, trustees and employees, as described in this Agreement or the Reclamation encroachment agreement; and
- (iv) All provisions regarding remedies, and limitations of warranties or representations.

8. **Removal.** SWUA will reasonably determine what portion of Spanish Fork's improvements on SVP lands will be removed upon termination of this Agreement and set a reasonable deadline for removal and restoration. Such removal and restoration will be at the sole expense of the Spanish Fork.

9. **Remedies.** A party will first submit any claim or dispute to the authorized representative of the other party. If the matter is not resolved satisfactorily, a party may submit the dispute or claim in concise written form, together with any supporting documentation, to SWUA's board of directors, or committee of board members assigned by the board to hear the matter, and to the Spanish Fork City Council, or a committee of council members assigned by the Council to hear the matter. If the matter is not resolved satisfactorily the dispute or claim will be submitted to non-binding mediation, with a qualified mediator selected by the parties, with each party sharing the cost of that non-binding mediation. After and only if these processes are first followed and the dispute or claim remains unresolved, an action may be brought in the Fourth Judicial District Court of the State of Utah In and For Utah County. The prevailing party shall be awarded reasonable costs, including engineering, witness and attorneys' costs and fees.

10. **General Provisions.**

(a) **Notices.** Any notice which a party is required or may desire to give the other shall be in writing and may be sent by personal delivery, by United States registered or certified mail, return receipt requested, postage prepaid, or by generally recognized overnight carrier regularly providing proof of delivery, addressed as follows (subject to the right of a party to designate a different address for itself by at least fifteen (15) days advance notice similarly given):

SWUA:

Strawberry Water Users Association

Attn.: General Manager
P. O. Box 70
Payson, UT 84651

SPANISH FORK:

Spanish Fork City
Attn: Public Works Director
40 So. Main Street
Spanish Fork, UT 84660

Any notice so given by mail shall be deemed to have been given as of the date of delivery (whether accepted or refused) established by U.S. Post Office return receipt or the overnight carrier's proof of delivery, as the case may be. Any such notice not so given shall be deemed given upon receipt of the same by the party to whom the same is to be given.

(b) **Waiver.** Failure of any party at any time to require performance of any provision of this Agreement shall not limit such party's right to enforce the provision. Waiver of any breach of any provision by either party shall not be a waiver of any succeeding breach of the provision or a waiver of the provision itself or any other provision.

(c) **Changes in Writing.** This Agreement and any of its terms may only be changed, waived, discharged or terminated by a written instrument executed by both parties.

(d) **Authority.** Those persons signing as representatives of the parties hereto represent and warrant that they have been duly authorized to sign as officers and on behalf of the party they represent, either through a vote of their board of directors or a vote of the school board.

(e) **Counterparts.** This Agreement may be executed in counterparts, each of which when executed and delivered shall be deemed to be an original, binding agreement between the executing parties, and all of which shall together constitute one and the same instrument. Original, facsimile or power of attorney signatures shall be binding upon the executing party.

(f) **Legal Compliance.** Spanish Fork shall comply with all terms and conditions in the Reclamation encroachment agreement, which is incorporated by reference here as if restated here, any applicable provisions of federal, state and local statutes, rules, regulations, ordinances or common law.

(g) **Extension of Term of Reclamation Encroachment.** SWUA staff will support Spanish Fork's desire to extend the Reclamation encroachment agreement to 50 years.

Spanish Fork understands this will require approval by the SWUA Board of Directors.

(h) **Reimbursement of Reasonable Expenses.** Spanish Fork shall reimburse SWUA for expenses, including engineering expenses, reasonable incurred as a result of this Agreement.

SWUA:

SPANISH FORK:

By: Jeremy Sorensen

Date: _____

By: G. Wayne Andersen, Mayor

Date: _____

Attest:
City Clerk

STATE OF UTAH)
 : ss.
COUNTY OF UTAH)

On the ___ day of _____, 2011, personally appeared before me, Jeremy Sorensen, and having been first duly sworn by me acknowledged that he is the General Manager of Strawberry Water Users Association, and that he executed the foregoing agreement for and on behalf of Strawberry Water Users Association with full authority.

NOTARY PUBLIC

STATE OF UTAH)
 : ss.
COUNTY OF UTAH)

On the ___ day of _____, 2011, personally appeared before me G. Wayne Andersen, and having been first duly sworn by me acknowledged that he is the Mayor of Spanish Fork City, and that he executed the foregoing agreement for and on behalf of Spanish Fork City with full authority.

NOTARY PUBLIC



MAP AMENDMENT

REPORT TO THE CITY COUNCIL TENEDOR ZONE CHANGE APPROVAL REQUEST

- Agenda Date:** December 20, 2011.

- Staff Contacts:** Dave Anderson, Community Development Director.

- Reviewed By:** Development Review Committee, Planning Commission.

- Request:** Richard Mendenhall has requested that the zoning be changed on some 199 acres in the vicinity of Chappel Drive and 700 East from Industrial 1 and Shopping Center to Commercial 2 and Business Park.

- Zoning:** I-1 and SC existing, BP and C-2 proposed.

- General Plan:** Industrial and General Commercial.

- Project Size:** 199.37 acres.

- Number of lots:** Not applicable.

- Location:** Approximately 700 East Chappel Drive.

Background Discussion

Richard Mendenhall, representing Tenedor, LLC, has requested that the zoning be changed for 199.37 acres from a combination of Shopping Center and Industrial 1 to General Commercial and Business Park.

In staff's view, the proposed Zone Change would only result in one significant regulatory change. Hospitals are currently permitted uses in the Business Park zone but are not permitted in the Commercial 2 or Industrial 1 zones. Staff understands that the primary impetus for the request is to provide zoning that would accommodate the construction of some type of hospital by Intermountain Health Care. Incidentally, staff understands that IHC has no immediate plans to construct a facility on the subject properties but requires that the necessary zoning be in place prior to executing a land trade.

The proposed Zone Change is consistent with the land use pattern described by the City's Land Use Map in that it would facilitate retail development adjacent to Highway 6 which would be flanked to the north by development that would generate employment. It is anticipated that development in the Business Park area would be arranged in a campus-like setting. It is also anticipated that development in the Commercial 2 area would house a variety of retail establishments including such things as specialty shops, entertainment and both mid-size and big box retailers. Also, one would expect development in the Commercial 2 area to be designed to accommodate a large amount automobile traffic and associated parking.

The proposed zoning designations have been arranged so as to permit development that would follow the realignment of Chappel Drive and 1100 East.

Development Review Committee

The Development Review Committee reviewed this request in their November 23, 2011 meeting and



recommended that it be approved. Minutes from that meeting read as follows:

Tenedor

Applicant: Richard Mendenhall

General Plan: General Commercial and Light Industrial

Zoning: Commercial 2 and Business Park

Location: 700 East Chappel Drive

Mr. Anderson explained that the applicant was requesting that the zoning be changed from Light Industrial and Shopping Center to Business Park and Commercial 2. There are a few uses that are permitted in the Commercial 2 zone that are not permitted in the Shopping Center zone. The applicant would like to keep his options as broad as possible and that is why the applicant has insisted on the Commercial 2 zone rather than the Shopping Center zone.

Discussion was held regarding the current zoning of the property.

Mr. Anderson explained that he felt this area was an excellent fit for the Shopping Center zone and that if it wasn't going to be zoned Shopping Center then it is perhaps time to evaluate whether the Shopping Center zone is really needed. He continued to explain that the configuration of the proposed Zone Change was not haphazard and that there was an underlying concept that the applicant is working to follow.

Discussion was held regarding the City's Master Transportation Plan and the configuration of the proposed Zone Change.

Mr. Anderson explained that the difference between the Business Park zone and the Commercial 2 zone is that the Commercial 2 zone is going to be predominately retail but permit some office uses where the Business Park zone will be predominately office but permit some retail. The big difference is that hospitals are not permitted in the Commercial 2 zone; which, in this case, is why the Business Park zone is needed. The proposed change is consistent with the General Plan where the City has planned for commercial uses immediately north of highway six and uses that generate employment further to the North by 84 Lumber, Pre-corp etc.

Mr. Anderson moved to recommend that the City Council approve the Zone Change for Tenedor. LLC, as requested by Richard Mendenhall. Mr.

Burdick seconded and the motion passed all in favor.

Planning Commission

The Planning Commission reviewed this request in their December 7 meeting and recommended that it be approved. Draft minutes from that meeting read as follows:

Tenedor

Applicant: Richard Mendenhall

General Plan: General Commercial and Light Industrial

Zoning: Commercial 2 and Business Park proposed, Shopping Center and Industrial 1 existing

Location: 700 East Chappel Drive

Mr. Anderson explained the zoning as it exists today. At present, the properties are zoned Shopping Center and Light Industrial. The proposal involves changing the zoning from what is currently zoned today as light industrial and Shopping Center to Commercial 2. The Shopping Center and Commercial 2 zones are almost identical so it would not be a significant change. This change would primarily facilitate retail development. The other part of the change involves changing what is now zoned Light Industrial to Business Park, two zoning districts that the City's General Plan identifies in our industrial land use category so, in that sense, it is not a change that necessitates a modification of the General Plan. Spanish Fork City has one zone that, as a permitted use, allows a hospital. That is the Business Park zone. City staff understands that the impetus for the Zone Change is changing the zoning so that a hospital would be allowed. City staff also acknowledges that the change impacts the area. They know that there are other uses in the area that would be impacted. We have a representative here tonight from Sapa. Sapa has been an excellent corporate citizen in Spanish Fork City. The City appreciates them being here and certainly does not want to do anything to make it any less desirable for them to maintain their presence here in Spanish Fork. Mr. Anderson further explained the road alignment and said that City staff recommends that the Zone Change be approved as proposed.

Commissioner Gonzales asked about 2600 North and if UDOT would re-entertain the possibility of an interchange at I-15 and 2600 North. Mr. Anderson explained that UDOT has been working with the City to plan for an interchange.

Chairman Christianson invited the applicant to address the Commission.

Richard Mendenhall introduced himself as representing the partnership that has made the application and collectively the property owners in the affected area. He explained the proposal deals with some zone adjustments within the proposed area in such a way that they can do some large scale planning in order to bring commercial uses into the City to increase the opportunity for commerce and some opportunities to generate tax revenue. He said that IHC was a party to the application and was fully aware of the situation and anxious to see it go through. He said that his hope was to bring plans into the City within the next couple of months and be in compliance with zoning.

Commissioner Sorensen asked if the intent was to relocate the properties that were currently owned by IHC which is prime commercial property and relocating whatever it is in the future out of the prime commercial property. Mr. Mendenhall concurred and explained what parcels IHC owns which are the parcel across Highway 6 as well as everything around the Kmart property. IHC acquired the property for insta-care and outpatient clinics. If the properties were developed for uses that are consistent with IHC's traditional land uses the City would not have any sales tax revenue generated from the properties as well as a tax exempt status that could affect the money collected on property tax. He further explained that he had been working for 18 months to develop some concepts that will allow the properties to be commercial, predominately retail, and out of a non-profit tax exempt area.

Chairman Christianson asked if Mr. Mendenhall anticipated any traffic impacts to the north. Mr. Mendenhall explained that the City had done a very good job at master planning transportation facilities.

Discussion was held regarding access issues, what properties IHC owns.

Chairman Christianson asked who would be paying for the roads. Mr. Mendenhall said that the developer would be.

Discussion was held regarding a development agreement. Mr. Mendenhall explained that once the zone is in place that a whole host of issues would be addressed with a development agreement.

Mr. Anderson said the City had not discussed preparing a development agreement that would accompany the Zone Change.

Chairman Christianson invited public comment.

Dwight Packard addressed the Commission. Mr. Packard said that he had studied the county recorder plats and it appears to him that the east coordinates bisect a parcel. Mr. Mendenhall explained that the parcel would be subdivided by a metes and bounds description. Mr. Packard asked Mr. Mendenhall if IHC had any immediate plans. Mr. Mendenhall said that he could not speak for IHC but that it was his understanding was that it was purely a function of supply and demand in the market place. IHC is not compelled to move into a market to capture market share with competing hospitals. As population grows in south Utah County they want to be ready to expand.

Londo Fawcett asked if the Shopping Center zone had always been zoned that. Mr. Anderson said that he could only go back 6 years but that in the last 6 years it has been zoned Shopping Center. He explained that the extension of Chappel drive and 1100 East would be too expensive for a developer to construct and didn't feel that the road would connect. Chairman Christianson said that the road would be driven by development.

Discussion was held regarding Chappel Drive and 1100 East.

Mr. Fawcett told the Commission that next year SAPA will have been in Spanish Fork for 20 years. He explained that at night you can hear noise from there facility. He said that before the mobile home park was removed with the north park project that people would complain about the noise. He asked if noise from there facility was going to create a problem for the Business Park zone. He also said that there were wetlands in the area. He said that Sapa employs close to 200 people and pay \$12 million a year in payroll. Sapa does not generate sales tax but does inject money into the local economy and purchases \$1.3 million worth of electricity every year.

Discussion was held regarding the petitioners being fully aware of the conditions of the businesses that currently exist in the area.

Commissioner Sorensen said he felt this was good for the City to keep the industrial uses in the area,

to permit IHC to build to the north and use property along US 6 for retail purposes.

Commissioner Sorensen **moved** to recommend that the City Council **approve** the Zone Change to Commercial 2 and Business Park as proposed. Commissioner Gull **seconded** and the motion **passed** all in favor by a roll call vote.

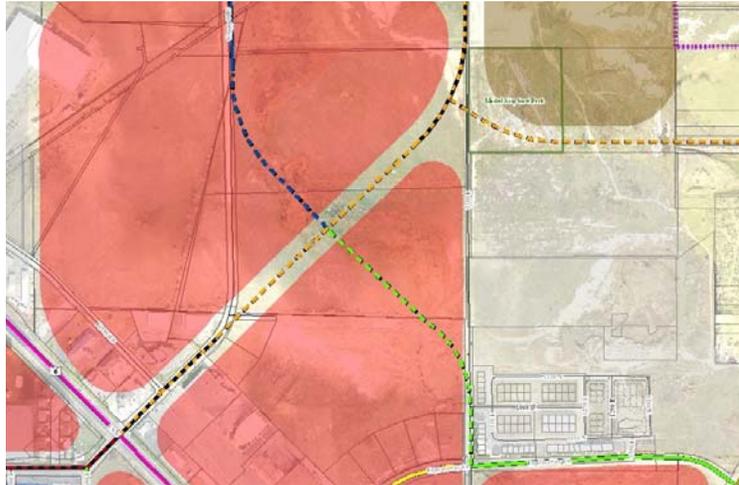
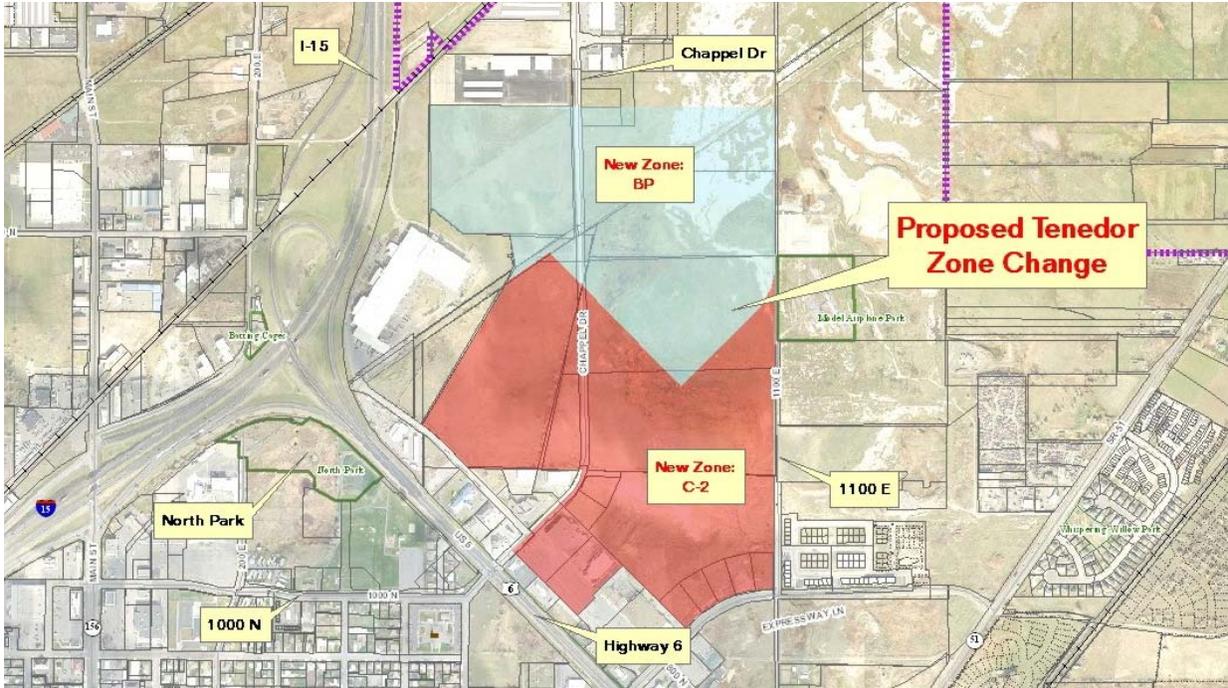
Commissioner Sorensen **moved** to **close** the public hearing. Commissioner Gonzales **seconded** and the motion **passed** all in favor.

Budgetary Impact

It is unlikely that any accurate prediction of the budgetary impact of this proposal can be made at this time. Even so, in as much as this proposal may facilitate retail development, one would suspect that the eventual, overall impact of the change would have a positive impact on the City's finances.

Recommendation

Staff recommends that the proposed Zone Change be approved.





Memo

To: Mayor and City Council
From: Chris Thompson, Public Works Director/City Engineer
Date: December 15, 2011
Re: Transportation Element of the General Plan

Staff Report

The engineering office provided the mayor and city council with a proposed transportation element of the general plan a couple months ago. As this has been reviewed by city staff and the planning commission a few additional modifications have been proposed.

These revisions are shown graphically in the attached figures. The major changes are:

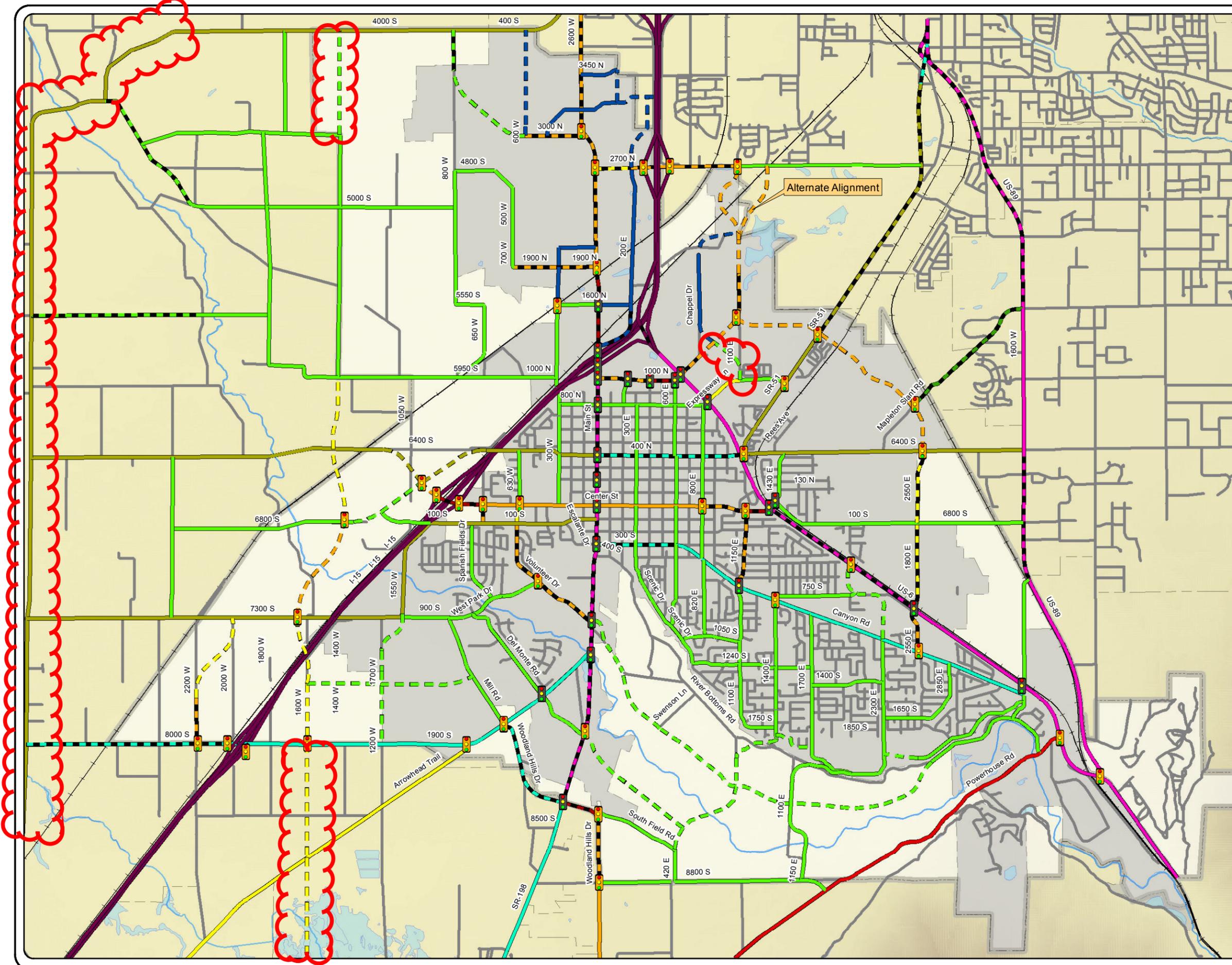
- We coordinated with the county to lay out a north south corridor west of I-15 that would stretch from Payson to Highway 77.
- We aligned the Chappel Drive with the collector road portion of 1100 East.
- We planned trails on both side of the Spanish Fork River to better facilitate flood control in the future and provide a more significant buffer between the river and residential housing.

We recommend that the city council approve this transportation element to the general plan.

Attached: figures



**Figure 11
 Transportation
 Master Plan**



Legend

Intersection Improvements

- Existing Traffic Signal
- Future Traffic Signal*

UDOT Functional Classification

- Urban Interstate
- Urban Other Principal Arterial (7 Lanes)
- Rural Other Principal Arterial (7 Lanes)
- Urban Minor Arterial (5 Lanes)
- Urban Collector (2/3 Lanes)

Spanish Fork Functional Classification

- Major Arterial (7 Lanes)
- Major Arterial (5 Lanes)
- Minor Arterial (5 Lanes)
- Minor Arterial (3 Lanes)
- Collector (5 Lanes)
- Collector (2/3 Lanes)
- Commercial Local (2 Lanes)
- Residential Local (2 Lanes)
- Residential Sub-Local (2 Lanes)
- Rural Local (2 Lanes)

Recommended Improvements

- No Improvements Needed
- Improvements Required
- Proposed New Alignment
- Railroad
- Rivers
- Lakes
- Spanish Fork City
- Other Cities
- Policy Boundary

*Future traffic signal pending warrants outlined in MUTCD



1 Inch = 0.667 Miles



**Figure 8
Trail Plans**

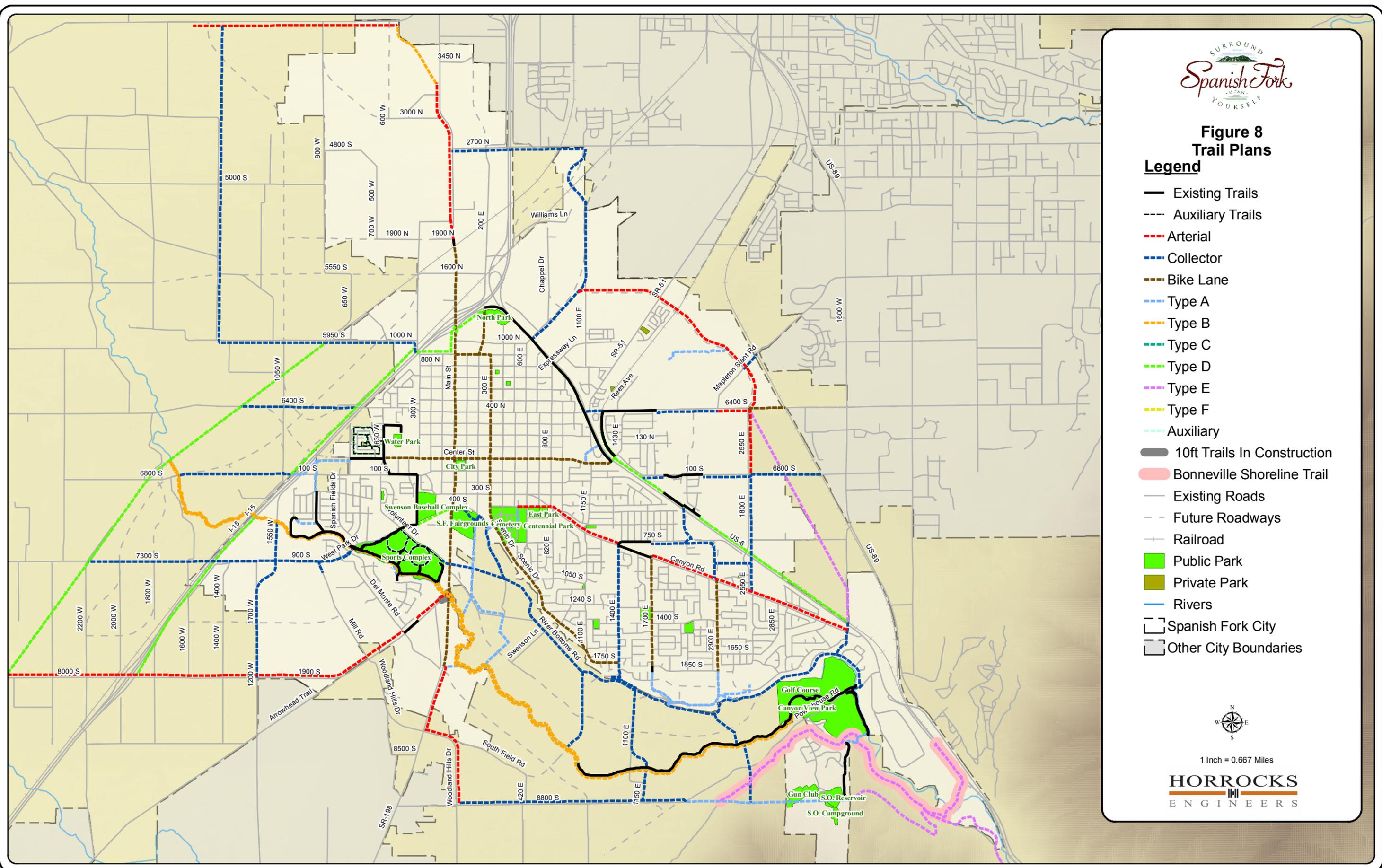
Legend

- Existing Trails
- Auxiliary Trails
- Arterial
- Collector
- Bike Lane
- Type A
- Type B
- Type C
- Type D
- Type E
- Type F
- Auxiliary
- 10ft Trails In Construction
- Bonneville Shoreline Trail
- Existing Roads
- Future Roadways
- Railroad
- Public Park
- Private Park
- Rivers
- Spanish Fork City
- Other City Boundaries



1 Inch = 0.667 Miles

HORROCKS
ENGINEERS



ECONOMIC INCENTIVE AGREEMENT

1. **Identification and Parties.** This Economic Incentive Agreement (“**Agreement**”), dated for reference purposes as of _____, is made by and between:

1.1 Spanish Fork City, a Utah municipal corporation (the “**City**”);
and

1.2 Costco Wholesale Corporation, a Washington corporation (“**Costco**”).

2. **Recitals.**

2.1 Costco is the owner of that certain parcel of unimproved land located at the intersection of 200 East Street and 1000 North Street in Spanish Fork, Utah, containing approximately **13.24 acres**, legally described on **Exhibit A** attached to this Agreement and shown on the sketch attached to this Agreement as **Exhibit B** (the “**Property**”).

2.2 Costco intends to develop, construct, and operate on the Property, in accordance with Costco’s requirements, a wholesale and retail general merchandise facility, which facility also may include, without limitation, a pharmacy, tire sales and installation center, liquor sales (in accordance with applicable state regulations), a vehicle fueling facility, a car wash, photo processing, butcher, deli and bakery services, optometry services, related office space, related parking, and other improvements (collectively, the “**Project**”).

2.3 As a primary inducement for Costco to develop, construct, and operate the Project on the Property, and in order to encourage additional retail development in the City, and to increase the tax base of the City, and to stimulate the economy of the City, the City has agreed to provide Costco with a number of economic incentives, as more particularly described herein.

2.4 The City has conducted a study as required by Utah Code Ann. Section 10-8-2(3), and determined that the net value to the City of this Project is greater than the appropriations made as economic incentives to cause the Project to happen.

3. **Agreement.** NOW, THEREFORE, in consideration of the covenants and agreements contained herein, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, City and Costco agree as follows:

3.1 **Recitals.** The foregoing recitals are true and correct, and are incorporated herein by this reference.

3.2 **Fee Waiver.** The City will waive the following City-assessed fees charged in connection with Costco's development, construction, and operation of the Project on the Property: plan application fees, plan check fees, building permit fees, connection charges or fees, and impact fees imposed on the Project by the City.

3.3 **Sales Tax Rebate.** For the first eighteen (18) months of Costco's operation of the Project on the Property, commencing on the first day of the month following the date the Project opens for business to the public, and continuing for the eighteen (18) consecutive calendar months thereafter, the City will rebate to Costco the portion of sales taxes generated by the Project, and received by the City, for such 18 month period as follows: (a) sales tax rebate payments from the City to Costco shall be made quarterly, after the third, sixth, ninth, twelfth, fifteenth, and eighteenth months of Project operations on the Property; (b) such payments shall be in an amount equal to the aggregate amount of sales tax remitted by the State of Utah to the City for the applicable three-month period; (c) such payments shall be made within ninety (90) days after the end of the applicable three-month period, and shall be accompanied by reasonable written evidence of how the payment amount was calculated; and (d) payments not made within such 90-day period shall accrue interest at the lesser of (i) five percent (5%) per annum in excess of the Prime Rate (as hereinafter defined), or (ii) the highest lawful rate permitted in the jurisdiction where the Project is located, from the end of such 90-day period until paid in full; provided, however, that in no event shall the City be obligated to rebate more than **US\$1,025,000.00** (in the aggregate) to Costco during such 18-month period. The "**Prime Rate**" shall be the prime or reference rate of interest announced as such from time to time by Bank of America, N.A. or its successor for short-term, uninsured loans to its most creditworthy borrowers. If there shall be no such announced rate of such bank or its successor, then the Prime Rate instead shall be the equivalent rate that is charged from time to time by another major money-center bank operating in the United States chosen by Costco. For example, if the Project opens to the public on November 15, 2012, then the sales tax rebate payments from the City to Costco shall be made no later than May 31, 2013 (for months December, January, and February), August 31, 2013 (for months March, April, and May), November 30, 2013 (for months June, July, and August), ~~and~~ February 28, 2013 (for months September, October, and November), May 31, 2014 (for months December, January, and February), and August 31, 2014 (for months March, April, and May).

Execution Version

3.4 Free Utilities. For the first four years of Costco's operation of the Project on the Property, commencing with the date the Project opens for business to the public, and continuing until the fourth anniversary of such opening date, the City will provide the following City-owned utilities: electric power, culinary water, sanitary sewer, storm sewer, and pressure irrigation, at no cost to Costco.

3.5 Grading/Fill Work Reimbursement. No later than the date the Project opens for business to the public, the City shall pay to Costco the sum of **US\$225,000.00** as partial reimbursement for the grading/fill work performed on the site by the City in the fall of 2011, and paid for by Costco.

4. **Miscellaneous.**

4.1 Entire Agreement; No Oral Modifications. This Agreement and the exhibits hereto constitute the final and complete agreement, and supersede all prior correspondence, memoranda or agreements between the parties relating to the subject matter hereof. This Agreement cannot be changed or modified other than by a written agreement executed by both parties.

4.2 Governing Law. This Agreement shall be governed by and construed in accordance with the laws of Utah.

4.3 Severability. If any term or provision of this Agreement shall, to any extent, be held invalid or unenforceable, the remaining terms and provisions of this Agreement shall not be affected thereby, but each remaining term and provision shall be valid and enforced to the fullest extent permitted by law.

4.4 Construction. The City and Costco acknowledge that each party and its counsel have reviewed and revised this Agreement and that the normal rule of construction to the effect that any ambiguities are to be resolved against the drafting party shall not be employed in the interpretation of this Agreement (including the exhibits) or any amendments thereto, and the same shall be construed neither for nor against the City or Costco, but shall be given a reasonable interpretation in accordance with the plain meaning of its terms and the intent of the parties.

4.5 Computation of Time. If the time for performance of any provision of this Agreement ends on a Saturday, Sunday or federal, state or legal holiday, then such date shall automatically be extended until 5:00 p.m. (Mountain time) on the next day which is not a Saturday, Sunday or federal, state or legal holiday.

4.6 Attorneys' Fees. In the event that either party to this Agreement brings an action or proceeding for a declaration of the rights of the parties under this Agreement, for injunctive relief or for an alleged breach or default of this Agreement, or in any other action arising out of this Agreement or the

Execution Version

transactions contemplated by this Agreement, the predominantly prevailing party in any such action shall be entitled to an award of reasonable attorneys' fees and any court costs incurred in such action or proceeding, in addition to any other damages or relief awarded, regardless of whether such action proceeds to final judgment.

4.7 Facsimile/Email Signature; Counterparts. This Agreement may be executed and delivered by facsimile or email (PDF) signature, and in more than one counterpart, each of which shall be deemed an original, and all of which together shall constitute one and the same instrument.

ECONOMIC INCENTIVE AGREEMENT
SIGNATURE PAGE

IN WITNESS WHEREOF, this Agreement is executed by the parties, intending to be legally bound.

CITY: **SPANISH FORK CITY**

By: _____
Name: _____
Title: _____

STATE OF UTAH
COUNTY OF _____ ss.

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged that said person signed this instrument, on oath stated that said person was authorized to execute the instrument and acknowledged it as the _____ of Spanish Fork City, to be its free and voluntary act for the uses and purposes mentioned in the instrument.

Dated this _____ day of _____, 2011.

(Signature of Notary)

(Legibly Print or Stamp Name of Notary)

Notary public in and for the state of Utah,
residing at _____

My appointment expires _____

ECONOMIC INCENTIVE AGREEMENT
SIGNATURE PAGE

IN WITNESS WHEREOF, this Agreement is executed by the parties, intending to be legally bound.

COSTCO:

COSTCO

WHOLESALE CORPORATION

by: _____

name: _____

title: _____

B
N
T

STATE OF WASHINGTON

ss.

COUNTY OF KING

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged that said person signed this instrument, on oath stated that said person was authorized to execute the instrument and acknowledged it as the _____ of Costco Wholesale Corporation, to be its free and voluntary act for the uses and purposes mentioned in the instrument.

Dated this

_____ day of _____, 2011.

(Signature of Notary)

Execution Version

(Legibly Print or Stamp Name of Notary)

Notary public in and for the state of
Washington, residing at _____

My appointment expires _____

EXHIBIT A
TO
ECONOMIC INCENTIVE AGREEMENT

Lots 1, 2, and 3, Phase 2, North Park Subdivision

EXHIBIT B
TO
ECONOMIC INCENTIVE AGREEMENT

Sketch of the Property

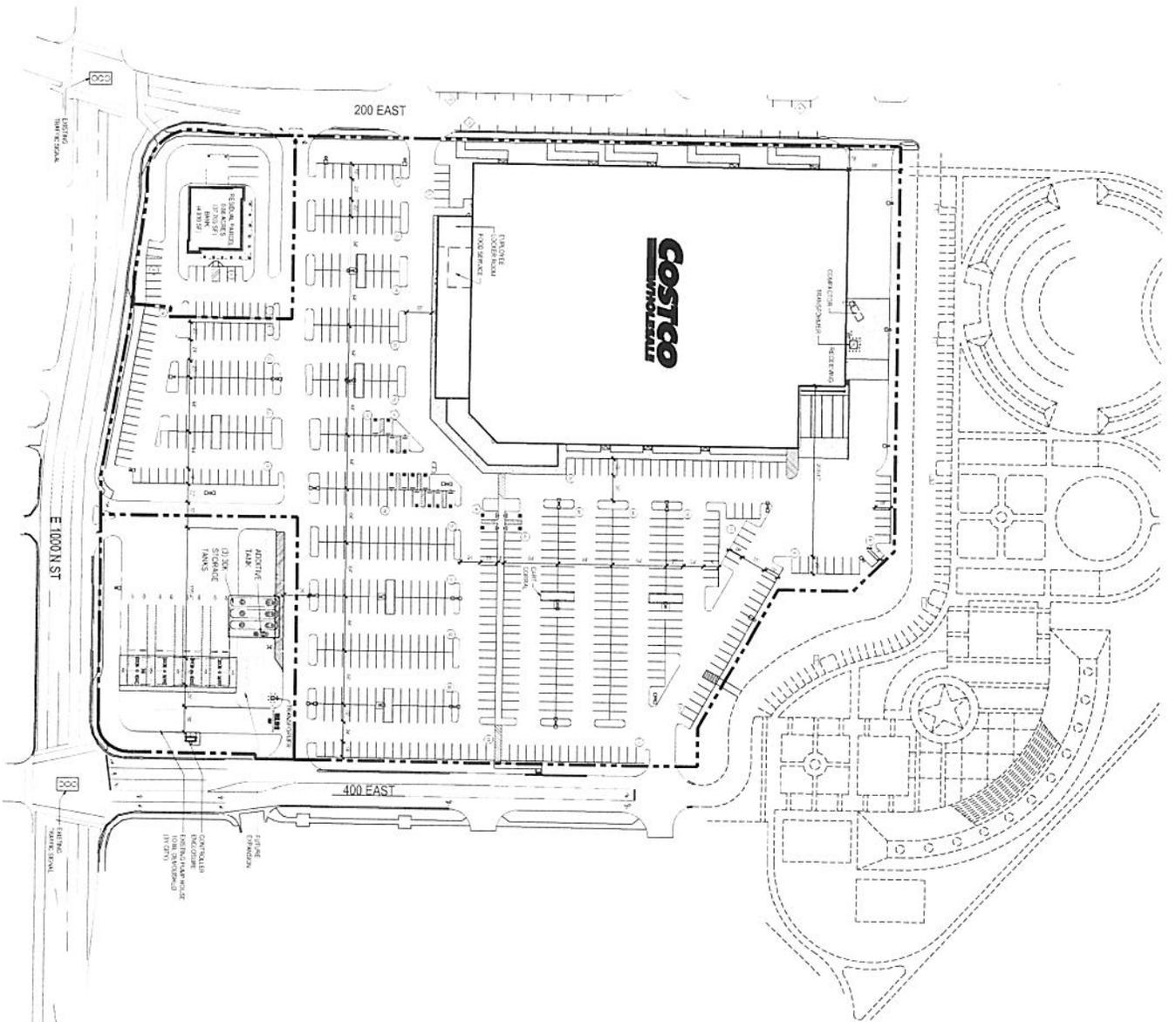
[Parties to insert prior to execution.]

COSTCO WHOLESALE

SPANISH FORK, UTAH

CONCEPT SITE PLAN

SEPTEMBER 7, 2011



PROJECT DATA

CLIENT: COSTCO WHOLESALE
 PROJECT ADDRESS: 200 EAST AND 1000 NORTH
 SPANISH FORK, UT

COSTCO SITE DATA

COSTCO SITE AREA: 12.17 ACRES (530,521 SF)
 WHOLESALE PARCEL: 12.17 ACRES (530,521 SF)
 TOTAL COSTCO AREA: 12.17 ACRES (530,521 SF)
 COSTCO LANDSCAPE AREA: 13.65 ACRES (594,171 SF)
 CHALKITE: 69,424 SF
 TOTAL COSTCO LANDSCAPE AREA: 138,027 SF (618,595)

RESIDUAL PARCEL SITE DATA

TOTAL SITE AREA: 9.86 ACRES (427,037 SF)
 TOTAL SITE AREA: 2,258,984.67 SF
 ZONING: C-2 COMMERCIAL
 SETBACKS: 15' REQUIRED ADJACENT TO ROW, 25' BUILDING SETBACK

BUILDING DATA

TOTAL BUILDING AREA: 142,400 SF
 INCLUDES:
 - WHOLESALE BUILDING
 - LANDSCAPE
 - CHALKITE
 - DRIVEWAY
 - SERVICE AREA
 - OFF-SITE PARKING

SITE PARKING DATA

TOTAL OFF-SITE PARKING: 634 STALLS
 INCLUDES:
 - 480 STALLS
 - 54 STALLS
 - 10 STALLS
 - 10 STALLS

OFF-SITE PARKING DATA

TOTAL OFF-SITE PARKING: 634 STALLS
 INCLUDES:
 - 480 STALLS
 - 54 STALLS
 - 10 STALLS
 - 10 STALLS

LANDSCAPE DATA

TOTAL LANDSCAPE AREA: 13.65 ACRES (594,171 SF)
 INCLUDES:
 - CHALKITE
 - DRIVEWAY
 - SERVICE AREA
 - OFF-SITE PARKING

EXISTING CONDITIONS TO BE FIELD VERIFIED

1. ALL EXISTING UTILITIES AND STRUCTURES
 2. ALL EXISTING SURFACE AND SUBSURFACE CONDITIONS
 3. ALL EXISTING EROSION CONTROL MEASURES
 4. ALL EXISTING LANDSCAPE AND PLANTING



10-0323-01
 SEPTEMBER 7, 2011
 CONCEPT SITE PLAN
 DD1.1-01

ORDINANCE NO. 17-11

ROLL CALL

VOTING	YES	NO
G. WAYNE ANDERSEN <i>Mayor (votes only in case of tie)</i>		
ROD DART <i>Council member</i>		
RICHARD M. DAVIS <i>Council member</i>		
STEVE LEIFSON <i>Council member</i>		
JENS P. NIELSON <i>Council member</i>		
KEIR A. SCUBES <i>Council member</i>		

I MOVE this ordinance be adopted: _____

I SECOND the foregoing motion _____

ORDINANCE No. 17-11

AN ORDINANCE AMENDING PROVISIONS OF THE CITY PURCHASING SYSTEM TO PROVIDE BETTER EFFICIENCIES

WHEREAS, Spanish Fork City has adopted a formal purchasing system in order to comply with state law and provide efficiencies; and

WHEREAS, amendments need to be made from time to time in order to remain in compliance with the law and provide greater efficiencies; and

WHEREAS, the City policy seeks to assure City Council control of the budget, while allowing projects to be bid and awarded in a timely manner to complete the projects and avoid taking administrative details to the Council;

NOW THEREFORE, be it ordained and enacted as follows:

I.

Spanish Fork Municipal Code §§3.08.040 through 3.08.070 and §3.08.090 are hereby amended as follows:

3.08.040 Bid Processes

The City shall substantially comply with the following guidelines for the specific bid process used:

A. Formal Competitive Bidding.

1. Notice Inviting Bids Issued

- a. Notice includes a general description of the articles to be purchased or the work to be performed, the location where bid plans and specifications may be secured, and the time and place for opening bids.
- b. The notice inviting bids shall be:
 - i. In cases involving building improvements or public works projects over the bid limit as defined in Utah Code Ann. §11-39-101:
 1. Published twice (2) in a newspaper of general circulation within the City five (5) days before the date of the opening of the bids and, at the discretion of the City, may be:
 - A. Delivered to all known responsible prospective bidders, including those whose names are on a bidders' list or who have made a written request that their names be added to the bidders' list.
 - B. Posted on an electronic bid page which is accessible to large numbers of potential bidders.
 - ii. In cases involving building improvements or public works projects less than the bid limit, or the purchase of any supplies, materials and equipment:
 1. Perform the work itself, purchase off the State Bid, or, at the discretion of the City, bid requests may be;
 2. Delivered to all known responsible prospective bidders and/or suppliers, including those whose names are on a bidders' list or who have made a written request that their names be added to the bidders' list, or
 3. Post on an electronic bid page which is accessible to large numbers of potential bidders.

2. State Bid List

If there is a quotation for the item desired to be purchased on the State bid list, the City may invite prospective bidders to bid against the price quoted in the State bid list.

3. Bid Procedure

- a. Sealed bids shall be submitted as designated in the notice with the statement "Bid for (item or project)" on the envelope.
- b. Bids shall be opened in public at the time and place stated in the notice.
- c. A tabulation of all bids received shall be open for public inspection during regular business hours for a period of not less than thirty (30) days after the bid opening.
- d. Bids submitted to the City shall be evaluated on the basis of compliance with specifications and other relevant criteria.

4. Bid Award

Bids shall be awarded or rejected as set forth in Section 3.08.060.

B. Competitive Sealed Proposals in Lieu of Bids (RFP)

This bid process may only be used when the City Finance Director or designee determines that the use of formal competitive bidding is either impractical or not advantageous to the City, or for professional service contracts.

1. **Notice** shall be given by:
 - a. Solicitation through a request for proposals. Request are to be delivered to all known responsible prospective bidders or suppliers, including those whose names are on a bidders' list or who have made a written request that their names be added to the bidders' list, and/or
 - b. Public notice of the request for proposals may be given by publication once in a newspaper, magazine or journal likely to give notice to qualified bidders or suppliers five (5) days prior to the date of bid opening and/or
 - c. Posting on an electronic bid page which is accessible to large numbers of potential bidders.
2. **Request for Proposals** The request for proposals shall state the relative importance of price and other evaluating factors.
3. **Opening of Proposals**
 - a. Proposals shall be opened so as to avoid disclosure of contents to competing bidders during the process of negotiation.
 - b. A register of proposals shall be maintained by the City for thirty (30) days after the contract award and shall be open for public inspection.
4. **Revision of Proposals**
 - a. As provided in the request for proposals, discussions may be conducted with responsible bidders who submit proposals determined to be reasonably susceptible of being selected for award. The purpose of the discussion is to assure full understanding of and responsiveness to the solicitation requirements.
 - b. Bidders shall be accorded fair and equal treatment with respect to any opportunity for discussion and revision of proposals. Any revision may be permitted after submissions and prior to award for the purpose of obtaining best and final offers.
 - c. In conducting discussions, there shall be no disclosure of any information derived from proposals submitted by competing bidders.
5. **Award of Proposal**

Award shall be made to the responsible bidder whose proposal is determined to be the most advantageous to the City, taking into consideration price, the evaluation factors set forth in the request for proposals, and other criteria set forth herein. The City may further negotiate terms in order to comply with budgets, specific services/products sought, and other matters beneficial to the City. The award shall be in accordance with section 3.08.060.

C. **Open Market Procedure**

1. Supplies may be purchased through supplier accounts the City has opened with various vendors. Employees are encouraged to use sales events for those common supplies sold through various public vendors.
2. Purchases shall, whenever possible, be based on at least three (3) bids (price quotations) and shall be awarded to the lowest responsible bidder.
3. Bids (price quotations) shall be solicited from prospective vendors by written or oral request.

4. The City Finance Director or his/her designee may approve purchases on the open market.

3.08.050 Choice of Bid Process

Except as otherwise provided in this Chapter or by provisions of State or Federal law, purchases of supplies, services, or equipment shall follow one of the bid or rfp processes outlined below for the appropriate dollar amount. In cases where more than one alternative is listed as acceptable for a given dollar amount, any of the listed alternatives shall be acceptable. The City shall not incur any liability for choosing one alternative over another. The choices of bid process are as follows:

- A. Purchases of supplies or services having an estimated value in excess of seventy five thousand dollars (\$75,000.00) shall be pursuant to one of the following procedures:
 1. State bid.
 2. Formal competitive bidding, without the requirement of publishing notice.
 3. Competitive sealed proposals in lieu of bids.
- B. Purchases of supplies or services having an estimated value of greater than five thousand dollars (\$5,000.00) but less than or equal to seventy-five thousand dollars (\$75,000.00) shall be pursuant to one of the following procedures:
 1. State bid.
 2. Formal competitive bidding, without the requirement of publishing notice.
 3. Competitive sealed proposals in lieu of bids.
 4. Open market procedure.
- B. Whenever the supplies or services have an estimated value of \$5,000.00 or less, all bid processes and price solicitation procedures may be dispensed with.

3.08.060 Awarding of Bids and RFPs

A. Bids/Purchases in Relation to Budget

Except as otherwise required by law, building improvement or public works projects and supplies, services, and equipment no more than \$2,500.00 over the appropriation balance, and within the scope of the project, as budgeted by the City Council, may be accepted and awarded by the City Finance Director or designee. Bids which exceed the budgeted amounts by more than \$2,500.00 must be approved and awarded by the City Council.

B. Professional Services

Contracts for professional services in an estimated amount no more than \$2,500 over the appropriation balance, and within the scope of the project, as budgeted by the City Council, may be accepted and awarded by the City Finance Director or designee. Bids which exceed the budgeted amounts by more than \$2,500.00 must be approved and awarded by the City Council.

C. Rejection of Bids

The City Council or the City Finance Director or his/her designee, or others authorized to accept and award bids may reject any and all bids presented, and may resolicit for bids as set forth in this Chapter. The City may proceed to do any work itself after rejecting all bids, by following the procedures set forth in Utah Code Ann. §11-39-103.

D. Lowest Responsible Bidder

Except as otherwise allowed or required, the City shall award the contract or bid to the

lowest responsible bidder.

E. **Negotiation of Bids**

Where a bid exceeds available funds and time or economic considerations preclude resolicitation of work or purchase of a reduced scope or quantity, the City Finance Director or designee may negotiate an adjustment of the bid price, including changes in the bid requirements, with the lowest responsible bidder, in order to bring the low bid within the amount of available funds.

F. **Tie Bids**

If two (2) or more of the bids received are for the same total amount or list price, quality and service being equal, the City Finance Director or designee may negotiate with the bidders and obtain the best bid possible and/or give a preference to a local bidder.

G. **Single Bids**

The City Finance Director or his/her designee may require a price or cost analysis if only one bid is received. The bidder may be required to furnish a detailed cost proposal, and the bid award shall be subject to subsequent negotiation.

H. **Bonds**

Before entering a contract, the City shall have authority to require performance, payment and other bonds in such amounts as deemed necessary to protect the interests of the City. The types and amounts of the bonds to be required shall be described in the notice inviting bids.

I. **Change orders**

Change orders in the amount of \$2,500.00 or less may be approved by the City Finance Director or designee, as long as the overall project budget is not exceeded by more than \$2,500.00. Line item change orders may be approved by the City Finance Director or designee as long as the overall project budget is not exceeded by more than \$2,500.00.

3.08.070 Exceptions to Bidding Requirements

Unless otherwise required by State or Federal law, the bid process requirements set forth in section 3.08.050 do not apply in the following situations.

A. **Professional service contracts**

1. Professional services shall include, but not be limited to, the following: auditing, architecture, banking, insurance, engineering, appraisals, legal services, and other consulting services. Professional service contracts shall be awarded based on professional qualifications, service ability, cost of service, and other criteria deemed important by the City.
2. A professional services contract for the annual fiscal year financial audit shall only be awarded by the City Council. This contract may be awarded for multiple years. The performance of the auditing firm may be reviewed periodically to determine whether to continue the contract or put it back out to bid.

B. **Contracts Not Suited to Competitive Bidding** Contracts, which by their nature are not suited to award by competitive bidding, shall not be subject to the competitive bidding requirements of Section 3.08.040. These contracts include, but are not necessarily limited to:

1. Contracts for items which may only be purchased from a single or sole source.
2. Contracts for additions to and repairs and maintenance of equipment owned by the City which may be more efficiently added to, repaired or

maintained by a particular person or firm.

3. Contracts for equipment which, by reason of the training of City personnel or the inventory of replacement parts maintained by the City, is more compatible with the existing equipment owned by the City.

C. **Library Purchases**

The purchase of library books, records, tapes, films, publications, periodicals and subscriptions are specifically exempted from competitive bidding requirements.

D. **Auction, Closeout, Bankruptcy Sales**

If the City Finance Director or designee determines that supplies, materials or equipment can be purchased at any public auction, closeout sale, bankruptcy sale or other similar sale, and if the City Manager or his/her designee finds that a purchase at any such auction or sale will be made at a cost below the market cost in the county, a contract or contracts may be let, or the purchase made, without complying with the competitive bidding requirements of this Chapter.

E. **Exchanges**

Exchanges of supplies, material or equipment between the City and any other public agency which are not by sale or auction shall be by mutual agreement of the respective public agencies.

F. **Projects Performed by City Employees**

City employees may be used to complete City projects, provided that the City complies with State statutory requirements governing contracts for building improvements and public works projects.

G. **State Bid List**

The City may purchase supplies from the vendor who has submitted the lowest bid price for such items to the State of Utah Purchasing Office at the quoted price, without any solicitation or price quotation or invitation to bid. For such purposes, the quoted price shall be deemed to be the lowest price available for such items and the City need not follow any other bidding requirements.

H. **Utah Correctional Industries Division**

Goods and services produced by the Utah Correctional Industries Division may be purchased from the Utah Correctional Industries Division without following any of the bidding requirements set forth herein.

I. **Emergency Purchases**

Notwithstanding any other section of this Chapter, competitive bidding may be suspended in the event of an emergency when supplies, services, and/or contracts are needed immediately in order to respond to the emergency. A state of emergency must have been declared by the Mayor, City Manager, Public Safety Director, or Public Works Director, or their next in command if they are not available. In order to suspend competitive bidding, the emergency must require immediate action and/or response in order to protect the life, health, or safety of persons or property, or, in the event of an improvement bond forfeiture, the need to complete the bonded improvements in a certain time frame, given all factors, including weather considerations.

3.08.090 Disposal or Lease of Public Property

- A. No public property having an estimated value in excess of one hundred dollars (\$100.00) shall be disposed of or released to anyone other than the City, unless such property has been declared surplus by the City Finance Director or designee.

- B. Whenever public property is surplus, unused, obsolete, unsuitable or otherwise no longer needed, the department head having control of such property shall notify the City Finance Director or designee. The City Finance Director or designee may notify other City departments of the availability of such property. The City Finance Director or designee shall supervise any transfer of such property to any other department. If no use can be made or can be expected to be made within the reasonably foreseeable future, the property shall be disposed of in accordance with this section.
- C. The City Finance Director or designee shall prepare a listing of all City-owned property which s/he feels is no longer needed by the City and which can be declared surplus. After an item has been declared surplus, the property may be disposed of or leased. If an item has an estimated salvage value over twenty thousand dollars (\$20,000), the City Council shall approve its disposal. All disposals, leases and/or subleases of public property shall be made, in accordance with law, under the direction of the City Finance Director or designee.
- D. Except as otherwise required by State law, boundary line agreements and deeds conveying unneeded portions of rights-of-way or easements may be executed without declaring the property surplus.
- E. Before disposing of a significant parcel of real property, the City shall comply with the provisions of Utah Code Ann. §10-8-2(4). For purposes of this section, a significant parcel of real property is defined to be any parcel with a value equal to or greater than \$100,000.00. Reasonable notice shall constitute posting the property thirty (30) days prior and publishing notice in a newspaper of local circulation fourteen (14) days prior to a public hearing concerning the disposition.

II.

This ordinance shall become effective twenty days after passage and publication.

DATED this 20th day of December, 2011.

G. WAYNE ANDERSEN, Mayor

Attest:

Kent R. Clark, City Recorder



Staff Report to City Council

Agenda Date:	December 20, 2011
Staff Contacts:	Dale Robinson, Trapper Burdick
Subject:	Fairgrounds Arena Lighting Request for Proposals

Background Discussion:

We sent out a request for proposals for the lighting of the arena and received two. Both proposals included the Musco Lighting System which we are very familiar with and have been satisfied with their product and service. The fees included in the proposals came in as follows:

Rydalch Electric, Inc.	\$239,765.00
Homeland Construction	\$274,000.00

Budgetary Impact:

This will be taken from the fund set up for construction of the new rodeo arena.

Recommendation:

Staff recommends the council authorize the Mayor to sign the notice of award and enter into an agreement with Rydalch Electric, Inc. to provide the indicated services for the proposed amount. Research was done and Rydalch was found to be a reputable company. Staff is confident that they will do an excellent job installing this lighting system.

Attachments:

Notice of Award

NOTICE OF AWARD

DATE: December 21, 2011

TO: Rydalch Electric Inc.

250 West Plymouth Ave.

Salt Lake City, UT 84115

PROJECT DESCRIPTION:

SPANISH FORK FAIRGROUNDS ARENA LIGHTING 2011

The OWNER have considered the bid submitted by you for the above described work in response to its Advertisement For Bids dated November 26th & 27th, 2011 and information for bidders.

You are hereby notified that your bid has been accepted in the amount of

\$239,765.00; Two Hundred Thirty Nine Thousand Seven Hundred Sixty Five Dollars and zero Cents

You are required by the Information For Bidders to execute the Agreement and furnish the required CONTRACTOR's Performance Bond, Payment Bond and Certificates of Insurance **within ten (10) calendar days** from the date of this notice to you.

If you fail to execute said Agreement and to furnish said bonds within ten (10) days from the date of this notice, said OWNER will be entitled to consider all your rights arising out of the OWNER's acceptance of your bid as abandoned and as a forfeiture of your Bid Bond. The OWNER will be entitled to such other rights as may be granted by law. You are required to return an acknowledged copy of this Notice of Award to the OWNER.

DATED THIS ___ DAY OF _____, 2011.

SPANISH FORK CITY CORPORATION

BY: _____

G. Wayne Andersen, Mayor

ACCEPTANCE OF NOTICE
RECEIPT OF THE ABOVE NOTICE OF AWARD IS HEREBY ACKNOWLEDGED

BY: _____

THIS THE ___ DAY OF _____, 2011.



Staff Report to City Council

Agenda Date:	December 20, 2011
Staff Contacts:	Dale Robinson, Trapper Burdick
Subject:	Fairgrounds Arena Change Order #1

Background Discussion:

The original specifications sent out in the RFP to hire an architect had two building designs that would each be repeated three times. This made it easy and inexpensive for the architect to complete the work. WPS architecture originally proposed a cost of \$7,408 for this work. As the design proceeded there were many issues with code, concessions layouts, additional storage and electrical buildings that drastically changed the scope of work that had to be done by the architect. Instead of having to design two buildings and just duplicate them, there were now seven unique buildings to be designed and provide plans for. I have included his proposal for your review which covers all of those additions and they have been reviewed by staff and deemed to be correct. The new proposed cost for architectural services is \$36,000.

Budgetary Impact:

The project will still be within the projected budget with this change order.

Recommendation:

Staff recommends approval of the change order.

Attachments:

Change Order
Architects New Proposal

Spanish Fork City Contract Change Order

Change Order Number: 1

Contract for	Sanish Fork Fairground Buildings (Restrooms & Concessions Architecture)	Date	12/16/2012
Owner	Spanish Fork City		
To	WPA Architecture		

You are hereby requested to comply with the following changes from the contract plans and specifications:

Description of Changes (Supplemental Plans and Specifications Attached)	Decrease in Contract Price	Increase in Contract Price
Fixed Fee Compensation for architectural services		\$28,592.00
TOTALS :	\$0.00	\$28,592.00
NET CHANGE IN CONTRACT PRICE :	\$0.00	\$28,592.00

JUSTIFICATION:

The design requirements for the restrooms and concessions have changed and require additional designs to be completed.

The amount of the contract will be increased by the sum of :	Twenty Eight Thousand Five Hundred Ninety Two Dollars Even
	\$28,592.00
The contract total including this and previous change orders will be :	Thirty Six Thousand Dollars and zero cents
	\$36,000.00

This document will become a supplement to the contract and all provisions will apply herein.

Requested: _____	Date: _____
(Owner)	
Recommended: _____	Date: _____
(Owner's Architect/Engineer)	
Accepted: _____	Date: _____
(Contractor)	



30 November 2011

Mr. Dale Robinson
Parks and Recreation Director
Spanish Fork City
775 North Main Street
Spanish Fork, Utah 84660

RE: Fee Proposal for Architectural Services
Spanish Fork Fairground Buildings (Restrooms & Concessions)
475 South Main Street, Spanish Fork, Utah 84660

Dale,

WPA Architecture is enjoying the opportunity to work with you and Spanish Fork City on the above noted project and we are writing to submit our updated Fee Proposal to you.

Our original fee proposal for the project was based on the following assumptions:

- A 36 foot x 20 foot restroom building that would be repeated 3 times.
- A 36 foot x 20 foot concession building that would be repeated 3 times.
- We estimated that the construction cost for these buildings would be \$100 per square foot and used that as the basis for our proposal.
- We assumed that there would be one restroom building to be designed and one concession building to be designed, which would then be repeated throughout the facility. Our fee was established with designing each building once with a repeat fee for the work needed to place the buildings on the site.
- We used 6.0 percent as a basis for the design of the 2 buildings and then added 25 percent for the repeat for a total of \$10,500.

The scope of the project has changed from the original assumptions and our understanding of the proposed project is:

- Six unique buildings with 6,934 sq. ft. of building (Building B is a mirror image of Building D, bringing the total to 7 buildings).
 - Building A: Restroom & Storage Building (806 sq. ft.)
 - Buildings B & D: Restrooms (1,505 sq. ft. each)
 - Building C: Concession Building (630 sq. ft.)
 - Building E: Restroom & Concession Building (1,097 sq. ft.)
 - Building F: Electrical Building (296 sq. ft.)
 - Building G: Restroom & Concession Building (1,095 sq. ft.)
- Layout of the lighting around the building was added beyond the original scope which was to provide lighting within the buildings.
- Coordination with the bleacher company between our structural engineer and their engineers.

Compensation:

We propose to be compensated with a fixed fee of **\$36,000.00**, which is just below 6.0 percent of the estimated construction costs of \$112 per square foot. We have not included the repeated building (B & D) in establishing our fee, but used 5,429 sq. ft. to determine the estimated construction cost. The fee includes Architectural, Structural, Mechanical and Electrical Engineering.

475 north freedom blvd
provo, utah 84601
801.374.0800
801.374.0805 (fax)
info@wpa-architecture.com

www.wpa-architecture.com

Alan R. Poulson, Architect
Ronald B. Jones, Architect
Bruce T. Fallon, AIA, LEED® AP



It does not include any Civil Engineering, Site Survey, Geotechnical Studies, Landscape Architecture, Environmental assessments, 3-D models or renderings, special inspections or reimbursable expenses as described below. Payment of fees will be made monthly based on the time and work performed and will break down into the following phases:

	Approximate % of fee
Schematic Design	10 percent
Design Development	15 percent
Construction Documents	55 percent
Bidding and Negotiation	5 percent
Construction	15 percent

Reimbursable costs, including reproduction expenses for copies and prints, postage or shipping costs including overnight or other mailings, and electronic storage (CD, DVD, etc) will be billed in addition to the hourly rates. If the scope of work changes considerably from what is outlined in this letter, WPA reserves the right to re-negotiate a fee that is merited by such changes. Additional services will be billed at the following hourly rates or for a pre-approved addition to the fixed fee:

Hourly Rates

Principals	\$ 100.00/HR
Licensed Architects	\$ 90.00/HR
Intern Architects	\$ 70.00/HR
CADD Operators/Draftsmen	\$ 60.00/HR
Clerical / Administrative	\$ 45.00/HR

If this is acceptable to you, please prepare the city's standard Task Order documentation and return two copies to our office for signature. We will then return both copies for final signature.

We appreciate the opportunity to submit this proposal for your consideration and trust that it meets with your approval. If you have any questions or concerns, please contact us at 801.374.0800.

Sincerely,

A handwritten signature in black ink, appearing to read 'Bruce T. Fallon', is written over a horizontal line. Below the line, the name and title are printed.

Bruce T. Fallon, AIA, LEED® AP
Principal

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Alan R. Poulson, Architect
Ronald B. Jones, Architect
Bruce T. Fallon, AIA, LEED® AP



Memo

To: Mayor and City Council
From: Chris Thompson, Public Works Director/City Engineer
Date: December 15, 2011
Re: Utility Masterplans

Staff Report

The engineering office provided the mayor and city council with proposed masterplans for the city drinking water, pressurized irrigation, waste water and storm drain systems in early November. As these plans have been reviewed a few additional modifications have been proposed and included in with this memo.

Whenever a comprehensive masterplan is first introduced there will need to be some adjustments to it as it is first implemented. While we hope that we have found the majority of such changes we believe there will still be several more this coming year.

Many of the revisions were to make minor format changes to clarify the reports. Some of the major changes are related to defining clearly what portions of proposed projects are related to growth and therefore reimbursable by impact fees.

Other significant additions to the masterplans are the sections on renewal. Each utility's infrastructure has an estimated service life. It is advisable that the city budget a little amount each year to update facilities that have reached their service life so that we do not have to do expensive one time projects that burden a single generation with decades of maintenance costs.

We recommend that the city council approve the proposed masterplans for the drinking water, pressurized irrigation, waste water and storm drain system.

Attached: final draft revisions



Drinking Water and Pressurized Irrigation Masterplans

Final Draft Revisions

SUMMARY OF UPDATES

Spanish Fork Drinking Water Master Plan

A percentage of the Fire Flow Projects attributed to future growth was added to Table VI-1 on page VI-3.

Page VI-3 was updated.

Spanish Fork PI Master Plan

The following sentences were added to pages III-7 and VI-5 to make recommendations to the quantity of water to exact for new development.

“It is recommended that the City exact that amount of water the new development will use to irrigate. This master plan assumes that 4.0 acre-feet is needed per irrigated acre. It was determined that the average irrigated acreage per ERC is 0.15 acres which produces a yearly demand requirement of 0.6 acre-feet per ERC. It is recommended that for nonresidential development the City calculate the amount of water required by multiplying the irrigated acreage by 4.0 acre-feet.”

Pages III-7, VI-5 and VI-6 were updated.

**TABLE VI-1
CAPITAL IMPROVEMENT PROJECTS
(CONTINUED)**

TYPE	MAP ID	RECOMMENDED PROJECT	COST
Malcomb Transmission Projects	6	Disconnect the 12-inch and 10-inch pipelines from the 30-inch pipeline at the intersection of Center Street and Highway 6. Connect the 12-inch line to the 10-inch line	\$6,000
Malcomb Transmission Projects	7	Close the 12-in line in 200 N just west of Highway 6	No Cost
Malcomb Transmission Projects	8	Install a check valve in the 8-inch line in 400 E just east of Highway 6	\$2,000
Malcomb Transmission Projects	9	Close valve in 4-inch line in 100 E just south of 400 N	No Cost
Malcomb Transmission Projects	10	Close valve on 12-inch line in 900 E just south of 400 N	No Cost
Malcomb Transmission Projects	11	Open Valve in 500 N just east of 800 E	No Cost
Malcomb Transmission Projects	12	Open 8" Valve in 600 N near 900 E	No Cost
Malcomb Transmission Projects	13	Install PRV at 500 E 200 S in 12-inch line. Disconnect the 18-inch transmission line and connect to the PI system	\$45,000
Fire Flow Projects	14	Install 4,700 feet of 12-inch pipe in 300 W between 900 N and 1900 N and 1,400 feet of 12-inch pipe in 900 N between 300 W and Main Street (73% attributed to future growth)*	\$939,000
Fire Flow Projects	15	Install 1,200 feet of 16-inch pipe in Main Street between 1380 N and 1600 N (88% attributed to future growth)*	\$211,000
Fire Flow Projects	16	Install 1,050 feet of 8-inch pipe in Industrial Park Drive between 45 N and 200 E and 1,600 feet of 8-inch pipe in 200 E between 1300 N and 1750 N (80% attributed to future growth)*	\$326,000
Fire Flow Projects	17	Install 700 feet of 10-inch pipe in from 1800 N and 150 E directly east to 1800 N and Main Street (16% attributed to future growth)*	\$96,000
Fire Flow Projects	18	Install a two-way PRV and meter station	\$41,000
Fire Flow Projects	19	Install 1,650 feet of 12-inch pipe in 1550 W between 750 S and 400 S (90% attributed to future growth)*	\$254,000
Fire Flow Projects	20	Install a PRV at approximately 2650 S Spanish Oaks Drive and adjust the Spanish Oaks East PRV located at about 2400 S Spanish Oaks Drive to 100 psi (100% attributed to future growth)*	\$43,000

* Percentage of the project attributed to future growth was determined by comparing peak flows in the existing and future models

Co., and Springville Irrigation District. The irrigation companies and their service areas can be seen in Appendix A on the map Ditches & Irrigation Companies. It is recommended that the City exact that amount of water the new development will use to irrigate. This master plan assumes that 4.0 acre-feet is needed per irrigated acre. It was determined that the average irrigated acreage per ERC is 0.15 acres which produces a yearly demand requirement of 0.6 acre-feet per ERC. It is recommended that for nonresidential development the City calculate the amount of water required by multiplying the irrigated acreage by 4.0 acre-feet.

- The City's water rights and water shares far exceed the City's current ability to receive the water through existing sources. It is recommended that the City continue to monitor and perfect water rights and shares. It is recommended that the City also continue to develop sources as more sources are needed.
- Currently, the Central Utah Project (CUP) water is anticipated to be at a much higher cost than the other potential sources. It is therefore recommended that the other sources of water be developed first.
- It is recommended that the City promote the need for a CUP pipeline that is planned to convey water south from the existing 96-inch CUP pipeline so that the City can convey irrigation shares and Strawberry Project water at a high pressure directly to the Spanish Oaks reservoir.
- It is recommended that the City add a 4,000 gpm pump station with Variable Speed Drive (VFD) at the 2550 East Tank and well site to deliver irrigation share water and Cold Springs water out of the storage tank.
- It is recommended that the City add a 4,000 to 6,000 gpm pump station with Variable Speed Drive (VFD) at the Golf Course Pond to deliver additional irrigation share water out of the pond.

and virtual elimination of federal revenue sharing dollars are clear indicators that local government may be left to its own devices regarding infrastructure finance in general. However, state/federal grants and loans should be further investigated as a possible funding source for needed PI system improvements.

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

Impact Fees

Impact fees can be applied to water related facilities under the Utah Impact Fees Act. The Utah Impacts Fees Act is designed to provide a logical and clear framework for establishing new development assessments. It is also designed to establish the basis for the fee calculation which the City must follow in order to comply with the statute. However, the fundamental objective for the fee structure is the imposition on new development of only those costs associated with providing or expanding water infrastructure to meet the capacity needs created by that specific new development. Also, impact fees cannot be applied retroactively.

SUMMARY OF RECOMMENDATIONS

Several recommendations were made throughout the master plan report. The following is a summary of the recommendations.

1. It is recommended that the City continue to update the model as the PI system changes and use the model as a tool for determining: the effect of changes to the system, verification of pipe diameters, and location of proposed PI water mains.
2. It is recommended that redundancy be incorporated into the pressurized irrigation system so that the pressurized irrigation system is able to meet all of the demand objectives with a major source unavailable.
3. It is recommended that the City continue to exact water rights and shares as land in Spanish Fork City is developed. However, the City should avoid accepting water rights that are not for current use in the Policy Declaration Boundary or in current sources. Irrigation companies that have service areas within the Policy Declaration Boundary include the Highline Division, Spanish Fork East Bench Irrigation, Spanish Fork South Irrigation Co., Spanish Fork Southeast Irrigation Co., Spanish Fork West Field Irrigation Co., and Springville Irrigation District. The irrigation companies and their service areas can be seen in Appendix A on the map Ditches & Irrigation Companies. It is recommended that the City exact that amount of water the new development will use to irrigate. This master plan assumes that 4.0 acre-feet is needed per irrigated acre. It was determined that the average irrigated acreage per ERC is 0.15 acres which produces a yearly demand requirement of 0.6 acre-feet per ERC. It is recommended that for nonresidential development the City calculate the amount of water required by multiplying the irrigated acreage by 4.0 acre-feet.

4. The City's water rights and water shares far exceed the City's current ability to receive the water through existing sources. It is recommended that the City continue to monitor and perfect water rights and shares. It is recommended that the City also continue to develop sources as more sources are needed.
5. Currently, the Central Utah Project (CUP) water is anticipated to be at a much higher cost than the other potential sources. It is therefore recommended that the other sources of water be developed first.
6. It is recommended that the City promote the need for a CUP pipeline that is planned to convey water south from the existing 96-inch CUP pipeline so that the City can convey irrigation shares and Strawberry Project water at a high pressure directly to the Spanish Oaks reservoir.
7. It is recommended that the City add a 4,000 gpm pump station with VFD at the 2550 East Tank and well site to deliver irrigation share water and Cold Springs water out of the storage tank.
8. It is recommended that the City add a 2,000 to 6,000 gpm pump station with VFD at the Golf Course Pond to deliver additional irrigation share water out of the pond and to allow the Golf Course Pond as equalization storage.

HANSEN, ALLEN & LUCE, INC.

Client: Spanish Fork City
 Project: Cold Springs Transmission Line Cost Assessment
 Project No.: 230.18.104
 Date: Dec 8, 2011

Present Worth Calculation

Project	Construction Year	Construction Year ENR Index	Present Year	Present ENR Index	Multiplier	Contract Amount	Current Value	Percent of Project used for PI	Current Value of PI Portion	Service Life (years)	Facility Age	Salvage Value	Annual Depreciation of Present Worth	Depreciation	Current Value for PI	Comment
Cold Springs Transmission Line	1985	4195	2011	9172	2.19	\$598,315.00	\$1,308,163.33	27.69%	\$362,260.62	50	26	\$0.00	\$7,245.21	\$188,375.52	\$173,885.10	Assumes that 46.15% of pipe carries 60% PI water, the remainig capacity is drinking water.
SR 198 1100 S Main to 1100 E Canyon Rd.	2003	6794	2011	9172	1.35	\$722,433.55	\$975,295.93	100.00%	\$975,295.93	50	8	\$0.00	\$19,505.92	\$156,047.35	\$819,248.58	

TOTAL = \$993,133.67

This evaluation will be added to the masterplan as well as all bond information to the appendixes.

Waste Water Masterplan

Final Draft Revisions

2011 WASTEWATER MASTER PLAN FINAL DRAFT REVISION

NOTES ABOUT THIS REVISION

Spanish Fork City personnel provided some comments to BC&A after production of the final draft printed October 2011. This document identifies changes made to the original final draft to address Spanish Fork City questions and comments.

Figure 2-1 – Figure 2-1 was updated to expand future lift station areas. This was done to modify the potential service area of the Spanish Fields Lift Station so that no future improvements will be required at that lift station to meet build-out needs.

Chapter 3 – Additional information was provided by Mapleton City regarding the City’s build-out population. Some discussion of the new information is discussed and Table 3-1 and Table 3-3 were updated to reflect the differences. Some modifications were made to Figure 3-2 to more clearly show the general flow direction of sewer trunks in the City.

Chapter 5 – Additional detail was added to the description of the deficiencies indicated in Figure 5-2. An alternative solution to deficiency B4 was developed so that future service area of the Spanish Fields lift station was reduced to within acceptable limits (eliminating the need for a future project at the Spanish Fields lift station). Figure 5-2 was updated to reflect new information provided by Mapleton City.

Chapter 6 – Some modifications to proposed projects were made reflecting Spanish Fork City personnel comments. Percentage attributable to existing and future growth was added to Table 6-1. Table 6-1, Figure 6-1, and Figure 6-2 were modified to reflect the changes discussed below:

- Redundant Siphon (Project 2) – A redundant siphon was requested by Spanish Fork City personnel west of the City’s treatment plant. Some additional cost estimates were included in this revision to accommodate additional flows that might be expected at this site.
- New West Lift Station vs. Spanish Fields Lift Station Upgrade (Project 13) – A project was previously identified at the Spanish Fields lift station due to the potential service area of this lift station. Rather than upgrading the Spanish Fields Lift Station, a new West Lift Station has been proposed to accept more of the service area from areas that need to be pumped toward the City’s treatment plant. This alternative provides more flexibility for future development while preserving the existing infrastructure at the Spanish Fields Lift Station.

Chapter 7 – A clarification note was added to the header of Table 7-1 to indicate that the total population for the Spanish Fork Wastewater Treatment Plant includes both the population of Spanish Fork City and Mapleton City.

Chapter 8 – Recommended renewal costs for the treatment plant were updated to reflect the known costs associated with improvements listed in Chapter 7. A table of renewal costs for various wastewater system components was added summarizing costs for collection system, lift station, and treatment plant renewal.

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- APPENDIX A - Flow Meter Figures**
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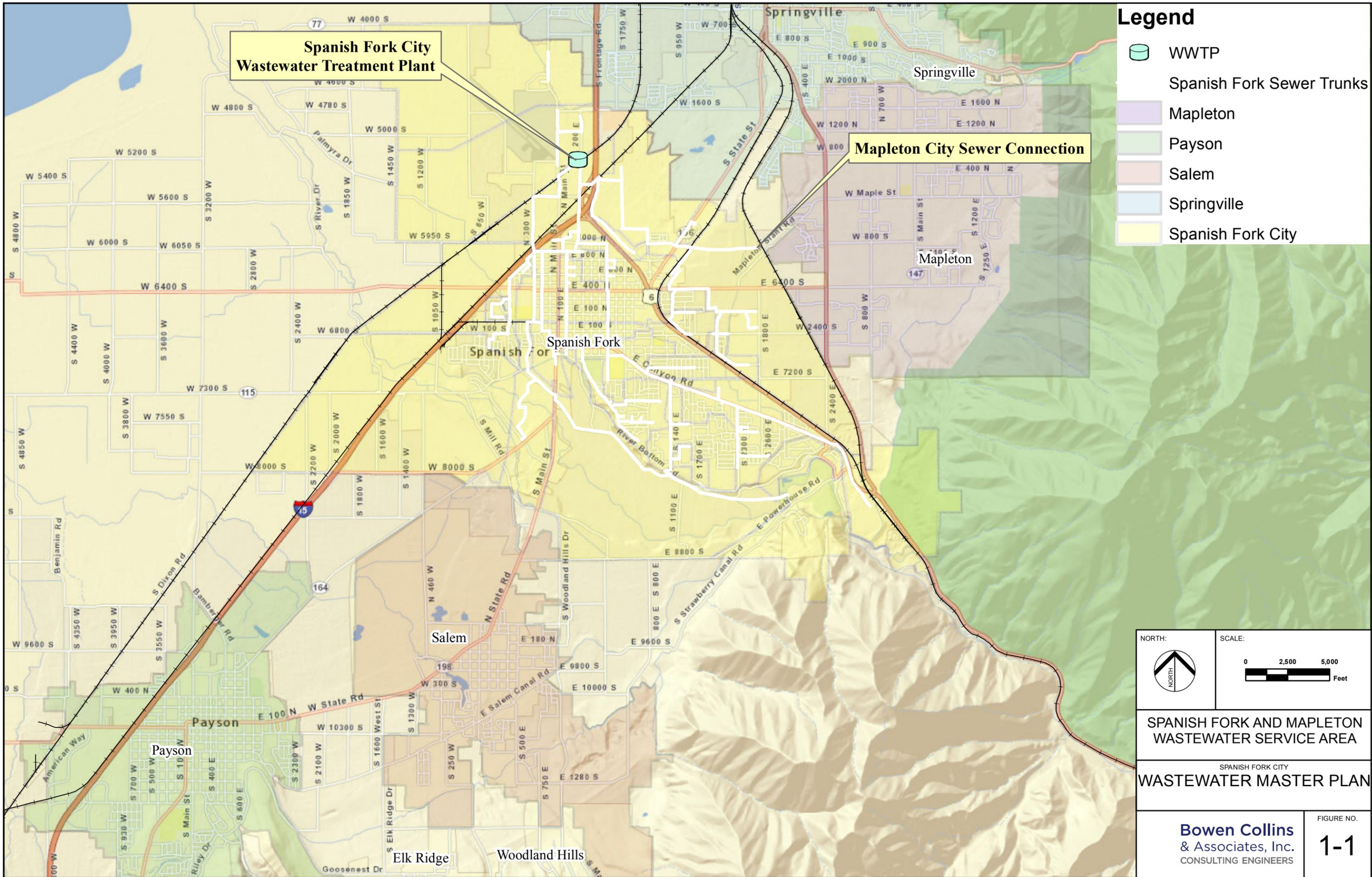
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LIST OF ACRONYMS

ASCE	American Society of Civil Engineers
BC&A	Bowen, Collins & Associates
CIPP	cured-in-place pipe
DEM	digital evaluation model
EBCO	Ensign Bickford Company
ft	feet
GASB	Government Accounting Standards Board
GIS	geographical information system
GOBP	Governor's Office of Planning and Budget
gpd	gallons per day
gpm	gallons per minute
H ₂ S	hydrogen sulfide
H ₂ SO ₄	Sulfuric Acid
I&I	Infiltration and Inflow
in	inch
MACP	Manhole Assessment and Certification Program
mgd	millions of gallons per day
NASSCO	National Association of Sewer Service Companies
O&M	Operations and Maintenance
PACP	Pipeline Assessment and Certification Program
ppm	parts per million
TAZ	Traffic Analysis Zone
UPDES	Utah Pollution Discharge Elimination System
WWTP	Wastewater Treatment Plant



Legend

-  WWTP
-  Spanish Fork Sewer Trunks
-  Mapleton
-  Payson
-  Salem
-  Springville
-  Spanish Fork City



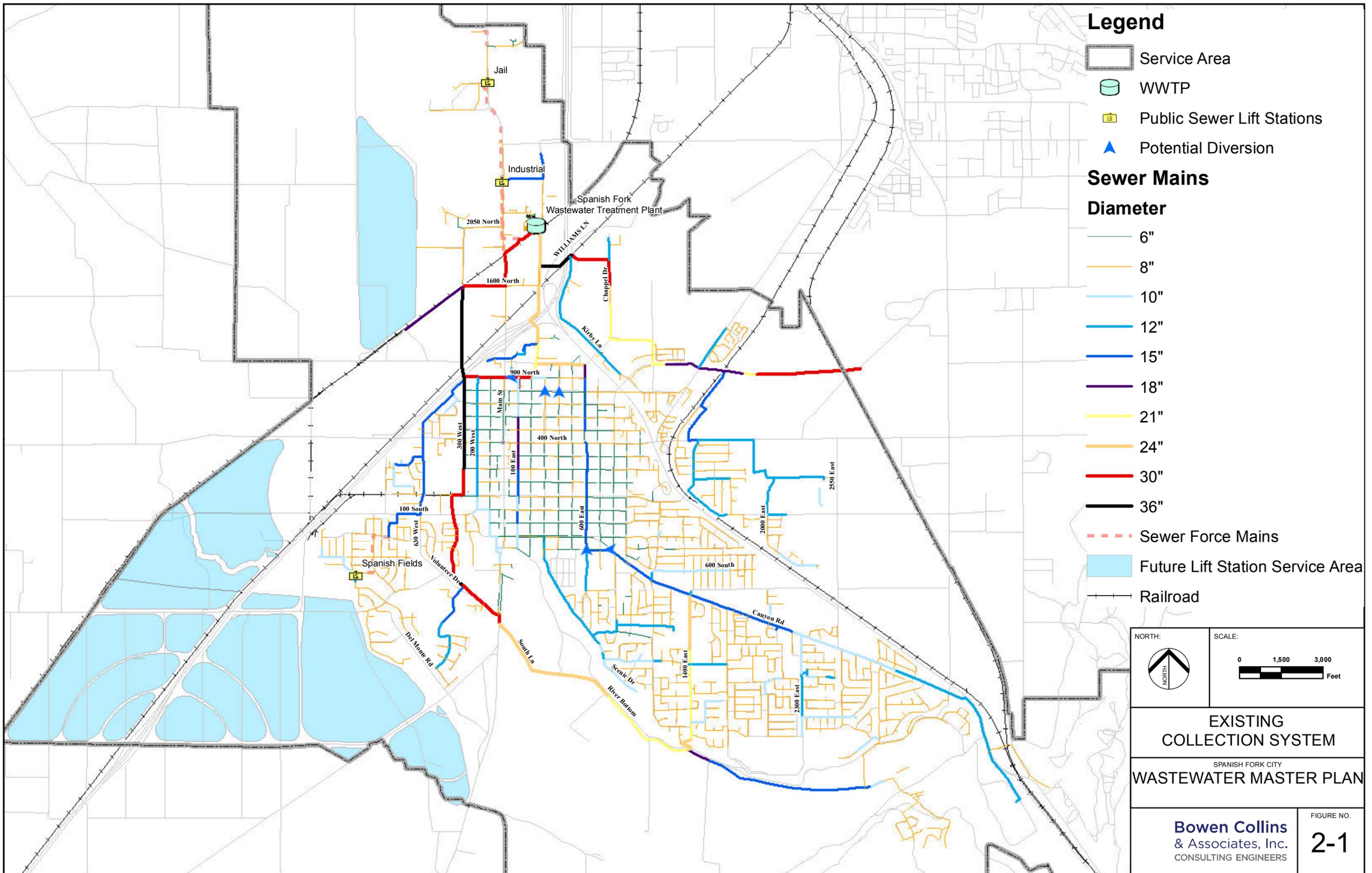
SPANISH FORK AND MAPLETON WASTEWATER SERVICE AREA

SPANISH FORK CITY
WASTEWATER MASTER PLAN

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FIGURE NO.
1-1

P:\Spanish Fork City\Sewer Modeling\GIS\MXDs\Figure 1-1 Service Area.mxd mstayner 12/15/2011



Legend

- Service Area
 - WWTP
 - Public Sewer Lift Stations
 - Potential Diversion
- Sewer Mains**
- Diameter**
- 6"
 - 8"
 - 10"
 - 12"
 - 15"
 - 18"
 - 21"
 - 24"
 - 30"
 - 36"
- Sewer Force Mains
 - Future Lift Station Service Area
 - Railroad

NORTH:

SCALE:

EXISTING COLLECTION SYSTEM

SPANISH FORK CITY
WASTEWATER MASTER PLAN

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FIGURE NO. **2-1**

CHAPTER 3 FUTURE GROWTH

Future growth projections were used in this study to estimate where and what type of future development will occur, and to identify the capital improvements needed for the wastewater collection system. The purpose of this chapter is to document the growth projections used as the basis for evaluation in this report.

POPULATION PROJECTIONS

Population projections for the Spanish Fork City sewer system service area were prepared through the year 2080 in two steps:

1. Population projections through 2080 for Spanish Fork City were provided by Spanish Fork City personnel.
2. Population projections through the year 2030 for Mapleton City, which contributes wastewater flow to the WWTP, were obtained from the Governor's Office of Planning and Budget (GOPB). Mapleton City estimates a build-out population of 29,403. No projections of the growth rate were available, so build-out for Mapleton has been assumed to be the year 2080. A declining growth rate for Mapleton City was assumed from 2031 to 2080 as Mapleton begins to approach build-out.

Table 3-1 shows the projected population for both Spanish Fork City and Mapleton City.

**Table 3-1
Projected Population for Spanish Fork City and Mapleton City**

Year	Spanish Fork City	Mapleton City	Spanish Fork & Mapleton
2010	34,691	8,764	43,455
2020	42,871	11,644	54,515
2030	51,775	16,358	68,133
2040	61,918	18,967	80,884
2050	73,322	21,576	94,898
2060	85,978	24,185	110,163
2070	99,928	26,794	126,722
2080	115,971	29,403	145,374

In addition to estimating the future population of Spanish Fork City, the distribution of future population was also estimated. This was done using the zoning and land use maps in the City's existing General Plan and estimating the percentage of existing development (using 2009 aerial photography). Table 3-2 lists the zoned land use in the General Plan and the estimated fully-developed equivalent residential units (ERUs) associated with each zoned land use. A single

FUTURE SEWER FLOW ESTIMATES

For the purposes of this study, it was assumed that domestic sewer flow will increase proportionally with population. Total domestic wastewater production for 2010 was estimated to be approximately 2.03 mgd based on 90 percent of indoor water use data collected by the City from 2007 to 2009 for the months of December to April. For 2010, this is equivalent to a per capita domestic sewage production rate of approximately 58.5 gpcd based on Spanish Fork City's current population. The estimated current domestic sewage production rate of 58.5 gpcd has been applied to future populations to estimate future sewer flows for both Spanish Fork and Mapleton. At full build-out, it was estimated that the average daily domestic sewer discharge from Spanish Fork City and Mapleton City will increase to approximately 6.79 mgd and 1.72 mgd respectively as shown in Table 3-3.

Table 3-3
Projected Average Daily Sewer Discharge from Spanish Fork and Mapleton City

Year	Spanish Fork City Domestic Sewer Production (mgd)	Mapleton Domestic Sewer Production (mgd)	Combined Spanish Fork/Mapleton Domestic Sewer (mgd)	Combined Spanish Fork/Mapleton Infiltration (mgd)	Combined Spanish Fork/Mapleton Total Sewer Flow (mgd)
2010	2.03	0.51	2.54	2.85	5.39
2020	2.51	0.68	3.19	2.95	6.14
2030	3.03	0.96	3.99	3.07	7.05
2040	3.62	1.11	4.73	3.18	7.91
2050	4.29	1.26	5.55	3.30	8.86
2060	5.03	1.42	6.45	3.44	9.88
2070	5.85	1.57	7.42	3.58	11.00
2080	6.79	1.72	8.51	3.75	12.25

Infiltration at the WWTP was estimated to be approximately 2.85 mgd in the spring of 2011 based on the difference between average monthly flows at the WWTP and the estimated domestic production. This was a historic high for the WWTP and represents the planning infiltration that should be expected at the facility during a wet climate year. As the City's population and collection system expands, a small amount of new infiltration was added each year to account for infiltration associated with new construction. For new construction, allowable infiltration should range between 400 and 600 gpd/in-diam/mile¹ compared to a range of 1,000 to 4,000 gpd/in-diam/mile expected for older construction. For new collection systems, this can be estimated to be approximately 15 percent of the domestic sewer production (or approximately 500 gpd/in-diam/mile).

¹ "Chapter 3 Quantity of Wastewater." *Gravity Sanitary Sewer Design and Construction*. NY, NY: American Society of Civil Engineers.

these lift stations were modeled using a simplified approach. Flows upstream of the lift station are directed to the force main discharge without cycling through on/off cycles of the lift station pumps, similar to the situation that would exist when variable frequency drives are used. This modeling approach does not reproduce the cycling effects experienced at the discharge end of a force main, but still reasonably represents flow from the lift station after attenuation effects in the downstream gravity main. This was a reasonable representation of these lift stations because cycling effects of the pump station were not observed at the flow meters directly downstream of the lift station force mains.

Sediment and Debris

Because of the transportable nature of grease and sediment in a sewer collection system, it is generally not possible to use a computer model to identify the exact location and quantity of grease or sediment accumulation in the system for any specific point in time. Similarly, the build-up and erosion rates of sediment in sanitary sewer systems are not always well understood. As a result, detailed computer modeling of sediment, grease, and debris on a system wide basis is not possible because of continually changing conditions. Therefore, no sediment was included in the hydraulic model. Instead, the design and evaluation criteria for the Spanish Fork City collection system is based on “clean” pipes, with an allowance for capacity lost due to the potential accumulation of sediment.

It should be noted that the hydraulic modeling software used to simulate the operation of the Spanish Fork City wastewater collection system does have the ability to set sediment depth in pipes. Therefore, if the City collects sediment data for a given section of pipe, the sediment may be added to the model and its effects evaluated. However, it should be emphasized that any sediment levels defined today may change in the future as flow conditions change or as maintenance practices are implemented to address sediment accumulation.

Wastewater Treatment Plant

The WWTP located at 2160 North 175 East was used as the outfall in the hydraulic model.

FLOW DATA DEVELOPMENT

Development of flow data for a dynamic computer model consists of estimating the magnitude of flow, point of entry into the system, and a definition of how flow varies with time (to establish peak flow rates and consider the effects of flow travel time in the system). There are three potential sources of flow in sewer pipelines: domestic flow, infiltration, and inflow. They are each described below.

Domestic Flow

Domestic flow consists of the wastewater generated by residential, commercial, and industrial customers. Domestic flow from residential and commercial customers varies throughout the day and throughout the week. For Spanish Fork City, flow records indicate that the peak flow typically occurs on Saturdays during the afternoon. Therefore, most of the calibration data used

**Table 4-2
Estimated Infiltration for March 2011 at Various Flow Meter Sites**

Flow Meter	Address	Infiltration Adjustment Factor	Estimated Infiltration for Collection Area (mgd)	Estimated Infiltration for Collection Area (gal/in-diam-mile)
1 - WWTP	2160 N 175 E	1.00	2.921	1,688
2	1750N I15	1.63	0.465	2,569
3	1600N 250W	1.63	0.135	1,048
4	1600N 200E	1.63	0.032	1,865
5	1550N Kirby Ln	1.68	0.115	10,229
6	1000N 250E	1.00	0.159	1,866
7	900N 200W	1.16	0.045	586
8	800N 100E-East	1.10	0.314	2,089
9	800N 100E-West	1.10	0.111	4,504
10	750N Mitchell	1.00	0.113	990
11	700N 300W	1.15	0.139	1,427
12	800N 800E	1.68	0.144	3,802
13	100N 600E	1.10	0.024	189
14	100W Volunteer Dr	1.00	0.691	2,910
15	1450E Canyon	1.10	0.011	79
100	Other Areas	1.00	0.057	1,321
Mapleton City	--	--	0.369	--

In sub-basins where infiltration for various flow metering basins could not be estimated reliably because of erratic flow meter data, the estimated average infiltration rate for the entire City was applied to that basin (approximately 1,700 gal/in-diam-mile for March 2011).

The American Society of Civil Engineers (ASCE) recommends an allowable infiltration rate for new construction of 500 gpd/in-dia-mile. For older sewer systems, infiltration rates are usually much greater than this. Average infiltration rates for older sewer systems range between 1000 and 4000 gpd/in-dia-mile depending on groundwater depth and age of pipe. Most of the estimated infiltration rates at locations monitored in this study fall within this range of expected values.

Based on ASCE infiltration criteria, Meter locations 5 and 9 appear to have unusually large amounts of infiltration.

- Meter 5 is located in an industrial area and had an indoor winter water use demand of approximately 37 gpm corresponding to approximately 33 gpm of domestic wastewater production. Average flow at this site was measured as 93 gpm for the month of August 2010. This suggests that more than half of the flow in this sewer trunk is a result of infiltration. Flows in this sewer trunk likely fluctuate significantly with the seasons as a

result of changing infiltration conditions. Although this sewer main only contributes a small amount of flow to the City's collection system, it is recommended this trunk be inspected (using CCTV) to identify any major sources of infiltration.

- Meter 9 is located on the Westside of 100 East and serves neighborhoods between Main Street and 100 East. Indoor winter water use demand for the area was estimated at approximately 43 gpm corresponding to approximately 39 gpm of domestic wastewater production. Flow was monitored for 10 days in February 2011 and averaged as 123 gpm. The sewer main upstream of Meter 9 is located in one of the older areas of Spanish Fork City and may be leaking more than other areas of the collection system. It may be difficult to identify large sources of infiltration for this area because leaks likely come from older service laterals, cracked pipes, broken joints, etc. However, this line should be inspected to determine if rehabilitation efforts would be worthwhile for this area.

Inflow

The third and final component of wastewater flow that must be considered for hydraulic modeling purposes is inflow. Inflow is defined as any water that enters into the sewer system which is directly or indirectly related to a storm event. It can come directly from storm runoff through improper connections to the storm water system, missing or leaky manhole covers, roof drains connected to the system, etc. Storm events can also cause the ground water to raise temporarily, which can cause an increase in flow in the sewer system through the same mechanisms that result in groundwater infiltration during dry weather (cracked pipes, leaky laterals, etc.). This temporary increase in sewer flow due to raising levels of ground water is also considered inflow.

To accurately model inflow into the City collection system, it is necessary to estimate both the magnitude and distribution of the inflow in the system. This requires accurate measurements of precipitation around the City and simultaneous flow measurements throughout the City's collection system. Because this data is not available, inflow was not modeled as part of the hydraulic model.

Figure 4-6 shows the increase in peak flow at the WWTP compared to the corresponding precipitation event. No clear pattern could be obtained from this data, but the figure indicates that inflow can be a significant contribution to sanitary sewer flows in the City. For this study, 25 percent of the pipe's hydraulic capacity is reserved to accommodate the accumulation of sediment or debris or for higher flows from inflow or higher infiltration.

CALIBRATION

Simulated hydraulic flows were calibrated based on March 2011 infiltration conditions because infiltration rates for March 2011 are the highest historical flows observed in Spanish Fork. Where possible, monitored flow meter data was adjusted to reflect March 2011 conditions using estimates of infiltration at the flow meter and fluctuations at the City's wastewater treatment plant. Simulated flows were compared to observed monitored flows at the various flow meter locations shown in Figure 4-2. Although the timing of the peak varies in some cases, the overall magnitude of flow correlates well for most of the flow monitors (see Appendix for Figures M1 to

Meter 4

Flow Meter 4 was placed upstream of the City's wastewater treatment plant along 200 East. The simulated average flow at Meter 4 was slightly lower than observed flows while the simulated maximum flow was 25% higher than the observed maximum. The simulated maximum and minimum flows at other flow meter sites higher up in the collection system are much closer to observed flows. This suggests that there is a significant amount of attenuation upstream of this flow meter site. Attenuation reduces the amplitude of swings in a typical diurnal pattern and is caused by friction and storage in system pipes and/or structures. Sediment, debris, roots, siphons, may increase attenuation in a collection system by restricting flow and storing flow temporarily in system pipes. This essentially slows down the time of the peak and reduces the amplitude. Because of unknowns about restrictions such as sediment, roots, and debris, it is very difficult to model attenuation. For areas close to the City's treatment plant, hydraulic deficiencies resulting from peak flows in the hydraulic simulation may be mitigated somewhat by attenuation. This should be considered while defining the priority of system capital improvements.

Meter 5

For smaller collection areas, larger variations in simulated flows from observed flows are difficult to avoid due to the potential for larger fluctuations in wastewater production. For example, wastewater production for the Meter 5 collection area is largely dominated by one industry (Alcoa Extrusions Inc) which makes up for about 75% of the indoor water use for this area. A specific diurnal pattern could be developed for this industry. However, it is unknown how this industrial facility operates. The diurnal pattern could change due to changing industrial requirements. Because the peak simulated flow was close to the observed peak flow from this area, the results were considered satisfactory at this site.

Meter 7A

Meter 7A was installed by a consultant prior to this study, and the results of the meter were considered questionable. Meter 7B and 7C were installed to evaluate the accuracy of this meter and to provide additional flow distribution detail in the City. After evaluating Meters 7B and 7C, flows appear to be satisfactory and model correlation is adequate.

Meter 7B

For smaller collection areas, larger variations in simulated flows from observed flows are difficult to avoid due to the potential for larger fluctuations in wastewater production. The larger difference in simulated to observed flows was considered satisfactory at this site due to the relatively low flows.

Meter 7C

The level of accuracy between simulated and observed flows at this flow meter helped to confirm that flows monitored at Meter 7A were satisfactory.

CHAPTER 5

COLLECTION SYSTEM EVALUATION

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

Recommended solutions to identified deficiencies are not included in this chapter. Instead, this chapter identifies the capacity deficiencies identified through modeling, which were used to develop the comprehensive improvement plan presented in Chapter 6.

EVALUATION CRITERIA

In defining what constitutes a hydraulic deficiency, it is important to consider the assumptions made in estimating sewer flows in the model. As described in Chapters 3 and 4, the sewer flow used in hydraulic modeling is composed of two parts: domestic sewer flow and infiltration. The estimated domestic sewer flow for existing conditions came from Spanish Fork water meter data, while future domestic sewer flows were based on an average sewer production as estimated using land area, land use type, and an average unit hydrograph. Infiltration levels in Spanish Fork were developed using the historic high rates in 2011 based on flow data collected at the WWTP. Most of the flow monitoring data used to calibrate the existing hydraulic model was collected from February to March of 2011 or was adjusted to reflect early 2011 conditions. The conditions for defining system deficiencies are therefore based on a historic infiltration year with peak flows from domestic production. Because no inflow data was available for hydraulic model calibration, the criteria for defining deficiencies must be sufficiently conservative to account for inflows into the collection system from snowmelt or storm events. The criteria should also provide a buffer for the potential accumulation of sediment and/or other debris.

The following criteria have been established to help identify capacity deficiencies:

- **Pipeline Capacity** – The most important deficiency to eliminate in the sewer system is inadequate hydraulic capacity. For this master plan, it was decided to define capacity deficiency as any point where the peak daily flow in the pipe exceeds 75 percent of the pipe's full flow capacity. The remaining 25 percent of the pipe's capacity was reserved for inflow and/or unaccounted for fluctuations in domestic flow and infiltration.
- **Lift Station Capacity** – A lift station capacity deficiency is defined as anytime peak daily flows exceed 85 percent of the pump station's pumping capacity.
- **Minimum Velocities** – For the purpose of this report, pipes were identified as having insufficient velocity when the peak daily velocity in the pipe is less than 2.0 feet per second. A velocity of at least 2.0 feet per second is required to keep sediment from accumulating at the bottom of the pipe. Areas identified with this type of deficiency will likely require more frequent maintenance and cleaning than those areas with higher velocities. Many sewer mains for smaller neighborhoods will often have velocities less than 2.0 ft/sec during peak flows. Therefore, only pipes serving approximately 600

ERUs or greater with velocities less than 2.0 ft/sec were identified as deficient. For inverted siphons, the minimum velocity that should be maintained through the pipe is 3.0 ft/sec to keep sediment from accumulating in the siphon.

SYSTEM ANALYSIS

The following sections summarize evaluations of the system for both existing and future conditions. Where possible system deficiencies are listed in order of their relative severity based on total flow volume, surcharging severity, and extent of surcharging.

EXISTING SYSTEM ANALYSIS

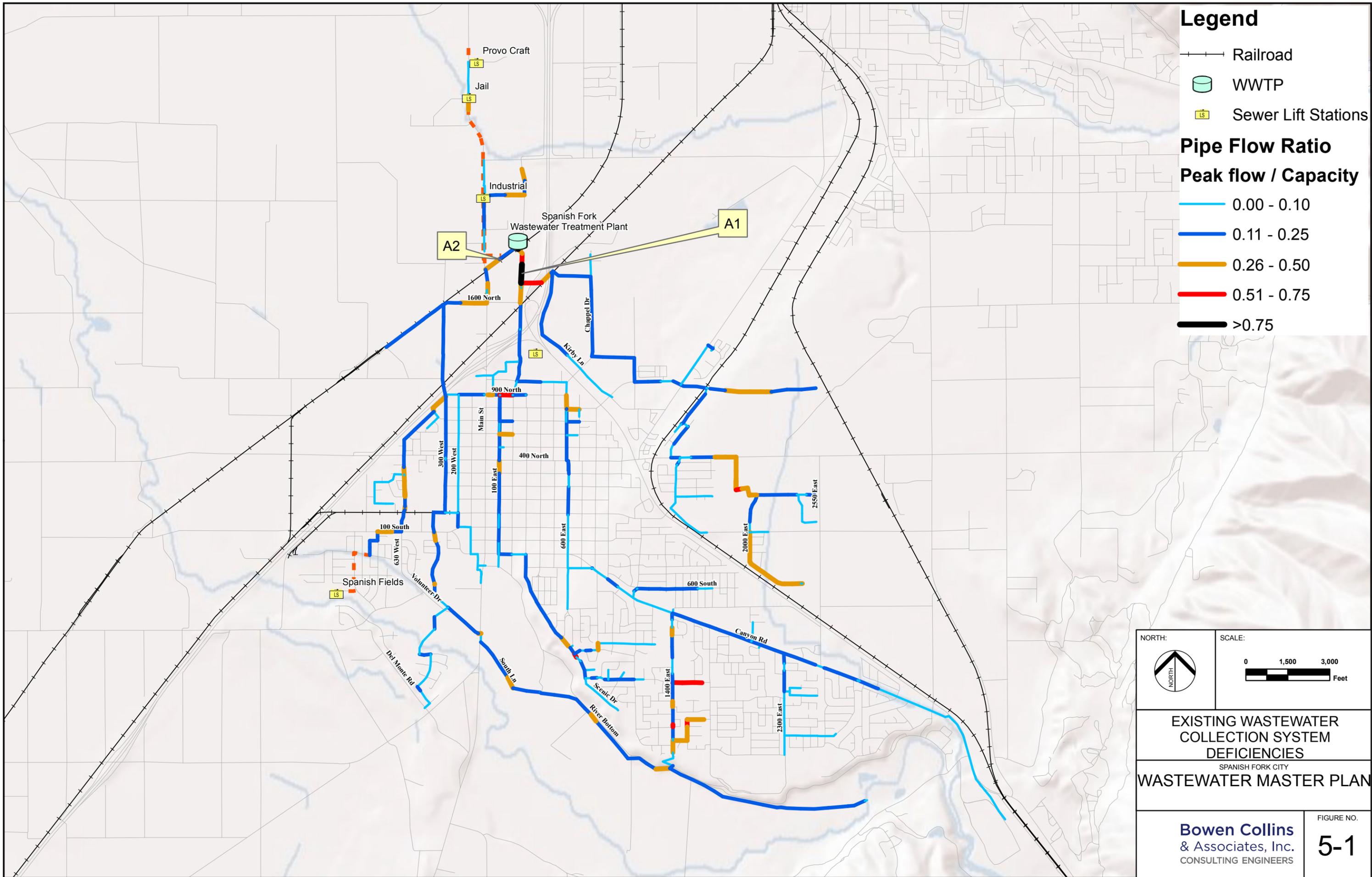
The hydraulic model was used to simulate discharges and flow conditions in the wastewater collection system under existing conditions. In general, most of the collection system facilities perform well under existing conditions. However, the hydraulic model did identify a few deficient areas. Figure 5-1 shows the performance of the sewer system under existing flow conditions based on flow monitoring and the calibrated hydraulic model. Pipes in the figure are color coded to show the ratio of peak flow in the pipe to the pipe's full flow capacity. The peak flows under existing conditions were calibrated based on flow monitoring as described in Chapter 3. Existing system deficiencies are summarized below:

A1 – 200 East, 1700 North – The 24-inch sewer main directly south of the Spanish Fork Wastewater Treatment Plant (WWTP) has reached its design capacity and has no additional capacity to accommodate future growth. Development affecting the 100 East, 600 East, or Chappel Dr sewer trunk lines will begin to exceed the capacity of this trunk line.

Observed Deficiencies

Observed deficiencies are deficiencies caused by accumulated sediment and/or debris, or unexplained surcharging of pipes or manholes.

A2 – 150 East, 2160 North – The siphon west of the treatment plant has significant backwater under normal operating conditions. Approximately 2 ft of sediment was measured at the bottom of the upstream and downstream manhole. Hydrogen Sulfide gas was also detected at this location. The siphon and the downstream sewer main should be cleaned and inspected to determine what is causing the backwater condition at the downstream end of the siphon and to assess the capacity of the siphon. This deficiency should be corrected before a sanitary sewer overflow occurs. It should also be noted that the segment of sewer main upstream of this siphon does not have sufficient capacity for build-out flows.



Legend

- Railroad
- WWTP
- Sewer Lift Stations

**Pipe Flow Ratio
Peak flow / Capacity**

- 0.00 - 0.10
- 0.11 - 0.25
- 0.26 - 0.50
- 0.51 - 0.75
- >0.75



**EXISTING WASTEWATER
COLLECTION SYSTEM
DEFICIENCIES**
SPANISH FORK CITY
WASTEWATER MASTER PLAN

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FIGURE NO.
5-1

BUILD-OUT SYSTEM ANALYSIS

Figure 5-2 shows the projected performance of the sewer system under build-out development conditions assuming that wastewater discharges from all new growth will be conveyed by the existing collection system. Hydraulic deficiencies observed for build-out conditions include:

B1 – 2000 East, 600 South to 400 North – The sewer trunk along 2000 East from 600 South to 400 North will not have sufficient capacity to accommodate all of the future growth east of 2000 East. This will require either upsizing all of the deficient sewer mains or routing new development flows to a new trunk line.

B2 – Main Street, 2050 North to 2400 North – The sewer line along Main Street from approximately 2050 North to 2400 North will not have sufficient capacity to accommodate all of the potential future growth from the west. This line may need to be upsized to accommodate future development. Because of the wide variability of flows from industrial areas (the general plan zoning type in the vicinity), the capacity of this main should be considered while approving industrial development.

B3 – Williams Lane – The sewer trunk that passes underneath the freeway along Williams Lane does not have sufficient capacity to accommodate buildout flows from the east. The peak flow depth in the pipe is projected to reach approximately 80% of the pipes diameter under dry weather conditions at build-out. Because this sewer main passes underneath I-15 and may not have any local connections, it may not be a significant concern for the City. This pipe should be monitored as the City approaches build-out to determine if there is potential concern for surcharging local connections during a storm event.

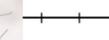
B4 – 630 West, Center Street to 400 North – The sewer main downstream of the Spanish Fields Lift Station will not have sufficient capacity to accommodate all of the potential growth from the south and west. Peak flows exceed the capacity of the majority of the pipes along this sewer main. This will require constructing a new lift station further west to accommodate additional development west of the Spanish Fields Lift Station.

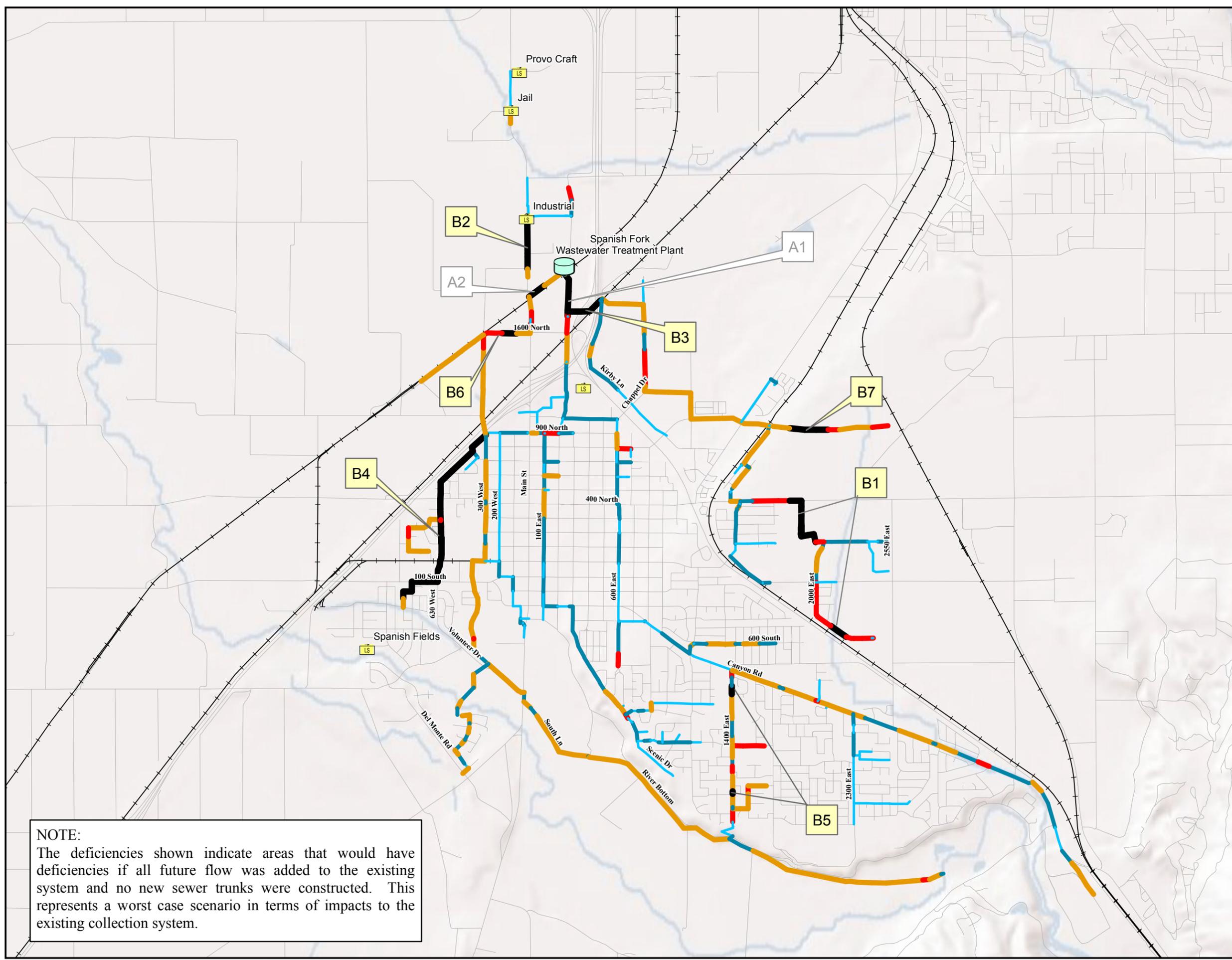
B5 – 1400 East, Canyon Road to River Bottom – Several pipes along this section of sewer main will not have sufficient capacity to accommodate buildout flows. This section of trunk line should be monitored as the City approaches build-out to determine if there is potential concern for surcharging local connections during a storm event.

B6 – 1600 North, 300 West to Main – A single pipe along this stretch of pipe may act as a bottleneck at build-out flow conditions. Because this deficiency only affects a single pipe, lower than projected growth may reduce projected flow to within the capacity of this pipeline. This pipe should be monitored as the City approaches build-out to determine if there is potential concern for surcharging local connections during a storm event.

B7 – Existing Mapleton Connection – The sewer trunk downstream of Mapleton City's existing connection to Spanish Fork does not have capacity to accommodate all of the

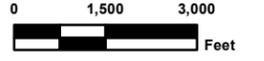
Legend

-  Railroad
-  WWTP
- Pipe Flow Ratio**
- Peak flow / Capacity**
-  0.00 - 0.10
-  0.11 - 0.25
-  0.26 - 0.50
-  0.51 - 0.75
-  >0.75
-  Sewer Lift Stations



NOTE:
 The deficiencies shown indicate areas that would have deficiencies if all future flow was added to the existing system and no new sewer trunks were constructed. This represents a worst case scenario in terms of impacts to the existing collection system.

NORTH: 

SCALE:  Feet

**FUTURE WASTEWATER
 COLLECTION SYSTEM
 DEFICIENCIES**
 SPANISH FORK CITY
WASTEWATER MASTER PLAN

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FIGURE NO.
5-2

future growth from Mapleton City. This will require either upsizing all of the deficient sewer mains downstream of the Mapleton Connection or routing the flow from the Mapleton to a new trunk line.

LIFT STATION ANALYSIS

There are 3 sewer lift stations owned and operated by Spanish Fork City in its sewer collection system. Table 5-1 shows each of the lift stations with their existing capacity and associated peak instantaneous flows for existing and build-out development conditions.

**Table 5-1
Lift Station Capacities and Peak Design Flows**

Lift Station	Pump Capacity (gpm)	85% Pump Capacity (gpm)	Existing Peak Flow^{1,2} (gpm)	Build-out Peak Flow¹ (gpm)
Industrial	600	510	126	775
Jail	430	366	391	868
Spanish Fields	600	510	342	510

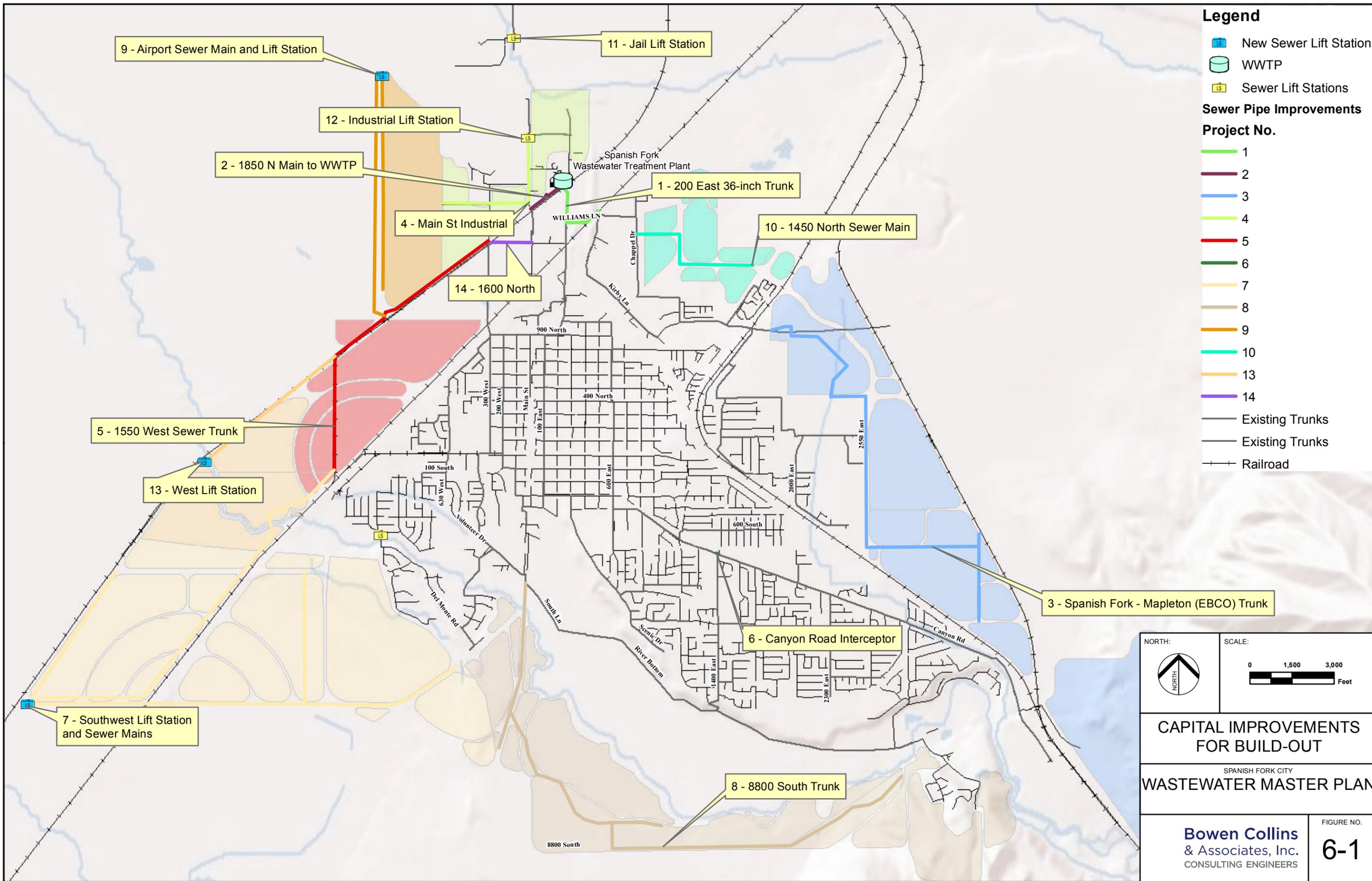
- (1) Different peaking factors were used for each of the lift stations depending on its overall size. For the lift stations that serve smaller areas, there can be much more variation in flow, resulting in peaking factors that can be much higher than for the City as a whole (see Appendix –Peaking Factors).
- (2) Sewer flows estimated based on available water meter data contributing to lift station.
- (3) Red indicates that the design flows exceed 85 percent of lift station capacity

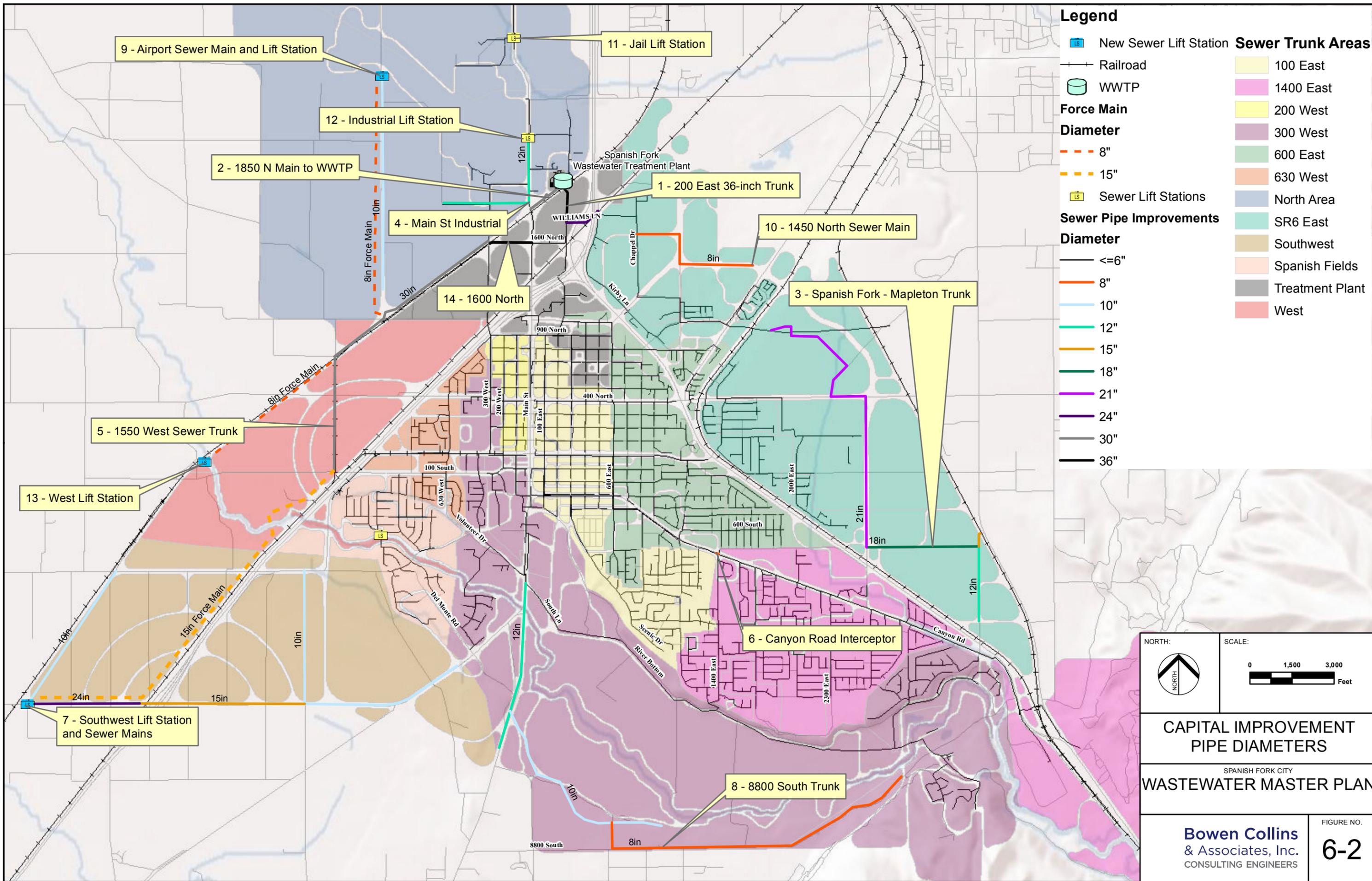
From the table, it can be concluded that projected build-out peak instantaneous flows will potentially exceed existing pump station capacities at each of the lift stations. Based on existing flows, no improvements will be needed at the Industrial lift station for many years (depending on the rate of development in the vicinity). However, the Jail lift station may be approaching the lift stations capacity. Flow monitoring should be conducted upstream of the lift station to identify what the peak flow and existing peaking factor is at the lift station.

POTENTIAL MAINTENANCE PROBLEMS

While the main purpose of assembling a sewer model is to identify pipe segments with insufficient capacity, a model may also be used to identify areas of low velocity where potential additional maintenance may be required. Low velocities are not a major concern for the day-to-day operation of the system, but may result in the accumulation of sediment and debris over time. Areas identified with this type of deficiency will likely require more frequent maintenance and cleaning than those areas with higher velocities.

Figure 5-3 shows pipes in the collection system that do not have velocities above 2.0 ft/sec despite having at least 600 ERUs of contributing flow. The figure shows velocity ranges to indicate which areas of the system will likely have need for more frequent maintenance. Of particular concern are large diameter concrete pipes (greater than 15-inch) with low velocity





NORTH: [North Arrow]

SCALE: 0 1,500 3,000 Feet

**CAPITAL IMPROVEMENT
PIPE DIAMETERS**

SPANISH FORK CITY
WASTEWATER MASTER PLAN

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FIGURE NO.
6-2

2– 1850 North, Main to WWTP

The last stretch of sewer main leading toward the WWTP from 1850 North Main does not have sufficient capacity to accommodate build-out flows. In addition, the downstream end of the existing Fastenal/WWTP siphon has significant backwater problems under existing conditions. This line should be cleaned and inspected in the near future to determine what is causing the backwater on the main, and the capacity of the siphon should be evaluated to determine if there are any deficiencies. For long term capacity issues, a new 30-inch parallel sewer trunk and redundant siphon should be constructed next to the existing sewer trunk. The existing sewer trunk should be lined to prevent deterioration of the concrete structure. This new parallel trunk will resolve deficiency A2 as noted in Chapter 5. Interconnections between each main should be constructed so that flow may be diverted from one pipe to the other for maintenance purposes.

3 – Spanish Fork/Mapleton (Ensign-Bickford Company) Sewer Trunk

The “Spanish Fork – Mapleton Trunkline Study” completed in July 2010 represents the most up to date plans for development along the east side of Spanish Fork City. This study includes three alternatives to convey sewer flow from eastern parts of Spanish Fork City and parts of Mapleton City. The recommended alternative (Alternative B) includes connecting to Spanish Fork City at approximately 750 South from Mapleton City and using a combination of 15-inch to 21-inch pipes to accommodate future wastewater discharge from Mapleton City (approximately 2,200 ERUs) and surrounding areas of Spanish Fork City. As part of this study, pipe diameters decrease from 21-inch to 18-inch from upstream to downstream in some areas because of increased capacity from higher slopes. This is generally not recommended for maintenance purposes. For this master plan, the pipe diameter is maintained as 21-inch for most of the alignment. Conformance with the Spanish Fork City General Plan and other assumptions regarding flow from the July 2010 study are assumed to be based on the best available information from proposed developers and have not been evaluated as part of this study. The July 2010 study also includes the installation of some 21-inch diameter concrete pipe. BC&A recommends that all sewer pipe materials be acid resistant (to mitigate the effects of hydrogen sulfide gas). The sewer main should connect into the sewer main at approximately 950 North 1800 East to avoid causing hydraulic deficiencies in the relatively flat sewer mains downstream of Mapleton City’s existing flow meter. This improvement resolves deficiency B1 and B7 as noted in Chapter 5.

4 – Main St Industrial Trunk

A new 12-inch sewer main should be constructed to replace the existing 8-inch sewer main conveying flow to the Industrial Lift Station. A new sewer main to the west should also be constructed to service the industrial area. Because of the wide variations in potential industrial wastewater use, this project should be re-evaluated as industrial development occurs. This improvement resolves deficiency B2 as noted in Chapter 5.

5 – 1550 West Sewer Trunk

A combination of 24-inch and 30-inch sewer mains will be needed to service areas along 1550 West and other areas in the southeast portion of Spanish Fork City. The Spanish Fields lift station should also be redirected through a new force main into this new main. The existing sewer mains along 630 West were not constructed to accommodate the build-out flows that may

12 – Industrial Lift Station

Because there is a significant amount of developable land that may flow to this lift station, City personnel should conduct flow monitoring upstream of the lift station to verify the existing flow to capacity ratio.

13 – West Lift Station

At build-out, the sewer main that the Spanish Fields Lift Station currently discharges to will not have sufficient capacity to accommodate all of the flows that may develop within the Spanish Fields tributary area. To prevent the downstream main from exceeding its design capacity, a new lift station and force main should be constructed to collect areas west of the Spanish Fields lift station and pump to the proposed 1550 West Sewer Trunk (Improvement 5 above). City personnel should periodically monitor flows to the Spanish Fields Lift Station to ensure flows are not approaching its available capacity.

14 – 1600 North, 300 West to Main

A new 36-inch sewer main should be constructed to eliminate the potential bottleneck along this stretch of sewer main. Because the existing pipe is borderline adequate for projected flows, flow monitoring should be conducted to verify the necessity of this project. This improvement resolves deficiency B6 as noted in Chapter 5.

PROJECT COSTS

Tables 6-1 shows the estimated project costs for the improvements recommended above. All costs shown are in 2011 dollars. Only Project 1.1 and 2.2 listed in Table 6-1 (below) will be needed to resolve existing deficiencies. The remaining projects will be needed to resolve potential deficiencies arising from future growth. The timing of the following projects will therefore depend on the timing of future development.

Table 6-1
Recommended Collection System Improvements

Project No.	Project Name	Diameter	Length	Design Flow (gpm)	Service ERUs	Percent Attributable to Future Growth	Total Cost in 2011 Dollars
1.1	200 East 36-inch Sewer Trunk	36	1,285	7,650		99	\$976,000
1.2	Williams Lane 24-inch	24	1,301			100	\$578,000
Project 1 Total							\$1,554,000
2.1	1850 N to Main	30	1,471			100	\$845,000
2.2	Redundant Siphon	NA	NA			60	\$115,000
Project 2 Total							\$960,000
3.1	Mapleton-Spanish Fork Trunk	21	11,406			100	\$4,784,000
3.2		18	4,005			100	\$1,579,000
3.3		15	502			100	\$169,000
3.4		12	2,651			100	\$842,000
Project 3 Total							\$7,374,000
4.1	Main St Industrial Trunk	12	5,376	1,440	720	100	\$1,707,000
5.1	1550 West Sewer Trunk	30	11,064	3,400	9,500	100	\$6,350,000
6.1	Canyon Road Diversion/Interceptor	8	69	400	400	100	\$20,000
7.1	Southwest Force Main	15	15,208	2200	5500	100	\$3,901,000
7.2		24	4,000	1,200	2127	100	\$1,777,000
7.3		15	5,881	950	1683.875	100	\$1,977,000
7.4		10	16,224	--	--	100	\$4,886,000
7.5	Southwest Lift Station			2,200		100	\$1,780,000
Project 7 Total							\$14,321,000
8.1	8800 South Sewer Trunk	12	5,970	620	620	100	\$1,895,000
8.2		10	7,751	620	620	100	\$2,334,000
8.3		8	12,047	310	310	100	\$3,432,000
Project 8 Total							\$7,661,000
9.1	Airport Gravity Sewer Main	10	7,587	600	500	100	\$2,285,000
9.2	Force main	8	8,972	600	600	100	\$2,556,000
9.3	Airport Lift Station			600		100	\$570,000
Project 9 Total							\$5,411,000
10.1	1450 North Sewer Main	8	5,197	530	530	100	\$1,481,000
11.1 ^a	Jail Lift Station			1,021		100	\$970,000
12.1 ^a	Industrial Lift Station			912		100	\$860,000
13.1	West Lift Station			600	800	100	\$800,000
13.2	West Force Main	8	5,971	600	800	100	\$1,701,000
Project 13 Total							\$2,501,000
14.1	1600 North, 300 West to Main	36	1,512	5700		100	\$1,148,000
Total Project Costs							\$52,318,000

^acosts shown for these lift stations are replacement costs. Early projects will likely be much less and consist of minor repairs or upgrades to pumps.

CHAPTER 7

WASTEWATER TREATMENT PLANT SYSTEM IMPROVEMENTS

Spanish Fork City retained Aqua Engineering to prepare a facility plan for the Spanish Fork City WWTP. Note that the WWTP facility plan was prepared independently from the scope of work performed by Bowen Collins & Associates. BC&A made minor clerical corrections and Spanish Fork City personnel provided some effluent requirement corrections to the Aqua facility plan. The purpose of this chapter is to provide background for the WWTP and discuss Aqua's recommended WWTP system improvements, their costs, and timing of implementation.

WWTP HISTORY

The WWTP services most of Mapleton City and all of Spanish Fork City. Currently the ownership of the treatment facility is split between the two Cities with Spanish fork owning 77% and Mapleton owning 23% of the capacity in the treatment facility. As upgrades are made at the facility the financial requirements for the projects are split between the two Cities according to the capacity split.

The original wastewater treatment plant was constructed in 1956. The original treatment facility consisted of a headworks, a primary clarifier, rock trickling filter, secondary clarifier and two anaerobic digesters. The design capacity of the original facility was 1.8 MGD. In 1987 the plan was upgraded through a series of projects that included a new headworks, primary clarifier, plastic media trickling filter, secondary clarifier, and an additional digester. The design capacity of the upgraded facility is 5.0 MGD.

In 1996 there was a permit change that required a dechlorination system. Sodium bisulfate was added to the system along with the equipment to inject it into the end of the chlorine contact basin. In 1998 a small upgrade was completed which expanded the chlorine contact basin. This expansion allowed half of the basin to be shut down for cleaning while the new basin could continue to allow for contact time prior to discharge. In addition, at that time the primary sludge pumps were also replaced.

In 2002 a new sludge dewatering facility was added to the treatment facility. This included a new 2 meter belt press and a dewatering building used to house the equipment. The headworks were also upgraded with two new step screens and washpactors.

In 2003 a new STM Aerotor basin and a 90-foot final clarifier were added to the treatment system. The original rock trickling filter was abandoned due to a concrete failure at the distributor arm connection. In addition the permit was changed to include an ammonia limit which reduced the biological capacity of the existing system. The new biological process replaced the old rock trickling filter and gave the facility the ability to treat for ammonia. However, even with these additions the design capacity of the treatment facility was reduced to 4.9 MGD because of the new permit requirements.

In 2006 an additional STM Aerotor basin was added to the treatment facility along with a thickener facility. In addition, one of the old secondary clarifiers was converted to a primary clarifier. This conversion required a new pumping station for the clarifier. This upgrade increased the design flow to 6MGD

constructed will depend on the rate of growth in Spanish Fork City wastewater service area. The future layout of the 8 MGD facility is shown in the Figure 7-1.

**Table 7-1
Recommended WWTP Improvements**

Project No.	Total Population (Spanish Fork City + Mapleton City)	Projected Year of Required Completion ¹	Project Name	Percent Attributable to Future Growth	Total Cost in 2011 Dollars
1.1	54,000	2013	Primary Mechanism Replacement	0	\$100,000
1.2	54,000	2013	Install Snail Removal System	0	\$150,000
1.3	54,000	2020	Install New Automatic Transfer Switch on Backup Generator	0	\$10,000
1.4	54,000	2020	Convert Chlorine Contact Basin to UV Disinfection	25%	\$1,000,000
	54,000		Project 1 Total		\$1,260,000
2.1	57,637	2023	New STM Aerotor	100%	\$2,600,000
2.2	57,637	2023	90-Foot Final Clarifier	100%	\$700,000
2.3	57,637	2023	Headworks Upgrade	100%	\$200,000
2.4	57,637	2023	Remove Old Trickling Filter	0	\$100,000
			Project 2 Total		\$3,600,000
3.1	68,000	2030	Replace Existing Trickling Filter With STM Aerotor ²	0	\$3,000,000
			Project 3 Total		\$3,000,000
Total WWTP Improvements					\$7,860,000

1- Based on the population projections as described in Chapter 3.

2- This project will need to be done when the existing trickling filter has reached the useful life or when it becomes too difficult to operate.

FUTURE PERMIT CHANGES

One of the primary items that cause changes in treatment facilities are more stringent permitting requirements. There are several issues that will probably be addressed in future UPDES permits as discussed below.

Chlorine

About 10 years ago there was a push to eliminate chlorine from waterways because of the harm it could cause to aquatic species. When this originally happened Spanish Fork City installed a dechlorination system which used sulfur dioxide to remove chlorine from the water after

Pharmaceuticals / Endocrine Disruptors

Pharmaceuticals and endocrine disruptors is a relative new area of research and not a lot is known about the effects of these contaminants. However, this issue is getting quite a bit of attention in the news. This attention is increasing the public's concern with the potential risks associated with these contaminants. This is an area of research that should be monitored for changes but at this time they are just starting research on methods to remove this from wastewater. Because of this new research, the public is doing a better job of disposing of their medication in a safe manner by taking it to a collection area. Historically, it was common for people to flush medications down their toilet and this is one of the major ways these contaminants reached the treatment plant. However, even with this new awareness some of the medication that people use is filtered out through their bodies and wasted not the normal matter. This will continue to be an issue at the wastewater treatment plant and in the future there will be discharge requirements for these contaminants.

REGIONAL TREATMENT FACILITY

The Southern Utah Valley Municipal Water Association (SUVMWA) was tasked with looking at regionalizing wastewater treatment for the southern part of Utah County by the political leaders that is over the organization. The Cities involved with the initial study were all members of SUVMWA and they included Santaquin, Goshen, Genola, Payson, Salem, Elkridge, Woodland Hills, Spanish Fork, Mapleton, and Springville. The first report was finalized in 2001 and the basic conclusion of the report was that the least expensive alternative was to upgrade existing facilities and build a couple of regional facilities. The most expensive alternative was to build a single regional treatment facility. However, the political leaders felt that they should continue to look at a single regional facility. They felt that the even though the cost was higher, having a single facility would have additional benefits that are not accounted for with a simple engineering cost analysis.

The political leaders requested SUVMWA to enhance on the original regionalization study. They wanted to look at more detail of having a single plant site. They also determined from the first study that Goshen and Genola would not be compatible with a regional facility near Utah Lake because they were small and did not contribute much sewage and they would need a substantial lift station. One of the primary purposes of the second study was to locate a potential site for a single plant regional system. As part of the process trunk line routes and lift stations were selected. A general location for a regional facility was selected; several different treatment alternatives were evaluated. One of the tasks of that report was to determine the best time line to combine all the different existing systems. Based on the population predictions given by the Central Utah Project (CUP) it was anticipated that the regional plant would be needed in about 2030. To get to this time period several upgrades to existing facilities would be required. It was anticipated that Spanish Fork would need to get to a design flow of about 8 MGD.

As part of the regionalization plan there was several steps that were outlined that would help facilitate a regional plant they are as follows:

1. Look for an opportunity to purchase a fairly large contiguous piece of property near Utah Lake. It was recommend to find an area at least 100 acres and preferably closer to 300 acres. This would give the treatment plant a large buffer as development occurs in the surrounding area.

Other areas of concern for hydrogen sulfide accumulation are at force main discharge locations. Because force mains flow full, very little corrosion will occur through the force main pipe. However, because they flow full, there is a larger hydrogen sulfide (H₂S) producing slime layer. As these pipes discharge into gravity mains and are aerated, hydrogen sulfide gas can be released. The 30-inch trunk near the City's wastewater treatment plant has a siphon and two force mains that discharge into it. This configuration may lead to elevated levels of hydrogen sulfide. Each of the trunks upstream of the WWTP should be monitored to determine if hydrogen sulfide is above normal levels. If high levels of H₂S are present, it is recommended that the concrete pipes be rehabilitated to prevent corrosion. Several available rehabilitation technologies include: cured-in-place pipe, thermoformed pipe, and sliplining.

SYSTEM RENEWAL BUDGET

System Pipes

The total cost to replace all of the pipes in the Spanish Fork Collection system would be approximately \$163 million based on 2011 construction costs. For the purposes of this evaluation, BC&A recommends that Spanish Fork assume a 100-year system service life. This is probably not unreasonable given the observed performance of historic sewer collection systems and the expected design lives of new materials. To replace 1 percent of the collection system every year (or 100 percent every 100-years), it would cost approximately \$1.63 million/year in 2011 dollars.

Figure 8-1 indicates two approaches for system renewal of a hypothetical system that began to be installed around the year 1910. Note that many sewer collection systems in Utah County began to be installed around this time. The first approach assumes that the pipe is replaced at approximately 100-years of age. Based on this approach, replacement costs would be as low as \$500,000/year up until approximately the year 2030 when the amount of pipes reaching 100-years of age begins to increase. Note that replacement costs using this approach mimic the development pattern from the previous 100-years. This approach keeps annual renewal costs low initially, but these costs begin to grow rapidly as the overall system progressively ages.

The uniform approach presented in Figure 8-1 assumes that the City either replaces aging pipes on an annual basis or establishes a depreciation fund (or sinking fund) that invests sufficient capital so that pipes may be replaced when they have reached the end of their service life. BC&A recommends this approach for system renewal because the service life of many pipes in the system may fail before reaching 100-years of age, leading to costly emergency repairs. Assuming Spanish Fork City's development history is similar to the history shown in Figure 8-1, the City should not expect to see significant deterioration of its wastewater collection system in the near future. However, to prevent long-term increases in the cost of system renewal or system failures, the City should begin establishing a depreciation fund or committing to rehabilitation projects soon.

In reality, it will not be necessary to completely replace all system components every 100 years because of new rehabilitation technologies (e.g. sliplining, cast-in-place pipe, etc.). Rehabilitation costs are much lower than replacement costs (20% to 60% depending on pipe diameter). If the City were able to rehabilitate all of its system components once every 100 years (instead of replacements components), it could reduce its annual renewal budget to about \$0.5 million/year. It is generally not possible to rehabilitate all system components due to either

be spending approximately \$54,500/year on lift station rehabilitation. This may include saving funds for future rehabilitation of wet wells, pump replacement, or control repairs.

Wastewater Treatment Plant

The City’s Wastewater Treatment Plant is one of the most expensive parts of its wastewater system. Based on data provided by Aqua Engineering, estimated costs for wastewater treatment plant improvements are approximately \$7,860,000 over the next 20 years. Therefore the City should be saving approximately \$400,000 per year to provide sufficient funds for treatment plant improvements. Table 8-2 shows the total renewal costs that should be spent or saved every year for system rehabilitation and/or replacement.

**Table 8-2
Required System Renewal Budgets for Various System Components**

System Component	Renewal Cost
Collection System	\$800,000
Lift Stations	\$54,500
Wastewater Treatment Plant	\$400,000
Total	\$1,254,500

SYSTEM RENEWAL PRIORITIES

Because of limited funding, it may be necessary to prioritize initial system rehabilitation activities based on the potential consequence of various pipes. The following criteria may aid Spanish Fork City personnel in identifying pipes that are most critical based on their relative importance in the Spanish Fork City collection system:

- **Sewer Flow Rate** – Flow rate in a sewer pipe is the single most important indicator of the importance of a pipe. In most situations, the higher the flow rate, the larger the area that pipe serves. Bypass pumping cost, the risk of property damage, environmental and regulatory consequences, the cost of pipe replacement, and problems from sewage backing up in the system are all greater for larger flow rates. In a worst case scenario, if a pipe collapses or becomes blocked (due to corrosion or a natural disaster) and surcharging in the pipeline results in wastewater flows in basements and the street, there is a greater health hazard to the public with a larger wastewater flow rate.
- **Road Type** – There is a direct connection between the density of traffic and the cost and time associated with maintenance and repairs on sewer pipes. Thus, pipelines in high traffic areas must be considered more critical than similarly sized pipelines in lower traffic areas. For example, the cost of failure for pipes under I-15 would be much higher than equivalent sized pipes in residential streets or open space areas.
- **Pipe Depth** - The depth of the pipe can have a significant impact on the cost of repairs and rehabilitation of sewer pipe. Extensions on backhoes, very wide trenches, possible dewatering, etc. make repairs and maintenance much more expensive and time consuming on deeper pipes. As a result, deep pipelines should be considered higher priority than their similarly sized shallow counterparts.

Storm Drain Masterplan

Final Draft Revisions

CHAPTER 6 SYSTEM RENEWAL

In addition to the capacity related improvements described in previous chapters, it is recommended that Spanish Fork City consider and prepare for expected future expenditures associated with the general maintenance and renewal of the existing storm drainage system. The purpose of this chapter is to present recommendations regarding system maintenance and renewal. This is not a comprehensive evaluation of existing maintenance procedures or system conditions, nor is it a complete asset management plan. Instead, it is a collection of general recommendations developed assembled during the master planning process relative to system maintenance and renewal.

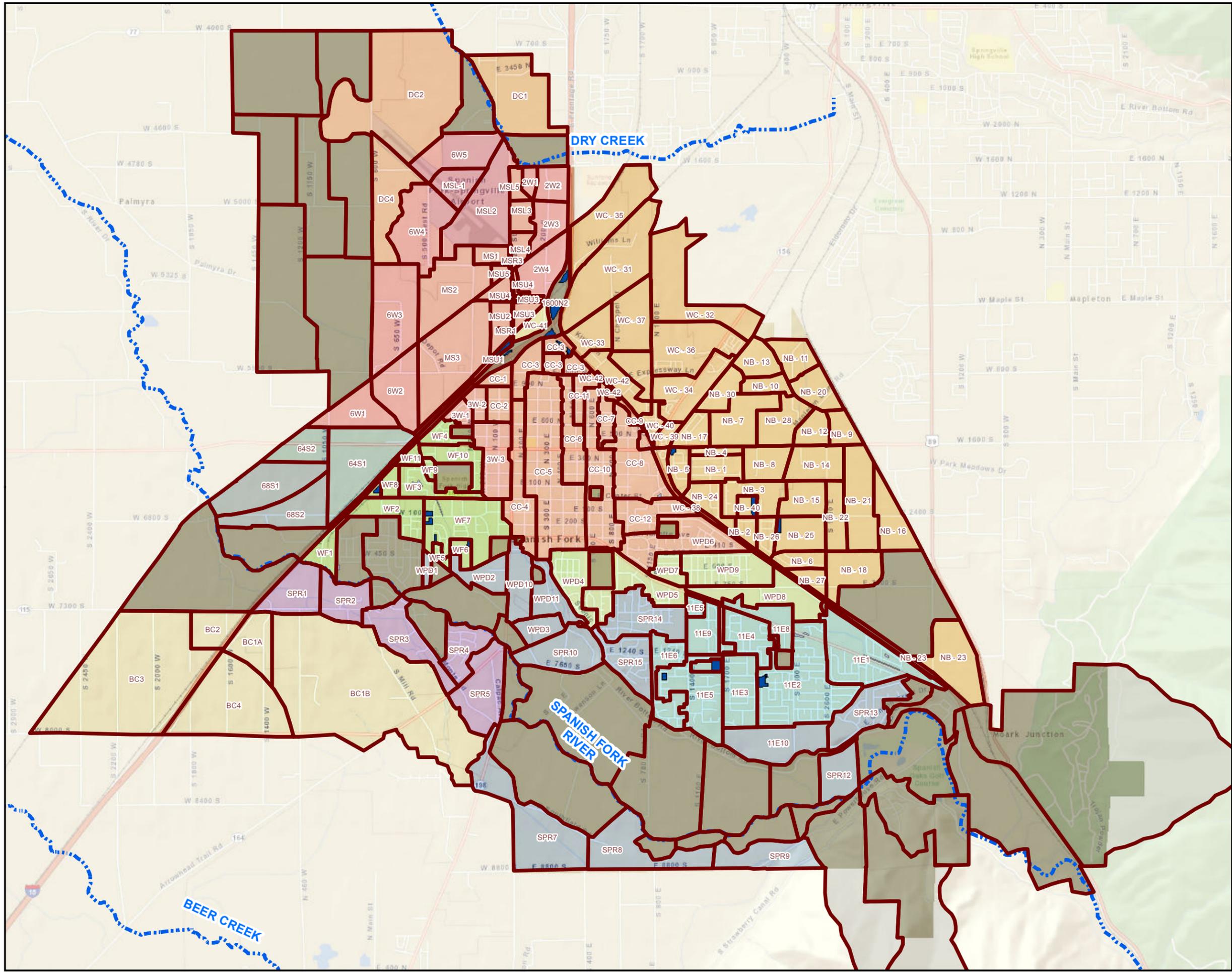
SYSTEM RENEWAL

Along with system capacity improvements, effective infrastructure planning must also include asset rehabilitation and replacement, commonly termed renewal. To effectively identify which system facilities need replacement and plan for future asset renewal projects, Spanish Fork City needs to accurately assess and document the current condition of system assets. Towards this goal, BC&A would recommend improvements to its data collection and storage practices regarding system facilities and how the condition of existing facilities is assessed.

City personnel should inspect all pipes about once every 10 years. This will require City personnel to inspect at least 10 percent of the City's storm drainage system every year. This will provide sufficient inspection frequency to identify most pipe deterioration issues before they become problems. In some cases, however, groundwater, vegetation, and/or sediment concerns may merit more frequent inspection. When possible, inspections should be conducted during, and immediately after, major precipitation events to assess conditions.

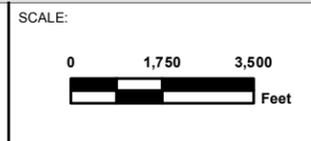
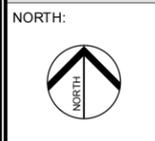
SYSTEM RENEWAL BUDGET

The total cost to replace all of the pipes in the Spanish Fork Collection system would be approximately \$54 million based on 2011 construction costs. For the purposes of this evaluation, BC&A recommends that Spanish Fork assume a 100-year system service life. To replace 1 percent of the collection system every year (or 100 percent every 100-years), it would cost approximately \$540,000/year in 2011 dollars.



LEGEND

- Drainage Subbasin
- Major River
- Mask_CITY
- Detention Basins**
- Regional Detention Facility
- Local Detention Facility



**SUBBASINS AND
DETENTION BASINS**

SPANISH FORK CITY
**STORM DRAIN
MASTER PLAN**

**Bowen Collins
& Associates, Inc.**
CONSULTING ENGINEERS

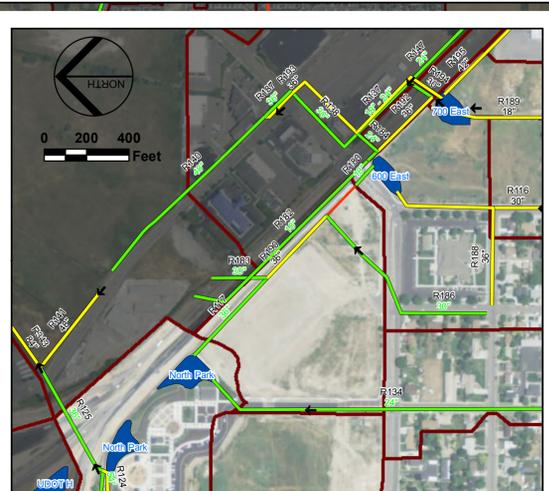
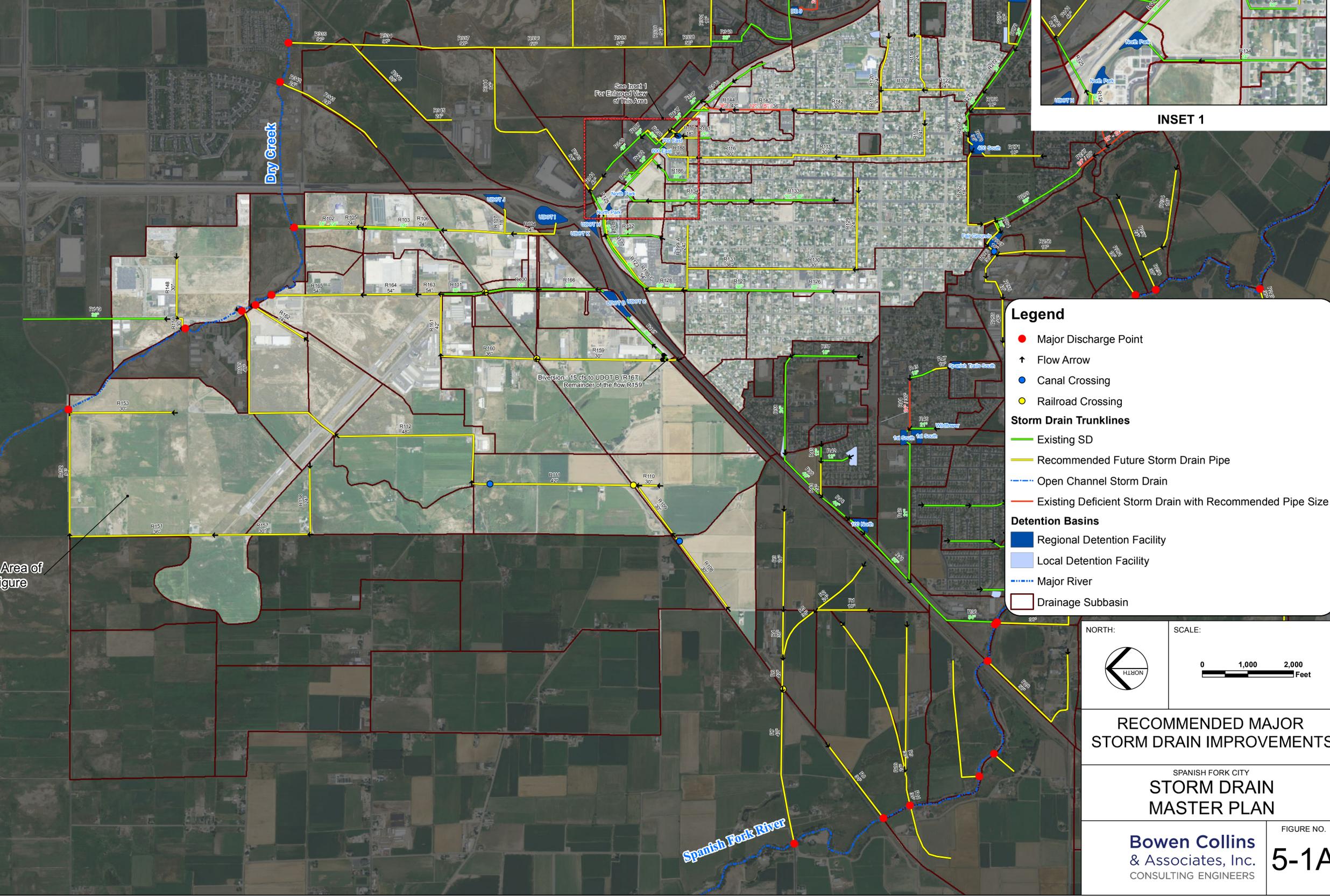
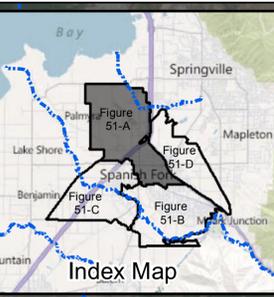
FIGURE NO.
3-1

Recommended Pipe Sizes										
Flow ID	Existing Flow (cfs)	Design Flow (cfs)	Existing Diameter (in)	Estimated Existing Pipe Capacity (cfs)	Estimated Existing Full Pipe Capacity (cfs)	Existing Deficient	Future Deficient	Recommended Future Diameter (in)	Estimated Future Pipe Capacity (cfs)	
R100	2.5	27.3	30	0.008	0.013	15.8	NO	NO	30	36.8
R101	3.6	11.0	24	0.004	0.013	10.5	NO	NO	24	14.3
R102	14.8	14.8	24	0.004	0.013	20.0	NO	NO	24	30.8
R103	2.7	14.3	24	0.004	0.013	20.0	FUT	FUT	24	14.3
R104	2.7	14.3	24	0.004	0.013	20.0	FUT	FUT	24	14.3
R105	2.7	14.3	24	0.004	0.013	20.0	FUT	FUT	24	14.3
R106	0.4	0.4	0.002	0.013	0.013	FUT	FUT	18	4.7	
R107	0.4	0.4	0.002	0.013	0.013	FUT	FUT	18	4.7	
R108	0.0	14.6	0.003	0.013	0.013	FUT	FUT	30	22.5	
R109	0.0	14.6	0.003	0.013	0.013	FUT	FUT	30	22.5	
R110	0.0	14.1	0.003	0.013	0.013	FUT	FUT	30	22.5	
R111	0.0	61.8	0.005	0.013	0.013	FUT	FUT	42	59.7	
R112	0.0	61.8	0.005	0.013	0.013	FUT	FUT	42	59.7	
R113	0.0	18.3	0.006	0.013	0.013	FUT	FUT	48	111.6	
R114	14.8	14.8	0.009	0.013	0.013	FUT	FUT	24	17.6	
R115	31.9	31.9	0.012	0.013	0.013	FUT	FUT	30	46.1	
R116	39.9	39.9	0.014	0.013	0.013	FUT	FUT	30	48.7	
R117	39.9	2.5	36	0.007	0.013	2.5	NO	NO	36	10.3
R118	20.0	20.0	0.01	0.013	0.013	FUT	FUT	24	22.7	
R119	50.8	50.8	0.02	0.013	0.013	FUT	FUT	30	58.2	
R120	14.8	14.8	0.008	0.013	0.013	FUT	FUT	24	20.3	
R121	14.8	14.8	0.008	0.013	0.013	FUT	FUT	24	20.3	
R122	14.8	14.8	0.008	0.013	0.013	FUT	FUT	24	20.3	
R123	71.1	78.7	48	0.002	0.013	78.9	NO	NO	48	80.0
R124	175.7	66.6	54	0.002	0.013	66.6	YES	NO	78	73.6
R125	296.1	138.1	36	0.002	0.013	138.1	YES	NO	36	129.1
R126	31.1	31.1	36	0.006	0.013	39.9	NO	NO	36	39.9
R127	51.8	51.8	36	0.005	0.013	52.4	NO	NO	36	51.2
R128	67.3	37.5	36	0.004	0.013	37.5	YES	NO	42	66.1
R129	14.8	14.8	0.008	0.013	0.013	FUT	FUT	24	20.3	
R130	39.5	39.5	0.013	0.013	0.013	FUT	FUT	30	46.9	
R131	71.8	71.8	0.01	0.013	0.013	FUT	FUT	36	66.9	
R132	71.8	71.8	0.01	0.013	0.013	FUT	FUT	36	66.9	
R133	12.3	12.3	18	0.016	0.013	14.5	NO	NO	18	13.3
R134	20.5	20.5	24	0.008	0.013	22.5	NO	NO	24	20.3
R135	9.1	9.1	24	0.009	0.013	25.0	NO	NO	24	19.0
R136	9.1	7.9	24	0.009	0.013	7.9	NO	NO	24	12.8
R137	25.7	25.0	24	0.011	0.013	25.0	YES	NO	24	23.8
R138	25.7	25.0	24	0.008	0.013	25.0	YES	NO	24	23.2
R139	25.7	107.8	36	0.009	0.013	107.8	NO	NO	48	136.6
R140	27.3	34.9	48	0.009	0.021	34.9	NO	NO	48	55.8
R141	27.3	34.9	48	0.009	0.021	34.9	NO	NO	48	55.8
R142	81.1	42.6	30	0.02	0.013	42.6	YES	NO	30	58.2
R143	81.1	42.6	30	0.02	0.013	42.6	YES	NO	30	58.2
R144	81.1	42.6	30	0.02	0.013	42.6	YES	NO	30	58.2
R145	81.1	42.6	30	0.02	0.013	42.6	YES	NO	30	58.2
R146	11.6	11.6	24	0.014	0.013	38.3	NO	NO	18	17.7
R147	5.9	19.1	36	0.014	0.013	19.1	NO	NO	24	26.6
R148	5.9	19.1	36	0.014	0.013	19.1	NO	NO	24	26.6
R149	5.9	19.1	36	0.014	0.013	19.1	NO	NO	24	26.6
R150	5.9	19.1	36	0.014	0.013	19.1	NO	NO	24	26.6
R151	0.0	39.6	0.004	0.013	0.013	FUT	FUT	36	42.3	
R152	0.0	39.6	0.004	0.013	0.013	FUT	FUT	36	42.3	
R153	0.0	34.1	0.004	0.013	0.013	FUT	FUT	30	26.0	
R154	0.0	23.5	0.004	0.013	0.013	FUT	FUT	30	26.0	
R155	0.0	23.5	0.004	0.013	0.013	FUT	FUT	30	26.0	
R156	0.0	27.1	0.008	0.013	0.013	FUT	FUT	30	36.8	
R157	33.2	34.1	0.008	0.013	0.013	FUT	FUT	36	59.8	
R158	14.1	14.1	0.008	0.013	0.013	FUT	FUT	42	90.2	
R159	11.3	11.3	0.004	0.013	0.013	COF	FUT	24	14.3	
R160	61.1	102.5	0.004	0.013	0.013	FUT	FUT	54	124.7	
R161	61.1	102.5	0.004	0.013	0.013	FUT	FUT	54	124.7	
R162	73.9	129.4	0.004	0.013	0.013	FUT	FUT	54	124.7	
R163	73.9	129.4	0.004	0.013	0.013	FUT	FUT	54	124.7	
R164	7.3	7.3	18	0.002	0.013	8.0	NO	NO	18	4.7
R165	67.5	67.5	36	0.005	0.013	34.4	NO	NO	36	33.4
R166	67.5	67.5	36	0.005	0.013	67.5	NO	NO	54	111.2
R167	29.9	29.9	18	0.021	0.013	28.9	YES	YES	30	59.3
R168	29.9	29.9	18	0.021	0.013	28.9	YES	YES	30	59.3
R169	14.7	14.7	18	0.022	0.013	14.7	NO	NO	18	15.6
R170	9.1	9.1	15	0.015	0.022	9.1	NO	NO	15	4.6
R171	9.1	9.1	15	0.015	0.022	9.1	NO	NO	15	4.6
R172	29.3	29.3	30	0.31	0.013	29.3	NO	NO	30	71.7
R173	15.6	15.6	24	0.019	0.013	15.6	NO	NO	24	16.3
R174	13.3	13.3	24	0.022	0.013	13.3	NO	NO	24	16.3
R175	8.4	8.4	30	0.007	0.012	8.4	NO	NO	30	38.0
R176	36.2	36.2	36	0.01	0.013	36.2	NO	NO	36	65.7
R177	36.2	36.2	36	0.01	0.013	36.2	NO	NO	36	65.7
R178	9.1	9.1	0.015	0.013	0.013	FUT	FUT	18	12.9	
R179	31.8	31.8	36	0.003	0.013	31.8	FUT	FUT	36	36.5
R180	9.3	9.3	0.007	0.013	0.013	FUT	FUT	18	9.0	
R181	24.7	24.7	0.013	0.013	0.013	FUT	FUT	36	46.8	
R182	35.6	35.6	0.011	0.013	0.013	FUT	FUT	36	69.3	
R183	35.3	35.3	0.015	0.013	0.013	FUT	FUT	30	49.9	
R184	67.0	67.0	0.007	0.013	0.013	FUT	FUT	42	86.0	
R185	49.3	49.3	0.011	0.013	0.013	FUT	FUT	36	71.5	
R186	15.0	15.0	24	0.017	0.013	15.0	NO	NO	24	30.0
R187	44.9	44.9	0.011	0.013	0.013	FUT	FUT	30	43.2	
R188	15.9	15.9	0.01	0.013	0.013	FUT	FUT	24	22.7	
R189-A	63.5	63.5	0.003	0.013	0.013	FUT	FUT	48	88.5	
R189-B	63.5	63.5	0.003	0.013	0.013	FUT	FUT	48	88.5	
R189-C	63.5	63.5	0.003	0.013	0.013	FUT	FUT	48	102.2	
R189-D	2.5	2.5	0.005	0.013	0.013	FUT	FUT	36	47.3	
R189-E	3.9	3.9	15	0.0021	0.013	3.0	FUT	NO	15	3.0

FUT = Future Pipe
 Pipe diameter is based on estimated slope. Pipe diameter and slope should be designed to convey the estimated design flow.
 Design flows computed for estimated full build-out conditions and assumes all storm drain sumps are abandoned.

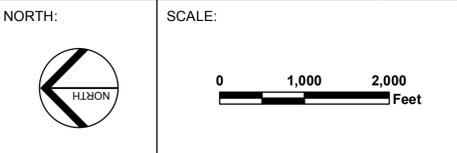
Detention Facilities						
Name	Existing Volume (ac-ft)	Capacity Deficient?	Future Volume (ac-ft)	Discharge (cfs)	Discharge (cfs/ac)	Existing?
1400 South	-	-	2.2	7.7	0.055	No
1400 East	-	-	0.8	1	0.02	No
1450 South	-	-	6.6	6.8	0.032	No
2000 South	-	-	1.2	8	0.075	No
2500 East	-	-	2.7	4	0.021	No
400 North	-	-	1.1	14	0.10	No
400 South	-	-	6.1	6	0.018	No
600 East	-	-	0.5	30	0.220	No
700 East	-	-	1.1	18.5	0.021	No
700 South	-	-	0.5	60	0.187	No
Arrowhead Trail	2.5	Yes	4.4	7.5	0.019	Yes
Canyon School	6	No	57.9	10	0.016	Yes
Fair Grounds	-	-	2.6	10	0.041	No
North Park	2.8	No	-	162.9	0.29	Yes
Parkside Estates*	1.9	No	-	17	0.021	Yes
Spanish Trails North**	0.4	No	-	0.8	0.05	Yes
Wildflower	0.2	No	-	0.4	0.05	Yes

*Orifice Size May Need to be Adjusted
 ** Existing Retention in Poor Condition and Needs to be Replaced with a Detention Basin



Legend

- Major Discharge Point
- Flow Arrow
- Canal Crossing
- Railroad Crossing
- Storm Drain Trunklines
 - Existing SD
 - Recommended Future Storm Drain Pipe
 - Open Channel Storm Drain
 - Existing Deficient Storm Drain with Recommended Pipe Size
- Detention Basins
 - Regional Detention Facility
 - Local Detention Facility
- Major River
- Drainage Subbasin



RECOMMENDED MAJOR STORM DRAIN IMPROVEMENTS

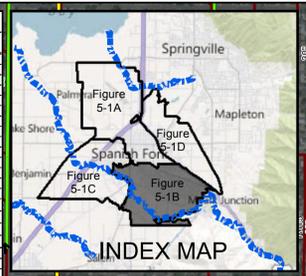
SPANISH FORK CITY
STORM DRAIN MASTER PLAN

Bowen Collins & Associates, Inc.
 CONSULTING ENGINEERS

FIGURE NO.
5-1A

Recommended Pipe Sizes										
ID	Existing Flow (cfs)	Design Flow (cfs)	Existing Diameter (in)	Estimated Pipe Capacity (cfs)	Capacity Deficient?	Estimated Existing Full Pipe Capacity (cfs)	Existing Deficient?	Future Deficient?	Recommended Future Diameter (in)	Estimated Future Capacity (cfs)
R200	0.0	28.7	24	0.006	0.013	-	FUT	FUT	30	21.9
R201	0.0	8.0	18	0.006	0.013	-	FUT	FUT	18	25.8
R202	0.0	18.0	18	0.006	0.013	-	FUT	FUT	18	6.2
R203	0.0	5.5	18	0.006	0.013	-	FUT	FUT	18	27.7
R204	1.0	20.1	18	0.004	0.013	4.9	NO	YES	30	29.0
R205	0.0	15.0	18	0.006	0.013	-	NO	NO	18	13.4
R206	0.0	4.0	18	0.008	0.013	5.0	NO	NO	18	9.4
R207	11.8	11.8	18	0.003	0.013	6.0	YES	YES	24	12.4
R208	20.7	20.7	18	0.006	0.013	5.0	YES	YES	24	20.3
R209	42.9	42.9	24	0.004	0.013	10.9	YES	YES	36	42.3
R210	7.6	7.6	18	0.002	0.013	30.6	NO	NO	18	17.7
R211	8.7	8.7	18	0.005	0.013	7.6	NO	NO	18	11.1
R212	20.1	20.1	18	0.002	0.013	4.9	YES	YES	30	11.4
R213	1.5	1.5	18	0.003	0.013	4.0	NO	NO	18	11.1
R214	28.0	28.0	18	0.005	0.013	7.0	YES	YES	30	29.1
R215	1.7	1.7	21	0.004	0.022	6.6	NO	NO	21	15.9
R216	11.4	11.4	18	0.004	0.013	8.0	YES	YES	24	15.6
R217	13.2	13.2	24	0.004	0.013	15.5	NO	NO	24	15.5
R218	1.6	1.6	18	0.001	0.012	3.0	NO	NO	18	12.2
R219	14.4	14.4	24	0.002	0.013	3.0	YES	YES	30	14.4
R220	12.8	12.8	18	0.004	0.013	6.0	YES	YES	24	14.3
R221	26.3	26.3	24	0.005	0.013	5.1	YES	YES	36	47.3
R222	1.6	1.6	15	0.001	0.012	2.0	NO	NO	15	2.2
R223	11.0	11.0	24	0.005	0.012	13.7	NO	NO	24	17.4
R224	30.0	30.0	24	0.006	0.013	-	FUT	FUT	24	19.0
R225	36.9	36.9	24	0.006	0.012	6.7	YES	YES	30	34.5
R226	36.9	36.9	24	0.3	0.012	130.0	NO	NO	24	138.8
R227	18.5	18.5	18	0.002	0.013	-	FUT	FUT	30	19.4
R231	18.5	26.5	-	0.002	0.013	-	FUT	FUT	36	29.9
R232	1.8	1.8	-	0.002	0.013	-	OCF	FUT	18	4.7
R234	0.0	6.0	-	0.003	0.013	-	FUT	FUT	18	8.8
R235	0.0	18.0	-	0.004	0.013	-	FUT	FUT	24	16.3
R238	0.0	24.0	-	0.004	0.013	-	FUT	FUT	30	28.0
R242	13.0	13.0	24	0.005	0.013	16.0	NO	NO	24	16.0
R243	37.0	37.0	30	0.005	0.013	200.0	NO	NO	30	206.6
R244	37.0	37.0	-	0.002	0.013	-	FUT	FUT	42	46.1
R245	19.6	25.9	18	0.005	0.013	0.0	YES	YES	30	29.1
R246	19.6	25.9	24	0.005	0.013	4.2	YES	YES	30	29.1
R247	38.5	45.9	24	0.01	0.013	13.5	YES	YES	30	41.1
R248	28.5	51.1	-	0.005	0.013	-	YES	FUT	36	54.4
R250	0.0	45.2	-	0.003	0.013	-	FUT	FUT	42	56.3
R251	0.0	11.0	-	0.003	0.013	-	FUT	FUT	24	12.4
R252	0.0	11.0	-	0.003	0.013	-	FUT	FUT	24	12.4
R253	0.0	22.0	-	0.002	0.013	-	FUT	FUT	36	29.9
R254	0.0	22.8	-	0.003	0.013	-	FUT	FUT	30	22.5
R255	31.8	36.0	-	0.004	0.013	-	FUT	FUT	42	37.7
R256	1.1	6.8	-	0.004	0.013	-	FUT	FUT	18	6.7
R257	0.0	15.0	54	0.006	0.012	166.9	NO	NO	54	165.5
R258	0.0	50.5	-	0.003	0.013	-	OCF	FUT	54	166.0
R259	53.0	62.9	-	0.002	0.013	-	FUT	FUT	48	60.1
R260	0.0	93.2	24	0.002	0.013	-	FUT	FUT	24	93.6
R261	0.0	7.1	-	0.004	0.013	-	FUT	FUT	18	6.7
R262	0.0	18.0	-	0.015	0.013	-	FUT	FUT	18	12.9
R263	38.4	45.6	36	0.015	0.013	48.0	NO	NO	36	46.1
R264	0.0	8.0	36	0.3	0.013	300.0	NO	NO	36	306.3
R265	10.0	10.0	-	0.001	0.013	-	FUT	FUT	24	11.4
R266	20.6	24.3	-	0.0014	0.013	-	FUT	FUT	30	25.0
R267	0.0	8.0	-	0.005	0.013	-	FUT	FUT	18	7.4
R268	1.7	1.8	-	0.008	0.013	-	FUT	FUT	18	8.4
R269	18.3	18.6	24	0.011	0.013	34.5	NO	NO	24	20.1
R270	20.4	21.9	-	0.01	0.012	-	FUT	FUT	36	22.5
R271	1.2	1.9	-	0.013	0.013	-	FUT	FUT	18	19.5
R272	7.7	7.7	24	0.0012	0.012	7.7	NO	NO	24	8.5
R273	11.9	12.4	30	0.014	0.013	42.9	NO	NO	30	32.7
R274	1.8	1.8	-	0.003	0.012	-	OCF	FUT	18	6.2
R275	1.6	2.5	-	0.004	0.013	-	FUT	FUT	30	29.0
R276	1.1	1.2	24	0.003	0.012	10.0	NO	NO	24	13.5
R277	22.1	28.1	-	0.005	0.013	-	FUT	FUT	30	29.1

Detention Facilities						
Name	Existing Volume (ac-ft)	Capacity Deficient?	Future Volume (ac-ft)	Discharge (cfs)	Discharge (cfs/ac)	Existing?
1400 South	-	-	2.2	7.7	0.055	No
1400 East	-	-	0.8	1	0.02	No
1450 East	-	-	6.6	6.8	0.032	No
2000 South	-	-	1.2	8	0.075	No
2500 East	-	-	2.7	4	0.021	No
400 North	-	-	1.1	14	0.10	No
400 South	-	-	6.1	0	0.010	No
600 East	-	-	0.5	30	0.250	No
700 East	-	-	0.5	60	0.187	No
700 West	-	-	1.1	18.5	0.021	No
Arrowhead Trail	2.5	Yes	4.4	7.5	0.019	Yes
Canyon School	5	No	57.9	10	0.018	Yes
Fair Grounds	-	-	2.6	10	0.041	No
North Park	2.8	No	-	162.9	0.29	Yes
Paradise Estates*	1.9	No	-	17	0.021	No
Spanish Trails North**	0.4	No	-	0.8	0.025	Yes
Wildflower	0.2	No	-	0.4	0.05	Yes



Legend

- Recommended Floating Boom
- Canal Crossing
- Railroad Crossing
- Major Discharge Point
- Flow Arrow

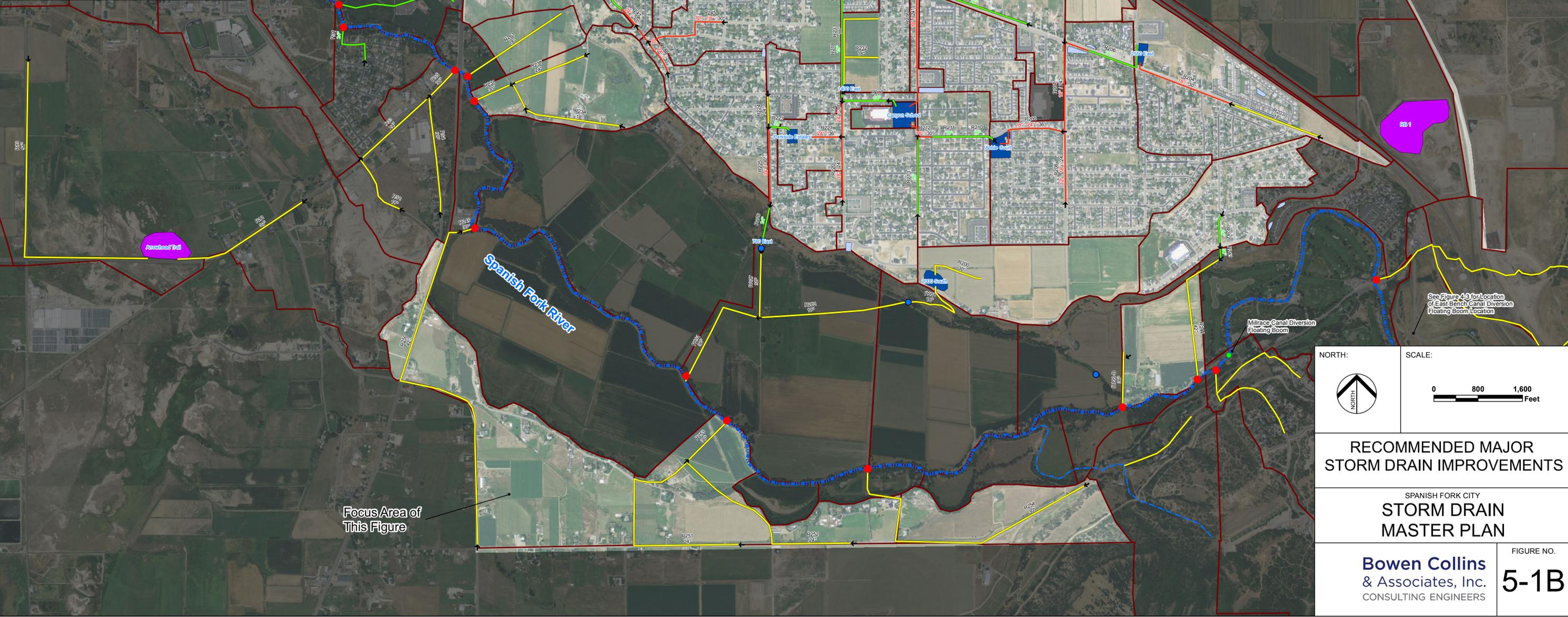
Storm Drain Trunklines

- Existing SD
- Recommended Future Storm Drain Pipe
- Open Channel Storm Drain
- Existing Deficient Storm Drain with Recommended Pipe Size

- Major River
- Drainage Subbasin

Detention Basins

- Regional Detention Facilities
- Local Detention Facilities
- Retention Facilities



NORTH:

SCALE:

RECOMMENDED MAJOR STORM DRAIN IMPROVEMENTS

SPANISH FORK CITY
STORM DRAIN MASTER PLAN

Bowen Collins & Associates, Inc.
CONSULTING ENGINEERS

FIGURE NO.
5-1B

Recommended Pipe Sizes										
ID	Existing Flow (cfs)	Existing Flow (MGD)	Existing Diameter (in)	Estimated Manning's n	Estimated Full Pipe Capacity (cfs)	Existing Deficient	Future Deficient	Capacity Required (cfs)	Recommended Future Diameter (in)	Estimated Future Pipe Capacity (cfs)
R1	0	3.2	0	0.015	0.015	NO	NO	3.2	18	15.5
R2	0	12.8	0	0.003	0.015	NO	NO	12.8	24	12.4
R3	0	12.8	0	0.003	0.015	NO	NO	12.8	24	12.4
R4	0	22.5	0	0.003	0.015	NO	NO	22.5	30	22.5
R5	0	23.3	0	0.003	0.015	NO	NO	23.3	30	22.5
R6	0	45.8	0	0.003	0.015	NO	NO	45.8	42	53.3
R7	0	45.8	0	0.003	0.015	NO	NO	45.8	42	53.3
R8	0	25.3	0	0.003	0.015	NO	NO	25.3	30	22.5
R9	0	11.1	0	0.002	0.015	NO	NO	11.1	18	18.4
R10	0	10.0	0	0.002	0.015	NO	NO	10.0	18	10.1
R11	0	28.8	0	0.002	0.015	NO	NO	28.8	30	28.1
R12	0	55.9	0	0.003	0.015	NO	NO	55.9	42	71.2
R13	0	121.1	0	0.004	0.015	NO	NO	121.1	54	124.7
R14	0	45.4	0	0.004	0.015	NO	NO	45.4	30	43.3
R15	0	18.1	0	0.003	0.015	NO	NO	18.1	18	22.5
R16	0	208.9	0	0.004	0.015	NO	NO	208.9	60	208.9
R17	0	37.8	0	0.003	0.015	NO	NO	37.8	30	30.6
R18	0	23.3	0	0.003	0.015	NO	NO	23.3	30	22.5
R19	0	113.2	0	0.003	0.015	NO	NO	113.2	42	143.0
R20	0	18.8	0	0.003	0.015	NO	NO	18.8	18	22.5
R21	0	155.3	0	0.003	0.015	NO	NO	155.3	42	184.4
R22	0	15.3	0	0.004	0.015	NO	NO	15.3	18	18.3
R23	4	21.0	0	0.004	0.015	NO	NO	27.0	30	28.0
R24	3	18.8	0	0.003	0.015	NO	NO	24.8	30	28.1
R25	11.1	23.4	24	0.01	0.012	25.6	NO	23.6	24	24.6
R26	18	18.0	24	0.005	0.012	17.1	NO	24.3	24	17.4
R27	4.2	14.2	0	0.01	0.013	17.7	NO	17.7	18	18.8
R28	9.45	32.0	0	0.017	0.013	24.7	NO	24.7	24	29.6
R29	9.45	32.0	0	0.01	0.013	27.3	NO	27.3	30	41.1
R30	21	71.1	0	0.005	0.015	31.0	NO	31.0	30	60.0
R31	27.6	31.0	54	0.007	0.015	30.0	NO	44.4	48	38.1
R32	4.06	4.7	18	0.003	0.013	12.9	NO	15.7	18	18.8
R33	13.4	13.4	24	0.003	0.013	12.0	NO	24.7	24	12.4
R34	17.4	17.4	48	0.006	0.013	35.3	NO	38.8	48	35.3
R35	15	12	21	0.002	0.013	10	NO	22.2	24	10.1
R36	13.4	13.3	30	0.005	0.013	14.0	NO	38.5	30	12
R37	6.5	6.7	12	0.002	0.013	8.0	NO	20.1	12	10.5
R38	15.5	15.5	0	0.002	0.013	10	NO	25.5	24	10.1
R39	33.6	28.8	24	0.004	0.012	11.2	YES	30.1	30	28.2
R40	0	1.8	18	0.006	0.012	2.0	NO	9.4	18	9.8
R41	6.5	8.2	21	0.002	0.012	9.0	NO	21.5	24	11.0
R42	0	0.8	0	0.003	0.013	0	NO	8.6	18	5.8
R43	20.7	34.5	48	0.006	0.013	35.3	NO	47.7	48	35.3
R44	4.2	4.2	12	0.002	0.013	3.6	NO	17.2	12	1.6

Detention Facilities						
Name	Existing Volume (ac-ft)	Capacity Deficient?	Future Volume (ac-ft)	Discharge (cfs)	Discharge (cfs/ac)	Existing?
1400 South	-	-	2.2	7.7	0.055	No
1400 East	-	-	0.8	1	0.02	No
1450 South	-	-	6.8	6.8	0.032	No
2000 South	-	-	1.2	8	0.075	No
2500 East	-	-	2.7	4	0.021	No
400 North	-	-	1.1	14	0.10	No
400 South	-	-	0.5	8	0.016	No
600 East	-	-	1.1	18.5	0.027	No
700 East	-	-	0.5	60	0.187	No
Arrowhead Trail	2.5	Yes	4.4	7.5	0.019	Yes
Canyon School	6	No	57.9	10	0.018	No
Fair Grounds	-	-	2.8	10	0.041	No
North Park	2.8	No	-	162.9	0.29	Yes
Paradise Estates*	1.9	No	-	17	0.02	Yes
Spanish Trails North**	0.4	No	-	0.8	0.05	Yes
Wildflower*	0.2	No	-	0.4	0.05	Yes

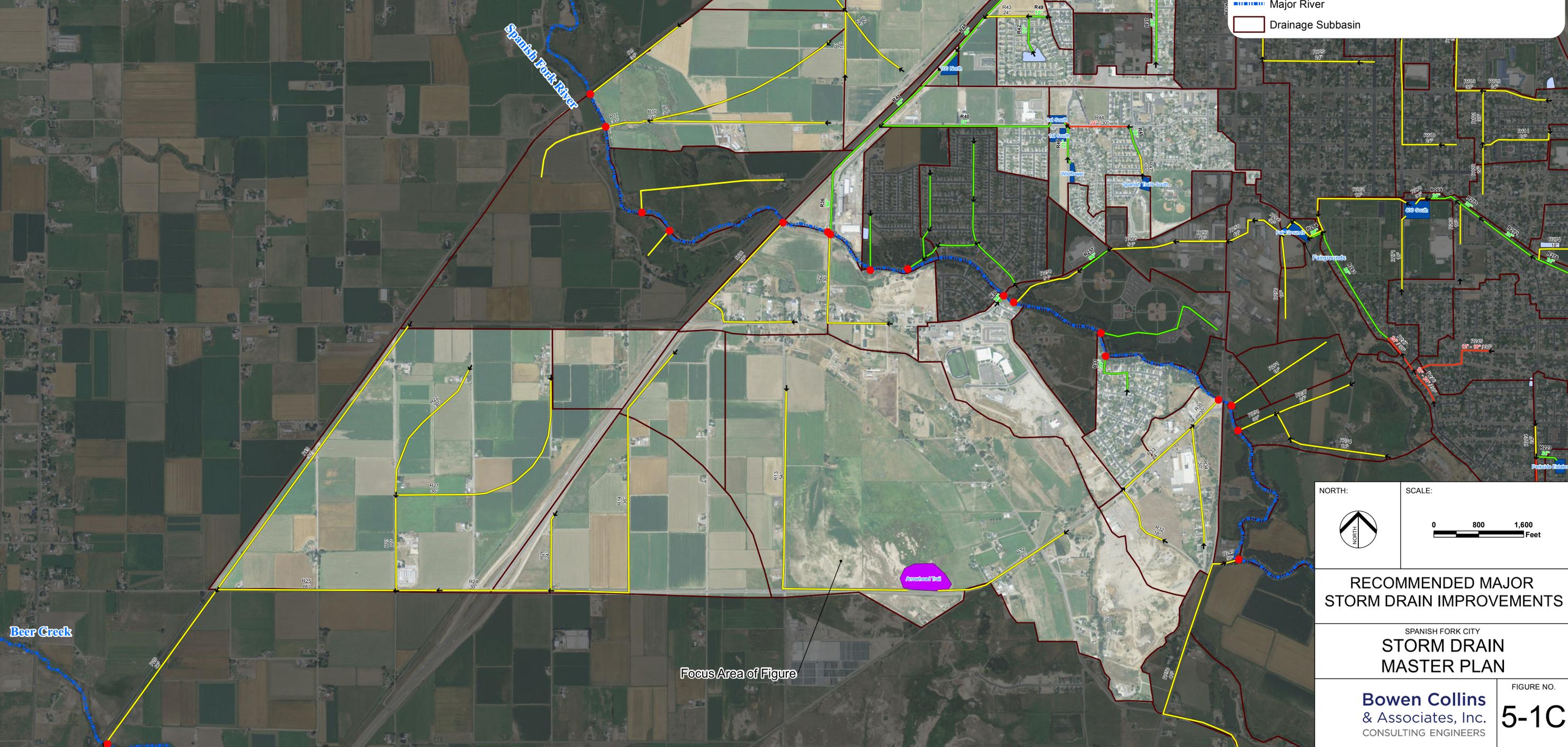


Legend

- Canal Crossing
- Railroad Crossing
- Major Discharge Point
- Flow Arrow
- Existing SD
- Recommended Future Storm Drain Pipe
- Open Channel Storm Drain
- Existing Deficient Storm Drain with Recommended Pipe Size

Detention Basins

- Regional Detention Facilities
- Local Detention Facilities
- Retention Facilities
- Major River
- Drainage Subbasin



NORTH:

SCALE:

RECOMMENDED MAJOR STORM DRAIN IMPROVEMENTS

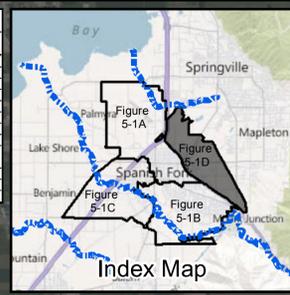
SPANISH FORK CITY
STORM DRAIN MASTER PLAN

Bowen Collins & Associates, Inc.
CONSULTING ENGINEERS

FIGURE NO.
5-1C

Recommended Pipe Sizes											
ID	Existing Flow (cfs)	Design Flow (cfs)	Existing Diameter (in)	Estimated Pipe Slope (ft/ft)	Estimated Existing Full Pipe Capacity (cfs)	Manning's n	Estimated Future Full Pipe Capacity (cfs)	Existing Deficient	Future Deficient	Recommended Future Pipe Diameter (in)	Estimated Future Pipe Capacity (cfs)
R1	0	3.2	-	0.003	0.013	-	FUT	FUT	18	5.8	
R2	0	12.8	-	0.003	0.013	-	FUT	FUT	24	12.4	
R3	0	22.5	-	0.003	0.013	-	FUT	FUT	30	22.5	
R4	0	23.3	-	0.003	0.013	-	FUT	FUT	30	22.5	
R5	0	45.8	-	0.003	0.013	-	FUT	FUT	42	55.3	
R6	0	45.8	-	0.003	0.013	-	FUT	FUT	42	55.3	
R7	0	23.3	-	0.003	0.013	-	FUT	FUT	30	22.5	
R8	0	17.1	-	0.002	0.013	-	FUT	FUT	30	18.4	
R9	0	10.0	-	0.002	0.013	-	FUT	FUT	24	10.1	
R10	0	28.5	-	0.003	0.013	-	FUT	FUT	30	29.1	
R11	0	55.9	-	0.003	0.013	-	FUT	FUT	30	71.2	
R12	0	121.1	-	0.004	0.013	-	FUT	FUT	54	124.7	
R13	0	48.4	-	0.004	0.013	-	FUT	FUT	36	42.3	
R14	0	19.1	-	0.003	0.013	-	FUT	FUT	30	22.5	
R15	0	224.0	-	0.006	0.013	-	FUT	FUT	66	260.8	
R16	0	37.8	-	0.003	0.013	-	FUT	FUT	36	36.8	
R17	0	23.9	-	0.003	0.013	-	FUT	FUT	30	22.5	
R18	0	113.2	-	0.003	0.013	-	FUT	FUT	60	143.0	
R19	0	18.8	-	0.003	0.013	-	FUT	FUT	30	22.5	
R20	0	155.3	-	0.003	0.013	-	FUT	FUT	66	184.4	
R21	0	13.3	-	0.004	0.013	-	FUT	FUT	24	14.3	
R22	4	21.0	-	0.004	0.013	-	FUT	FUT	30	26.0	
R23	4.2	18.6	-	0.005	0.013	-	FUT	FUT	30	20.1	
R24	11.1	23.4	24	0.01	0.012	25.6	NO	NO	24	24.6	
R25	18	18.0	24	0.005	0.012	17.1	NO	NO	24	17.4	
R26	4.2	14.2	-	0.002	0.013	-	FUT	FUT	18	14.9	
R27	9.45	32.0	-	0.017	0.013	-	FUT	FUT	24	29.6	
R28	9.45	32.0	-	0.01	0.015	-	FUT	FUT	30	41.1	
R29	21	71.3	-	0.005	0.013	-	FUT	FUT	30	69.0	
R30	27.6	31.0	54	0.0007	0.013	30.0	NO	NO	48	38.1	
R31	4.89	4.7	18	0.003	0.013	10.9	NO	NO	18	5.8	
R32	13.4	13.4	24	0.003	0.013	12.0	NO	NO	24	12.4	
R33	17.4	17.4	48	0.0006	0.013	35.3	FUT	NO	48	35.3	
R34	9.5	8.2	21	0.002	0.013	8.0	NO	NO	24	10.1	
R35	15.4	15.5	30	0.0025	0.013	14.0	NO	NO	30	12.2	
R36	6.3	6.3	12	0.002	0.013	8.0	NO	NO	12	1.6	
R37	10.5	10.5	-	0.002	0.013	-	FUT	FUT	24	10.1	
R38	13.8	28.6	24	0.004	0.012	11.2	YES	YES	30	28.2	
R39	0	1.6	18	0.006	0.012	2.0	NO	NO	18	8.8	
R40	9.5	8.2	21	0.002	0.012	8.0	NO	NO	24	11.0	
R41	0	0.8	48	0.003	0.013	-	FUT	FUT	18	1.8	
R42	29.7	34.8	48	0.0006	0.013	35.3	FUT	NO	48	35.3	
R43	4.2	4.2	12	0.002	0.013	3.6	NO	NO	12	1.6	

Detention Facilities						
Name	Existing Volume (ac-ft)	Capacity Deficient?	Future Volume (ac-ft)	Discharge (cfs)	Discharge (cfs/ac)	Existing?
DB1	-	-	8.5	7.9	0.04	No
DB3	-	-	4.5	13.1	0.08	No
DB4	-	-	4.9	12.2	0.05	No
DB5	-	-	3.1	89.3	0.11	No
DB6	-	-	2.6	20.5	0.15	No
DB7	-	-	1	5.7	0.15	No
DB8	-	-	2	2.8	0.05	No
DB9	1.7	No	1.7	47.1	0.32	Yes
Spanish Highlands	3.7	No	3.7	2.5	0.04	Yes
RB1	-	-	22.7	0	-	No
RB2	-	-	2.3	0	-	Yes
RB3	-	-	2.6	0	-	No



Legend

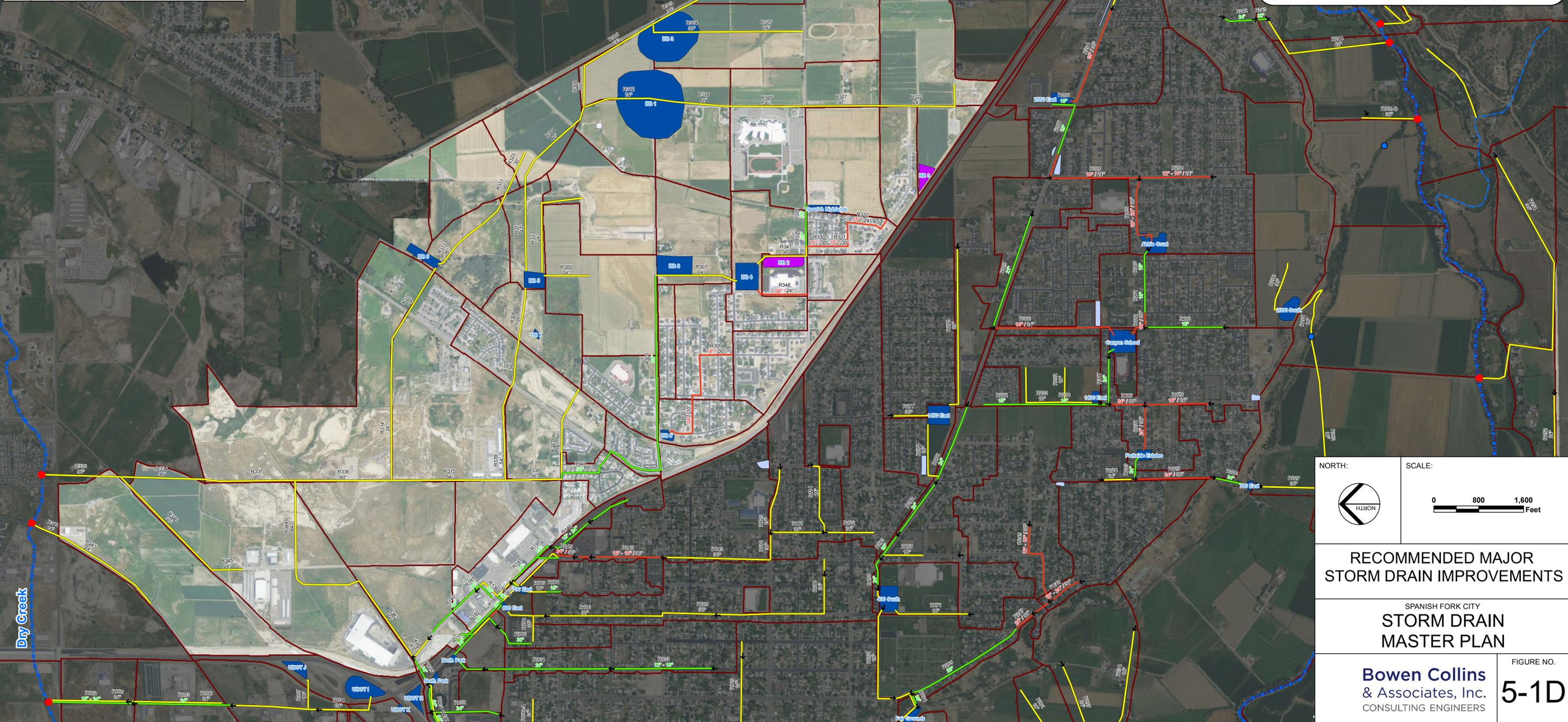
- Major Discharge Point
- ↑ Flow Arrow
- Canal Crossing
- Railroad Crossing

Storm Drain Trunklines

- Existing SD
- Recommended Future Storm Drain Pipe
- Open Channel Storm Drain
- Existing Deficient Storm Drain with Recommended Pipe Size

Detention Basins

- Regional Detention Facilities
- Local Detention Facilities
- Retention Facilities
- Major Rivers
- Drainage Subbasin



NORTH:

SCALE:

RECOMMENDED MAJOR STORM DRAIN IMPROVEMENTS

SPANISH FORK CITY STORM DRAIN MASTER PLAN

Bowen Collins & Associates, Inc.
CONSULTING ENGINEERS

FIGURE NO. **5-1D**

Table 5-2
Estimated Costs of Capital Improvements
Recommended Storm Drain Trunk Lines

Project Identifier	Total Estimated Cost	Percentage of Cost Attributable to:		Cost Attributable to:	
		Existing Development	Future Development	Existing Development	Future Development
R1	\$ 273,943	0%	100%	\$ -	\$ 273,943
R2	\$ 243,985	0%	100%	\$ -	\$ 243,985
R3	\$ 532,853	0%	100%	\$ -	\$ 532,853
R4	\$ 288,943	0%	100%	\$ -	\$ 288,943
R5	\$ 265,357	0%	100%	\$ -	\$ 265,357
R6	\$ 250,851	0%	100%	\$ -	\$ 250,851
R7	\$ 1,267,970	0%	100%	\$ -	\$ 1,267,970
R8	\$ 409,646	0%	100%	\$ -	\$ 409,646
R9	\$ 736,340	0%	100%	\$ -	\$ 736,340
R10	\$ 809,279	0%	100%	\$ -	\$ 809,279
R11	\$ 177,404	0%	100%	\$ -	\$ 177,404
R12	\$ 621,388	0%	100%	\$ -	\$ 621,388
R13	\$ 2,243,057	0%	100%	\$ -	\$ 2,243,057
R14	\$ 1,499,734	0%	100%	\$ -	\$ 1,499,734
R19	\$ 1,171,277	0%	100%	\$ -	\$ 1,171,277
R20	\$ 1,660,388	0%	100%	\$ -	\$ 1,660,388
R21	\$ 1,003,331	0%	100%	\$ -	\$ 1,003,331
R22	\$ 548,854	0%	100%	\$ -	\$ 548,854
R23	\$ 733,486	0%	100%	\$ -	\$ 733,486
R24	\$ 758,491	0%	100%	\$ -	\$ 758,491
R25	\$ 1,554,115	0%	100%	\$ -	\$ 1,554,115
R26	\$ 233,996	0%	100%	\$ -	\$ 233,996
R28	\$ 1,017,360	19%	81%	\$ 193,783	\$ 823,577
R29	\$ 734,286	20%	80%	\$ 148,269	\$ 586,017
R32	\$ 279,606	30%	70%	\$ 82,584	\$ 197,022
R33	\$ 402,460	30%	70%	\$ 118,870	\$ 283,590
R34	\$ 586,254	30%	70%	\$ 173,155	\$ 413,099
R35	\$ 181,788	30%	70%	\$ 53,693	\$ 128,095
R43	\$ 181,666	85%	15%	\$ 154,416	\$ 27,250
R44	\$ 340,029	15%	85%	\$ 51,004	\$ 289,025
R47	\$ 82,958	100%	0%	\$ 82,958	\$ -
R104	\$ 640,163	19%	81%	\$ 120,870	\$ 519,293
R105	\$ 376,174	0%	100%	\$ -	\$ 376,174
R106	\$ 376,121	0%	100%	\$ -	\$ 376,121
R107	\$ 115,537	100%	0%	\$ 115,537	\$ -
R108	\$ 403,403	0%	100%	\$ -	\$ 403,403
R109	\$ 272,571	0%	100%	\$ -	\$ 272,571
R110	\$ 98,199	0%	100%	\$ -	\$ 98,199
R111	\$ 1,165,927	0%	100%	\$ -	\$ 1,165,927
R112	\$ 1,544,843	0%	100%	\$ -	\$ 1,544,843
R113	\$ 1,670,508	0%	100%	\$ -	\$ 1,670,508

Table 5-2
Estimated Costs of Capital Improvements
Recommended Storm Drain Trunk Lines

Project Identifier	Total Estimated Cost	Percentage of Cost Attributable to:		Cost Attributable to:	
		Existing Development	Future Development	Existing Development	Future Development
R114	\$ 326,289	100%	0%	\$ 326,289	\$ -
R115	\$ 530,432	100%	0%	\$ 530,432	\$ -
R116	\$ 506,534	100%	0%	\$ 506,534	\$ -
R118	\$ 592,491	100%	0%	\$ 592,491	\$ -
R119	\$ 130,895	100%	0%	\$ 130,895	\$ -
R120	\$ 292,764	100%	0%	\$ 292,764	\$ -
R121	\$ 263,526	100%	0%	\$ 263,526	\$ -
R122	\$ 208,935	100%	0%	\$ 208,935	\$ -
R129	\$ 478,257	100%	0%	\$ 478,257	\$ -
R130	\$ 509,326	100%	0%	\$ 509,326	\$ -
R131	\$ 592,079	100%	0%	\$ 592,079	\$ -
R132	\$ 301,434	100%	0%	\$ 301,434	\$ -
R141	\$ 151,842	100%	0%	\$ 151,842	\$ -
R142	\$ 522,847	100%	0%	\$ 522,847	\$ -
R143	\$ 406,742	100%	0%	\$ 406,742	\$ -
R144	\$ 110,415	100%	0%	\$ 110,415	\$ -
R145	\$ 122,159	100%	0%	\$ 122,159	\$ -
R148	\$ 271,666	31%	69%	\$ 83,458	\$ 188,207
R150	\$ 59,981	31%	69%	\$ 18,427	\$ 41,554
R151	\$ 1,010,122	0%	100%	\$ -	\$ 1,010,122
R152	\$ 1,359,130	0%	100%	\$ -	\$ 1,359,130
R153	\$ 461,822	0%	100%	\$ -	\$ 461,822
R157	\$ 580,632	0%	100%	\$ -	\$ 580,632
R158	\$ 362,387	0%	100%	\$ -	\$ 362,387
R159	\$ 855,039	100%	0%	\$ 855,039	\$ -
R160	\$ 674,537	61%	39%	\$ 413,949	\$ 260,588
R161	\$ 504,413	47%	53%	\$ 238,933	\$ 265,481
R162	\$ 240,040	100%	0%	\$ 240,040	\$ -
R163	\$ 234,892	60%	40%	\$ 140,018	\$ 94,873
R164	\$ 578,472	57%	43%	\$ 330,620	\$ 247,852
R165	\$ 978,032	57%	43%	\$ 558,552	\$ 419,481
R178	\$ 48,476	100%	0%	\$ 48,476	\$ -
R188	\$ 301,111	100%	0%	\$ 301,111	\$ -
R189	\$ 81,142	100%	0%	\$ 81,142	\$ -
R190	\$ 126,889	100%	0%	\$ 126,889	\$ -
R192	\$ 110,846	100%	0%	\$ 110,846	\$ -
R193	\$ 134,007	100%	0%	\$ 134,007	\$ -
R194	\$ 51,870	100%	0%	\$ 51,870	\$ -
R195	\$ 350,448	100%	0%	\$ 350,448	\$ -
R196	\$ 51,414	100%	0%	\$ 51,414	\$ -
R198	\$ 88,562	100%	0%	\$ 88,562	\$ -

Table 5-2
Estimated Costs of Capital Improvements
Recommended Storm Drain Trunk Lines

Project Identifier	Total Estimated Cost	Percentage of Cost Attributable to:		Cost Attributable to:	
		Existing Development	Future Development	Existing Development	Future Development
R199-A	\$ 229,826	82%	18%	\$ 188,457	\$ 41,369
R199-B	\$ 188,257	96%	4%	\$ 180,727	\$ 7,530
R199-C	\$ 1,354,367	97%	4%	\$ 1,306,965	\$ 47,403
R199-D	\$ 337,980	0%	100%	\$ -	\$ 337,980
R200	\$ 284,065	0%	100%	\$ -	\$ 284,065
R200	\$ 227,158	0%	100%	\$ -	\$ 227,158
R201	\$ 220,361	0%	100%	\$ -	\$ 220,361
R202	\$ 434,524	0%	100%	\$ -	\$ 434,524
R203	\$ 378,796	0%	100%	\$ -	\$ 378,796
R204	\$ 541,790	10%	90%	\$ 53,977	\$ 487,813
R207	\$ 511,304	100%	0%	\$ 511,304	\$ -
R208	\$ 306,990	100%	0%	\$ 306,990	\$ -
R209	\$ 473,559	100%	0%	\$ 473,559	\$ -
R212	\$ 70,864	100%	0%	\$ 70,864	\$ -
R214	\$ 90,226	100%	0%	\$ 90,226	\$ -
R216	\$ 563,787	76%	24%	\$ 428,478	\$ 135,309
R219	\$ 177,144	100%	0%	\$ 177,144	\$ -
R220	\$ 278,808	100%	0%	\$ 278,808	\$ -
R221	\$ 280,685	100%	0%	\$ 280,685	\$ -
R224	\$ 144,048	100%	0%	\$ 144,048	\$ -
R225	\$ 381,634	100%	0%	\$ 381,634	\$ -
R227	\$ 265,613	100%	0%	\$ 265,613	\$ -
R231	\$ 514,171	20%	80%	\$ 105,107	\$ 409,064
R232	\$ 182,486	63%	37%	\$ 115,012	\$ 67,474
R233	\$ 330,598	63%	37%	\$ 208,360	\$ 122,238
R234	\$ 510,597	0%	100%	\$ -	\$ 510,597
R237	\$ 241,473	0%	100%	\$ -	\$ 241,473
R238	\$ 146,453	0%	100%	\$ -	\$ 146,453
R244	\$ 771,695	100%	0%	\$ 771,695	\$ -
R245	\$ 457,661	81%	19%	\$ 370,667	\$ 86,993
R246	\$ 183,231	94%	6%	\$ 172,660	\$ 10,571
R247	\$ 197,836	87%	13%	\$ 172,323	\$ 25,513
R249	\$ 69,668	0%	100%	\$ -	\$ 69,668
R250	\$ 2,591,131	0%	100%	\$ -	\$ 2,591,131
R251	\$ 937,870	0%	100%	\$ -	\$ 937,870
R252	\$ 636,322	0%	100%	\$ -	\$ 636,322
R253	\$ 238,998	0%	100%	\$ -	\$ 238,998
R254	\$ 1,520,964	0%	100%	\$ -	\$ 1,520,964
R255	\$ 274,056	86%	14%	\$ 235,349	\$ 38,707
R256	\$ 227,461	45%	55%	\$ 102,193	\$ 125,268
R258	\$ 518,625	72%	28%	\$ 374,408	\$ 144,217

Table 5-2
Estimated Costs of Capital Improvements
Recommended Storm Drain Trunk Lines

Project Identifier	Total Estimated Cost	Percentage of Cost Attributable to:		Cost Attributable to:	
		Existing Development	Future Development	Existing Development	Future Development
R259	\$ 403,283	81%	19%	\$ 326,987	\$ 76,297
R260	\$ 456,388	72%	28%	\$ 330,539	\$ 125,850
R261	\$ 318,044	0%	100%	\$ -	\$ 318,044
R262	\$ 514,097	100%	0%	\$ 514,097	\$ -
R265	\$ 25,198	100%	0%	\$ 25,198	\$ -
R266	\$ 164,338	85%	15%	\$ 139,315	\$ 25,023
R267	\$ 108,724	100%	0%	\$ 108,724	\$ -
R268	\$ 158,769	100%	0%	\$ 158,769	\$ -
R270	\$ 99,835	91%	9%	\$ 90,501	\$ 9,335
R271	\$ 327,370	100%	0%	\$ 327,370	\$ -
R274	\$ 167,406	100%	0%	\$ 167,406	\$ -
R275	\$ 836,186	34%	66%	\$ 282,008	\$ 554,178
R277	\$ 201,496	79%	21%	\$ 158,472	\$ 43,024
R300	\$ 364,915	71%	29%	\$ 260,902	\$ 104,013
R302	\$ 119,378	93%	7%	\$ 111,152	\$ 8,225
R303	\$ 243,138	0%	100%	\$ -	\$ 243,138
R304	\$ 516,989	0%	100%	\$ -	\$ 516,989
R305	\$ 158,601	0%	100%	\$ -	\$ 158,601
R306	\$ 216,049	0%	100%	\$ -	\$ 216,049
R307	\$ 371,874	100%	0%	\$ 371,874	\$ -
R308	\$ 239,499	0%	100%	\$ -	\$ 239,499
R309	\$ 141,155	0%	100%	\$ -	\$ 141,155
R310	\$ 456,940	0%	100%	\$ -	\$ 456,940
R311	\$ 129,845	0%	100%	\$ -	\$ 129,845
R312	\$ 217,163	0%	100%	\$ -	\$ 217,163
R313	\$ 373,485	0%	100%	\$ -	\$ 373,485
R314	\$ 430,382	21%	79%	\$ 89,580	\$ 340,801
R315	\$ 814,053	46%	54%	\$ 375,823	\$ 438,229
R316	\$ 249,125	23%	77%	\$ 57,165	\$ 191,960
R317	\$ 410,561	0%	100%	\$ -	\$ 410,561
R318	\$ 390,046	0%	100%	\$ -	\$ 390,046
R319	\$ 174,408	0%	100%	\$ -	\$ 174,408
R320	\$ 195,505	0%	100%	\$ -	\$ 195,505
R322	\$ 297,304	0%	100%	\$ -	\$ 297,304
R323	\$ 82,506	0%	100%	\$ -	\$ 82,506
R324	\$ 324,370	0%	100%	\$ -	\$ 324,370
R325	\$ 222,302	0%	100%	\$ -	\$ 222,302
R326	\$ 310,452	0%	100%	\$ -	\$ 310,452
R327	\$ 262,685	0%	100%	\$ -	\$ 262,685
R330	\$ 88,520	78%	22%	\$ 68,987	\$ 19,532
R331	\$ 60,810	75%	25%	\$ 45,587	\$ 15,223

Table 5-2
Estimated Costs of Capital Improvements
Recommended Storm Drain Trunk Lines

Project Identifier	Total Estimated Cost	Percentage of Cost Attributable to:		Cost Attributable to:	
		Existing Development	Future Development	Existing Development	Future Development
R332	\$ 197,344	71%	29%	\$ 140,266	\$ 57,078
R333	\$ 356,013	0%	100%	\$ -	\$ 356,013
R334	\$ 1,165,528	72%	28%	\$ 842,362	\$ 323,167
R335	\$ 1,168,811	68%	32%	\$ 795,721	\$ 373,090
R336	\$ 753,101	41%	59%	\$ 305,463	\$ 447,638
R337	\$ 1,260,651	71%	29%	\$ 895,280	\$ 365,372
R339	\$ 659,830	17%	83%	\$ 112,321	\$ 547,509
R341	\$ 347,924	0%	100%	\$ -	\$ 347,924
R342	\$ 86,545	0%	100%	\$ -	\$ 86,545
R347	\$ 237,232	83%	17%	\$ 195,996	\$ 41,236
R348	\$ 212,463	0%	100%	\$ -	\$ 212,463
Total	\$ 73,451,053	45%	55%	\$ 33,037,528	\$ 40,413,525

Table 5-3
Estimated Costs of Capital Improvements
Recommended Detention Basin Facilities

Name	Total Estimated Cost	Percentage of Cost Attributable to:		Cost Attributable to:	
		Existing Development	Future Development	Existing Development	Future Development
100 North	\$ 219,600	70%	30%	\$ 153,720	\$ 65,880
100 South	\$ 698,500	68%	32%	\$ 476,250	\$ 222,250
1400 East	\$ 163,100	50%	50%	\$ 81,550	\$ 81,550
1450 East	\$ 1,094,700	26%	74%	\$ 281,968	\$ 812,732
2000 South	\$ 366,300	0%	100%	\$ -	\$ 366,300
2550 East	\$ 552,600	85%	15%	\$ 470,733	\$ 81,867
400 South	\$ 288,200	36%	64%	\$ 103,941	\$ 184,259
600 East	\$ 383,300	0%	100%	\$ -	\$ 383,300
780 East	\$ 219,600	100%	0%	\$ 219,600	\$ -
Abbie Court	\$ 151,300	100%	0%	\$ 151,300	\$ -
Arrowhead Trail	\$ 7,440,100	0%	100%	\$ -	\$ 7,440,100
DB1	\$ 1,148,600	0%	100%	\$ -	\$ 1,148,600
DB3	\$ 603,700	0%	100%	\$ -	\$ 603,700
DB4	\$ 672,600	0%	100%	\$ -	\$ 672,600
DB5	\$ 564,000	0%	100%	\$ -	\$ 564,000
DB6	\$ 492,200	0%	100%	\$ -	\$ 492,200
DB7	\$ 216,800	0%	100%	\$ -	\$ 216,800
DB8	\$ 388,900	0%	100%	\$ -	\$ 388,900
Fair Grounds	\$ 549,700	100%	0%	\$ 549,700	\$ -
RB1	\$ 2,932,200	0%	100%	\$ -	\$ 2,932,200
RB3	\$ 492,200	0%	100%	\$ -	\$ 492,200
Total	\$ 19,638,200	13%	87%	\$ 2,488,762	\$ 17,149,438

Table 5-4
Estimated Costs of Capital Improvements
Recommended Debris Mitigation Facilities

Name	Total Estimated Cost	Percentage of Cost Attributable to:		Cost Attributable to:	
		Existing Development	Future Development	Existing Development	Future Development
Millrace Canal Diversion Floating Boom	\$ 60,000	100%	0%	\$ 60,000	\$ -
East Bench Canal Diversion Floating Boom	\$ 60,000	100%	0%	\$ 60,000	\$ -
Total	\$ 120,000	100%	0%	\$ 120,000	\$ -