



CITY COUNCIL AGENDA

COUNCIL CHAMBERS

TUESDAY, JANUARY 11, 2022

6:00 PM

1. **Call to Order/Roll Call/Pledge of Allegiance**
2. **Presentations/Introductions – None**
3. **Approve minutes of December 28, 2021 City Council Meeting, January 4, 2022 Special City Council Meeting and January 4, 2022 Special City Council Meeting-Closed Session**
 - A. December 28, 2021 City Council Meeting Minutes, January 4, 2022 Special City Council Meeting Minutes and January 4, 2022 Special City Council Meeting Minutes - Closed Session
4. **Consent Agenda**
 - A. List of Claims for Release
 - B. Resolution 2022-001 Approve Designation of Official Newspaper
 - C. Resolution 2022-002 Approve City Administrator Purchasing and Contracting Authority
 - D. Resolution 2022-003 Appoint Deputy City Administrator
 - E. Resolution 2022-004 Approve Designation of Authorized Signers, Official Depository and Broker/Dealers for City of Faribault
 - F. Resolution 2022-006 Accept Donation from Barta Machine to Police Department
 - G. Resolution 2022-007 Accept Donation from State Bank of Faribault to Police Department
 - H. Approve Hangar Rental Agreement Renewals
 - I. Resolution 2022-008 Approval of Equitable Sharing Agreement and Certification
 - J. Approve LG240B Application to Conduct Excluded Bingo for Infants Remembered in Silence (IRIS)
 - K. Adopt 2021 Comprehensive Water Plan Update
 - L. Adopt Sanitary Sewer Comprehensive Plan Update
 - M. Approve City Council Appointments to Committees, Boards, and Commissions
 - N. Resolution 2022-010 Amend Official Downtown Parking Restrictions Map
 - O. Resolution 2022-011 Approve 2022 Massage License Renewals
 - P. Resolution 2022-012 Approve 2022 Salvage Dealer License Renewals
 - Q. Resolution 2022-013 Approve 2022 Vehicles for Hire License Renewal
 - R. Approve Task Order No. 11 with Foth for Airfield Lighting Improvements Project at Airport
 - S. Resolution 2022-014 Accept Donation from The State Bank of Faribault
 - T. Resolution 2022-015 Authorize the Faribault Fire Department to Apply for the Hannah Lips Foundation Grant

U. Approve City of Faribault Employee Choice Vaccination Policy with Attestation Form

5. Requests to be Heard

6. Public Hearings

- A. Resolution 2022-009 Order Improvements and Order Preparation of Plans and Specifications for 2022 Street Overlay and Sidewalk Improvements - City Contract 2022-02

7. Items for Discussion

- A. Approve Summary Publication of Ordinance 2021-14 Amend Northgate Business Park PUD
- B. Approve Summary Publication of Ordinance 2021-15 Repeal and Replace Chapter 13, Article 2, Sec. 13-90 of the UDO related to Floodplain Management Districts
- C. Ordinance 2022-1 Amend the Specific Development Standards for Residential Care Facilities Outlined in Chapter 7, Sec. 7-30 of the City's Unified Development Ordinance - 1st Reading
- D. Ordinance 2022-2 Amend Table 11-1 of the City's Unified Development Ordinance Related to Residential Care Facilities in Commercial Districts - 1st Reading
- E. Ordinance 2022-3 Approve a Zoning Text Amendment to Create a Public/Institutional Zoning District - 1st Reading

8. Bids - None

9. Boards and Commissions Reports, Announcements and Project Updates

10. Adjournment

(The Council may meet as a group for dinner)

NOTE:

CC Closed Captioning of Council meetings available on FCTV.

Please contact the City Administrator's Office if you need special accommodations related to a disability while attending the City Council meeting.



CITY COUNCIL MINUTES

COUNCIL CHAMBERS

TUESDAY, DECEMBER 28, 2021

6:00 PM

Call to Order/Roll Call/Pledge of Allegiance

The regular meeting of the City Council was called to order by Mayor Kevin Voracek at 6:00pm. Councilors Peter van Sluis, Tom Spooner, and Janna Viscomi were in attendance. Councilors Sara Caron, Royal Ross and Jon Wood were absent. Also, in attendance was City Administrator Tim Murray, Assistant to the City Administrator Heather Slechta, Community and Economic Development Director Deanna Kuennen, Police Chief Andy Bohlen, and Public Works Director Travis Block.

Presentations/Introductions – None

Approve minutes of December 14, 2021 City Council Meeting

Motion by van Sluis, seconded by Viscomi to approve the minutes of the December 14, 2021 City Council Meeting and carried unanimously.

Consent Agenda

- A. List of Claims for Release
- B. Resolution 2021-281 Approve Premises Permit Application for Faribault Hockey Association
- C. Approve 2022 Non-Profit/Civic Organization Agreements
- D. Approve Change Order No.3 for Flood Mitigation Project
- E. Approve 2022 CIP Purchase of Two Marked Police Squads
- F. Approve CIP Purchase of New Portable Radios
- G. Resolution 2021-282 Accept Donation from Crane Creek Asphalt
- H. Approve Professional Services Agreement with KLJ for Noise Study Related to TH 3-30th Street NW Roundabout, City Contract 2023-04
- I. Approve Purchase of a Battery-Operated Extrication Tool

Motion by Spooner, seconded by van Sluis to approve Consent Agenda Items A-I and carried unanimously.

Requests to be Heard - None

Public Hearings – None

Items for Discussion

Ordinance 2021-14 Amend Northgate Business Park PUD - Second Reading

Community and Economic Development Director Deanna Kuennen informed the Council that the on December 14, 2021, the City Council approved the first reading of Ordinance 2021-14, which removed Lots 3, 4, 7, and 8, Block 1, NORTHGATE SECOND ADDITION from the Northgate Business Park Planned Unit Development (PUD), and allows the lots to develop per the permitted and conditional uses in the existing underlying C-2 Highway Commercial zoning district. Since its first reading, the City has received no comments and has made no changes to the ordinance. Kuennen further explained that because the publication of a summary ordinance requires an affirmative vote from five Council members, City Staff will ask the Council to approve the publication of a summary ordinance at the Council's January 11, 2022 meeting.

Motion by van Sluis, seconded by Spooner to approve Ordinance 2021-14 Amend Northgate Business Park PUD - Second Reading

Roll Call Vote:

Aye: Councilor van Sluis, Spooner, Viscomi and Mayor Voracek
Nay:

Motion carried 4:0

Ordinance 2021-15 Repeal and Replace Chapter 13, Article 2, Sec. 13-90 of the City's Unified Development Ordinance related to Floodplain Management Districts - Second Reading

Community and Economic Development Director Deanna Kuennen explained that on December 14, 2021, the City Council approved the first reading of Ordinance 2021-15 related to Faribault's floodplain management district. The ordinance simply amends the date of a flood insurance rate map (FIRM) recently prepared by the Federal Emergency Management Agency (FEMA). While the updated FIRM does not directly affect property in Faribault, the FIRM extends into a small area of Faribault. Consequently, FEMA requires that the City update its ordinance to refer to the new FIRM.

Since its first reading, the City has received no comments and has made no changes to the ordinance. Because the publication of a summary ordinance requires an affirmative vote from five Council members, City Staff will ask the Council to approve the publication of a summary ordinance at the Council's January 11, 2022 meeting.

Motion by Spooner, seconded by Viscomi to approve Ordinance 2021-15 Repeal and Replace Chapter 13, Article 2, Sec. 13-90 of the City's Unified Development Ordinance related to Floodplain Management Districts - Second Reading

Roll Call Vote:

Aye: Councilor van Sluis, Spooner, Viscomi and Mayor Voracek
Nay:

Motion carried 4:0

Bids - None

Boards and Commissions Reports, Announcements and Project Updates

The Monthly Financial Report was included as part of the meeting packet prior to the meeting.

City Administrator Tim Murray informed the Council and the Public that applications for Boards and Commissions are currently being accepted.

Mayor Voracek received a book from Wurzburg

Adjournment

Motion by Spooner, seconded by van Sluis to adjourn the meeting and carried unanimously.

Meeting adjourned at 6:05pm

Respectfully Submitted,

Heather Slechta
Assistant to the City Administrator



CITY COUNCIL MINUTES

PUBLIC MEETING ROOM

TUESDAY, JANUARY 4, 2022

6:00 PM

Call to Order/Roll Call

The special meeting of the City Council was called to order by Mayor Kevin Voracek at 6:00pm. Councilors Sara Caron, Royal Ross, Peter van Sluis, Tom Spooner and Janna Viscomi were in attendance. Councilor Jon Wood was absent. Also, in attendance was City Administrator Tim Murray, Assistant to the City Administrator Heather Slechta, Parks and Recreation Director Paul Peanasky, Community and Economic Development Director Deanna Kuennen, Public Works Director Travis Block, Finance Director Jeanne Day, and Human Resources Manager Kevin Bushard.

Items for Discussion

Resolution 2022-005 Approve a Consumption and Display Permit for Gather on Central LLC

City Administrator Tim Murray explained that Gather on Central LLC, has submitted an application for a Consumption and Display Permit. This permit type is issued by the Minnesota Department of Public Safety, Alcohol and Gambling Division. The Permit authorizes Gather on Central LLC to allow the consumption and display of alcohol by individuals that are renting space at 206 Central Ave for private parties and events. The applicant will abide by State statutes and City ordinances regarding all requirements and the hours of sale of alcoholic beverages. The Police Department conducted a background check and a review of the Certificate of Liability Insurance by the City Attorney has been completed. Consumption and Display Permits are valid through March 31st of each year.

Motion by Spooner, seconded by Ross to approve Resolution 2022-005 Approve a Consumption and Display Permit for Gather on Central LLC and carried unanimously.

Adjournment

Motion by van Sluis, seconded by Caron to adjourn the meeting and carried unanimously.

Meeting adjourned at 6:03pm

Respectfully Submitted,

Heather Slechta
Assistant to the City Administrator



SPECIAL CITY COUNCIL MEETING MINUTES

PUBLIC MEETING ROOM

TUESDAY, JANUARY 4, 2022

The Special meeting of the City Council was called to order by Mayor Kevin Voracek at 7:19 pm. Councilors in attendance included Sara Caron, Royal Ross, Peter van Sluis, Tom Spooner and Janna Viscomi. Councilor Jon Wood was absent. Also in attendance was City Administrator Tim Murray and Human Resources Manager Kevin Bushard.

Motion by Ross, seconded by van Sluis to close the Special City Council meeting.

The meeting was closed at 7:20 pm.

The City Council held a Special Closed Meeting pursuant to Minnesota Statutes, Section 13D.03, subdivision I(b) on Tuesday, November 2, 2021, for the following purpose: To consider strategies for labor negotiations, including negotiation strategies or developments or discussion and review of labor negotiations proposals, conducted pursuant to Minnesota Statutes Sections 179A.01-179A.025.

Motion by van Sluis, seconded by Spooner to open the Special City Council meeting.

The meeting was opened at 7:45 pm.

Adjournment

Motion by Caron, seconded by Ross to adjourn the meeting.

Meeting adjourned at 7:45 pm.

Respectfully Submitted,

Timothy C. Murray
City Administrator



Request for Council Action

TO: Mayor and City Council
THROUGH: Tim Murray, City Administrator
FROM: Jeanne Day, Finance Director
MEETING DATE: January 11, 2022
SUBJECT: List of Claims for Release

Background:

A copy of the list of claims is available for City Council review through the City Administrator, in the amount of \$784,215.37, which includes check numbers 173605 to 173723 and automatic clearing house payments.

The description line for each claim provides information to assist readers in understanding the purpose of the purchase and the department making the purchase. Initials of the department making the purchase are included in the description when possible. At the bottom of each page is a key, listing the primary funds to help identify the fund associated with the claim.

Recommendation:

Approve the attached List of Claims for Release.

Attachments:

1. 01-11-2022 Council AP List

AP
AP Council Approval 01-11-2022



User: astadler
Printed: 1/7/2022 9:49:27 AM

Check Num	Last Name	Acct 1	Amount	Description
0	5 Star Inspections Inc	101-42400-420-43090	14,747.61	Electrical Inspections - December
	5 Star Inspections Inc		14,747.61	
173613	Abbott Sharon	601-00000-000-20200	101.55	Refund Check 008228-001, 328 8 St NW
	Abbott Sharon		101.55	
0	All Pro Cleaners LLC	898-46310-000-44010	1,173.58	Janitorial Service December 2021-39.25 Hrs
	All Pro Cleaners LLC		1,173.58	
173614	Amazon Capital Services	101-42121-420-42410	89.65	Battery Stick/Stinger LED/ PolyStringer LED Switch Boot
173614	Amazon Capital Services	101-45140-450-42110	115.06	Neon Night Supplies
173614	Amazon Capital Services	101-45140-450-42110	13.98	Frostival Smores
173614	Amazon Capital Services	101-45140-450-42110	169.67	Fun Center Games
173614	Amazon Capital Services	101-45122-450-42110	29.94	Wallyballs
173614	Amazon Capital Services	101-42123-420-42020	31.89	Standing Dual LCD Monitor Desk Mount
173614	Amazon Capital Services	101-45140-450-42110	118.72	Frostival Supplies
173614	Amazon Capital Services	101-42110-420-42230	44.30	Eyewash Station Solution
173614	Amazon Capital Services	101-42121-420-42110	87.20	Black Face Masks
173614	Amazon Capital Services	101-45140-450-42110	37.27	Frostival Cocoa Cooler
173614	Amazon Capital Services	101-42220-420-42110	89.37	iPhone Charger Cables/iPad Otterboxs
173614	Amazon Capital Services	101-45140-450-42110	14.97	Frostival Event
173614	Amazon Capital Services	101-45110-450-42010	53.00	Markers
	Amazon Capital Services		895.02	
0	American Engineering Testing Inc	469-43121-430-45300	5,294.25	(2021-04) Materials Testing
	American Engineering Testing Inc		5,294.25	
173615	American Red Cross	101-45130-450-43131	200.00	Lifeguarding Certificates

Check Num	Last Name	Acct 1	Amount	Description
173615	American Red Cross	101-45130-450-43131	90.00	Babysitters Training Certificates
	American Red Cross		290.00	
173616		241-46330-461-44375	220.00	408 NW 13th Street Utility Reimbursement January 2022
			220.00	
0	Arrow Electric LLC	101-43160-430-44045	92.00	Locate For Gas Line Project
	Arrow Electric LLC		92.00	
173617	ASCAP	101-45110-450-44390	390.00	2022 License Fee - Acct No 500578841
	ASCAP		390.00	
173605	Aspen Mills	101-42123-420-42180	229.98	Vest Carrier Samples
173618	Aspen Mills	101-42123-420-42180	134.39	Mock Neck Shirt / T Kuchinka
	Aspen Mills		364.37	
173619	Auto Value Parts Store	101-43126-430-42110	6.35	Sandpaper
	Auto Value Parts Store		6.35	
173620	Axon Enterprise Inc	101-42123-420-44160	37,416.00	BWC Evidence.com License Year 3 Payment 2022
	Axon Enterprise Inc		37,416.00	
173621	Baker & Taylor Entertainment	101-45500-450-42190	3.02	Books
173621	Baker & Taylor Entertainment	101-45500-450-42190	116.18	Books
173621	Baker & Taylor Entertainment	101-45500-450-42190	82.12	Books
	Baker & Taylor Entertainment		201.32	
173622	Barta Machine LLC	101-43121-430-42210	726.97	Custom Made Pins & Shafts -Street #316 & #307
	Barta Machine LLC		726.97	
173623	Battles Noah	101-45140-450-42110	75.00	Live Music - Frostival
	Battles Noah		75.00	

Check Numb	Last Name	Acct 1	Amount	Description
0	BCM Construction Inc	601-49430-000-44050	9,593.10	(2021-07) Pay Request 2
	BCM Construction Inc		9,593.10	
173624	Berg Kirk	873-00000-000-20200	36.75	Refund Check 020962-000, 18214 Roberds Lake Blvd
	Berg Kirk		36.75	
0	BGMN Inc	101-43121-430-42130	62.56	SLC Grease for Stock
0	BGMN Inc	602-49450-000-42130	23.46	SLC Grease for Stock
0	BGMN Inc	101-42123-420-42130	15.64	SLC Grease for Stock
0	BGMN Inc	101-45200-450-42130	31.28	SLC Grease for Stock
0	BGMN Inc	601-49430-000-42130	23.46	SLC Grease for Stock
	BGMN Inc		156.40	
0	BHE Renewables	602-49480-000-43810	6,797.89	Solar Energy November
	BHE Renewables		6,797.89	
0	Border States Industries Inc	101-41940-410-42230	236.10	Light Bulbs
0	Border States Industries Inc	101-45122-450-42230	18.08	Light Bulb - Community Center
	Border States Industries Inc		254.18	
173625	Brody David	601-00000-000-20200	33.28	Refund Check 017938-000, 1201 Amber Ln
	Brody David		33.28	
173626	Bussert Karen M	101 42123 420 44390	20.00	License Plate / #24
173626	Bussert Karen M	431-42123-420-45500	620.00	Squad Decal - License Plate / #2
	Bussert Karen M		640.00	
173627	Canon Financial Services Inc	101-41940-410-44160	224.41	Copy Machine Lease
173627	Canon Financial Services Inc	101-42210-420-44160	68.46	Copier Charges 12/01/2021 to 12/31/2021
173627	Canon Financial Services Inc	101-42124-420-44160	201.90	Copy Machine Leases
173627	Canon Financial Services Inc	101-41940-410-44160	224.41	Copy Machine Lease
	Canon Financial Services Inc		719.18	
0	Cardmember Service	240-46210-460-43430	40.75	DEED & Econ Dev Authority Advertising
0	Cardmember Service	101-45500-450-42190	10.80	Books

Check Numb	Last Name	Acct 1	Amount	Description
0	Cardmember Service	101-45500-450-42190	67.79	Books
0	Cardmember Service	101-45500-450-42010	3.76	Hand Soap Refill
0	Cardmember Service	101-45500-450-42190	17.03	Books
0	Cardmember Service	101-45500-450-43130	12.99	Foam Dot Adhesive
0	Cardmember Service	101-45500-450-43130	7.13	Thread
0	Cardmember Service	101-45500-450-42010	39.20	Calendars
0	Cardmember Service	101-45500-450-42190	53.21	Books
0	Cardmember Service	101-45500-450-42010	9.42	Magnetic Hooks
0	Cardmember Service	101-42400-420-44330	231.04	2020 Plumbing Code Books
0	Cardmember Service	101-42123-420-43135	-48.27	Credit - Muddy Paws
0	Cardmember Service	101-45500-450-42190	-10.10	Book Return
0	Cardmember Service	101-45500-450-42190	8.26	Books
0	Cardmember Service	101-45500-450-42190	14.91	Books
0	Cardmember Service	101-42110-420-42180	98.00	Badge and Wallet" Badge Wallet
0	Cardmember Service	101-42123-420-43310	454.08	Hotel: SOTA Conf / T Kuchinka
0	Cardmember Service	101-42110-420-43220	118.00	USPS Store: Postage Stamps
0	Cardmember Service	101-45500-450-42010	13.98	Calendar
0	Cardmember Service	101-45500-450-42010	43.45	Kleenex/Isopropyl Alcohol/Lysol/Vinegar/Hand Soap/Dixie Cups
0	Cardmember Service	101-45110-450-43310	459.78	Embassy Suites - MRPA State Convention - Peanasky
0	Cardmember Service	101-45110-450-44330	14.99	Zoom - Monthly Subscription
0	Cardmember Service	101-45500-450-42410	109.89	Standing Desk Converter
0	Cardmember Service	101-45500-450-42190	17.43	Books
0	Cardmember Service	101-45500-450-42190	25.49	Books
0	Cardmember Service	240-46210-460-43140	25.62	MN Attorney General Training for EDA
0	Cardmember Service	101-45110-450-43310	459.78	Embassy Suites - MRPA State Convention - O'Brien & Barman
0	Cardmember Service	290-46500-462-43430	277.79	Promotional Stickers For Events
0	Cardmember Service	101-42123-420-43135	223.13	Airline Ticket to Send Cannon to New Facility
0	Cardmember Service	101-42210-420-42110	81.24	Wal Mart - Shop Towels/Hand Sanitizer/Trash Bags
0	Cardmember Service	101-45500-450-42190	14.69	Books
0	Cardmember Service	101-45500-450-42190	8.26	Books
0	Cardmember Service	101-42123-420-43310	454.08	Hotel: SOTA Conf / J Holm
0	Cardmember Service	101-45500-450-42190	15.10	Books
0	Cardmember Service	101-45500-450-42190	18.79	Books
0	Cardmember Service	101-45500-450-42010	7.28	Poly File Jacket
0	Cardmember Service	101-42121-420-44330	85.00	NRA Membership / J Burbank
0	Cardmember Service	101-45500-450-42190	20.49	Books
0	Cardmember Service	101-42123-420-43310	454.08	Hotel: SOTA Conf / S Angle
0	Cardmember Service	101-45500-450-42190	136.37	Books
	Cardmember Service		4,094.71	
173606	CenturyLink	101-45500-450-43210	49.00	507 334-0138 069 Elevator Phone
173606	CenturyLink	601-49430-000-43210	83.04	507-332-9045 313Sensus Back-up Dialer

Check Numb	Last Name	Acct 1	Amount	Description
173606	CenturyLink	602-49480-000-43210	175.17	507-334-8696 581
173606	CenturyLink	602-49450-000-43210	53.96	507-334-0412 356 Matteson St Lift Station
173606	CenturyLink	225-49810-430-43210	65.39	507-334-2850 219
173606	CenturyLink	902-00000-000-23935	-844.87	Monthly Service 12/13/21-01/12/22
173606	CenturyLink	601-49430-000-43210	65.39	507-334-0557 655
173606	CenturyLink	101-41940-410-43210	287.53	507-332-2400 019
173606	CenturyLink	602-49450-000-43210	65.39	507-334-0586 787
173606	CenturyLink	902-00000-000-23935	844.87	Monthly Service 12/13/21-01/12/22
CenturyLink			844.87	
0	Cintas Corporation	601-49430-000-44060	25.25	Uniform Cleaning Water
0	Cintas Corporation	898-46310-000-44010	24.00	Sanitizer Service
0	Cintas Corporation	898-46310-000-42110	2.00	Hand Sanitizer
0	Cintas Corporation	602-49480-000-44060	10.96	Lab Towels Floor Mats
0	Cintas Corporation	602-49450-000-44060	14.97	Uniform Cleaning Sewer
0	Cintas Corporation	898-46310-000-44060	42.98	Mats
0	Cintas Corporation	601-49430-000-44060	25.25	Uniform Cleaning Water
0	Cintas Corporation	101-43121-430-44060	26.49	Uniform Cleaning Streets
0	Cintas Corporation	602-49480-000-44060	23.28	Lab Towels Floor Mats
0	Cintas Corporation	602-49450-000-44060	14.97	Uniform Cleaning Sewer
0	Cintas Corporation	101-43126-430-44060	3.50	Shop Towels
0	Cintas Corporation	101-43126-430-44060	3.50	Shop Towels
0	Cintas Corporation	602-49480-000-44060	33.20	Uniform Laundry
0	Cintas Corporation	101-43126-430-44060	12.68	Uniform Cleaning Mechanics
0	Cintas Corporation	602-49480-000-44060	30.45	Uniform Laundry
0	Cintas Corporation	602-49450-000-44060	6.59	Uniform Cleaning Stormwater
0	Cintas Corporation	603-49500-000-44060	6.59	Uniform Cleaning Stormwater
0	Cintas Corporation	101-45122-450-44060	14.40	Laundry Services - Mops
0	Cintas Corporation	101-43121-430-44060	26.49	Uniform Cleaning Streets
0	Cintas Corporation	101-43126-430-44060	12.68	Uniform Cleaning Mechanics
0	Cintas Corporation	101-45200-450-44060	30.89	Laundry Service - Uniforms
Cintas Corporation			391.12	
173628	City of Faribault	241-46330-461-44390	110.00	830 SW 9th Avenue Rental Registration License 2022
173628	City of Faribault	241-46330-461-44390	110.00	523 Division Street Rental Registration License Fee 2022
173628	City of Faribault	241-46330-461-44390	210.00	1518 -1526 Western Ave Rental Registration License Fee 2022
173628	City of Faribault	211-46310-460-44390	110.00	16 SE 1st Street SE Rental Registration License Fee 2022
173628	City of Faribault	241-46330-461-44390	190.00	519-527 Lincoln Ave Rental Registration License Fee 2022
173628	City of Faribault	241-46330-461-44390	110.00	404 NW 13th Street Rental Registration License Fee 2022
173628	City of Faribault	241-46330-461-44390	150.00	904 A Spring Road Rental Registration License Fee 2022
173628	City of Faribault	241-46330-461-44390	210.00	1528 - 1536 Western Rental Registration License Fee

Check Numb	Last Name	Acct 1	Amount	Description
173628	City of Faribault	241-46330-461-44390	150.00	904 C Spring Road Rental Registration License Fee 2022
173628	City of Faribault	241-46330-461-44390	150.00	1818-1820 Shumway Rental Registration License Fee 2022
173628	City of Faribault	241-46330-461-44390	110.00	1225 NW 2nd Street Rental Registration License Fee 2022
173628	City of Faribault	241-46330-461-44390	170.00	1319-1323 NW 7th Street Rental Registration License Fee 2022
173628	City of Faribault	241-46330-461-44375	187.00	910 SW 1st Street Utility Reimbursement Water Acct # 022499-001
173628	City of Faribault	241-46330-461-44390	150.00	1810 -1812 Shumway Rental Registration License Fee 2022
173628	City of Faribault	898-46310-000-44390	1,130.00	1324 Prairie Ave Rental License Fees 2022
173628	City of Faribault	241-46330-461-44390	150.00	902 A Spring Road Rental Registration License Fee 2022
173628	City of Faribault	241-46330-461-44390	150.00	900 A-B Spring Road Rental Registration License Fee 2022
173628	City of Faribault	241-46330-461-44390	110.00	725 Willow Street Rental Registration Fee 2022
173628	City of Faribault	241-46330-461-44390	110.00	20 NE 14th Street Rental Registration License Fee 2022
173628	City of Faribault	241-46330-461-44390	150.00	1814-1816 Shumway Rental Registration License Fee 2022
173628	City of Faribault	241-46330-461-44390	150.00	408-412 NW 13th Street Rental Registration License Fee 2022
173628	City of Faribault	241-46330-461-44390	150.00	900C-D Spring Road Rental Registration License Fee 2022
173628	City of Faribault	241-46330-461-44390	230.00	910-920 SW 1st Street Rental Registration License Fee 2022
173628	City of Faribault	241-46330-461-44390	150.00	1806-1808 Shumway Rental Registration Fee 2022
	City of Faribault		4,597.00	
173629	CL Bensen Company Inc	101-42110-420-42230	78.51	Pleated Filters
	CL Bensen Company Inc		78.51	
173630	Clean Choice Energy	602-49480-000-43810	57.71	304239286214 14 St NE
173630	Clean Choice Energy	101-45200-450-43810	17.14	3043066891800 Alexander Dr Concession Stand
173630	Clean Choice Energy	101-45200-450-43810	408.00	303239611330 9th Ave SW Sr High Tennis Cts
173630	Clean Choice Energy	101-45200-450-43810	133.85	303510224520 3rd St NW (Central Pk Bandstand)
173630	Clean Choice Energy	101-45200-450-43810	117.15	302458578828 8th Ave NW (Park Shop)
173630	Clean Choice Energy	101-43160-430-43810	12.94	304116511800 Lyndale Ave SW
173630	Clean Choice Energy	101-43160-430-43810	96.53	303661815495 Heritage Place
173630	Clean Choice Energy	602-49450-000-43810	11.27	303203605319 Lind St Lift Station
173630	Clean Choice Energy	101-45126-450-43810	122.64	303373970117 Shumway Ave
173630	Clean Choice Energy	101-43160-430-43810	11.71	302767481210 3 St NE St Light
173630	Clean Choice Energy	101-45200-450-43810	2,444.10	304017445900 Lyndale Ave N
173630	Clean Choice Energy	101-43121-430-43810	254.36	3040518161200 Belview Tr
173630	Clean Choice Energy	601-49430-000-43810	119.90	3039299721904 Fairgrounds Dr Well
173630	Clean Choice Energy	101-43170-430-43810	457.34	3025252474050 Highway 60W Signal Lights
173630	Clean Choice Energy	101-43170-430-43810	34.31	3021541976 1/2 4 St NW Signal Liights
173630	Clean Choice Energy	902-00000-000-23935	9,040.87	Solar Bill - November
173630	Clean Choice Energy	101-43170-430-43810	105.51	3041315032200 30 St NW Signal Lights
173630	Clean Choice Energy	101-42210-420-43810	416.05	302527702122 2nd St NW (Fire Hall)
173630	Clean Choice Energy	101-43170-430-43810	9.85	303021725126 4 St NW Signal Lights
173630	Clean Choice Energy	101-45200-450-43810	252.23	3025764661815 Alexander Dr

Check Numb	Last Name	Acct 1	Amount	Description
173630	Clean Choice Energy	101-43170-430-43810	879.51	302954624400 4 St NW Signal Lights
173630	Clean Choice Energy	602-49450-000-43810	1,199.02	3036919802219 Grant St NW Lift Station
173630	Clean Choice Energy	101-43170-430-43810	104.93	3042653021990A Lyndale Ave N Signal
173630	Clean Choice Energy	101-43160-430-43810	14.98	3041165101904 Grant St
173630	Clean Choice Energy	101-43160-430-43810	14.50	3041165121000 Lyndale Ave S
173630	Clean Choice Energy	101-45200-450-43810	11.14	302261595920 9th Ave SW
173630	Clean Choice Energy	603-49500-000-43810	16.69	3040518161200 Belview Tr
173630	Clean Choice Energy	101-43160-430-43810	77.99	3041576453305 Highway 60
173630	Clean Choice Energy	101-45200-450-43810	1,152.82	3023211021000 7th Ave SW
173630	Clean Choice Energy	601-49430-000-43810	254.36	3040518161200 Belview Tr
173630	Clean Choice Energy	101-43160-430-43810	172.75	3041576321602 2nd Ave NW
173630	Clean Choice Energy	101-43170-430-43810	23.42	303507016415 8th Ave NW Signal Lights
173630	Clean Choice Energy	902-00000-000-23935	-9,040.87	Solar Bill - November
173630	Clean Choice Energy	602-49450-000-43810	36.17	3040518161200 Belview Tr
	Clean Choice Energy		9,040.87	
173631	Community Co-op Oil Assn	101-45122-450-42120	29.65	Gasoline - Snow Blower
173631	Community Co-op Oil Assn	101-42220-420-44040	120.00	Mount and Balance Tires
	Community Co-op Oil Assn		149.65	
173632	Consolidated Communications	101-41110-410-43250	13.63	Council Chambers TV Services
173632	Consolidated Communications	902-00000-000-23935	-894.43	Consolidated Communications
173632	Consolidated Communications	101-41940-410-43250	227.22	City Hall Metro Line
173632	Consolidated Communications	601-49430-000-43250	73.82	Water Plant DSL w/ Static IP
173632	Consolidated Communications	602-49450-000-43210	57.57	507-331-3308 Liftsation Phone Service
173632	Consolidated Communications	902-00000-000-23935	894.43	Consolidated Communications Monthly Bill
173632	Consolidated Communications	101-42110-420-43210	579.76	Police Phone Services and Long Distance Fees
	Consolidated Communications		952.00	
173633	Core & Main LP	601-49430-000-42410	1,180.54	Command Links For Programming Water Meter Radios
	Core & Main LP		1,180.54	
173634	Culligan	101-45122-450-44160	34.00	Water Equipment Rental
173634	Culligan	898-46310-000-44010	38.95	Water Softener Service
173634	Culligan	101-45500-450-44160	35.00	Drinking Water Equip Rental
173634	Culligan	101-45500-450-44010	230.32	Water Softener Repair
173634	Culligan	101-41940-410-44160	-1.00	Water Equipment Rental - Credit
173634	Culligan	101-42110-420-42230	158.60	Water
173634	Culligan	101-41940-410-44160	148.50	Water Equipment Rental

Check Numb	Last Name	Acct 1	Amount	Description
173634	Culligan	602-49480-000-44160	45.00	Softener Rental
173634	Culligan	898-46310-000-42110	39.00	Solar Salt
	Culligan		728.37	
173635	Dakota County Technical College	101-43121-430-43140	400.00	Snowplow Driving Course
	Dakota County Technical College		400.00	
173636	Deputy Registrar	101-42110-420-44390	14.25	Tabs / #5
	Deputy Registrar		14.25	
173637	Doll Daniel	601-00000-000-20200	116.38	Refund Check 015294-000, 616 Prairie Ave
	Doll Daniel		116.38	
173638	E O Johnson Company Inc-Dallas	101-45500-450-44160	300.91	Copier Lanier IM C2500
173638	E O Johnson Company Inc-Dallas	101-45110-450-44160	260.07	Copier Lease Payment
	E O Johnson Company Inc-Dallas		560.98	
173639	Earl F Andersen Inc	101-43170-430-42240	1,394.10	Breakaway Bases/Green Plates For Street Signs
	Earl F Andersen Inc		1,394.10	
173640	Ehlers & Associates Inc	290-46500-462-43090	135.00	General TIF Consulting
	Ehlers & Associates Inc		135.00	
0	Electric Pump Inc	603-49500-000-44045	370.00	Park Ave Sanitary Liftstation Repairs
0	Electric Pump Inc	602-49450-000-44045	514.65	Repairs to Willow Liftstation
0	Electric Pump Inc	602-49450-000-42210	1,772.00	Controller For Willow Liftstation
	Electric Pump Inc		2,656.65	
173641	EleMech, Inc.	601-49430-000-43095	1,600.00	Service Agreement Water Fill Station 2022
	EleMech, Inc.		1,600.00	
0	Elsmore Swim Shop	101-45122-450-42990	313.13	Swim Caps for Resale at Community Center

Check Numb	Last Name	Acct 1	Amount	Description
	Elsmore Swim Shop		313.13	
173642	Emergency Apparatus Maintenance Inc	101-42220-420-42210	96.36	90 Degree Auto Drain Valve
	Emergency Apparatus Maintenance Inc		96.36	
173643	Fame Awards	101-45130-450-42110	133.00	Free Throw Contest Plaques
	Fame Awards		133.00	
173644	Fareway Stores Inc #126	101-42123-420-42115	4.14	Treats for Drug Burn
173644	Fareway Stores Inc #126	101-41940-410-42115	20.97	Coffee
	Fareway Stores Inc #126		25.11	
173645	Faribault Ace Hardware	101-43121-430-42210	23.99	Bolts And Bushing For Fender Mount / Street #218
173645	Faribault Ace Hardware	101-41940-410-42110	50.84	Hooks/Cleaner/Wood Putty & Paper Towels
173645	Faribault Ace Hardware	602-49480-000-42110	40.18	Glass Cleaner & Degreaser
173645	Faribault Ace Hardware	601-49430-000-42110	4.72	Fasteners
173645	Faribault Ace Hardware	601-49430-000-42410	35.60	Saw Blades/Drill Bit
173645	Faribault Ace Hardware	101-45200-450-42110	11.04	Plug & Key
173645	Faribault Ace Hardware	602-49480-000-42110	86.14	Cleaning Supplies and Ice Melt
173645	Faribault Ace Hardware	101-42110-420-42110	23.18	Ice Scrapper - Trufuel
	Faribault Ace Hardware		275.69	
173646	Faribault Area Chamber of Commerce	101-41110-410-44384	8,307.20	Lodging Tax
	Faribault Area Chamber of Commerce		8,307.20	
0	Faribault Fleet Supply Inc	101-42121-420-42110	8.58	Turn Buckles / #1021
0	Faribault Fleet Supply Inc	601-49430-000-42110	11.96	Heat Shrinks
0	Faribault Fleet Supply Inc	603-49500-000-42110	58.94	Chainsaw Supplies
0	Faribault Fleet Supply Inc	101-43126-430-42110	13.98	Brush For Shop
	Faribault Fleet Supply Inc		93.46	
173647	Faribault Rental Equipment Inc	101-43121-430-42110	13.99	Chain For Chainsaw
173647	Faribault Rental Equipment Inc	101-43121-430-42410	1,366.95	Chainsaw
	Faribault Rental Equipment Inc		1,380.94	

Check Numb	Last Name	Acct 1	Amount	Description
173648	Faribault Rifle & Pistol Club	101-42110-420-44330	80.00	Membership Dues 2022 / D Dillon
173648	Faribault Rifle & Pistol Club	101-42123-420-44330	80.00	Membership Dues 2022
173648	Faribault Rifle & Pistol Club	101-42123-420-44330	80.00	Annual Dues 2022
173648	Faribault Rifle & Pistol Club	101-42121-420-44330	80.00	Membership Dues 2022 / K Willers
	Faribault Rifle & Pistol Club		320.00	
0	Fette Electronics Inc	101-42123-420-42020	16.99	USBC Parts
	Fette Electronics Inc		16.99	
173649	Fremarek, Inc.	602-49450-000-42160	2,088.38	Sanitary Liftstation Chemicals
	Fremarek, Inc.		2,088.38	
173650	Geiger	101-42110-420-42180	33.02	Sweatshirt - Paul C.
173650	Geiger	101-45110-450-42180	33.01	Sweatshirt - Mona G.
173650	Geiger	101-41940-410-42180	81.35	Shirts
	Geiger		147.38	
173651	Glenn's Service LLC	101-42121-420-43090	65.00	Tow Silverado from Walmart to FPD
173651	Glenn's Service LLC	215-42123-420-43090	60.00	Tow '07 Focus 2nd Ave to FPD Storage
173651	Glenn's Service LLC	101-42121-420-43090	82.50	Tow '16 Chevy 15 1/2 St to FPD Storage/21-4168
	Glenn's Service LLC		207.50	
0	Gliem Brandon	101-42123-420-43310	15.00	Lunch Per Diem / Patrol Supervision of Critical Incidents
	Gliem Brandon		15.00	
0	Gopher State One Call	603-49500-000-43090	31.05	Tickets for December 2021
0	Gopher State One Call	601-49430-000-43090	31.05	Tickets for December 2021
0	Gopher State One Call	602-49450-000-43090	31.05	Tickets for December 2021
	Gopher State One Call		93.15	
173652	Grainger Inc	101-42210-420-42230	46.70	Ice Melt 50 # Carton
173652	Grainger Inc	602-49480-000-42210	185.35	Heater Fan
	Grainger Inc		232.05	
0	Guardian Fleet Safety	215-42123-420-45500	9,034.05	Build Out For New Squad / #2

Check Numb	Last Name	Acct 1	Amount	Description
	Guardian Fleet Safety		9,034.05	
173653	Hach Company	601-49430-000-42110	150.32	WTP Water Testing Supplies
	Hach Company		150.32	
173654	Harlequin Sales Corp/Reader Service	101-45500-450-42190	30.30	Books
173654	Harlequin Sales Corp/Reader Service	101-45500-450-42190	21.96	Books
	Harlequin Sales Corp/Reader Service		52.26	
173655	Hauff Mid-America Sports	101-45126-450-42110	823.64	Basketballs
	Hauff Mid-America Sports		823.64	
173656	Hawkins Inc	601-49430-000-42160	0.01	Chlorine Cylinder Return
173656	Hawkins Inc	601-49430-000-42160	677.00	Chlorine For Water Treament
173656	Hawkins Inc	601-49430-000-42160	-0.01	Chlorine Cylinder Return
173656	Hawkins Inc	602-49480-000-42160	1,269.41	Bleach Filament Control
	Hawkins Inc		1,946.41	
173657	HD Supply Facilities Maintenance	241-46330-461-42110	27.12	Light Switch Wall Plates 80
173657	HD Supply Facilities Maintenance	898-46310-000-42110	96.72	Door Kickplates
173657	HD Supply Facilities Maintenance	241-46330-461-42110	455.84	Passage Knob/Splash Guards//Fill Valve/Toilet Wax Rings/DAP
	HD Supply Facilities Maintenance		579.68	
0	Heiman Fire Equipment	101-42220-420-42170	1,031.35	Coveralls 3XL (Qty. 2)
0	Heiman Fire Equipment	101-42220-420-42170	-403.52	Coveralls Size 3XL - Return
0	Heiman Fire Equipment	101-42220-420-42210	292.25	Adapter
0	Heiman Fire Equipment	101-42220-420-42170	540.30	Coveralls (1)
0	Heiman Fire Equipment	101-42220-420-42170	-403.52	Coveralls 3XL - Return
0	Heiman Fire Equipment	101-42220-420-42410	82.58	Hydrant Wrench
	Heiman Fire Equipment		1,139.44	
173658	Held Gavin	601-00000-000-20200	16.14	Refund Check 023571-000, 1004 1 St NE
	Held Gavin		16.14	
173659	Hillyard Hutchinson	101-42110-420-42230	478.71	Urinal Screen - Enmotion Towels - Tissue

Check Numb	Last Name	Acct 1	Amount	Description
	Hillyard Hutchinson		478.71	
173660	Holmblad Fran	601-00000-000-20200	12.59	Refund Check 007956-000, 28 Mitchell Dr
	Holmblad Fran		12.59	
173661	HSG, LLC	101-42123-420-42410	160.22	Pistol Mount - Handcuff Mount / SWAT
	HSG, LLC		160.22	
173662		241-46330-461-44375	206.00	523 Lincoln Ave Utility Reimbursement January 2022
			206.00	
173663	Hydro-Klean LLC	602-49450-000-45300	74,128.98	(2021-08) Pay Req. 2
	Hydro-Klean LLC		74,128.98	
173610	ICMA Retirement Trust 457	101-00000-000-21706	335.00	PR Batch 00526.12.2021 ICMA Deferred Comp
	ICMA Retirement Trust 457		335.00	
173664	IFACS	101-43121-430-42210	78.30	Wing Bolts / Street #208
	IFACS		78.30	
0	Innovative Office Solutions LLC	601-49430-000-42020	69.44	Ink Cartridges for Water Plant
0	Innovative Office Solutions LLC	101-45110-450-42010	10.98	Zip Lock Bags
0	Innovative Office Solutions LLC	601-49430-000-42010	9.12	Copier Paper/Calendar Book
0	Innovative Office Solutions LLC	101-42124-420-42010	27.35	Desk Calendar/Ruled Paper
0	Innovative Office Solutions LLC	101-45110-450-42010	433.19	Pens/Scissors/Mouse Pads/Markers/Rulers/USB Drives/Etc
0	Innovative Office Solutions LLC	240-46210-460-42010	12.60	Band-aids/Bandages
0	Innovative Office Solutions LLC	101-41320-410-42010	87.66	Copier Paper/Calendar Book
0	Innovative Office Solutions LLC	101-43121-430-42010	27.60	Week At A Glance Calendars
0	Innovative Office Solutions LLC	603-49500-000-42010	1.30	Copier Paper/Calendar Book
0	Innovative Office Solutions LLC	101-45200-450-42010	17.71	Calendars
0	Innovative Office Solutions LLC	101-45110-450-42010	30.84	Canned Air
0	Innovative Office Solutions LLC	101-43121-430-42010	20.03	Desk Calendar
0	Innovative Office Solutions LLC	101-45110-450-42010	19.12	Markers & Push Pins
0	Innovative Office Solutions LLC	101-42400-420-42010	80.52	11x17 Paper/Calendar/Pens/Pencils/Labels
0	Innovative Office Solutions LLC	602-49450-000-42010	9.12	Copier Paper/Calendar Book
0	Innovative Office Solutions LLC	101-41800-410-42010	32.80	Planner Notebooks

Check Numb	Last Name	Acct 1	Amount	Description
0	Innovative Office Solutions LLC	101-45110-450-42010	217.39	Highlighters/Binders/Staplers
0	Innovative Office Solutions LLC	101-42121-420-42110	130.28	Paper Plates - Bowls
	Innovative Office Solutions LLC		1,237.05	
0	Internal Revenue Service	101-00000-000-21703	16,534.94	PR Batch 00526.12.2021 FICA Employer
0	Internal Revenue Service	101-00000-000-21701	42,759.36	PR Batch 00526.12.2021 Federal Income Tax
0	Internal Revenue Service	101-00000-000-21703	16,534.94	PR Batch 00526.12.2021 FICA Employee
0	Internal Revenue Service	101-00000-000-21704	6,127.79	PR Batch 00526.12.2021 Medicare Employer
0	Internal Revenue Service	101-00000-000-21704	6,127.79	PR Batch 00526.12.2021 Medicare Employee
	Internal Revenue Service		88,084.82	
173665	Jeff Jandro Properties LLC	601-00000-000-20200	25.43	Refund Check 008015-031, 1020 8 Ave SW
	Jeff Jandro Properties LLC		25.43	
0	Kimley-Horn and Associates Inc	469-43121-430-45300	1,665.26	2nd Ave Bridge Through 11/30/2021
	Kimley-Horn and Associates Inc		1,665.26	
0	Krenik Mark	101-42123-420-43310	15.00	Lunch Per Diem / Patrol Supervision of Critical Incidents
	Krenik Mark		15.00	
173666	Larkin Jimmie	898-46310-000-44010	70.54	Monthly Fire Alarm/Elevator/Occupant Monitoring
	Larkin Jimmie		70.54	
173667	Larson Milo	101 45110 450 42030	487.00	Thank You Cards
173667	Larson Milo	101-43190-430-42010	46.85	Notary Stamp - Manz
	Larson Milo		533.85	
173668	League of Minnesota Cities	101-42123-420-44330	2,970.00	Patrol Training Subscription for 2022
	League of Minnesota Cities		2,970.00	
0	Lerner Publishing Group	101-45500-450-42190	21.99	Books
	Lerner Publishing Group		21.99	
173669	Little Falls Machine Inc	101-43121-430-42210	187.20	Bolt/Pin/Clevis For Plow On #208

Check Numb	Last Name	Acct 1	Amount	Description
	Little Falls Machine Inc		187.20	
173670	Loffler Companies Inc	601-49430-000-44160	9.49	Copies December 2021 PWP
173670	Loffler Companies Inc	602-49450-000-44160	9.49	Copies December 2021 PWP
173670	Loffler Companies Inc	101-42124-420-44160	116.32	Black/White and Color Copy Costs
173670	Loffler Companies Inc	101-43121-430-44160	91.15	Copies December 2021 PWP
173670	Loffler Companies Inc	101-42210-420-44160	39.53	Copier Charges 12/01/2021 to 12/31/2021
173670	Loffler Companies Inc	603-49500-000-44160	1.34	Copies December 2021 PWP
	Loffler Companies Inc		267.32	
0	MacQueen Equipment LLC	101-42220-420-42110	56.50	Gasket Seal
	MacQueen Equipment LLC		56.50	
0	Marco Technologies LLC	101-41320-410-44045	25.42	Administration Print Fee
0	Marco Technologies LLC	902-00000-000-23935	361.70	Marco Print Usage
0	Marco Technologies LLC	101-42123-420-44045	53.71	Police Patrol Print Fee
0	Marco Technologies LLC	240-46210-460-44045	25.42	Community & Economic Development Print Fee
0	Marco Technologies LLC	101-45126-450-44045	12.71	Washinton Rec Print Fee
0	Marco Technologies LLC	101-42110-420-44045	12.71	Police Administration Print Fee
0	Marco Technologies LLC	902-00000-000-23935	-361.70	Marco Main 1
0	Marco Technologies LLC	101-43110-430-44045	12.71	Public Works Department Print Fee
0	Marco Technologies LLC	101-41510-410-44045	70.22	Finance Print Fee
0	Marco Technologies LLC	101-45200-450-44045	12.71	Parks Print Fee
0	Marco Technologies LLC	101-43126-430-44045	12.71	Public Works Maintenance Shop Print Fee
0	Marco Technologies LLC	101-45110-450-44045	12.71	Community Center Back Desk Print Fee
0	Marco Technologies LLC	101-41800-410-44045	38.12	HR Print Fee
0	Marco Technologies LLC	101-42124-420-44045	45.13	Police Records and Evid. Print Fee
0	Marco Technologies LLC	101-45500-450-44045	27.42	Library Print Fee
	Marco Technologies LLC		361.70	
173671	Martin Sharon	601-00000-000-20200	17.46	Refund Check 015743-003, 1032 7 Ave SW
173671	Martin Sharon	601-00000-000-20200	31.98	Refund Check 015743-003, 1032 7 Ave SW
	Martin Sharon		49.44	
173672	Mason City Police Department	101-42121-420-43090	30.95	Copies of Report / 21-4129
	Mason City Police Department		30.95	

Check Numb	Last Name	Acct 1	Amount	Description
173673	Mead Daniel or Alice	601-00000-000-20200	12.10	Refund Check 007865-000, 9 St James Bay
	Mead Daniel or Alice		12.10	
173674	Meisner Roofing & Building Maintenance Inc	101-45500-450-44010	537.00	Roof Repair Library
	Meisner Roofing & Building Maintenance Inc		537.00	
0	Met Con Companies	101-43125-430-43090	4,772.00	Snow Hauling
	Met Con Companies		4,772.00	
173675	Midwest Tape LLC	101-45500-450-42192	26.24	Audio/Visual
	Midwest Tape LLC		26.24	
173676	Minnesota Chiefs of Police Association	101-42110-420-44330	180.00	Membership Dues 2022 / J Severson
173676	Minnesota Chiefs of Police Association	101-42110-420-42030	114.00	Permit to Purchase Handgun Cards
173676	Minnesota Chiefs of Police Association	101-42110-420-44330	406.00	Membership Dues 2022 / A Bohlen
173676	Minnesota Chiefs of Police Association	101-42110-420-44330	180.00	Membership Dues 2022 / N Pederson
	Minnesota Chiefs of Police Association		880.00	
0	Minnesota Child Support Payment Center	101-00000-000-21716	426.30	PR Batch 00526.12.2021 Child Support
	Minnesota Child Support Payment Center		426.30	
173677	Minnesota Council of Airports	225-49810-430-44330	150.00	MCOA Membership Dues for 2022
	Minnesota Council of Airports		150.00	
173608	Minnesota Department of Health	601-00000-000-20800	17,867.00	Water Supply Connection Fee
173607	Minnesota Department of Health	601-49430-000-44330	23.00	MDH Class D Certification Renewal-Spencer McDermott
	Minnesota Department of Health		17,890.00	
173678	Minnesota Department of Labor & Industry	101-00000-420-36260	-25.00	December 2021 Surcharge Retained
173678	Minnesota Department of Labor & Industry	101-00000-000-20820	1,074.70	December 2021 Surcharge
	Minnesota Department of Labor & Industry		1,049.70	
0	Minnesota Department of Revenue	101-00000-000-21702	18,283.93	PR Batch 00526.12.2021 State Income Tax

Check Numb	Last Name	Acct 1	Amount	Description
	Minnesota Department of Revenue		18,283.93	
0	Minnesota Elevator Inc	101-41940-410-44010	187.88	Monthly Elevator Service - City Hall - January
0	Minnesota Elevator Inc	898-46310-000-44010	199.83	January 2022 Monthly Elevator Service
	Minnesota Elevator Inc		387.71	
173679	Minnesota State Fire Chiefs Association	101-42210-420-44330	100.00	Membership Renewal thru 12/31/2022
	Minnesota State Fire Chiefs Association		100.00	
0	Minnesota Valley Testing Labs Inc	602-49480-000-43090	393.80	SIU Lab Testing
0	Minnesota Valley Testing Labs Inc	602-49480-000-43090	88.40	SIU Lab Testing
0	Minnesota Valley Testing Labs Inc	602-49480-000-43090	191.00	SIU Lab Testing
0	Minnesota Valley Testing Labs Inc	602-49480-000-43090	191.00	SIU Lab Testing
0	Minnesota Valley Testing Labs Inc	602-49480-000-43090	393.80	SIU Lab Testing
0	Minnesota Valley Testing Labs Inc	602-49480-000-43090	156.80	SIU Lab Testing
	Minnesota Valley Testing Labs Inc		1,414.80	
173680	Mississippi Welders Supply Inc	101-43126-430-42110	207.03	Welding Gas
	Mississippi Welders Supply Inc		207.03	
173681	MNIAAI	101-42210-420-44330	25.00	Membership Renewal thru 12/31/2022
	MNIAAI		25.00	
173682		241-46330-461-44375	242.00	830 SW 9th Ave Utility Reimbursement January 2022
			242.00	
0	Motor Parts & Equipment Corp	601-49430-000-42210	3.88	Connectors for Stock
0	Motor Parts & Equipment Corp	602-49450-000-42210	280.50	Battery Cables Truck #1
0	Motor Parts & Equipment Corp	101-43126-430-42410	23.39	Digital Tire Gauge
0	Motor Parts & Equipment Corp	101-43126-430-42110	4.44	Lights
0	Motor Parts & Equipment Corp	101-45110-450-42210	33.38	Windshield Wipers
0	Motor Parts & Equipment Corp	101-45200-450-42210	5.16	Connectors for Stock
0	Motor Parts & Equipment Corp	101-43121-430-42210	6.29	Fuel Cap / Street #719
0	Motor Parts & Equipment Corp	602-49480-000-42210	-58.41	Parts For Truck 1 Credit
0	Motor Parts & Equipment Corp	101-43126-430-42110	5.29	Wire Connectors
0	Motor Parts & Equipment Corp	602-49450-000-42210	3.88	Connectors for Stock

Check Numb	Last Name	Acct 1	Amount	Description
0	Motor Parts & Equipment Corp	101-42123-420-42210	2.59	Connectors for Stock
0	Motor Parts & Equipment Corp	101-43121-430-42210	10.34	Connectors for Stock
0	Motor Parts & Equipment Corp	602-49450-000-42210	-168.74	Cables Utilities Truck #1 Credit
0	Motor Parts & Equipment Corp	602-49450-000-42210	382.90	Batterycables For Utilities Truck #1
0	Motor Parts & Equipment Corp	602-49480-000-42130	28.68	Fuel Oil 30 Quart
0	Motor Parts & Equipment Corp	101-42123-420-42210	25.19	Windshield Washer Pump / #3
0	Motor Parts & Equipment Corp	101-43126-430-42110	16.58	Paint
0	Motor Parts & Equipment Corp	101-43121-430-42210	22.48	Sander Light / Street #104
0	Motor Parts & Equipment Corp	601-49430-000-42210	30.36	Trailer #13 Brake Battery
0	Motor Parts & Equipment Corp	101-43121-430-42210	7.91	Door Seal / Street #719
	Motor Parts & Equipment Corp		666.09	
0	NCL of Wisconsin Inc	602-49480-000-42160	222.59	Lab Supplies
	NCL of Wisconsin Inc		222.59	
173683	NJ Criminal Interdiction LLC	101-42123-420-43140	199.00	Criminal Motel/Etc Training / Mike Shuda
	NJ Criminal Interdiction LLC		199.00	
0	Northern Safety Technology Inc	101-43126-430-42110	29.40	Flashlight Battery
	Northern Safety Technology Inc		29.40	
173684	Odette Lori	101-43121-430-44450	50.00	Mailbox Post Reimbursement
	Odette Lori		50.00	
0	Orchard Trust Company	101-00000-000-21706	1,427.00	PR Batch 00526.12.2021 Roth Deferred Compensation
0	Orchard Trust Company	101-00000-000-21706	9,326.88	PR Batch 00526.12.2021 MN Deferred Comp
	Orchard Trust Company		10,753.88	
0	Paape Companies Inc	101-45122-450-44010	145.50	Repair Rooftop Unit
0	Paape Companies Inc	101-45122-450-44010	324.00	Repaired Boiler
0	Paape Companies Inc	101-42110-420-44010	485.00	Repaired Air Unit in Evidence Garage
0	Paape Companies Inc	101-45122-450-44010	764.41	Replaced Rooftop Unit Blower Motor
0	Paape Companies Inc	101-41940-410-44010	384.50	Repaired Rooftop Unit
0	Paape Companies Inc	101-45500-450-44010	484.00	Boiler Maintenance
	Paape Companies Inc		2,587.41	

Check Numb	Last Name	Acct 1	Amount	Description
173685	Parallel Technologies Inc	101-42110-420-43095	725.00	Repair 4 Downtown Cameras
	Parallel Technologies Inc		725.00	
173686	Petty Cash	101-42123-420-43090	2.00	J Remme to Remove Patches from Patrol Sweater
	Petty Cash		2.00	
173687	Polzin Thomas	601-00000-000-20200	3.27	Refund Check 013908-002, 604 1 St NW
	Polzin Thomas		3.27	
173688	Powerplan OIB	101-43121-430-42210	234.01	Throttle Sensor / Street #119
	Powerplan OIB		234.01	
0	Property Pros	241-46330-461-42110	25.22	1225 NW 2nd Ave Lamperts Passage Knob
0	Property Pros	241-46330-461-44010	84.00	904 D Spring Road Unclog Sink/Repair Kitchen Cabinet
0	Property Pros	241-46330-461-44010	252.00	910-920 1st Street Trim Trees/Haul Away
0	Property Pros	241-46330-461-44010	42.00	1225 NW 2nd Street Dryer Vent Hook Up
0	Property Pros	241-46330-461-44010	42.00	1225 NW 2nd Street Broken Window Repair
0	Property Pros	241-46330-461-42110	32.18	1225 NW 2nd Street Ace Dryer Vent/Tape/Clamp
0	Property Pros	241-46330-461-44010	42.00	521 Lincoln Ave Window Repair
0	Property Pros	241-46330-461-44010	1,386.00	519 Lincoln Ave Paint/Wall Prep
0	Property Pros	241-46330-461-44010	63.00	527 Lincoln Ave Install Cover Plate/Window Repair
0	Property Pros	241-46330-461-42110	132.77	519 Lincoln Ave Sherwin Williams Paint 3 Gallons
0	Property Pros	241-46330-461-42110	227.53	519 Lincoln Ave Sherwin Williams Paint 5 Gallons
	Property Pros		2,328.70	
0	Public Employees Retirement Association	101-00000-000-21705	25,851.92	PR Batch 00526.12.2021 PERA Police & Fire
0	Public Employees Retirement Association	101-00000-000-21705	19,890.10	PR Batch 00526.12.2021 PERA Coordinated
0	Public Employees Retirement Association	101-00000-000-21705	17,234.59	PR Batch 00526.12.2021 PERA Police & Fire
0	Public Employees Retirement Association	101-00000-000-21705	17,238.04	PR Batch 00526.12.2021 PERA Coordinated
	Public Employees Retirement Association		80,214.65	
0	R C Bliss Inc	101-42123-420-42210	350.42	Brake Lining - Rotor Assembly / #9
0	R C Bliss Inc	101-42123-420-42210	30.24	V-Belt / #4
0	R C Bliss Inc	215-42123-420-45500	750.00	Body Paint for New Squad / #2
0	R C Bliss Inc	101-42220-420-42210	187.00	Cover - Wheel #2130
0	R C Bliss Inc	101-43121-430-42210	36.17	Thermostat Gaskets / Street #307

Check Numb	Last Name	Acct 1	Amount	Description
	R C Bliss Inc		1,353.83	
173689	R.A.W. Construction LLC	241-46330-461-44010	40.00	904 Spring Rd//910-920 1st St/1518-1536 Western Sanding 12/28/21
173689	R.A.W. Construction LLC	241-46330-461-44010	965.00	49 Units Sand/Plow/Shovel 12/27/21
173689	R.A.W. Construction LLC	211-46310-460-44010	30.00	16 SE 1st Street 12/27/21 Plow/Sand
173689	R.A.W. Construction LLC	898-46310-000-44010	500.00	1324 Prairie Ave 12/27/21 Plow/Sand/Shovel
173689	R.A.W. Construction LLC	898-46310-000-44010	200.00	1324 Prairie Avenue Sanding 12/28/21
173689	R.A.W. Construction LLC	211-46310-460-44010	30.00	16 SE 1st Street Plowing/Sanding 12/28/21
173689	R.A.W. Construction LLC	241-46330-461-44010	965.00	49 Units Plowing/Shoveling/Sanding 12/28/21
173689	R.A.W. Construction LLC	898-46310-000-44010	500.00	1324 Prairie Avenue Plowing/Sanding/Shoveling 12/28/21
	R.A.W. Construction LLC		3,230.00	
0	Real Estate Publishing Corporation	290-46500-462-43430	10,000.00	EDA Advertising for 2022
	Real Estate Publishing Corporation		10,000.00	
173690	Recap Advisors LLC	241-46330-461-43090	250.00	RAD Feasibility Thru 12/31/2021
	Recap Advisors LLC		250.00	
173691	Redstone Construction LLC	469-43121-430-45300	248,801.45	(2021-04) Pay Req. 10
	Redstone Construction LLC		248,801.45	
0	Rent 'N' Save Portable Services	101-45200-450-44160	60.00	Portable Toilet Rental
0	Rent 'N' Save Portable Services	101-45200-450-44160	60.00	Portable Toilet Rental
	Rent 'N' Save Portable Services		120.00	
173692	Retrofit Companies, Inc The	101-41940-410-43840	235.36	Recycle Lightbulbs
	Retrofit Companies, Inc The		235.36	
173694	Rice County	873-49499-000-44371	4,883.82	Roberds Lake Sewer Collected - November
173693	Rice County	101-41110-410-43510	2,734.06	2022 TNT Statements
	Rice County		7,617.88	
173695	Rice County Highway Department	475-43121-430-45300	8,813.88	I-35/CSAH 9 Agreement

Check Numb	Last Name	Acct 1	Amount	Description
	Rice County Highway Department		8,813.88	
173696	Riverbend Nature Center	101-00000-000-20200	1,200.00	River Bend Nature Center Ski Trail Grant Pass Thru
	Riverbend Nature Center		1,200.00	
0	Ronco Engineering Sales	101-43121-430-42210	97.90	Auger Motor Seal Kit / #104
	Ronco Engineering Sales		97.90	
173697	RTVision Inc	101-43190-430-43095	4,500.00	One Office-2022 Subscription Fee
	RTVision Inc		4,500.00	
173698	Safety-Kleen Systems Inc	101-43126-430-42110	103.15	Parts Washer
	Safety-Kleen Systems Inc		103.15	
173699	Salamone Devon	601-00000-000-20200	14.79	Refund Check 023912-000, 610 8 St NW
	Salamone Devon		14.79	
0	Sammon Eric	101-42123-420-43310	15.00	Lunch Per Diem / Patrol Supervision of Critical Incidents
	Sammon Eric		15.00	
0	Schilling Supply Company	101-42110-420-42230	230.18	Sno Melt Ice Melt
	Schilling Supply Company		230.18	
173700	SESAC LLC	101-45110-450-44390	513.00	2022 Music License Fee - Acct No 165241
	SESAC LLC		513.00	
173701	Sherek Becky	601-49430-000-43090	560.00	SCBA Physicals For Chlorine Use
	Sherek Becky		560.00	
173702	SHI International Corp	101-41580-410-43095	4.72	Visio Subscription
	SHI International Corp		4.72	

Check Numb	Last Name	Acct 1	Amount	Description
173703		241-46330-461-44375	214.00	1532 Western Ave Utility Reimbursement January 2022
			214.00	
173704	Sioux Sales Company	101-42123-420-42410	3,933.70	Suppressor & Lower Receivers (2)
173704	Sioux Sales Company	101-42110-420-42410	512.00	Smith & Wesson Pistol
	Sioux Sales Company		4,445.70	
173705	Sirek Hydraulic Service Inc	101-43121-430-42210	31.89	Hydraulic Fitting For #212
	Sirek Hydraulic Service Inc		31.89	
173706	Somn Holdings LLC	601-00000-000-20200	32.58	Refund Check 018438-016, 520 11 St SW
	Somn Holdings LLC		32.58	
173707	Southern Minnesota Inspection Co LLC	602-49450-000-44045	2,028.14	Retrieval Winch Repair
	Southern Minnesota Inspection Co LLC		2,028.14	
173708	Southern MN Recreation & Park Assoc	101-45110-450-44330	60.00	2022 Membership Fees
	Southern MN Recreation & Park Assoc		60.00	
0	Southwest Service Cooperative	101-00000-000-21707	9,032.50	Health Insurance Premiums - 2021
	Southwest Service Cooperative		9,032.50	
0	Springbrook Holding Company LLC	602-49450-000-44325	1,377.50	Civic Pay Transaction Fees September
0	Springbrook Holding Company LLC	601-49430-000-44325	1,377.50	Civic Pay Transaction Fees September
	Springbrook Holding Company LLC		2,755.00	
173709	Star Sports & Apparel LLC	101-41320-410-44382	1,199.25	Recognition for Board/Commission Service (Cups)
	Star Sports & Apparel LLC		1,199.25	
173611	Steele Waseca Coop Electric	225-49810-430-43810	37.66	1018624-Hangar 910J
173611	Steele Waseca Coop Electric	101-43160-430-43810	60.51	32089-Highway 21 Lights
173611	Steele Waseca Coop Electric	225-49810-430-43810	7.89	41927-Airport
173611	Steele Waseca Coop Electric	902-00000-000-23935	82.58	Monthly Charges-November
173611	Steele Waseca Coop Electric	225-49810-430-43810	63.12	20891-Airport New Hangar

Check Numb	Last Name	Acct 1	Amount	Description
173611	Steele Waseca Coop Electric	225-49810-430-43810	57.43	41901-Airport
173611	Steele Waseca Coop Electric	602-49450-000-43810	73.96	1089247-Lift Station-15625 Acorn Trl
173611	Steele Waseca Coop Electric	225-49810-430-43810	52.48	32094-Airport
173611	Steele Waseca Coop Electric	902-00000-000-23935	-82.58	Monthly Charges- November
173611	Steele Waseca Coop Electric	602-49480-000-43810	-47.68	23271-Sludge Farm
173611	Steele Waseca Coop Electric	225-49810-430-43810	7.89	1077021-Security Hangar 2
173611	Steele Waseca Coop Electric	225-49810-430-43810	35.03	1017445-2011 T-Hangar
173611	Steele Waseca Coop Electric	225-49810-430-43810	188.72	1018611-Hangar 910K
173611	Steele Waseca Coop Electric	602-49450-000-43810	27.17	30493-Lift Station
173611	Steele Waseca Coop Electric	225-49810-430-43810	-1,090.76	41875-Airport S Hangars
173611	Steele Waseca Coop Electric	101-43160-430-43810	-10.27	27205-Airtech Park
173611	Steele Waseca Coop Electric	225-49810-430-43810	7.89	41926-Airport
173611	Steele Waseca Coop Electric	225-49810-430-43810	611.54	23947-Airport 10
	Steele Waseca Coop Electric		82.58	
0	Stepp Manufacturing Co Inc	101-43121-430-42210	83.18	Connector And Pins / Street #105
	Stepp Manufacturing Co Inc		83.18	
173710	Streicher's Inc.	101-42110-420-42110	89.85	Life Saving Commendation Bars w/Stars
	Streicher's Inc.		89.85	
173711	Thomas Karen	101-43121-430-44450	115.00	Mailbox and Post Reimbursement
	Thomas Karen		115.00	
173712	Tifco Industries Inc	101-43126-430-42110	363.25	Shrink Wrap/Tape/Thread Locker
	Tifco Industries Inc		363.25	
173713	TK Elevator Corp	101-42110-420-44010	1,311.18	Elevator Inspection 1/1/22 - 3/31/22
	TK Elevator Corp		1,311.18	
173714	Tom's Lock & Key, LLC	101-42110-420-43090	15.00	Keys
	Tom's Lock & Key, LLC		15.00	
173715	Truck Center Companies East LLC	101-43121-430-42210	50.66	Oil Filters / Street #619
173715	Truck Center Companies East LLC	101-43121-430-42210	51.33	Fuel Line / Street #118

Check Numb	Last Name	Acct 1	Amount	Description
	Truck Center Companies East LLC		101.99	
173716	Truckvault Inc	101-42121-420-42410	1,933.75	Vault Drawer / Jeep Cherokee #10
	Truckvault Inc		1,933.75	
173717	Turek Darrell R	101-43125-430-43090	3,172.00	Snow Hauling
	Turek Darrell R		3,172.00	
0	Uline	601-49430-000-42410	239.76	Rolling Ladders For Pallet Racking
0	Uline	101-42121-420-42110	182.82	Black Bags/Surgical Masks
0	Uline	603-49500-000-42410	239.75	Rolling Ladders For Pallet Racking
0	Uline	602-49450-000-42410	239.76	Rolling Ladders For Pallet Racking
	Uline		902.09	
173718	Union Pacific Railroad Co	404-45200-450-45300	1,622.20	TeePee Tonka Trail Crossing
	Union Pacific Railroad Co		1,622.20	
173609	US Bank Equipment Finance	101-42400-420-44160	95.73	Copier Lease
	US Bank Equipment Finance		95.73	
0	Utility Consultants Inc	601-49430-000-43090	252.00	Monthly Coliform Test For December
0	Utility Consultants Inc	602-49480-000-43090	562.00	Lab Testing
	Utility Consultants Inc		814.00	
173612	Verizon Wireless	101-45500-450-43210	24.15	Cell Phone Service - Library
173612	Verizon Wireless	602-49450-000-43210	82.50	Cell Phone Service - Sewer Collection
173612	Verizon Wireless	101-41510-410-43210	82.50	Cell Phone Service - Finance
173612	Verizon Wireless	101-43110-430-43210	41.25	Cell Phone Service - PW Admin
173612	Verizon Wireless	101-42121-420-43210	330.00	Cell Phone Service - Investigations
173612	Verizon Wireless	101-42700-420-43210	206.25	Cell Phone Service - Special Services
173612	Verizon Wireless	101-42123-420-43210	990.00	Cell Phone Service - Patrol
173612	Verizon Wireless	101-45110-450-43210	241.55	Cell Phone Service - Parks & Rec
173612	Verizon Wireless	601-49430-000-43210	165.00	Cell Phone Service - Water Distribution
173612	Verizon Wireless	101-41580-410-43210	41.25	Cell Phone Service - IT
173612	Verizon Wireless	101-42220-420-43210	152.05	Cell Phone Service - Fire Suppression
173612	Verizon Wireless	101-42400-420-43210	203.77	Cell Phone Service - Building Codes

Check Numb	Last Name	Acct 1	Amount	Description
173612	Verizon Wireless	101-42210-420-43210	82.50	Cell Phone Service - Fire Administration
173612	Verizon Wireless	902-00000-000-23935	-3,038.17	Monthly Phone Bill-Dec
173612	Verizon Wireless	603-49500-000-43210	41.25	Cell Phone Service - Storm Water Utility
173612	Verizon Wireless	101-41940-410-43210	82.50	Cell Phone Service - Building Maintenance
173612	Verizon Wireless	101-43190-430-43210	41.25	Cell Phone Service - Engineering
173612	Verizon Wireless	101-42110-420-43210	165.00	Cell Phone Service - Police Administration
173612	Verizon Wireless	902-00000-000-23935	3,038.17	Monthly Phone Bill-Dec
173612	Verizon Wireless	240-46210-460-43210	65.40	Cell Phone Service - Community Development
173719	Verizon Wireless	603-49500-000-43210	210.06	Data Air Cards- Storm
173719	Verizon Wireless	602-49450-000-43210	70.02	Data Air Cards- Sewer
173719	Verizon Wireless	902-00000-000-23935	-1,759.15	Data Charges 10/29/2021-11/28/2021
173719	Verizon Wireless	101-41580-410-43210	40.01	Data -IT
173719	Verizon Wireless	101-42123-420-43210	840.58	Data Air Cards - MDC
173719	Verizon Wireless	101-42220-420-43210	35.01	Data Fire Captains
173719	Verizon Wireless	101-45140-450-43210	35.01	Data Community Center Youth Sports
173719	Verizon Wireless	101-42210-420-43210	35.01	Data Fire Chief
173719	Verizon Wireless	101-42110-420-43210	70.02	Data/Admin Ipad
173719	Verizon Wireless	601-49430-000-43210	241.26	Data Air Cards- Water
173719	Verizon Wireless	101-43121-430-43210	35.01	Data Street Sign Shop Devices
173719	Verizon Wireless	602-49480-000-43210	67.14	WWTP Phones
173719	Verizon Wireless	902-00000-000-23935	1,759.15	Data Charges 11/29/2021-12/28/2021
173719	Verizon Wireless	101-42220-420-43210	80.02	Data Fire Ipads (In Fire Trucks)
Verizon Wireless			4,797.32	
0	Virg's Appliance Service Inc	898-46310-000-44010	85.00	Dryer Repair
0	Virg's Appliance Service Inc	898-46310-000-44010	85.00	#208 Refrigerator Repair
0	Virg's Appliance Service Inc	241-46330-461-44050	934.99	904 B Spring Road Refrigerator
Virg's Appliance Service Inc			1,104.99	
173720	Wal-Mart	101-45140-450-42110	23.12	Frostival Supplies
173720	Wal-Mart	101-45140-450-42110	140.42	Frostival Supplies
Wal-Mart			163.54	
0	Walton's Inc	602-49480-000-42110	919.80	Screen Bags
Walton's Inc			919.80	
0	Wells Fargo Bank	101-41580-410-43095	258.00	Atera-Enterprise
0	Wells Fargo Bank	101-41580-410-43095	5.00	Oracle-DNS Renewal
0	Wells Fargo Bank	101-42121-420-42210	225.48	Menards: Shelving Unit

Check Numb	Last Name	Acct 1	Amount	Description
0	Wells Fargo Bank	101-42110-420-43095	14.99	ZOOM
0	Wells Fargo Bank	101-42110-420-42110	2.10	Vending Purchase (To Be Reimbursed)
0	Wells Fargo Bank	101-42110-420-43310	571.02	Hotel: Chief's Conf / D Dillon
0	Wells Fargo Bank	101-41580-410-43095	237.60	Atera-Webroot
0	Wells Fargo Bank	101-41580-410-43095	36.98	Network Solutions-Faribault.org Registration
0	Wells Fargo Bank	101-45200-450-42110	2,431.00	Baseball Concrete Bollard
	Wells Fargo Bank		3,782.17	
173721	Xcel Energy	898-46310-000-43810	1,762.03	1324 Prairie Ave 51 Apartments Electric Thru 12/08/2021
173721	Xcel Energy	101-45200-450-43810	-23.05	1800 Alexander Dr Solar Energy Credit Larger Than Bill
173721	Xcel Energy	101-43160-430-43810	-19.97	1990A Lyndale Ave N Solar Energy Credit Greater Than Bill
	Xcel Energy		1,719.01	
173722	Zee Medical Service	602-49480-000-42110	72.30	Gloves
	Zee Medical Service		72.30	
173723	Ziegler Inc	225-49810-430-42210	1,450.50	Cutting Edges for Snow Plowing Equipment
	Ziegler Inc		1,450.50	
			784,215.37	



Request for Council Action

TO: Mayor and City Council
THROUGH:
FROM: Tim Murray, City Administrator
MEETING DATE: January 11, 2022
SUBJECT: Resolution 2022-001 Approve Designation of Official Newspaper

Background:

Section 12.01 of the Faribault City Charter states that:

"The council shall annually at its first meeting of the year designate a legal newspaper of general circulation in the City as its official newspaper, or some other official publication as authorized by Minnesota law, in which shall be published ordinances and other matters required by law to be so published, as well as such other matters as the council may deem it in the public interest to have published in this manner."

The attached resolution designates the Faribault Daily News as the City's official newspaper for 2022.

Recommendation:

Approve Resolution 2022-001 Approve Designation of Official Newspaper

Attachments:

1. Resolution 2022-001 Approve Designation of Official Newspaper

CITY OF FARIBAULT

RESOLUTION #2022-001

APPROVE DESIGNATION OF OFFICIAL NEWSPAPER

WHEREAS, Section 12.01 of the Faribault City Charter requires that the City Council annually designate a legal newspaper of general circulation in the city as its official newspaper.

NOW, THEREFORE BE IT RESOLVED, that the Faribault Daily News be and hereby is designated as the official newspaper of the City of Faribault, Minnesota for the year 2022.

ALSO, BE IT RESOLVED, that if additional legal notices are required, the Owatonna People's Press or the Northfield News will be utilized.

Date Adopted: January 11, 2022

Faribault City Council

Kevin F. Voracek, Mayor

ATTEST:

Timothy C. Murray, City Administrator



Request for Council Action

TO: Mayor and City Council
THROUGH:
FROM: Tim Murray, City Administrator
MEETING DATE: January 11, 2022
SUBJECT: Resolution 2022-002 Approve City Administrator Purchasing and Contracting Authority

Background:

Section 6.05 of the Faribault City Charter requires that the amount for the City Administrator's purchasing and contracting authority be established at least annually by resolution. The amount was set at \$10,000 in 2021 and it is proposed that this amount remain at \$10,000 for 2022.

Recommendation:

Approve Resolution 2022-002 Approve City Administrator Purchasing and Contracting Authority

Attachments:

1. Resolution 2022-002 Approve City Administrator Purchasing and Contracting Authority

CITY OF FARIBAULT

RESOLUTION #2022-002

APPROVE CITY ADMINISTRATOR PURCHASING AND CONTRACTING AUTHORITY

WHEREAS, the Faribault City Charter Section 6.05 establishes the City Administrator's purchasing and contracting authority and states that City purchases and contracts shall be made or let by the City Administrator when the amount does not exceed an amount established at least annually by the City Council by resolution; and

WHEREAS, the most recent Resolution authorizing the amount not to exceed \$10,000 for purchasing and contracting was approved by the City Council on January 12, 2021; and

WHEREAS, the Charter requires this amount to be established annually.

NOW, THEREFORE BE IT RESOLVED, that pursuant to the authority of Faribault City Charter Section 6.05, the City Council directs that all City purchases and contracts shall be made or let by the City Administrator when the amount involved does not exceed \$10,000, except when necessary to pay monthly utility and credit card bills that produce late fees and interest charges if not paid prior to formal Council approval.

ALSO, BE IT RESOLVED, that consistent with the authority of Faribault City Charter Section 6.05, the City Council directs that the City purchasing and contracting amounts established in this resolution shall remain in effect until such time that the authority granted herein is changed by resolution consistent with the City Charter.

ALSO, BE IT RESOLVED, that the City Council directs that all administrative policies and requirements necessary for City purchases and contracts shall continue to be followed pursuant to the direction of the City Administrator and in compliance with the Faribault City Charter and Minnesota Law.

Date Adopted: January 11, 2022

Faribault City Council

Kevin F. Voracek, Mayor

ATTEST:

Timothy C. Murray, City Administrator



Request for Council Action

TO: Mayor and City Council
THROUGH:
FROM: Tim Murray, City Administrator
MEETING DATE: January 11, 2022
SUBJECT: Resolution 2022-003 Appoint Deputy City Administrator

Background:

In order to have a designated individual available to act in the City Administrator's absence, the Council annually appoints a Deputy City Administrator. For 2022, I am recommending that the City Council appoint Kevin Bushard, Human Resources Manager, to this position. When he would serve as the Acting City Administrator, he would receive additional compensation in the amount of \$80 per day in accordance with the attached resolution.

Recommendation:

Approve Resolution 2022-003 Appoint Deputy City Administrator

Attachments:

1. Resolution 2022-003 Appoint Deputy City Administrator

CITY OF FARIBAULT

RESOLUTION #2022-003

APPOINT DEPUTY CITY ADMINISTRATOR

WHEREAS, the City of Faribault desires to appoint a Deputy City Administrator to act in the absence of the City Administrator; and

WHEREAS, the City Administrator may from time to time be unavailable because of absence from the city, or for physical, mental, or legal reasons is unavailable to exercise the powers and discharge the duties of the position; and

WHEREAS, the City Administrator has the authority to notify the Deputy City Administrator when he/she shall serve as Acting City Administrator; and

WHEREAS, the City Administrator shall have the authority to compensate the Deputy City Administrator in the amount of \$80 per day for related duties; and

WHEREAS, this appointment shall remain in effect until a new appointment is approved by the City Council.

NOW, THEREFORE BE IT RESOLVED, by the City Council of the City of Faribault, Minnesota, that the City Council appoint Kevin Bushard, Human Resources Manager as Deputy City Administrator, to serve as Acting City Administrator at such times as the City Administrator is unavailable.

Date Adopted: January 11, 2022

Faribault City Council

Kevin F. Voracek, Mayor

ATTEST:

Timothy C. Murray, City Administrator



Request for Council Action

TO: Mayor and City Council
THROUGH: Tim Murray, City Administrator
FROM: Jeanne Day, Finance Director
MEETING DATE: January 11, 2022
SUBJECT: Resolution 2022-004 Approve Designation of Authorized Signers, Official Depository and Broker/Dealers for City of Faribault

Background:

In accordance with the Minn. Stat. 118A, and the City's Investment Policy, the Council is required to annually designate individuals as official signers and banking and financial institutions as official depositories and broker/dealers for the City for 2022. The banking and financial institutions proposed for these designations in the attached resolution.

Recommendation:

Approve Resolution 2022-004 Designation of Authorized Signers, Official Depository and Broker/Dealers for City of Faribault.

Attachments:

1. Resolution 2022-004 Designated Authorized Signers Official Depository 2022

CITY OF FARIBAULT

RESOLUTION #2022-004

APPROVE DESIGNATION OF AUTHORIZED SIGNERS, OFFICIAL DEPOSITORY AND BROKER/DEALERS FOR CITY OF FARIBAULT

WHEREAS, Minnesota State Statute 118A, and the City's Investment Policy requires that the City designate authorized signers and official depositories; and

WHEREAS, the listed financial institutions have agreed to follow the City of Faribault Investment Policy and have provided adequate collateralization for City funds.

NOW, THEREFORE BE IT RESOLVED, that the following individuals be designated as official signers for the City of Faribault:

Timothy C. Murray, City Administrator
Jeanne M. Day, Finance Director
Ann M. Remold, Accounting Supervisor

ALSO, BE IT RESOLVED, that the following financial institutions be designated as depositories for the City of Faribault:

Citizens Community Federal
State Bank of Faribault
Wells Fargo Bank

ALSO, BE IT RESOLVED, that the following institutions be designated as broker/dealers for the investment of City funds:

RBC Capital Market, LLC.
Oppenheimer & Co. Inc.
League of Minnesota Cities 4M Fund
UBS Financial Services Inc.

Date Adopted: January 11, 2022

Faribault City Council

Kevin F. Voracek, Mayor

ATTEST:

Timothy C. Murray, City Administrator



Request for Council Action

TO: Mayor and City Council
THROUGH: Tim Murray, City Administrator
FROM: Andy Bohlen, Chief of Police
MEETING DATE: January 11, 2022
SUBJECT: Resolution 2022-006 Accept Donation from Barta Machine to Police Department

Background:

Terry and Gregg Barta, owners of Barta Machine, located at 6024 233rd Street W Warsaw, MN 55087 donated \$15,000 to the Police Department for the specific purpose of purchasing a City-owned drone and ballistic vest carriers for police officers. They indicated they were grateful for the excellent work the officers do to keep the community safe. They further indicated they were financially blessed in their business and wanted to specifically give back to the law enforcement community.

Terry Barta and the Chief had a discussion on potential unbudgeted department needs and Terry specifically wanted to purchase a drone for the Police Department. The Police Department did have a future drone purchase scheduled in the 2022-2026 Capital Improvement Plan. The Police Department has several trained drone pilots that received licensing certification through drug task force funds. The Department also houses a very large drone owned by the Cannon River Drug & Violent Offender Task Force that can be used by all agencies participating in the drug task force. The new drone to be purchased would be smaller, contain updated technology, would be easier to deploy, require fewer licensed operators, and would be owned by the City of Faribault. The cost of the drone would be approximately \$8,000.

Terry Barta indicated that the remaining funds should also be used for equipment needed by the agency. Terry and the Chief agreed that the remaining funds could be used for the purchase of ballistic vest carriers for officers. The vest carriers provide a safe platform for officers to carry heavy tactical equipment and the designs are made specifically to reduce officer back injuries.

Recommendation:

Approve Resolution 2022-006 Accept Donation from Barta Machine to Police Department

Attachments:

1. Resolution 2022-006 Accept Barta Donation for Police Equipment
2. Drone Quote
3. Streichers Quote on Ballistic Vest Carriers
4. Barta Donation 2022 Budget Line Item Adjustment

CITY OF FARIBAULT

RESOLUTION #2022-006

ACCEPT DONATION FROM BARTA MACHINE TO POLICE DEPARTMENT

WHEREAS, on December 22, 2021, Terry and Gregg Barta of Barta Machine, made a \$15,000.00 donation to the Faribault Police Department; and

WHEREAS, based on the donors' request, the funds are to be used to purchase a city-owned drone and ballistic vest carriers for the police officers; and

WHEREAS, the donated funds will be used through a budget adjustment process in the 2022 budget to increase the existing previously approved Police Uniform Patrol line item of "Minor Equipment & Tools"; and

NOW, THEREFORE BE IT RESOLVED, the \$15,000.00 donation will be accepted and utilized, per the donors' request, to purchase a city-owned drone and ballistic vests for its officers.

Date Adopted: January 11, 2022

Faribault City Council

Kevin F. Voracek, Mayor

ATTEST:

Timothy C. Murray, City Administrator



Quote #D1212
Dec 29, 2021

SHIPPING ADDRESS

Matt Long
City of Faribault Police Department
25 4th Street Northwest
Faribault MN 55021
United States
Tel. +15073340952

CUSTOMER

Matt Long
City of Faribault Police Department
25 4th Street Northwest
Faribault MN 55021
United States

ITEMS	PRICE	TAX	QTY	ITEM TOTAL
 Landing Pad (3ft)	\$1.00\$0.07 \$0.01		1	\$1.00
 Vertex Drone Activation/onboarding	\$0.00	\$0.00	1	\$0.00
 DJI Mavic 2 Enterprise Advanced	\$6,500.00	\$0.00	1	\$6,500.00
 Mavic 2 Enterprise Fly More Kit	\$469.00	\$0.00	1	\$469.00
 Mavic 2 PRCS Elite Charger	\$518.00	\$0.00	1	\$518.00
 Mavic 2 Enterprise Advanced Flight Battery	\$189.00	\$0.00	3	\$567.00

Subtotal	\$8,055.00
Shipping	\$0.00
Minnesota State Tax 6.875%	\$0.07
Rice County Tax 0.5%	\$0.01
TOTAL (USD)	\$8,055.08

*This quote is confidential and is not to be shared or discussed with outside parties.

Vertex Unmanned Solutions, LLC
 14212 23rd Ave N, Plymouth, MN, 55447, United States
sales@vertexunmanned.com
vertex-unmanned-solutions-llc.myshopify.com

Streicher's - Minneapolis
10911 W Hwy 55
Minneapolis, MN 55441
Phone: 763-546-1155
Fax: 763-546-6776



SALES QUOTE

Federal ID # 41-1458127

Sales Quote Number: Q345057
Sales Quote Date: 01/04/22
Page: 1

Sell 665
To: Faribault Police Dept.
25 4th St NW
Faribault, MN 55021

Ship
To: Faribault Police Dept.
25 4th St NW
Faribault, MN 55021

Phone: (507) 334-4305
Fax: (507) 334-0268

Ship Via
Terms Net 15

SalesPerson Tom Carstens
Phone: 763-227-1983
E-mail: tomc@streichers.com

Item No.	Description	Unit	Quantity	Unit Price	Total Price
SBA-WORC6566.Z	Tactical Assault Carrier:NASPO,Oregon City 6566 (size,color)	EA	16	210.00	3,360.00
NTC-30N.WV	Name tag cloth: Dark navy w/ .30 (8mm) White Letters, VELCRO	EA	16	9.00	144.00
NTC-30N.WV	Name tag cloth: Dark navy w/ .30 (8mm) White Letters, VELCRO	EA	16	9.00	144.00
PRT-IDB5Z.N	ID PATCHES: BLANK, NAVY 8" X 4", w/ Velcro POLICE in WHITE	EA	16	8.00	128.00
Z9-4001M.BP	Handcuff Case: Fits Standard Cuffs, Molle Loks, BP	EA	16	27.00	432.00
Z9-4005M.BP	Magazine Case: Double, Glock 9/40, Molle Loks, Black Plain	EA	16	37.00	592.00
Z9-4009M.BP	Irritant Holder: MK3, Molle Loks, Black Plain	EA	16	22.00	352.00
Z9-4012M.BP	Flashlight Case: Streamlight Stinger, Molle Loks, BP	EA	16	22.00	352.00
Z9-5001M.BP	Radio Case: Fits APX6000/8000, Molle Loks, Black Plain	EA	16	46.00	736.00

Quoted prices do not include Sales Tax. All quoted prices are valid for 60 days from the date of the quote.

Total: 6,240.00



Request for Council Action

TO: Mayor and City Council
THROUGH: Tim Murray, City Administrator
FROM: Andy Bohlen, Chief of Police
MEETING DATE: January 11, 2022
SUBJECT: Resolution 2022-007 Accept Donation from State Bank of Faribault to Police Department

Background:

State Bank of Faribault donated \$1,000 to the Police Department to be used for the ongoing Police Department's wellness and mental health program. The donation shall be placed into a special fund restricted for that use.

Recommendation:

Approve Resolution 2022-007 Accept Donation from State Bank of Faribault to Police Department

Attachments:

1. Resolution 2022-007 State Bank Donation for Police Mental health
2. State Bank of Faribault Donation Letter and Check Copy

State of Minnesota
County of Rice

CITY OF FARIBAULT

RESOLUTION #2022-007

**ACCEPT DONATION FROM STATE BANK OF FARIBAULT TO POLICE
DEPARTMENT**

WHEREAS, on December 23, 2021, The State Bank of Faribault, made a \$1,000.00 donation to the Faribault Police Department; and

WHEREAS, based on the donor's request, the funds will be put towards the ongoing department's wellness and mental health program; and

NOW, THEREFORE BE IT RESOLVED, the \$1,000.00 donation will be accepted and utilized, per the donors' request, to be placed into the special fund for the wellness and mental health of its officers.

Date Adopted: January 11, 2022

Faribault City Council

Kevin F. Voracek, Mayor

ATTEST:

Timothy C. Murray, City Administrator



Downtown Office: 428 Central Avenue Faribault, MN 55021
Branch Office: 202 Western Avenue Faribault, MN 55021
(507) 332-7401

DATE 12/23/21

EXPENSE CHECK

ACCOUNT NUMBER

081732

75-55
919

One thousand & 00/100 dollars

AMOUNT

****1,000.00

FARIBAULT POLICE DEPARTMENT
FARIBAULT MN 55021

P
AY
TO
THE
ORDER OF


AUTHORIZED SIGNATURE



December 28, 2021

Enclosed you will find a contribution from The State Bank of Faribault for 2021.

We thank you for all you do for the community and wish you a wonderful Holiday season and a fabulous New Year!

Regards,

John R. Carlander

President/Chairman of the Board

DOWNTOWN
428 Central Avenue
Faribault, MN 55021
(507) 332-7401

WEST BRANCH
202 Western Avenue
Faribault, MN 55021
(507) 332-7401

PRIOR LAKE BRANCH
6867 Boudin Street NE
Prior Lake, MN 55372
(952) 204-1240

NMLS#638054

EOE/AA

Member FDIC



S T A T E B A N K O F F A R I B A U L T



Request for Council Action

TO: Mayor and City Council
THROUGH: Tim Murray, City Administrator
FROM: Travis Block, Public Works Director
MEETING DATE: January 11, 2022
SUBJECT: Approve Hangar Rental Agreement Renewals

Background:

The City has received renewals for Hangar Rental Agreements for 2022. Lease terms are for one year and expire on December 31, 2022. All hangar units are currently occupied. The following renters have submitted a renewal of their Hangar Rental Agreement.

Hangar No.	Building	Name	City	State
622	2	David Zlock	Lakeville	MN
626	2	Roger Southwick	Dundas	MN
628	2	Karen Workman	Northfield	MN
725	2	Mark Juelfs	Faribault	MN
727	2	Mark Carson	Northfield	MN
729	2	Dana Watson	Elko	MN
340	4	Bob Wander	Faribault	MN
348	4	Ron McLaughlin	Minneapolis	MN
824	5	Don Johnston	Prior Lake	MN
828	5	Lindquist Holdings	Lakeville	MN
832	5	Randy Christel	Northfield	MN
840	5	Joseph Reeder	Northfield	MN
925	5	Anthony Becker	Northfield	MN
937	5	Paul Stanton	Bloomington	MN

Recommendation:

Staff recommends that the Council approve the above referenced 2022 Hangar Rental Agreement renewals.

Attachments:



Request for Council Action

TO: Mayor and City Council
THROUGH: Tim Murray, City Administrator
FROM: Andy Bohlen, Chief of Police
MEETING DATE: January 11, 2022
SUBJECT: Resolution 2022-008 Approval of Equitable Sharing Agreement and Certification

Background:

In 2013, the City entered into an Equitable Sharing Agreement with the US Department of Justice. This agreement allows the Police Department to receive forfeited assets resulting from cases jointly investigated by the federal government and the Police Department.

This is an on-going agreement that is renewed on an annual basis, although no assets have been received over the past year.

The City incurs no expense in receiving forfeited assets.

Recommendation:

Approve Resolution 2022-008

Attachments:

1. Resolution 2022-008 Approve Equitable Sharing Agreement and Certification

CITY OF FARIBAULT

RESOLUTION #2022-008

APPROVE EQUITABLE SHARING AGREEMENT AND CERTIFICATION

WHEREAS, the Faribault Police Department cooperatively works with Federal Law Enforcement agencies; and

WHEREAS, during the course of these investigations, property and cash assets are subject to seizure and forfeiture; and

WHEREAS, federal law enforcement agencies allow for local agencies involved in the investigation of federal cases to receive and retain forfeited property from said cases.

NOW, THEREFORE BE IT RESOLVED, that the Faribault Police Department is hereby authorized and directed to complete the Equitable Sharing Agreement and Certification required by the Department of Justice.

Date Adopted: January 11, 2022

Faribault City Council

Kevin F. Voracek, Mayor

ATTEST:

Timothy C. Murray, City Administrator



Request for Council Action

TO: Mayor and City Council
THROUGH: Tim Murray, City Administrator
FROM: Heather Slechta, Assistant to the City Administrator
MEETING DATE: January 11, 2022
SUBJECT: Approve LG240B Application to Conduct Excluded Bingo for Infants Remembered in Silence (IRIS)

Background:

City Staff received an LG240B Application to Conduct Excluded Bingo from Infants Remembered in Silence (IRIS) for an event on February 20, 2022 at the American Legion located at 112 5th Street NE.

Recommendation:

Approve LG240B

Attachments:

1. IRIS - LG240B

LG240B Application to Conduct Excluded Bingo**No Fee**11/17
Page 1 of 2**ORGANIZATION INFORMATION**

Organization Name: Infants Remembered In Silence, Inc. Previous Gambling Permit Number: [REDACTED]

Minnesota Tax ID Number, if any: [REDACTED] Federal Employer ID Number (FEIN), if any: _____

Mailing Address: 218 3rd Ave. NW

City: Faribault State: MN Zip: 55021 County: Rice

Name of Chief Executive Officer (CEO): Diana Kelley

CEO Daytime Phone: 507-334-4748 CEO Email: support@irisRemembers.com
(permit will be emailed to this email address unless otherwise indicated below)

Email permit to (if other than the CEO): _____

NONPROFIT STATUS

Type of Nonprofit Organization (check one):

☐ Fraternal ☐ Religious ☐ Veterans ☒ Other Nonprofit Organization

Attach a copy of at least one of the following showing proof of nonprofit status:

(DO NOT attach a sales tax exempt status or federal employer ID number, as they are not proof of nonprofit status.)

- ☒ **Current calendar year Certificate of Good Standing**
Don't have a copy? This certificate must be obtained each year from:
MN Secretary of State, Business Services Division
60 Empire Drive, Suite 100
St. Paul, MN 55103
Secretary of State website, phone numbers:
www.sos.state.mn.us
651-296-2803, or toll free 1-877-551-6767
- ☒ **Internal Revenue Service-IRS income tax exemption 501(c) letter in your organization's name**
Don't have a copy? Obtain a copy of your federal income tax exempt letter by having an organization officer contact the IRS at 877-829-5500.
- ☐ **Internal Revenue Service-Affiliate of national, statewide, or international parent nonprofit organization (charter)**
If your organization falls under a parent organization, attach copies of both of the following:
1. IRS letter showing your parent organization is a nonprofit 501(c) organization with a group ruling; and
2. the charter or letter from your parent organization recognizing your organization as a subordinate.

EXCLUDED BINGO ACTIVITYHas your organization held a bingo event in the current calendar year? ☐ Yes ☒ No

If yes, list the dates when bingo was conducted: _____

The proposed bingo event will be:

☒ one of four or fewer bingo events held this year. Dates: February 20, 2022

-OR-

☐ conducted on up to 12 consecutive days in connection with a:

☐ county fair Dates: _____

☐ civic celebration Dates: _____

☐ Minnesota State Fair Dates: _____

Person in charge of bingo event: Diana Kelley Daytime Phone: 507-334-4748Name of premises where bingo will be conducted: Faribault American LegionPremises street address: 112 5th St. NECity: Faribault If township, township name: _____ County: Rice



Request for Council Action

TO: Mayor and City Council
THROUGH: Tim Murray, City Administrator
FROM: Mark DuChene, City Engineer
MEETING DATE: January 11, 2022
SUBJECT: Adopt 2021 Comprehensive Water Plan Update

Background:

Following the completion of the City's Journey to 2040 Comprehensive Plan, the City began the process of updating the comprehensive plans for the City's Water, Sanitary Sewer and Storm Sewer systems to make sure that these critical infrastructure plans aligned with the Journey to 2040 plans to provide utility systems that can accommodate the City's growth and development visions. The previous comprehensive water plans were completed in 1992 and 2001. Many improvements from those plans have been completed, but given the dramatic change in population growth estimates and development trends since the 2001 plan, it was important to compare the Journey to 2040 Comprehensive Plan to the existing water system and identify future capital improvements.

The main purposes of the update of the comprehensive water plan were:

- Evaluate existing and future water trunk lines in coordination with the City's recently adopted Journey to 2040 Comprehensive Plan
- Evaluate current and future water production, storage capacity, and treatment needs
- Develop a dynamic digital model of the water system that can be updated and evaluated as new development proposals come in that are different from the assumptions made at the time of the report.

City Staff presented a high level overview of the results of the 2021 Comprehensive Water Plan update at the November 16, 2021 Council Work Session. Since that time, minor updates to the plan (mostly grammatical changes and budget numbers added) were incorporated and the final plan is ready for council adoption as attached.

Recommendation:

Adopt 2021 Comprehensive Water Plan Update

Attachments:

1. 2021 Comprehensive Water Plan Update

A large, light gray graphic of a globe with intersecting lines, positioned on the left side of the page.

Comprehensive Water Plan

2021 Comprehensive Water Plan Update

Faribault, Minnesota

FARIT 158326 | January 3, 2022021



Building a Better World
for All of Us®

Engineers | Architects | Planners | Scientists

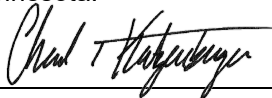
Comprehensive Water Plan Update

Faribault, Minnesota

SEH No. FARIT 158326

December 13, 2021

I hereby certify that this report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.



Chad T. Katzenberger, PE

Date: 12/13/2021

License No.: 46613

Reviewed By: Heather Yelle & Simon McCormack

Date: 12/13/2021

Short Elliott Hendrickson Inc.
416 South 6th Street, Suite 200
Brainerd, MN 56401-3540
218.855.1700



Executive Summary

Comprehensive Water Plan Update

A regular comprehensive analysis of a city's water system is good practice to assure safe and reliable water supply for years to come. Over the past decade the City of Faribault has taken responsible steps to improve the City's water supply, treatment, distribution, and water storage systems. With these improvements now nearing completion, it is beneficial to take a fresh look at the overall water system health and ability to serve the city over the next planning period. The recent completion of the City's overall comprehensive plan provides a good opportunity to revisit water system needs. Many of these anticipated needs will be based on the updated population and land use growth projections, both of which will have an influence on overall water system characteristics.

Existing Water System

The existing Faribault water system consists of Five (5) groundwater wells with a total production capacity of 11.6 MGD (million gallons per day) which supply water to a newly constructed water treatment facility. The water treatment plant has a normal production capacity of 7.0 MGD with the ability to operate at 10 MGD if needed. The water distribution system includes nearly 140 miles of piping ranging in size from 4-inches to 24-inches in diameter. The water main feeds two pressure zones. The main pressure zone is sustained by two 2,000,000-gallon water storage tank in addition to a new 750,000 gallon elevated water storage tank that is currently being constructed. (Total volume 4,750,000 gallons). There is also a small high elevation-pressure zone fed by a booster station and which includes a 150,000-gallon elevated water storage tank.

Historical and Projected Water System Demands

The Average Day (AD) water use has remained relatively stable over the last 10 years typically ranging from 2.73 to **3.69 MGD**. Records indicate that the yearly Maximum Day (MD) water use had more variation ranging from 4.59 to **7.31 MGD** which is likely from seasonal impacts. The Average Day and Maximum Day water use figures are important from a water system planning perspective. For planning purposes, a 2040 design demand projection of **3.88 MGD** for average day water use and **7.67 MGD** for maximum day water use will be utilized.

Water Model Analysis

The construction of a water model of Faribault's water system was included as part of the 2018 Water Treatment Plant Project to aid in the current and future planning process. This model was updated and utilized for overall water system analysis.

Water Distribution System Risk Analysis

New analysis techniques were developed to help prioritize ageing pipe replacement. System data was analyzed to develop an understanding of probability of failure while the hydraulic model was harnessed to understand the consequence of pipe failure. The information developed through this process provides for new metrics to develop a water main replacement priority.

Recommended Water System Improvements

With the recent work related to the construction of a new water treatment facility and current construction of a new elevated water storage facility, future water system improvement recommendations center around sustaining system reliability through redundant water supply, key water main replacement & renewal and right sized water distribution system piping in growth and expansion areas.

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Comprehensive Water Plan

2021 Comprehensive Water Plan Update

Prepared for City of Faribault, Minnesota

1 Introduction

The Faribault water system serves the City of Faribault, which is a community of approximately 24,000 people located in Rice County, Minnesota. The City of Faribault is surrounded by agriculture and supports robust industry within the city limits. Its location with respect to easy access along Interstate 35 along with its rich history presents an opportunity to support growth and development and enhance existing services. Therefore, proper planning is essential to coordinate the renewal and expansion of the municipal water system facilities with short term and long-term needs of the community.

This report summarizes the results of a water system evaluation completed for the Faribault water system. The primary purpose of the study was to evaluate the water needs and system expansion required to serve current and future utility customers to the year 2040. This report will serve as a plan to guide future expansion and redevelopment of the water system.

1.1 Scope

The Comprehensive Water Plan is intended to document the analysis and processes that lead to the development of the capital improvement recommendations. The following list summarizes each Section included in this report.

- Section 1:
 - Covers the project overview and identifies existing background information and reports referenced in this 2040 Comprehensive Water Plan.
- Section 2:
 - Reviews each component of the existing water system including infrastructure, water quality and operational processes.
- Section 3:
 - Analyzes the community's historical and projected development and growth including population, land uses and water service area.
- Section 4:
 - Establishes historical water use trends and develops water use projections based on Section 3 assumptions and conclusions.
- Section 5:
 - Evaluates and compares the existing water system to the projected water use and quality needs.

- Section 6:
 - Predicts the impact of future pipe break points using the Likelihood of Failure, Consequence of Failure and Risk of Failure analyses.
- Section 7:
 - Recommends improvement projects to address system deficiencies identified in Section 5 and 6.
- Section 8:
 - Outlines when recommended improvement projects should be implemented into the capital improvement plan.

Because needs change with time, municipal water system planning is a continuous function. Therefore, the long-term projections and improvements discussed in this report should be reviewed, re-evaluated and modified as necessary, to assure the adequacy of future planning efforts. Proper future planning will help assure that system expansion is coordinated and constructed in the most effective manner.

1.2 Background Information and Previous Study Reports

This plan reviews the following background information and previous water planning study reports provided by the City. This plan builds upon previous efforts and integrates new available information and system performance data:

- Well and Boring Logs
- Well Maintenance and Rehab Reports
- Water Use Data from Billing Records (2018)
- Sanitary Surveys (2020)
- Consumer Confidence Reports
- Water Treatment Plant Plans
- ISO Survey Reports
- Tank Inspection Reports
- Journey to 2040 Comprehensive Plan
- Water Supply Plan (2017)
- Wellhead Protection Plan (2020)
- Maps and GIS Data

2 Existing Water System

This section summarizes the components of the existing Faribault water system. The following components will be reviewed in detail:

- Supply – Five (5) groundwater wells
- Treatment – One (1) water treatment plant
- Storage – Four (4) storage tanks
- Pressure Service Areas – Two (2) pressure zones
- Booster Pumping – One (1) booster pumping station
- Distribution System

2.1 Supply

Depending on available resources, municipalities have the option of using different water sources as their municipal supply. The water source chosen as the supply influences the design of other water infrastructure and quality of finished water. The following sections provide an in-depth analysis of the Faribault water system's supply in terms of: Water Source, Water Quality, Vulnerability to Contamination and Production Reliability



The Faribault water system utilizes five municipal groundwater wells as the City's water source. Details of each well design are shown in Table 2-1.

Table 2-1 – Existing Supply Facilities

Well Name	Unique Well Number	Location	Install Year	Depth (ft)	Casing Diameter (in)	Casing Depth (ft)	Aquifer Source	Treatment
Well No. 1	217737	824 7 th St NW	1936	750	30 x 24	54	Prairie Du Chien, Jordan, Wonewoc	WTP
Well No. 3	217741	Across Street from 824 7 th St NW	1912	410	10	70	Prairie Du Chien, Jordan	WTP
Well No. 5	217746	Alexander Park North – SW Corner	1969	407	30 x 24	67	Prairie Du Chien-Jordan	WTP
Well No. 6	541549	Alexander Park North – NW Corner	1996	403	30 x 24 x 18	327	Jordan	WTP
Well No. 7	716426	1904 Fairgrounds Dr/Rice Co. Fairgrounds	2004	414	24 x 18	312	Jordan	WTP

Source: MDH Sanitary Survey (2020) & City Maintenance Records

2.1.2 Water Quality

Water samples from each municipal well were collected and analyzed to establish the existing water quality. The analytes selected for analysis were chosen based on their known presence in Minnesota groundwater. Typical analyte concentrations for each well are shown in Table 2-2.

Table 2-2 – Existing Source Water Quality

Analyte	Reporting Limit	Well No. 1	Well No. 3	Well No. 5	Well No. 6	Well No. 7
Iron(mg/L)	0.01	0.764	1.440	1.250	0.827	0.955
Manganese (mg/L)	0.01	0.061	0.102	0.301	0.049	0.096
Hardness (mg/L as CaCO ₃)	0	353	376	369	376	383
Ammonia Nitrogen, Total (mg/L)	0.05	0.29	-	0.39	-	0.35
Arsenic (ug/L)	1	< 1	-	1.87	-	< 1
Nitrate + Nitrite Nitrogen, Total (mg/L)	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Source: Feasibility Study (2016)

2.1.3 Source Water Vulnerability

In 2020 the City completed a Well Head Protection Plan (WHPP) which established the vulnerability of each well. The results of this plan indicated that four of the five wells were marked as vulnerable as shown in Table 2-3.

Table 2-3 – WHPP Vulnerability Classification

Well	Vulnerability Classification	Reason
Well No. 1	Vulnerable	Sampling Detected Trichloroethene and Dichloroethene
Well No. 3	Vulnerable	Sampling Detected Tritium, Trichloroethene and Dichloroethene
Well No. 5	Vulnerable	Sampling Detected Tritium and Dichloroethene
Well No. 6	Vulnerable	Sampling Detected Tritium
Well No. 7	Not Vulnerable	-

Source: WHPP Part I provided by the City

2.1.4 Production Reliability

Reliability of the water source was established based on determining the supply pumping capacity and the volume of source utilization. The total pumping capacity was determined to be 8,110 gpm as shown in Table 2-4. In the event the largest capacity well is offline, the pumping capacity, otherwise known as firm pumping capacity, will be 6,110 gpm. Using a more conservative approach, if the two largest capacity wells are offline, the firm pumping capacity will be 4,310 gpm.

Table 2-4 – Well Pumping Capacity

Well	Capacity (gpm)
Well No. 1	1,660
Well No. 3	1,000
Well No. 5 ⁽¹⁾	2,000
Well No. 6	1,800

Well	Capacity (gpm)
Well No. 7	1,650
Total Pumping Capacity	8,110
Firm Pumping Capacity	6,110
Conservative Firm Pumping Capacity (2-Wells Offline)	4,310
⁽¹⁾ Largest capacity well	

Source: Data provided by the City

Pumping records from 2018 were analyzed to establish the percentage of water pumped from each well. Results show that wells 1, 3 5, 6 & 7 support a similar amount of flow demand with Well No. 5 relied upon the most by supplying 29% of the system supply.

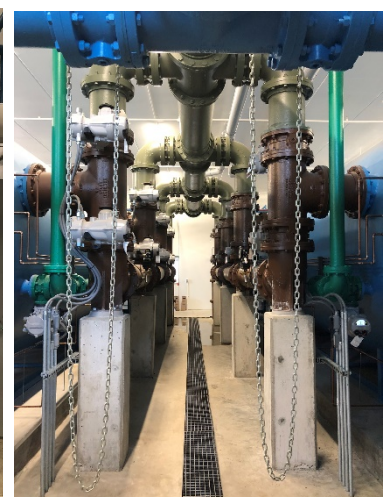
2.2 Treatment

Water Treatment Plants (WTPs) are designed to treat source water exceeding water quality regulatory standards to within regulatory limits. Treatment processes required for each WTP vary based on the source water quality and the finished water quality requirements. The following sections provide an in-depth analysis of the Faribault water system's treatment in terms of:

- Water Treatment Process Design
- Treatment Capacity

The Faribault water treatment process consists of four (4) horizontal pressure filters to remove the high concentrations of iron and manganese. Raw water is pumped from the well sites directly to the WTP site. The raw water is then combined with the recycled water from the plant. Sodium permanganate and chlorine are constantly added to the mixture. From there, the raw water flows through the pressure filters. After filtration, four (4) chemicals are added: chlorine, ammonia, fluoride, and sodium silicate. These are mixed together with a static mixer and sent into the distribution system.

The Faribault water treatment plant is designed to operate at 7 MGD under normal conditions with the ability to operate at 10 MGD for short periods of time.



2.3 Storage

Municipalities maintain storage tanks throughout the distribution system to:

- Store water in the distribution system
- Dampen dynamic pressure swings in the distribution system
- Maintain system pressure
- Provide operational flexibility at supply facilities
- Increase water supply reliability
- Meet peak hour demands
- Provide additional flow for fire protection

The Faribault water system has two elevated storage tanks and two ground storage reservoirs to provide distribution storage. The four tanks provide a total distribution storage capacity of 4.90 MG. Additional details for each storage tank are noted in Table 2-5.



Table 2-5 – Existing Storage Facilities

Structure Name	Storage Type	Constructed Year	Inspected Year	Style & Primary Material	Pressure Zone	Overflow Elevation (ft)	Storage Capacity (gal)
CBI	Elevated Storage	1996	2020	Single Pedestal	High	1,310.00	150,000
Gridor Reservoir	Ground Storage	2002	2018	GSR Concrete	Main	1231.50	2,000,000
Natgun Reservoir	Ground Storage	2005	2018	GSR Concrete	Main	1231.50	2,000,000
North CET	Elevated Storage	To Be Constructed - 2022	-	Composite	Main	1231.50	750,000
Total System Storage (MG)							4.9

Source: Water Supply Plan and Construction Plans

2.4 Pressure Zones

Pressure zones allow regions of the system to operate at different hydraulic grade levels (HGLs) while maintaining a connection to the water source via booster pumps, pressure reducing valves (PRVs), or pressure sustaining valves (PSV). The Faribault water system has been designed with two pressure zones to sustain adequate system pressure. Additional details for each pressure zone are noted in Table 2-6.

Table 2-6 – Existing Pressure Zones

Pressure Zone	High Water Level HGL (ft)	Lowest Elevation Served (ft)	Highest Elevation Served (ft)
Main Zone	1,231.5	964.6	1,208.3
High Zone	1,310.0	1,098.3	1,216.3

Source: Water Model

2.5 Booster Station

Booster stations are designed to act as water transfer points between pressure zones. The following sections provide an in-depth analysis of the Faribault water system's booster station in terms of:

- Booster Station Design
- Pumping Capacity

The Faribault water system currently has one booster station to pump water from the Main Zone to the High Zone. The booster station increases the HGL by approximately 79 ft. The station has three booster pumps, two larger pumps rated at 625 gpm each and one smaller pump which operates at +/- 125 gpm.



2.6 Distribution System

The water distribution system provides a means of transporting and distributing water from the supply sources to customers and other points of usage. The distribution system must be capable of:

- Supplying adequate quantities of water at reasonable pressures throughout the service area under a range of operating conditions
- Providing a uniform distribution of water during normal and peak demand conditions
- Delivering adequate water supplies for fire protection purposes

The Faribault water system is comprised of approximately 139 miles of water mains ranging in size from 4-inches to 24-inches in diameter. The current water main size inventory is summarized in Table 2-8 below. Of the 139 miles of water main, 4.0% are 16-inch in diameter or larger which represent the transmission mains in the system. The presence of large water main as exists in the Faribault water system supports the ability of the water system to transmit large system flows while the smaller diameter mains support distribution to end users.

Table 2-7 – Existing Pipe Network

Pipe Size	Length (ft)	Length (mi)	Percentage
< 4	1,694	0.3	0.2%
4	11,463	2.2	1.6%
6	379,712	71.9	51.7%
8	185,581	35.1	25.3%
10	6,523	1.2	0.9%
12	119,719	22.7	16.3%
16	16,291	3.1	2.2%
18	52	0.0	0.0%
20	12,628	2.4	1.7%
24	310	0.1	0.04%
Total	734,000	139	100%

Source: GIS provided by the City, and the Water Model.

3 Population and Community Growth

This section summarizes the planning assumptions made regarding future service area characteristics for the Faribault water service area. Input received from local officials and utility staff members was considered and incorporated. The following components will be reviewed in detail:

- Population
- Land Use
- Water Service Area

3.1 Population

There is generally a close relationship between a community's population and total water consumption volumes. Future water sales can be expected to generally reflect future changes in service area population. Similarly, commercial, public, and industrial water consumption will also tend to vary proportionately with the growth of the community.

3.1.1 Historical Population

Over the last 50 years the City of Faribault's population has steadily increased to 23,673 as reported in 2020. Historical records indicate a steady growth in population as indicated in Table 3-1.

Table 3-1 – Historical Population Data

Year	Population	Annual Growth Rate
1960	16,926	-
1970	16,595	-2.0%
1980	16,241	-2.2%
1990	17,085	4.9%
2000	20,818	17.9%
2010	23,352	10.9%
2020	23,673	1.4%

Source: Journey to 2040: Comprehensive Plan provided by City & MN State Demographer

3.1.2 Projected Population

The city has updated population projections during the development of their water supply plan as well as the recently completed City comprehensive plan (Journey to 2040). These population projections were used to keep consistency between planning documents. The City comprehensive plan asserted that Faribault's population will remain mostly unchanged through 2040 (As shown in Figure 2-A of Journey to 2040). The population projections utilized in the table below represent a median average of the low and high population projections included in the comprehensive plan and is intended to represent a realistic growth expectation. The projections indicate that the population has the potential to increase to 25,079 by the year 2040 as shown in Table 3-2. The Journey to 2040 comprehensive plan projects a population of 23,170 with a maximum 2040 city population projection of 26,878.

Table 3-2 – Population Projections

Year	Journey 2040 Low/Flat	Journey 2040 High	Composite Projection	Annual Growth Rate
2022	23,673	24,100	24,509	-
2023	23,660	24,247	24,622	0.46%
2024	23,630	24,394	24,735	0.46%
2025	23,595	24,541	24,849	0.46%
2030	23,572	25,275	24,964	0.46%
2035	23,370	26,075	25,022	0.23%
2040	23,170	26,878	25,079	0.23%

Source: Water Supply Plan provided by City – Avg. of Low and high population projections from Journey to 2040 Comprehensive Plan

For this study it is assumed that the total percentage of population served by the year 2040 will be similar to the current service percentage. As a result, future water users will grow at a rate similar to the population growth.

3.2 Land Use

Water consumption is also closely related to land use categorization. Generally, land use provides a rough estimate of how much water is used by an area.

3.2.1 Existing Land Use

Existing land use categories were determined from the City's GIS as illustrated in Figure 3-1. The City of Faribault breaks their land use types into the following categories:

- Single Family Residence
- Manufactured Home Community
- Multi-Family Residence
- Mixed Use Residential and Commercial
- Office
- Retail and Other Commercial
- Mixed Use Commercial and Other
- Industrial and Utility
- Mixed Use Industrial
- Park, Recreational, Preserve
- Airport
- Agriculture
- Undeveloped
- Railway
- Major Highway
- Institutional
- Golf Course
- Right-of-Way

Based on GIS data area land use estimates were made for each category as shown in Table 3-3. The data showed the largest user type was single - family residence - detached with a land use estimate of 22%. It is estimated that approximately 8% of the land is currently vacant. How the vacant land is used in the future will impact the projected water use.

Table 3-3 – Land Use

Land Use	Area (acre)	Percentage (%)
Agriculture	1,432	17%
Airport	256	3%
Extractive	21	0.2%
Golf Course	269	3%
Industrial and Utility	1,000	12%
Institutional	920	11%
Manufactured Home Community	113	1%
Mixed Use Commercial and Other	6	0.1%
Mixed Use Industrial	23	0.3%
Mixed Use Residential and Commercial	22	0.3%
Multi-Family Residence - 2-3 units/bldg	27	0.3%
Multi-Family Residence - 4+ units/bldg	122	1%
Office	36	0.4%
Park, Recreational, Preserve	1,239	14%
Railway	138	2%
Retail and Other Commercial	241	3%
Single-Family Residence - Attached	92	1%
Single-Family Residence - Detached	1,853	22%
Single-Family Residence - Farmstead	151	2%
Undeveloped	647	8%

Source: GIS provided by the City

3.2.2 Projected Land Use

Planned land use plays an important role in projecting future water consumption. Projected land use was determined from the City's planning zoning GIS as illustrated in Figure 3-2.

Comparing the land use to the zoning map identifies the central portion of the City is fairly developed indicating the majority of the future development will occur in the north and south. These areas are currently zoned for residential, commercial and industrial type users.

3.3 Water Service Area

The Faribault water system provides water to water users within the city limits. It is anticipated that the water system will grow with the City as undeveloped areas are developed in the future. The current water system is depicted in Figure 2-1

3.3.1 Projected Water Service Area

The future water service area was projected to expand to the undeveloped areas within the City limits and within the proposed system land use map. At this time, it is not expected that the water system would be extended to serve communities outside City limits.

4 Water Requirements

The following topics will be reviewed in detail to establish the foundation for future infrastructure planning:

- Historical Water Use
- Projected Water Use
- Other Water Use Requirements

4.1 Historical Water Use

Water use projections are derived from historical water use trends. Water consumption is commonly evaluated by:

- Year
- Customer Categories
- Per Capita Demand
- Pressure Zone
- Unaccounted Water
- Large Customers
- Seasonal Variations

4.1.1 Historical System Wide Water Use

Historical water records provide an overview of the water system consumption as a whole. Understanding the system demands on a large scale will establish system consumption trends and help project a future system baseline demand. Table 4-1 depicts the system wide water use over the last 10 years.

The Average Day (AD) water use has remained relatively stable over the last 10 years typically ranging from 2.73 to 3.69 MGD. Records indicate that the MD water use had more variation ranging from 4.59 to 7.31 MGD which is likely from seasonal impacts.

4.1.1.1 Historical System Wide Water Use Summary

For water use projection calculations, the following values will be used:

- AD = 3.69 MGD
- MD = 7.31 MGD
- MD:AD Ratio = 1.98

Table 4-1 – Historical System Wide Consumption

Year	Population	Average Day (AD) Water Pumped (MGD)	Maximum Day (MD) Water Pumped (MGD)	MD:AD Ratio
2011	23,409	2.73	4.59	1.68
2012	23,436	2.88	5.30	1.84
2013	23,477	3.01	5.68	1.89
2014	23,631	3.21	5.34	1.66
2015	23,700	2.95	5.09	1.72
2016	23,718	3.35	5.61	1.67
2017	23,769	3.51	6.16	1.75
2018⁽¹⁾	23,884	3.69	7.31	1.98
2019	23,912	3.47	5.45	1.57
2020	23,673	3.49	5.30	1.52
5-Year Average	-	3.50	5.96	1.70
⁽¹⁾ Demand used for design conditions.				

Source: 2010 – 2020 Water Use Data provided by the City & State Demographer

4.1.2 Historical Per Capita Demand

Calculating the per capita demand based on customer category identifies trends specific to the customer category in relation to population of the service area. Analyzing the records in this manner will identify how water consumption will change in the future based on population changing. Table 4-2 depicts water use by per capita demand over the last 10 years and summarizes the most recent 5-year averages for comparison purposes.

Table 4-2 – Water Use Demand per Capita

Year	Population	Average Day (AD) Water Pumped Per capita (gpm)	Maximum Day (MD) Water Pumped Per Capita (gpd))
2011	23,409	117	196
2012	23,436	123	226
2013	23,477	128	242
2014	23,631	136	226
2015	23,700	125	215
2016	23,718	141	236
2017	23,769	148	259
2018	23,884	155	306
2019	23,912	145	228
2020	23,673	148	224
5-Year Average		136	236

4.1.3 Historical Water Use by Pressure Zone

Evaluating water consumption trends based on pressure zones identifies demands specific to each zone. Understanding the demand distribution between zones will allow for better infrastructure and operational analysis within the zone. Table 4-3 depicts water use by pressure zone derived from 2018 billing data.

Table 4-3 – Historical Pressure Zone Demand

Demand	Main Zone	High Zone	Total (Main + High)
Average Day (AD) (gpm)	2,523	40	2,563
Average Day (AD) (MGD)	3.63	0.06	3.69
Maximum Day (MD) (gpm)	4,994	80	5,074
Maximum Day (MD) (MGD)	7.19	0.16	7.31

Source: 2018 Billing Data & Water Use Records Provided by the City

4.1.3.2 Zone Demand Distribution

Billing records from 2018 were placed geographically by address to establish the demand distribution across the system. The demand within each zone was summed to establish the zone demand. This analysis indicated that the Main Zone has the largest demand.

4.1.3.2.1 Main

Users in the Main Zone consume approximately 98% of the daily water sold. This zone has residential, commercial, industrial, agricultural, and institutional users. The Main Zone's average day and maximum day demand were calculated to be 3.63 MGD and 7.19 MGD, respectively.

4.1.3.2.2 High Zone

The High Zone consumes approximately 2% of the daily water sold. This zone serves residential users. The High Zone's average day and maximum day demand were calculated to be 0.06 MGD and 0.16 MGD, respectively.

4.1.3.3 Historical Pressure Zone Water Use Summary

For water use projection calculations, the following values will be used:

- Main Zone AD Demand = 3.63 MGD
- High Zone AD Demand = 0.06 MGD
- Main Zone MD Demand = 7.19 MGD
- High Zone MD Demand = 0.16 MGD

4.1.4 Historical Large Customers

The City of Faribault's largest water customers include industrial, residential, and institutional users. The highest ten users consume approximately 50% of the water on an average day and are listed in Table 4-4. The City's largest user is Jennie O Turkey Store, which consumes a little under a quarter of the water pumped every day.

Future water use projections should consider the expansion or abandonment of these top ten users as they will greatly impact the amount of water required to be pumped, treated, distributed and stored.

Table 4-4 – Top 10 Users

User	Category	Amount Consumed (MGY)	Average Day (AD) Water Consumed (MGD)	Percent of Total Annual Water Delivered
Jennie O Turkey Store	Industrial	277	0.76	20.6%
Faribault Foods	Industrial	239	0.65	17.7%
Faribault Dairy	Industrial	44	0.12	3.3%
Shattuck-St. Mary School	Institutional	20	0.05	1.5%
Genova MN	Industrial	19	0.05	1.4%
Cannon River Trailer Court	Residential	18	0.05	1.3%
Sage Electronics	Industrial	18	0.05	1.3%
Evergreen Estates	Residential	15	0.04	1.1%
Four Seasons Apartments	Residential	12	0.03	0.9%
FBLT Woolen Mills	Industrial	11	0.03	0.8%
Total				50%

Source: Water Supply Plan provided by the City of Faribault

4.2 Projected Water Use

Projections of customer demands serve as the basis for establishing water requirements for capital improvements planning. Several standard methods were used in this study to project water demands based on estimates of population and community growth. This section

summarizes the methodology used and the results of these projections. Water use projections will be reviewed in the following sections in terms of:

- Population
- Customer Category
- Pressure Zone

4.2.1 Projected Water Use by Population

Commonly, water consumption trends tend to follow population trends. As the City's population is expected to increase, it can also be assumed that the water consumption will increase. The overall system's projected water use in relation to population was used to calculate the:

- Projected Average Day Water Demand (Pumped)
- Projected Maximum Day Water Demand (Pumped)

To project future average day demands the established historical average day per capita water pumped value was multiplied by the expected population through the year 2040. This calculation indicated that by the year 2040 the average day water sold demand had the potential to increase to 3.88 MGD.

Similarly, the maximum day water sold demand was established by multiplying the projected average day water sold demand and the historical MD:AD ratio through the year 2040. This calculation indicated that by the year 2040 the maximum day demand will increase to 7.67 MGD.

4.2.1.1 Projected System Wide Water Use

For the 2040 water system evaluation the following values will be used:

- AD Water Sold= 3.88 MGD
- MD Water Sold = 7.67 MGD

Table 4-5 – Projected Water Use

Year	Population	Average Day (AD) Water Pumped (MGD)	Maximum Day (MD) Water Pumped (MGD)
2022	24,509	3.79	7.50
2023	24,622	3.80	7.53
2024	24,735	3.82	7.57
2025	24,849	3.84	7.60
2030	24,964	3.86	7.64
2035	25,022	3.87	7.66
2040	25,079	3.88	7.67

Source: MN State Demographer, City Projection Estimates & Historical Water Use

4.2.2 Water Use by Pressure Zone

As the population within each pressure zone increases the demand within each zone will also increase. Assuming that the ultimate growth in consumption follows expected land use trends, the majority of demand increase is expected in the main pressure zone, where the majority of the

current demand exists. 2040 Demand projections for each pressure zone are expected to be like the demands projected below.

Table 4-6 – 2040 Projected Demands by Pressure Zone

Demand	Main Zone	High Zone	Total (Main + High)
Average Day (AD) (gpm)	2,654	43	2,697
Average Day (AD) (MGD)	3.82	0.06	3.88
Maximum Day (MD) (gpm)	5,242	85	5,327
Maximum Day (MD) (MGD)	7.55	0.12	7.67

Source: 2018 Billing Data & Water Use Records Provided by the City

4.2.2.1 Main Zone

The water use projections assumed the Main Zone would continue to consume approximately 98% of the daily water sold. The Main Zone's projected average day and maximum day demand were calculated to be 3.82 MGD and 7.55 MGD, respectively.

4.2.2.2 High Zone

The High Zone currently consumes approximately 2% of the daily water sold. With the majority of future growth expected to occur in the Low Zone, the The High Zone's average day and maximum day demand were calculated to be a maximum of 0.06 MGD and 0.12 MGD, respectively which is only a small percentage of the overall system demand.

4.2.2.3 Projected Pressure Zone Water Use

For water use projection calculations the following values will be used:

- Main Zone AD Demand = 3.82 MGD
- High Zone AD Demand = 0.06 MGD
- Main Zone MD Demand = 7.55 MGD
- High Zone MD Demand = 0.12 MGD

4.3 Other Water Use Requirements

In addition to establishing water use requirements based on projected water use demands, requirements can be derived from water industry standards. The following sections will review the water system requirement industry standards for:

- Conservation
- Fire Flow

4.3.1.1 Fire Flow

Fire protection is an important factor to consider for capital improvement planning. In most instances, water main sizes are designed specifically to meet water requirements for fire flow. Guidelines for determining fire flow requirements are provided by the Insurance Service Office (ISO).

4.3.1.2 ISO Requirements

ISO is the organization responsible for evaluating and classifying municipalities for fire insurance rating purposes. Fire protection needs vary with the physical characteristics of each building to be protected. For example, needed fire flows for a specific building can vary from 500 gpm to as high as 12,000 gpm, depending on:

- Habitual classifications
- Separation distances between buildings
- Height
- Materials of construction
- Size of the building
- Presence or absence of building sprinklers.

Municipal fire insurance ratings are partially based on the City's ability to provide needed fire flows up to 3,500 gpm. If a specific building has a needed fire flow greater than this amount, the community's fire insurance rating will only be based on the water system's ability to provide 3,500 gpm.

The minimum fire flow available at any given point in a system should not be less than 500 gpm at a residual pressure of 20 psi. This represents the amount of water required to provide for two standard hose streams for fighting a fire a typical residential area (for single-family residential dwellings with spacing between 31 to 100 feet).

Table 4-13 below shows typical fire flow requirements for various land use types. These requirements were used as a basis for evaluating the Faribault water system. The requirements shown in Table 4-13 are only intended as a general guideline. The actual needed fire flow for a specific building can vary.

Table 4-7 – Typical Fire Flow Requirements

Land Use	Building Separation (feet)	Available fire flow @ 20 psi (gpm)
Single & Two Family Residential	>100	500
Single & Two Family Residential	30-100	750
Single & Two Family Residential	11-30	1000
Single & Two Family Residential	<10	1500
Multiple Family Residential Complexes	-	2,000 to 3,000+
Average Density Commercial	-	1,500 to 2,500+
High Value Commercial	-	2,500 to 3,500+
Light Industrial	-	2,000 to 3,500
Heavy Industrial	-	2,500 to 3,500+

Source: Insurance Services Office

4.3.1.3 Water Conservation

Water conservation occurs in two different forms, active conservation and passive conservation. Active conservation efforts include mechanisms such as educational programs, customer incentives and conservation ordinances while passive conservation results are a product of the installation of water efficient fixtures (toilets, showerheads and washers) implemented by manufacturing standards and plumbing codes which may or may not be a result of intended conservation efforts. Research has indicated that individual conservation efforts including educational programs, public information, school programs, retrofit programs, conservation ordinances, and/or regulations can reduce water use about 1%-4% per program. In summary, when estimating projected water use, both active and passive water conservation should be accounted for.

Historically the City of Faribault has utilized educational efforts to inform water users regarding suggested water conservation practices. This includes information provided on the water section of the city website and other information distributed directly to customers. As conservation relates to future water use projections, recent water use trends are assumed to reflect current conservation trends. Historical per capita residential water use data, as documented in the water supply plan, indicate a reasonable residential per capita water use average of 56 gallons per capita per day (GPCD). This is in line with the amount of water used by other residual users in Minnesota. The Minnesota DNR has a conservation goal of no more than 75 GPCD. The City of Faribault residential water use is well below this value and therefore meets this goal.

Peak Daily Use (maximum gallons per day during the year, divided by average daily use) in Faribault had ranged between 1.52 to 1.98 which meets the DNR conservation peaking factor goal of no more than 2.6. This is partially since Faribault has many larger commercial and industrial water customers which have consistent yearly water use. In summary the city has managed water conservation in a responsible manner and future water use projections reflect current conservation practices.

5 Water System Evaluation

Water systems are analyzed, planned, and designed to comply with rules and regulations enforced by regulatory agencies, and through hydraulic analysis. Some important factors that must be considered when designing water systems include:

- The location and capacity of supply facilities.
- The location, sizing, and design of storage facilities.
- The location, magnitude, and variability of customer demands.
- Water system geometry and geographic topography.
- Minimum and maximum pressure requirements.
- Land use characteristics with respect to fire protection need.

A system-wide evaluation was performed to identify strengths and weaknesses of the Faribault water system. This section will detail the analysis including the:

- Methods of Analysis
- Water System Analysis

5.1 Method of Analysis

To evaluate the strengths and weaknesses of the Faribault water system, the following analyses were performed:

- Water Quality Compliance
- Mass Balance
- Water Model

5.1.1 Water Quality Compliance

Water utilities serving the public population are required to comply with all federal, state and local government enforced water quality regulations. It is important to analyze water quality to establish if the water system is compliant with all regulations. The following sections will provide a review of the water quality regulations and standards enforced.

5.1.1.1 Water Quality Regulations & Standards

Federal (EPA), State (MDH and MN DNR) and local government agencies enforce water quality regulations created to protect public health. The existing regulations on contaminants have been developed over time and are continuously evolving as research is completed and additional harmful contaminants are discovered.

5.1.1.1.1 Safe Drinking Water Act (SDWA) Regulations

In 1974 Congress passed the Safe Drinking Water Act (SDWA) empowering the US EPA to create enforceable regulations on water quality to protect public health. The act was amended in 1986 and 1996 to include additional regulations and resources ensuring the protection of public health and water sources. Major regulations and standards included in the SDWA are described in detail in the following sections.

National Primary Drinking Water Regulations (NDPWR)

The National Primary Drinking Water Regulations (NPDWR) are enforceable regulations and treatment techniques designed to restrict contaminant levels in drinking water. Contaminates

regulated by the NPDWR include microorganisms, disinfectants, disinfection byproducts, inorganic chemicals, organic chemical and radionuclides. The allowable level of each contaminant present in drinking water is determined based on scientific research and known adverse health effects.

The US EPA utilize the maximum contaminant level goal (MCLG) and maximum contaminant level (MCL) to evaluate water quality. The MCLG is the desirable contaminant level in the water and is not a legally enforceable standard. The MCL is the maximum allowable contaminant level and is legally enforceable. For some contaminants the treatment technique (TT) is substituted for the MCL. TT is the treatment process required to reduce certain contaminants present in the water. Like the MCL the TT is a legally enforceable treatment technique.

National Secondary Drinking Water Regulations (NSDWR)

The National Secondary Drinking Water Regulations (NSDWR) are non-enforceable standards designed to address cosmetic and aesthetic issues related to water quality. Although not legally enforceable, the US EPA recommends public utilities adopt these standards.

Contaminant Candidate List (CCL)

The Contaminant Candidate List (CCL) is a list maintained by the US EPA of contaminants that are not regulated under existing law but are known to be present in water sources. These contaminants may be regulated in future versions of the NPDWR or NSDWR. Contaminants on the list include microorganism, inorganic chemicals, and organic chemicals.

5.1.1.1.2 Minnesota Department of Health Requirements

All regulations established by the U.S. EPA are adopted by the Minnesota Department of Health (MDH). MDH also develops their own health standards to indicate at what concentrations a contaminant may be impacting human health.

Along with adopting rules and regulations, the MDH implements a Drinking Water Protection Program to help public utilities stay in compliance and protect water sources. Through the program water sampling is performed, public water contamination problems are addressed, training is given to water operators, and grants are administered for infrastructure improvements and water protection.

5.1.2 Mass Balance

A mass balance evaluation compares the supply and demands of the system to evaluate if the system will have a water deficiency or water surplus. A water deficiency indicates that the water supply volume is less than the volume of water required to meet the system demand. A water surplus indicates that the water supply volume is greater than the volume of water required to meet the system demand.

Depending on the portion of the water system being evaluated, different mass balance analyses are performed. The following sections will provide details of the mass balance analyses used to evaluate the water system in terms of:

- Pumping Capacity
- Treatment Capacity
- Storage Capacity

5.1.2.1 Pumping Capacity Evaluation

Pumping capacity evaluations compare the pumping capacity to the system demand. This calculation determines whether the pumping capacity is capable of meeting system demands. The firm pumping capacity is utilized in this type of evaluation. As stated previously, the firm pumping capacity is the pumping capacity with the largest pump offline, and a more conservative approach is the pumping capacity with the two largest pumps offline. In pumping capacity evaluations the MD demand is considered to account for the worst case scenario.

5.1.2.2 Treatment Capacity Evaluation

Treatment capacity evaluations compare the treatment capacity to the system demand. This calculation determines whether the treatment capacity is capable of producing enough treated water to meet system demands. The treatment capacity of each treatment stage is utilized in this type of evaluation. Also, the MD demand is considered to account for the worst case scenario.

5.1.2.3 Storage Capacity Evaluation

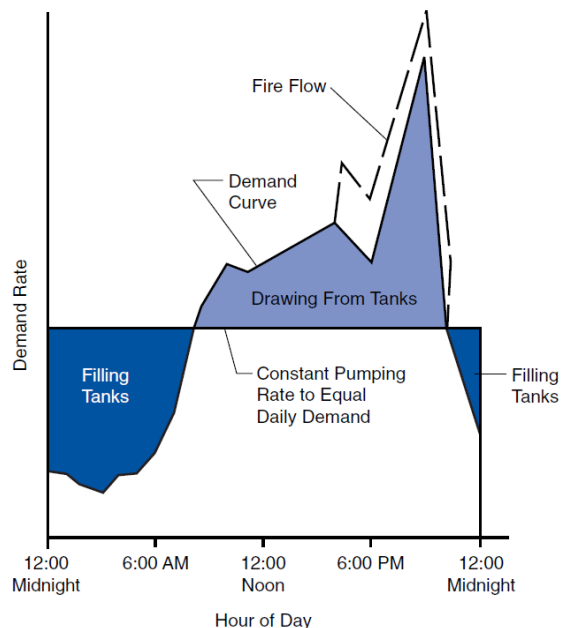
Mass balance evaluations for system storage review the following storage types:

- Equalizing storage (sometimes termed operational storage).
- Fire storage.
- Emergency storage.

5.1.2.3.1 Equalizing Storage

Equalizing storage works to allow the supply and treatment pumping systems to be sized and operate to produce at the rate of average demand over the course of a day. For example, during peak hours of water use, when customers are using large amounts of water, system demand may exceed the production rate of the water supply/treatment. It is during this time when water storage facilities will drain to satisfy the increased system demand. This concept is further illustrated in the figure below.

Figure 5-1 – Equalization Storage



5.1.2.3.2 Fire Storage

Fire storage includes water held in the tank in the case of an emergency. To assure a reliable supply for fire protection, this reserve storage should not be utilized to meet peak hour requirements and should be available when needed. Guidelines for determining fire flow requirements are developed based on recommendations offered by the Insurance Services Office (ISO), which is responsible for evaluating and classifying municipalities for fire insurance rating purposes. When a community evaluation is conducted by ISO, the water system is evaluated for its capacity to provide needed fire flow at a specific location and will depend on land use characteristics and the types of properties to be protected. A balance between having enough storage or too much storage must be found. For purposes of this evaluation it will be assumed that the goal for fire protection storage will be a volume equal to fighting a 3,500 gpm fire for three hours. This represents one of the largest potential fire flow demands that may potentially be feasibly present in the water system. This figure will be used as a basis for estimating the amount of water to be held in the proposed storage tank for fire protection.

5.1.2.3.3 Emergency Storage

Emergency storage is required to meet system water demands during an emergency event that limits or disrupts supply. Some examples of emergency events include water main breaks, equipment failure, and power failure or source contamination.

A mass balance analysis was performed to identify if the storage capacity is capable of meeting projected water use demands over the planning period.

5.1.2.3.4 Average Day Water Use Storage

An alternative more simple criteria for sizing water storage is to simply have a minimum of an average day of water use in storage. This common criteria is used by MDH and is common for sizing water tanks in smaller water systems. Since the Faribault water system has both traditional water users along with multiple large users, a balance between the water storage sizing criteria should be balanced.

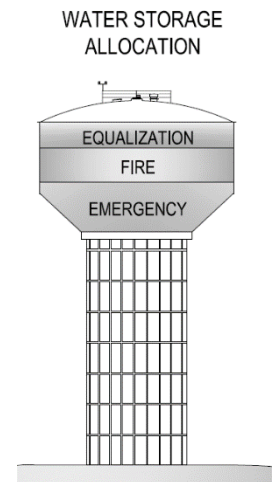
For the purposes of this evaluation, the sizing criteria developed for the Faribault water system are as follows:

1. **Requirement 1** - Available storage should be large enough to provide equalization storage (15% of MD) plus (+) Fire storage (+) 1/2 Average Day Demand for reserve storage. (Fire storage based on largest land use fire flow requirement in the zone being analyzed)
2. **Requirement 2** - Average daily consumption should not exceed the available storage. This sizing metric is commonly used by the Minnesota Department of Natural Resources (DNR) when determining if additional water storage is warranted.

This sizing practice is a commonly used industry requirement for storage that also accounts for hourly system operation in order to satisfy peak water demands.

5.1.3 Water Model

A water model is a useful tool in evaluating current water system conditions as well for simulating the operation of proposed improvements. The construction of a water model of Faribault's water



system was included as part of the 2018 Water Treatment Plant Project to aid in the current and future planning process. The following sections briefly summarize the means and methods used to develop the water model, and the capabilities of the model.

5.1.3.1 Model Construction

The computer model was developed using WaterCAD v8i software. The hydraulic computer model was initially set up using GIS information depicting the City's existing distribution system. All pipes 4 inches and larger were included in the model, and ground elevations were gathered from existing Lidar topographic data. The model was also analyzed visually to verify locations of the existing distribution piping.

Historical water pumping records were used to represent current demands on the system and were distributed through the model according to historical customer use. Water use data collected from 2018 billing records were assigned geographically in the model according to customer parcel, providing for a realistic distribution of water system demands. Storage and supply facilities were modeled based on available water system data. As the City's water system expands, calibration can be done to include future facilities as they are constructed.

5.1.3.2 Model Calibration

A well calibrated water distribution model is paramount for the use of the model as a trusted water system evaluation tool. As a result, extensive field testing and calibration exercises were conducted to assure that the newly created water model produces reliable results that closely match field conditions.

The Faribault water system model was calibrated using results of flow testing performed in the fall of 2018. During the model calibration process, pumping rates, customer demands, and tower water levels were set to the field conditions, and pipe roughness coefficients were adjusted until the calibrated system model adequately simulated field test data.

Precise duplication of the field test results at all locations during the calibration process is not realistic due to the many factors that influence the field test results. The goal of model calibration is to minimize the error between the field test data and the model simulations and create a "best fit" at all locations; therefore, some error between the field tests and model simulations is expected. However, limits to the amount of allowable error must also be made to ensure the calibrated model is a reasonably accurate representation of the actual water distribution system. The desired accuracy for Faribault's computer model is the greater of plus or minus 25 percent or 2 psi of the recorded pressure difference to a maximum of 5 psi, and plus or minus 10 percent of the recorded flow. For adequate model calibration, the desired accuracy must be met at a minimum percentage of the field test locations. The goal of this project is to have a minimum of 80 percent of the field test results within the desired calibration accuracy before the model is considered calibrated. Overall, the model calibration results met the calibration standards, with 13 out of 15 (87 percent) residual hydrants within the desired calibration criteria.

The calibration of the system resulted in reasonable pipe friction values which are comparable to what would be expected for the age and materials of the pipe present. In an effort to achieve uniform and consistent calibration results, when pipe age information was available, the friction values for various age groups were adjusted uniformly to a best fit result. From this point an iterative process was utilized to achieve the set calibration goals.

5.1.3.3 Model Capabilities

A complete and calibrated water model has many uses that aid in analyzing both the existing water system and potential proposed improvements. For purposes of this report standard functions of the water model software were used to analyze the City's existing water system as well as project specific issues.

Some of the standard water model analysis features include:

- Steady-state simulation
- Extended-period simulation (EPS)
- Fire-flow analysis
- Water-age analysis

5.1.3.3.1 Steady State Simulations

Pressure

This analysis reviews the water system operation at a single point in time and allows system pressures and flows to be monitored. The following topics are considered in steady state pressure analysis:

- Desired pressure range
- Factors impacting pressure
- Standards for pressure

Desired Pressure Range

A water distribution system is designed to provide pressures within a range of minimum and maximum allowable conditions. When system pressure is too low, customers may complain of inadequate water supply, customer meters may tend to record inaccurately, and fire protection will be limited. When system pressure is too high system operation and maintenance issues may occur and will tend to cause higher consumption rates by customers. High water system pressures can also increase the amount of water loss, as leakage rates will increase with increases in system pressure.

Factors Impacting Pressure

Water system pressure will vary around the service area based on land elevations, and to a lesser extent supply rates and customer demands. Areas higher in topographic elevation will tend to exhibit lower water system pressures. In general, as customer demands increase pressures will decrease, however, the effect of demands on overall system pressures is usually minor.

Pressure Range Standards

Ten States Standards for water system design suggest that a minimum pressure of 35 psi and a maximum pressure of 80 psi be provided at all locations in the service area under normal operating conditions. If service pressures exceed 80 psi at the water main in the street, plumbing code calls for PRV's (Pressure Reducing Valves) be installed at service lines. Furthermore, water systems are required to be operated so that under fire flow conditions, the residual pressure in the system will not fall below 20 psi at any location.

Due to the nature of the ground elevations within the service area of the Faribault water system, two (2) pressure zones have been developed to assure adequate pressure is provided to each customer.

Pipe Carrying Capacities

The pipe network and physical condition of the pipes impact the flow carrying capacity of a water system. Flow carrying capacity refers to the ability of the pipe network to transfer water across the system without inducing high velocity and head loss. Pipes with high velocities and head losses often indicate water mains that are exceeding their flow capacity. Mathematically, head loss is a function of velocity, and high head losses often occur within water mains that exhibit high velocities (greater than 5 feet per second). However, older water mains may also exhibit high head losses as a result of loss in hydraulic capacity due to the deterioration of the interior of the pipe, even when velocities are within acceptable values. In gravity systems (or when the well pumps are off), head losses within the distribution system result in lower system pressures. When the well pumps are on (filling the tower), head losses can contribute to higher operating costs, as more power is required to overcome the energy losses occurring within the water mains.

5.1.3.3.2 Extended Period Simulations

This operation is similar to the steady state operation except that multiple points in time are monitored allowing features such as tank levels to be analyzed through hourly, daily and weekly operation.

A reliable water system is capable of meeting system demands under extreme conditions without impacting pressure across the system or reducing operational capabilities. To evaluate the reliability of a system extended period modeling for multiple days of MD demands can be performed to simulate extreme conditions. The primary purpose of this simulation is to check for cumulative system imbalances that are not evident in standard simulations. Tower and system supply placement, and distribution pipe sizes can lead to system imbalances that are not exposed under AD demands. These imbalances can in turn contribute to a reduced storage-replenishment rate which could then limit the system's ability to refill the towers during nighttime low demand periods.

5.1.3.3.3 Fire Flow Simulations

This analysis determines the amount of water that can be pulled from various locations in the water system while maintaining a residual pressure of 20 psi. The strength of the distribution system can often be directly correlated to the results of fire flow analysis.

The model was set to simulate fire flows up to 3,500 gpm without dropping the system below 20 psi. Results indicate that flows higher than this upper threshold are available in some areas of the system, but at some point they become unrealistic because there are not enough hydrants or fire equipment to deliver such high flow rates. For the purposes of this analysis, only flows up to 3,500 gpm are documented.

5.1.3.3.4 Water Age Analysis

This operation makes an estimate of the age of water at various points in the water distribution system. As water is pumped into the water system from the WTP it is either consumed or continues to travel to the farthest most portions of the distribution system. Water starts to become noticeably older as it gets farther away from the WTP, on dead end pipes, and on sections of pipes with low consumption. When water ages the likelihood of poorer water quality and disinfection by-products increases. Regulatory agencies have regulations on water quality that utilities must comply with. Water age modeling can be beneficial to evaluate the average age of water in the distribution system and identify areas of particularly old water that may not meet regulations.

5.2 Water System Analysis

Using the methods outlines in the previous section, the following topics will be reviewed in detail to identify system strengths and deficiencies in terms of water quality, projected water use and system growth:

- Supply
- Treatment
- Storage
- Booster Station
- Distribution System

5.2.1 Supply

The existing five municipal wells were evaluated to determine if the existing water quality and production capacity would adequately meet future system needs.

5.2.1.1 Water Quality Supply

Comparing the raw water quality to regulations set by the governing agencies identified that all the City's wells exceed the regulatory limit for iron and manganese.

5.2.1.1.1 Iron

Iron is a naturally occurring element on the earth's crust and is commonly present in water sources. The NSDWR set a standard of less than 0.3 mg/L iron be present in drinking water. Concentrations above this standard can result in:

- Rust colored water
- Staining to fixtures and clothing
- Metallic tasting water
- Undesirable bacterial growth at treatment facilities

Raw water quality testing indicated the iron concentration in the City's municipal wells ranges between 0.76 mg/L to 1.44 mg/L which is above the NSDWR standard.

5.2.1.1.2 Manganese

Manganese is also a naturally occurring element on the earth's crust and is commonly present in water sources. The NSDWR set a standard of less than 0.05 mg/L manganese be present in drinking water. Concentrations above this standard can result in:

- Black or brown colored water
- Staining to fixtures and clothing
- Bitter or metallic tasting water
- Headache, apathy, irritability, insomnia, leg weakness and nervous system disorders can occur from the long term consumption of high concentrations

Raw water quality testing established the manganese concentration in the City's municipal wells ranges between 0.05 mg/L to 0.30 mg/L which is above the NSDWR standard.

5.2.1.1.3 Supply Water Quality Summary

Raw water quality testing identified that the concentration of iron and manganese exceeded NSDWR. However, it does not exceed the standard to the point where treatment is not an option and is therefore still an acceptable water source.

5.2.1.2 Mass Balance

A mass balance analysis was performed to identify if the firm well pumping capacity is capable of meeting projected water use demands over the planning period. As stated earlier the existing firm capacity is 6,110 gpm or 8.8 MGD, and with a more conservative approach with the two largest wells offline, the existing firm capacity is 4,310 gpm or 6.2 MGD. Water use projections estimate that by the year 2040 the MD system demand will increase to 5,328 gpm or 7.7 MGD. The increase in demand results in a supply deficit of 1,018 gpm.

Table 5-1 – Supply Mass Balance

Year	Existing Pumping Capacity	Existing Conservative Firm Pumping Capacity ⁽¹⁾	Projected MD Demand (gpm)	Supply Surplus (+) / Deficit (-) (gpm)
2022	8,110	4,310	5,207	-897
2023			5,231	-921
2024			5,255	-945
2025			5,279	-969
2030			5,304	-994
2035			5,316	-1,006
2040			5,328	-1,018
Note: ⁽¹⁾ Firm pumping capacity assumes largest 2 wells offline.				

5.2.1.2.2 Supply Mass Balance Summary

Based on the analysis, the City will need to install another well to meet projected system demands with conservative firm capacity. **The City should plan to add an additional well with a pumping capacity of at least 1,100 gpm to ensure they have sufficient supply capacity.** The addition of the well will increase the future total pumping capacity to 9,200 gpm or 13.1 MGD, and will increase the future firm pumping capacity to 5,400 gpm or 7.7 MGD.

5.2.2 Treatment

The existing WTP was evaluated to determine if the existing water quality and production capacity would adequately meet future system needs.

5.2.2.1 Treatment Water Quality

Pressure filtration is used to improve the water quality by removing iron and manganese prior to distribution. Finished water quality testing indicates the treatment process reduces the concentration of iron and manganese below the NSDWR. Therefore, the treatment process performance is acceptable.

The existing treatment process is capable of producing water quality within regulatory standards. However, if the raw water quality changes or the regulatory standards change the treatment process should be re-evaluated.

5.2.2.2 Treatment Mass Balance Analysis

A mass balance evaluation was performed to identify if the existing treatment capacity would be adequate for projected demands.

5.2.2.2.1 Treatment Capacity

The WTP is designed to have a treatment capacity of 7.7 MGD. However, the WTP capacity is limited by the well pump supply capacity because the well pumps produce the pressure to pump through the pressure filters. The supply analysis identified an additional well with a pumping capacity of greater than 1,100 gpm would be required to meet the projected 2040 MD demand assuming a conservative firm capacity. Therefore, the additional well would also be required to achieve the treatment capacity.

5.2.3 Booster Station

Given the capacity of the booster station compared to the relatively small demand of the high pressure zone (firm capacity of 1.0 MGD+ compared to a MD demand of 0.16) **there is no apparent need for future pumping capacity improvements in the high zone.** Continual and regular maintenance of the facility is recommended to sustain reliable operation of the pumping facility.

5.2.4 Storage Analysis

To determine the water supply and storage needs of a community, average daily demands, peak demands, and emergency needs must be considered. In the sections below, calculations are used to determine future water supply and storage volume requirements for the Faribault water system based on the required volume criteria previously described.

The calculations below assume that maximum day demands are occurring on the system, storage volume is reduced by peak demands greater than firm supply pumping rate (i.e. equalization storage is expended). For purposes of this analysis, it is assumed that the “firm capacity” of the water supply wells and booster pumps (largest pump out of service) is capable of supplying maximum day demands.

Table 5-2 – Storage Analysis

	Existing System	2040 System
Maximum Day Demand (MGD)	7.3	7.7
Average Day Demand (MGD)	3.7	3.9
Existing Firm Supply Capacity (MGD)	7.3	7.7
Available Storage		
Gridor GSR	2.0	
Natgun GSR	2.0	
Existing High Tower	0.15	
New Tower	0.75	

	Existing System	2040 System
Assumption 1		
AD Demand	3.7	3.9
Required Storage	3.7	3.9
Surplus Storage	1.21	1.01
Assumption 2		
Maximum Day Equalization Volume	1.1	1.15
Fire Protection Volume	0.63	0.63
Reserve Volume (½ AD)	1.85	1.94
Total Required Storage	3.58	3.72
Surplus Storage	1.33	1.18
Note: 1. Maximum day equalization volume is the projected maximum volume depletion during the peak hours of the maximum day assuming the pumping rate into the service zone is equal to the maximum day demand rate 2. Fire protection storage was calculated based on one fire of 3,500 gpm for 3 hours 3. Reserve volume is recommended to provide supply in event of a power outage		

The results shown above indicate the water system will have a surplus of storage based on both water storage requirement criteria. Requirement 1 estimates the water system will have 1.21 MGD and 1.01 MGD surplus of storage in the existing and 2040 system, respectively. Requirement 2 estimates the water system will have 1.33 MGD and 1.18 MGD surplus of storage in the existing and 2040 system, respectively. Based on these estimates additional storage will not be required.

5.2.5 Distribution System

The existing and 2040 distribution systems were evaluated to determine if the infrastructure could adequately meet system demands. The 2040 system, shown in Figure 7-1, included pipe size upgrades and pipe additions to serve the expanded service area.

5.2.5.1 Distribution System Water Model Analysis

Both system were evaluated based on the following criteria:

- Pressure
- Available Fire Flow
- Flow Capacity
- Water Age

5.2.5.1.1 Pressure

Existing AD Pressure

Two steady state scenarios were modeled to establish the static pressures of the existing system when the pumps are on and off during an AD demand. Figures 5-1 and 5-2 illustrate the pressure across the system.

Model results indicated that average day demand (AD) system pressures are typically within the desired pressure range with the outer edges of the system falling between 50 to 80 psi. Towards the center of the system pressures reach up to 110 psi. Near the WTP pressures reach greater than 120 psi when the WTP is on. There were no areas identified to have low pressure in the system. Areas along the river were identified to have high pressures outside of the desired range. However, the City did not report any concerns regarding the system static pressure at this time.

Existing MD Pressure

Two steady state scenarios were modeled to establish the static pressures of the existing system when the pumps are on and off during a MD demand. Figures 5-3 and 5-4 illustrate the pressure across the system.

Model results indicated that system maximum day demand (MD) pressures are typically within the desired pressure range with the outer edges of the system falling between 50 to 80 psi. Towards the center of the system pressures reach up to 110 psi. There were no areas identified to have low pressure in the system. Areas along the river were identified to have high pressures outside of the desired range. However, the City did not report any concerns regarding the system static pressure at this time.

2040 AD Pressure

Two steady state scenarios were modeled to establish the static pressures of the 2040 system when the pumps are on and off during an AD demand. Figures 5-5 and 5-6 illustrate the pressure across the system.

Model results indicated that system pressures were similar to the existing AD system pressures. New service areas had pressures within an acceptable range typically falling between 40 to 90 psi.

2040 MD Pressure

Two steady state scenarios were modeled to establish the static pressures of the 2040 system when the pumps are on and off during a MD demand. Figures 5-7 and 5-8 illustrates the pressure across the system.

Model results indicated that system pressures were similar to the existing MD system pressures. New service areas had pressures within an acceptable range typically falling between 40 to 90 psi.

5.2.5.1.2 Fire Flow

Existing MD Available Fire Flow

A fire flow scenario was modeled to establish the available fire flow of the existing system when the pumps are off during an MD demand. Figure 5-9 illustrates the estimated available fire flow while maintaining a residual system pressure of 20 psi compared to the fire flow requirement estimated based on land use.

Available fire flow varies across the system ranging from less than 500 - 3,500 gpm. However, most of the system has adequate available fire flow between 1,000 - 3,500 gpm. The lowest available fire flows occur on old 4-inch pipe and dead-end pipes. Areas that did not meet the fire flow requirement based on land use are shown in Figure 4-1. The amount of flow required to achieve the fire flow requirement is stated on each parcel.

2040 MD Available Fire Flow

A fire flow scenario was modeled to establish the available fire flow of the 2040 system when the pumps are off during an MD demand. Figures 5-10 illustrates the estimated available fire flow while maintaining a residual system pressure of 20 psi compared to the fire flow requirement estimated based on land use.

The 2040 system available fire flow varies across the system ranging from less than 500 - 3,500 gpm. There were not significant differences in available fire flow between the existing and 2040 system with the exception of the increased fire flow in the infrastructure improvement areas. Areas that did not meet the fire flow requirement based on land use are shown in Figure 7-9. The amount of flow required to achieve the fire flow requirement is stated on each parcel. It should be noted that the pipes shown in the service expansion areas are trunk mains only, and as additional piping is added to the area the available fire flow will likely increase due to the increase pipe connectivity.

5.2.5.1.3 Flow Carrying Capacity

Existing Peak Hour Carrying Capacity

A steady state scenario was modeled to establish pipe velocities, head losses and flow for the existing system when the system pumps are on during a peak hour demand. Figure 5-6 illustrates the estimated velocities across the system.

Modeling results conclude that pipe velocities vary across the system. The majority of pipes have velocities below 3 feet per second (fps), however some pipe segments exceed 3 fps. The distribution piping from the WTP had velocities between 4-5 fps and greater than 5 fps. Other areas with high velocities included smaller piping near Two Rivers Park.

2040 Peak Hour Carrying Capacity

A steady state scenario was modeled to establish pipe velocities, head losses and flow for the 2040 system when the system pumps are on during a proposed peak hour demand. Figure 7-7 illustrates the estimated velocities across the system.

The 2040 carrying capacity results were very similar to the existing results. The majority of pipes have velocities below 3 feet per second (fps), however some pipe segments exceed 3 fps. The distribution piping from the WTP had velocities between 4-5 fps and greater than 5 fps. Other areas with high velocities included smaller piping near Two Rivers Park.

5.2.5.1.4 Water Age

Existing Water Age

A water age scenario was modeled to evaluate the age of water in the distribution system over 30 days (720 hr) with an average day (AD) demand. Figure 5-15 shows the average water age in the pipes over the 30 day simulation.

Modeling results indicate the center of the water system has the youngest water with the majority of the system having water less than 3 days old.

Dead End Analysis

Oldest water in the system is found at the end of dead end pipes. These pipes tend to have the oldest water because once water enters the pipe it remains stagnant until it is consumed. Many of these pipes are located along the pressure zone boundary and outer edges of the system.

2040 Water Age

A water age scenario was modeled to evaluate the age of water in the distribution system over 30 days (720 hr) with a 2040 average day (AD) demand. Figure 5-16 shows the average water age in the pipes over the 30 day simulation.

Water age for the 2040 system had similar water as the existing system. Modeling results indicate the center of the water system has the youngest water with the majority of the system having water less than 3 days old. Pipe improvements lower water age in areas that lacked pipe looping.

5.2.5.1.5 Distribution System Water Model Summary

Based on the modeling results the following observations were made for each analysis.

Pressure

Both the existing system pressure and 2040 system pressure are within the desirable pressure range with few exceptions. No additional improvement to improve pressure are recommended at this time provided the defined pressure zones are utilized.

Fire Flow

The available fire flow across the system is within an acceptable range for both the existing and 2040 system; however, the existing water system model operation identified areas that would benefit from an increase in available fire flow compared to anticipated land use. The 2040/Ultimate water system represents the installation of additional trunk main piping which is reflected in the increase in available fire flow.

Flow Carrying Capacity

Some pipe velocities exceeded 3 fps in both the existing and 2040 system. Replacing the old and smaller diameter pipes would decrease pipe velocities and improve flow transfer capabilities across the system. These pipe improvements should be made as opportunities allow with road construction projects. Where not specifically indicated, the minimum size pipes should be replaced with is 6-inch.

Water Age

Both the existing system water age and 2040 system water age are within an acceptable age range with few exceptions. Looping piping in areas of dead ends and older water age would lower the age. These pipe improvements should be made as opportunities allow with road construction projects. In addition, areas of increased water area can be monitored for chlorine concentration. If testing results require, prescribed flushing plans could be executed to introduce fresh water to the area and clean and scour water main.

6 Water Main Replacement Risk Analysis

The work included in this section aims to gain a better understanding of the highest priority water main to be replaced. This alternative will work to develop a system to identify the consequence of failure (CoF) as well as the Likelihood of failure (LoF) for each water main which will develop the risk analysis. System data was analyzed to develop an understanding of probability of failure while the hydraulic model was harnessed to understand the consequence of pipe failure. The information here will then provide for metrics to develop a water main replacement priority. This information can then be harnessed to develop out the City's Capital Improvement Plan. We developed these tools in a way so they can be accessed on a regular basis so that City staff will be equipped to make informed and defensible water system planning decisions.

6.1 Likelihood of Failure (LoF) & Consequence of Failure (CoF) Water System Evaluation

Water systems are constantly aging, increasing the risk of pipe breaks. To predict future break points a LoF analysis can be performed. Furthermore, a CoF can be used to evaluate the unmet supply demands when pipe breaks occur. The product of these is the Risk of Failure (RoF). Pipes with a high RoF should be prioritized for replacement preventing potential breaks, therefore reducing O&M costs, water outages, and emergency repairs.

The effort contained in the report aims to develop a risk screening tool to prioritize pipes for assessment. Developing a firm estimate for likelihood of failure can often be difficult to develop depending on the data available, nonetheless data available can be ranked on a relative basis when accounting for factors such as pipe material, age and break history as well as system modeling performance and influence of system pressures.

In a similar fashion CoF can be used to evaluate and differentiate the most critical pipes. Critical pipes may be influenced by the customers served or if they provide service to an area that lacks water main redundancy. Critical pipes can be considered those pipes in which the City would like to minimize the potential for failure.

6.2 Likelihood of Failure (LoF) of Water Main

Data provided by the City of Faribault for existing water main, as well as modeling data, were harnessed to establish a scoring system to make for an estimate of LoF. These data consisted of pipe material, water main age, break history, pressure and velocity. Pipe cohorts with a higher LoF are assumed to experience significantly higher break rates over time and thus have a higher replacement priority.

Each water main segment of Faribault's distribution system was evaluated based on its pipe material, age, break history, pressure and velocity, and were assigned scores according to the mapping included in appendix D and the figure and tables below. LoF rates each water main segment on a scale of 1 to 5 and is determined using these scores by adding them up for each water main segment. Once added up, the result is scaled down to a scale of 5.

The chart summarizes water main break rates for Faribault's water main. The highest break rates occur among the post WWII water main which is typically cast iron.

Figure 6-1 – Watermain Breaks Per Mile – Since 2000

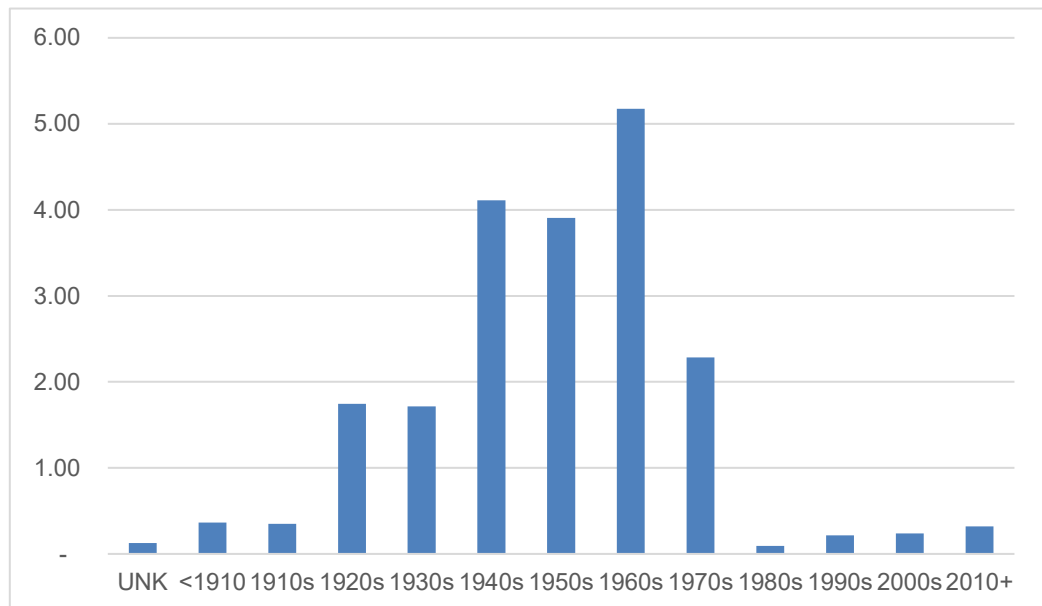


Table 6-1 – Age Score

Age (install date)

Range	Score
UNK	3
<1910	9
1910s	9
1920s	10
1930s	10
1940s	25
1950s	23
1960s	31
1970s	14
1980s	3
1990s	3
2000s	3
2010+	2

Table 6-2 – Material Score

Material (type)

Range	Score
Cast iron	3
Ductile iron	1
Unknown	3
PVC	1
HDPE	1

Table 6-3 – Velocity (ft/s) Score

Range	Score
<4	1
>4	2

Table 6-4 – Pressure Score

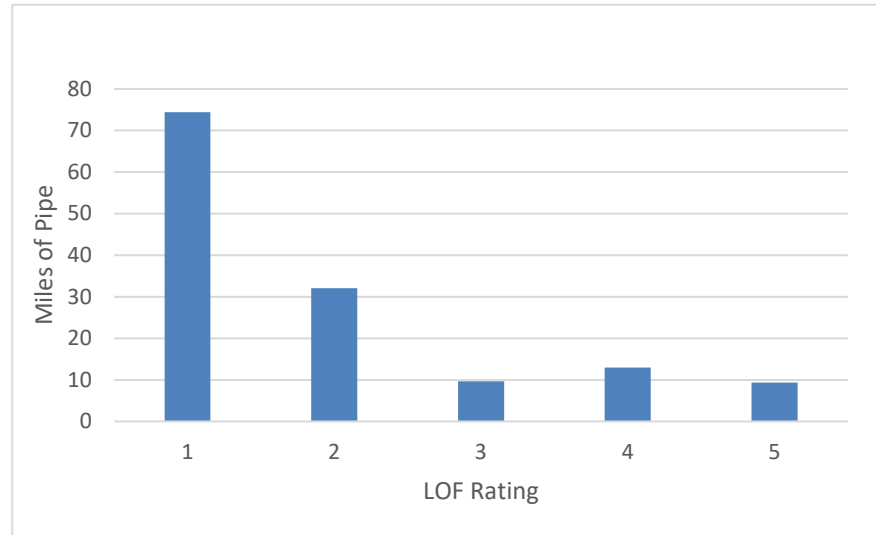
Pressure (psi)

Range	Score
<80	1
80-100	2
100-120	3
120-150	4
150	5

6.2.2 LoF Results

The chart below documents the miles of pipe in the LoF categories with 5 being most likely to break and 1 the least likely. The Maps included in Appendix D show the locations of the pipes and their LoF scores.

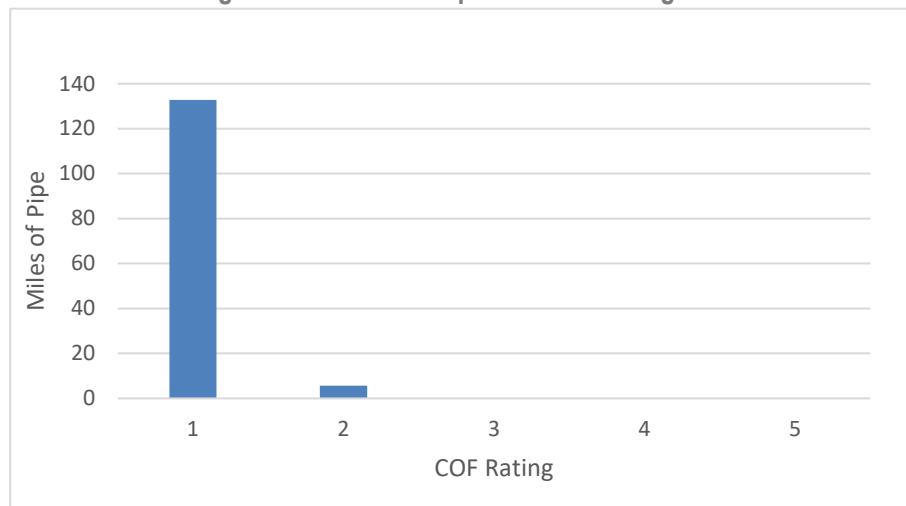
Figure 6-2 – Miles of Pipe with LoF Ratings



6.3 CoF Results

CoF rates the unmet system water demand when a pipe breaks. Using the water model, a criticality scenario was run to determine the percentage of demand that cannot be met when a pipe segment is broken. This percentage can then be ranked on a scale of 1 to 5. Typically, the more watermains that are looped in a system, the lower the CoF results will be.

Figure 6-3 – Miles of Pipe with CoF Rating



6.4 RoF Results

RoF is the product of LoF & CoF. This isolates the pipes most at risk on a scale of 1 to 10. A full map summary of the RoF results are included in appendix D.

Figure 6-4 – Miles of Pipe with RoF Rating

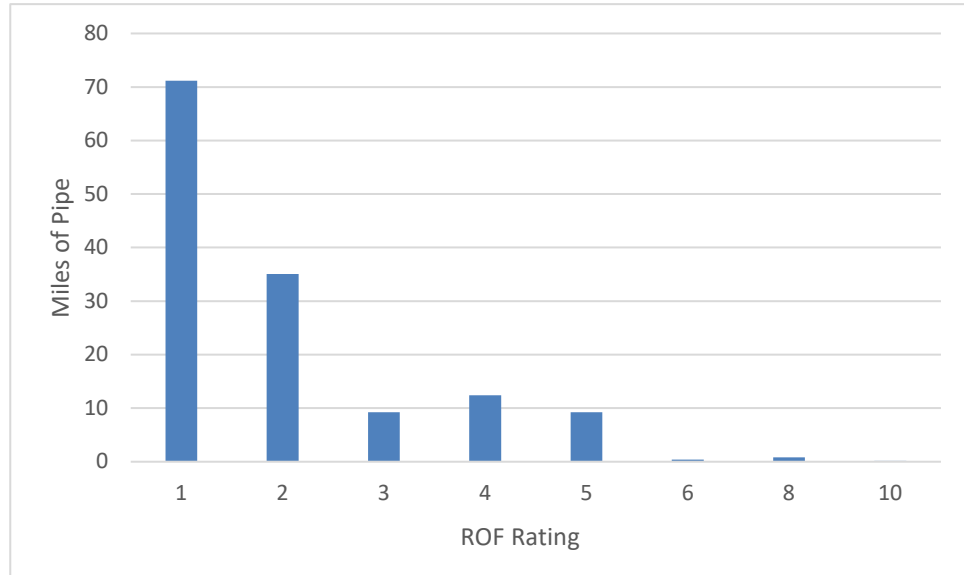
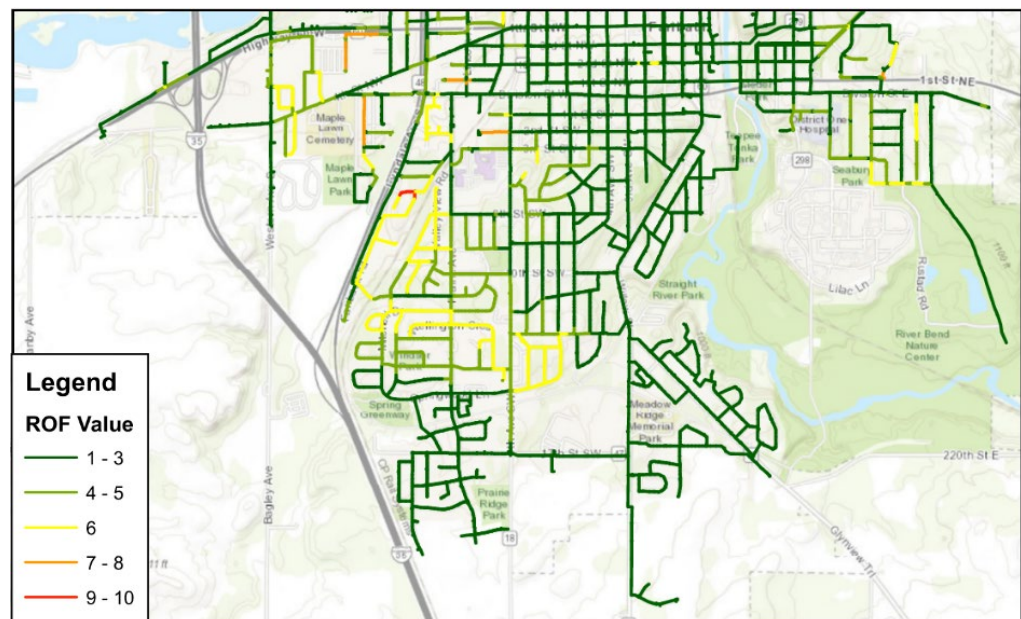


Figure 6-5 – RoF Map of Southern Faribault



7 Improvement Alternatives Review

With the updated water use projections, the recommended short and long term water system improvement recommendations have been revisited and summarized below. Many of the improvements previously identified have been confirmed and a more exhaustive list of improvements has been developed.

The purpose of this section of the report is to review facility improvement priorities for the water system moving forward. With growth of the City, and therefore the water system, expected during the next planning period, water system facilities improvements should be planned for so that all customers receive exceptional water service.

This section will provide recommendations to remediate deficiencies and to prepare the system for future growth. A map of planned improvements is shown in Figure 7-1 and will be referenced throughout this section. The contents of this section will present multiple alternatives for each system need type. Upon conclusion of this section, a combination of the proposed improvement alternatives will be selected which will support the long term facility planning priorities. Each facility selected for a given water system function may influence the need and priority of other functions. The advantages and disadvantages of each alternative will be summarized below along with the overall impact on other water system needs. The net result of this exercise will be to assemble a suite of proposed water system improvements to serve the needs of the water system customers economically and effectively.

This section aims to summarize and define suggested water system improvements to assure that the Faribault water system is capable of supplying excellent water service through the defined planning period.

7.1 Water Supply Alternatives

A community's water supply capacity is sized to meet maximum day demands reliably. The industry standard is to provide enough pumping capacity to meet the maximum day demand rate with the largest well pump of service (i.e. firm capacity). Given recent well failures a more conservative firm capacity of assuming two wells offline was adopted. Current conservative well supply capacity in Faribault is 6.2 MGD (4,310 gpm)

Water use projections and water supply analysis indicate a near term conservative firm water supply shortage of 900 gpm and a potential long term shortage of 1,000 gpm compared to existing well capacity. The potential for this shortage is based on maximum day demand projections and the assumption of the two largest active wells taken offline. This shortage could be even larger if a new large user were to locate to the city. As such **it is recommended that at least one new well be constructed to support water system supply both in the near and long term.** The location of the new well is likely to be located near the existing water treatment plant, and connected to the existing plant.

7.1.1 Supply Alternative 1 - New Well No.8 near Existing Water Plant

The simplest way to address the water supply shortage would be to construct an additional water supply well within the vicinity of the existing water treatment plant to support system redundancy. The primary function of this well would be mechanical redundancy and would likely access the Jordan aquifer similar to Well No.7. The addition of the new well would increase firm treatment capacity to meet the future water system demand projections. Currently a potential well site has yet

to be identified. For purposes of budgetary comparison, a location within a 1/2 mile radius of the existing water treatment plant is assumed. This facility would require a dedicated well house to contain process and electrical equipment as well as a dedicated raw water main connecting the well to the existing water treatment plant. A new dedicated water main from the well to the water treatment plant would be recommended to reduce stress on the existing raw water system network and to support system redundancy.

In general, Rice County is underlain by glacial sediment and several bedrock aquifers such as the Jordan aquifer the City's wells currently utilize. Determining whether the glacial sediment can be a suitable water source would require a more detailed evaluation as it would generally be too vulnerable to surface contamination. The bedrock aquifers, such as the St. Peter-Prairie du Chien-Jordan aquifer and the underlying Tunnel City-Wonewoc aquifer (Formerly known as the Franconia-Ironton-Galesville aquifer), are generally well established as suitable aquifers, although the Tunnel City-Wonewoc aquifer produces a lower water yield and shallow portions of the St. Peter-Prairie du Chien-Jordan aquifer can be unconfined and can be very highly susceptible to surface contamination. Confined conditions are more likely to occur east or southeast of the City, well outside the City limits, where the overlying Decorah Shale may be present.

Water quality of a new well in the St. Peter-Prairie du Chien-Jordan and Tunnel City-Wonewoc aquifers can vary based on whether it is confined or unconfined, but may reasonably be expected to be similar to that of the City's existing wells as would the water yield. It should be noted, though, that radium levels exceeding the MCL have been measured in wells in a beltway through Rice County according to MDH.

7.1.1.1 Rehabilitate or Replace Well No.3

It is understood that well #3, though active in producing water may have an issue with a potential hole in the casing. If this issue is left unaddressed there may be a need for an additional well beyond the new well discussed above. Additional exploration should take place in regard to the condition of this well as it is an important contributor to the overall water supply for Faribault. As an alternative to addressing the casing, a new redundant well could be drilled to replace this particular well, though the cost for such a construction would likely be for more than the rehabilitation costs. Therefore additional exploration into the condition of the well is recommended before a decision is made with regard to the future of this facility. Below budgetary numbers are included for either the rehabilitation or replacement of the wells. The replacement alternative includes drilling a new well within 2,500 feet of the water treatment facility and the construction of a new well facility.

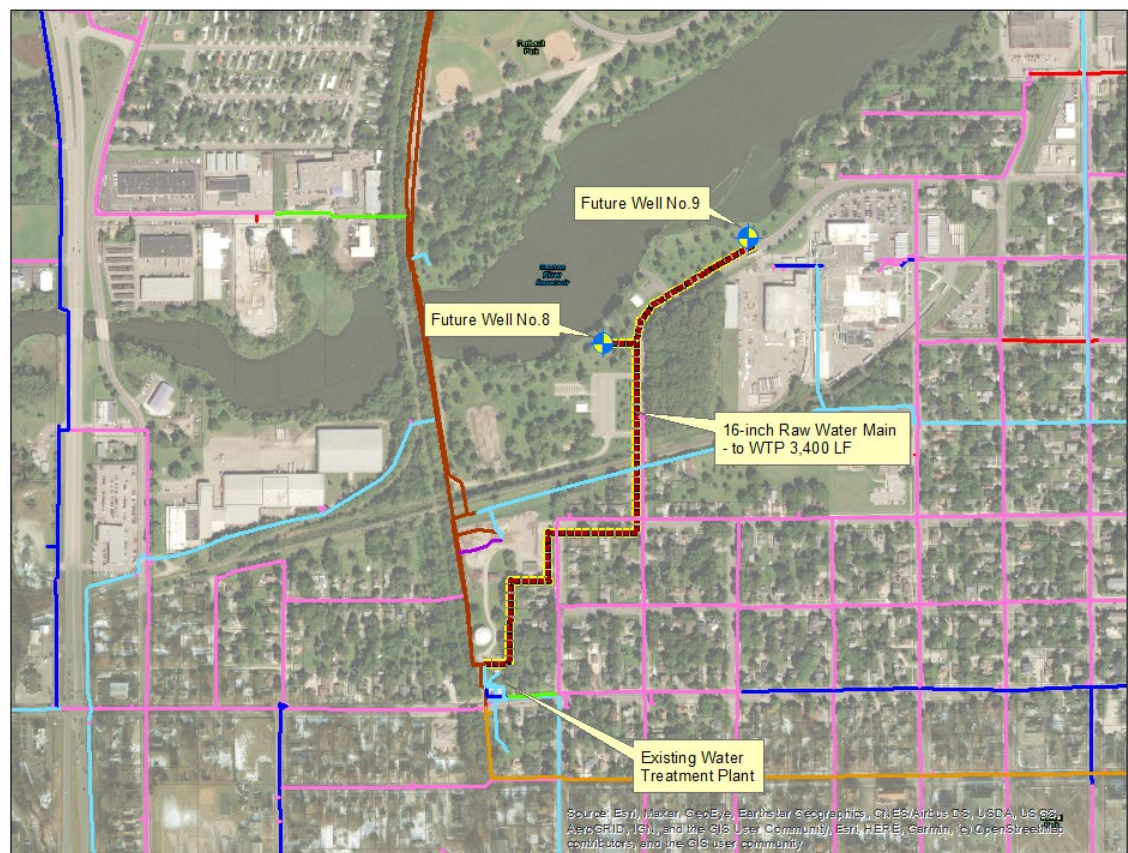
Budgetary Cost:

Rehabilitate Well No.3	\$350,000
Replace Well No.3	\$1,700,000

7.1.2 Supply Alternative 2 - New Well No. 8 & 9 near Existing Water Plant (Establish Southern well field)

This alternative would take the approach of establishing more wells in the southern well field area. Currently wells No. 5, No. 6 & No. 7 lie north of the river, if this raw water main were to

break, the City would be without the most major and relied upon wells. An alternative option would be to establish two new wells south of the river and construct a dedicated south raw water line. This would provide for redundant backup wells and a second raw water main route to



accommodate the wells. For purposes of high-level planning and cost estimating, a potential well supply configuration and layout was developed assuming the installation of wells and is shown below:

Budgetary Cost: \$3,000,000 - \$4,00,000

Cost above would include two new wells, buildings and 3,400 LF of 16-inch raw water main.

7.2 Water Storage Alternatives

Previous analysis identified the need for additional water storage. With a new water tower now under construction in the North part of the City, the near term need for additional storage had been addressed. However, if a major water user were to come to the City, the need for additional water storage should be re-evaluated. If the need for additional storage arises, a potential option for added elevated storage would be on the south end of the water system to support water system balance and pressure sustainability. For purposes of long range planning, a budgetary cost of \$2,000,000-\$4,000,00 is assumed which is dependent on the selected water storage tank size. The need for a future facility as well as analysis of the subsequent size should be re-evaluated as the need is for the tank approaches.

Budgetary Cost

South Elevated Storage Tank: \$2.0M – 4.0M

7.3 Distribution System Improvements

This section summarizes distribution system improvements that are recommended to strengthen the existing system, enhance supply reliability, loop major transmission mains, and improve flow capacity and fire protection to various parts of the City. The goal of these suggested improvements include:

1. Upgrade undersized water main
2. Develop pressure zone interconnection redundancy
3. Increase water transmission capacity
4. Increase fire flow
5. Support Redundant operation
6. Loop Long lengths of dead-end pipe
7. Enhance trunk water main grid
8. Maintain right sized piping
9. Maintain consistent and optimized water system pressure
10. Address pipe at risk of failure

As discussed in the previous chapters, there are various parts of the water distribution system where recommended fire flows cannot be supplied. For isolated deficiencies, it is often not economical to recommend specific improvements as these deficiencies will eventually be corrected by annual water main replacements (replacing existing older small diameter mains) and/or distribution system growth (primarily as a result of looping existing dead end mains). In locations where more widespread deficiencies are found, specific water distribution system improvements are presented in Figure 7-1. A well-developed trunk water main and distribution system helps to deliver adequate flows for various conditions including emergency fire flow.

Actual main routing will depend on a variety of local factors as individual street rehabilitation projects progress. This map should be seen as a recommendation for the general hydraulic capacity of the distribution system to optimize existing water service. These improvements are intended to support robust fire flow and increased system looping which will provide water service redundancy and reduce water age which benefits water quality.

As stated above, the improvements presented in Figure 7-1 represent a conceptual plan for potential long term water system improvements to improve and expand the hydraulic capacity of the water distribution system. These improvements are presented to improve flow capacity, increase system reliability, and support long term community development and growth. Although the local knowledge of development patterns was utilized in the preparation of the trunk water main plan as a conceptual plan, the actual size and location of the improvements will depend upon future planning efforts and the circumstances at the time of the improvement being implemented and may not follow exactly as shown in the figure.

7.3.1 Distribution System Planning

Figure 7-1 illustrates a vision of potential water main improvements to meet current and projected water system needs through the 2040 planning period. As mentioned previously, these improvements are intended to correct existing deficiencies as well as meet the needs for future growth and development. To demonstrate the effectiveness of the recommended improvements, Figures 6-2 and 6-3 illustrate the anticipated maximum day demand pressures and maximum day fire flows, respectively, with the recommended improvements under projected 2040 demands conditions.

The recommended improvement plan to serve the future service area has been developed as a tool to guide City of Faribault in the siting and sizing of future system improvements. While the plan may represent the current planned expansion of the City of Faribault system, future changes in land use, water demands, or customer characteristics could substantially alter the implementation of the plan. For this reason, it is recommended that the plan be periodically reviewed and updated using area planning information to reflect the most current projections of City of Faribault service area growth and development.

The improvement plan is a guidance document that details existing conditions and recommendations for the future. The plan is based on future conditions as perceived in 2021. As time progresses, additional information will become available, and events will shape the development of the City of Faribault service area. The plan must be dynamic in response; it should be studied and used but also adjusted to conform to the changes and knowledge that will come with time. Updates should be made on a regular basis, probably every five to ten years.

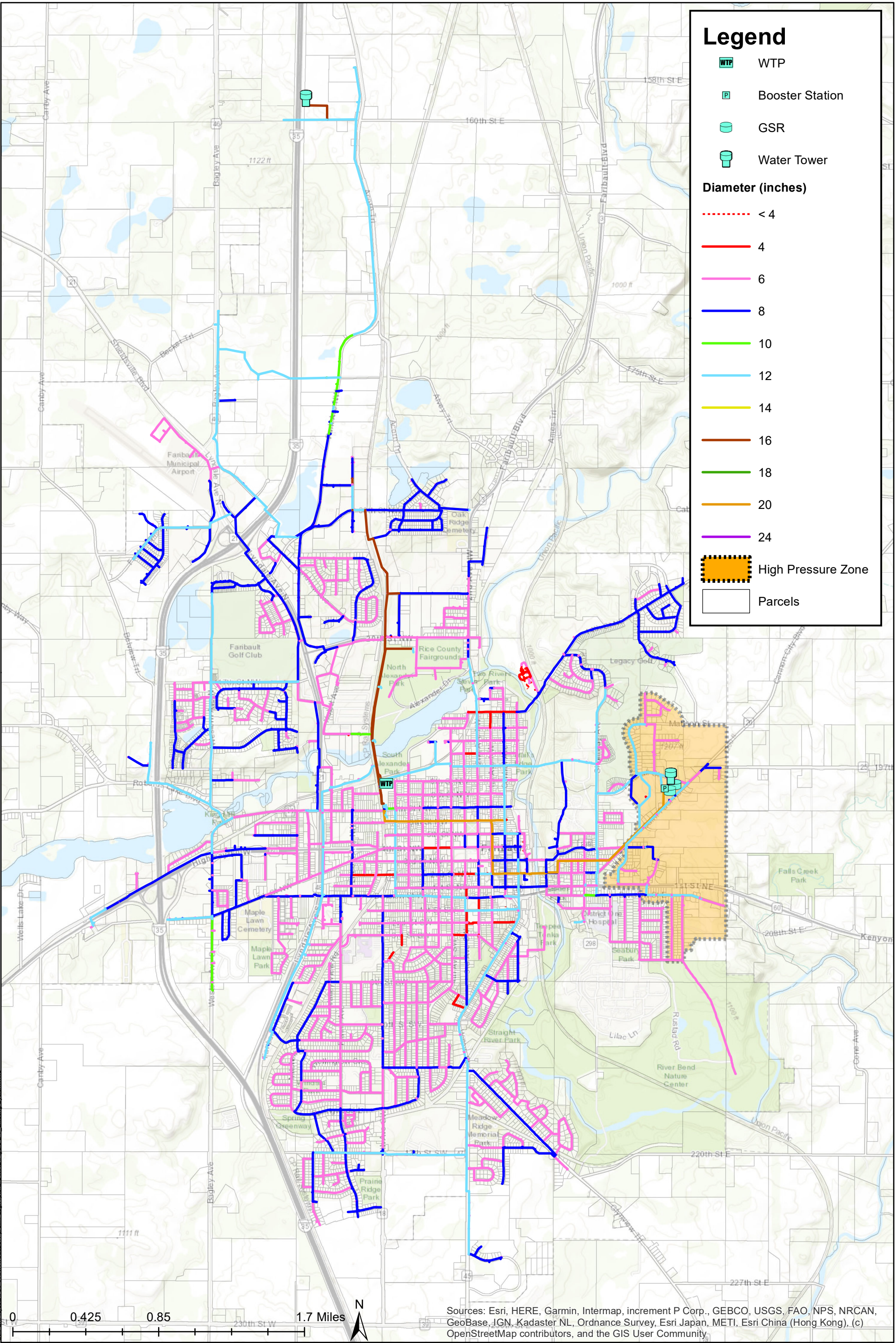
7.4 Future system model

Future water system improvements presented in the previous sections were built into the water distribution system model. Model simulations were then conducted for analysis of system pressure and fire flow. Figures 7-2 through 7-9 document the anticipated performance of the future water system, if developed per the recommended improvements.

8 Next Steps

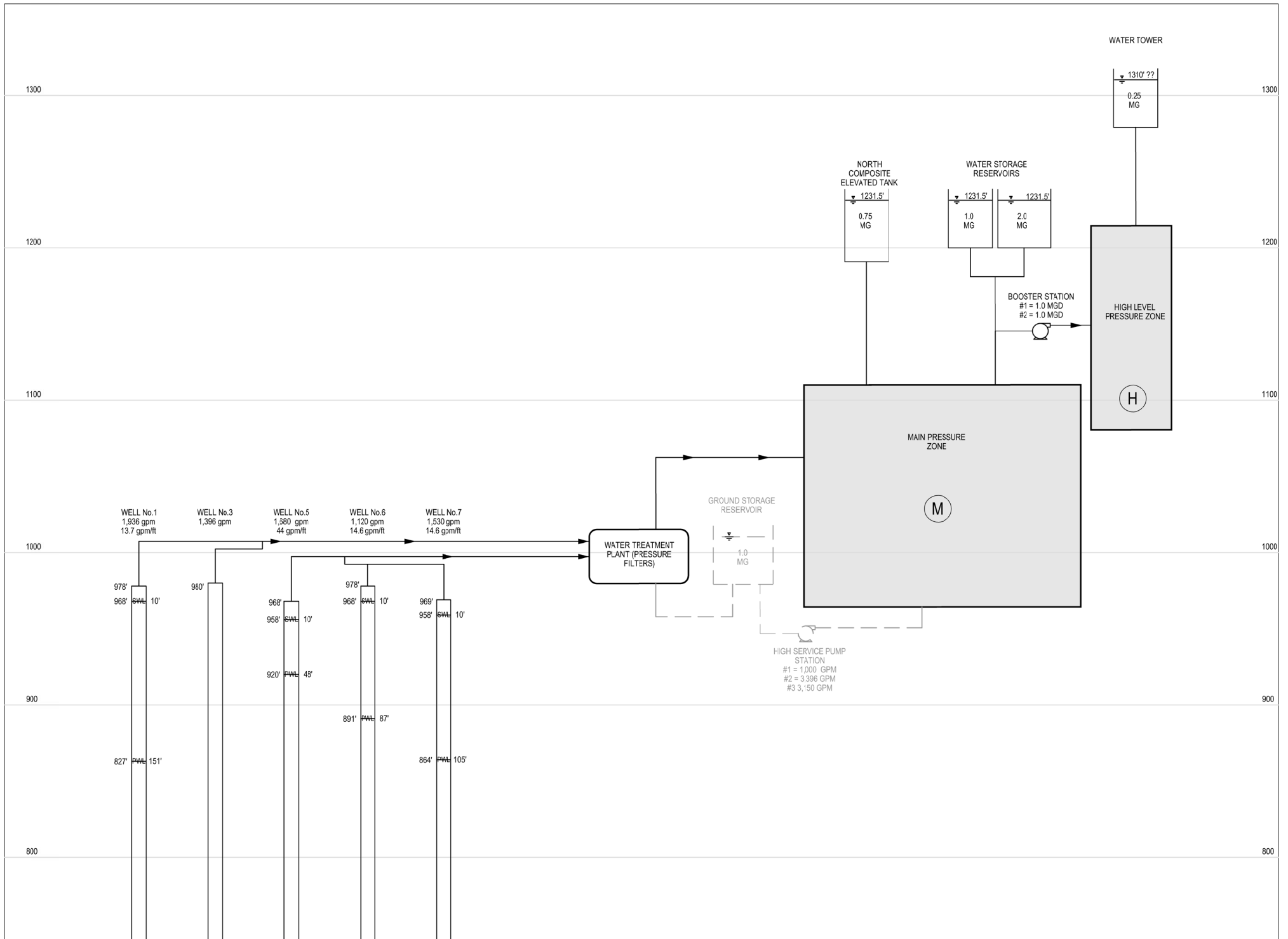
The recommendations in this report have identified the redundancy and reliability of the well field as being a high priority for the water system. In order to determine the best course of action for the future of the well supply for the City, a well site investigation should be pursued to identify the most productive site for the location of additional wells. In addition, this study will help to determine which aquifer the well is recommended to access. Determining appropriate well spacing and aquifer access will allow each well to maintain a desirable production capacity. In addition, the future system planning map can be utilized to support the sizing for future water system expansion as well as for the renewal and replacement of aging water main that may have a high-risk score.

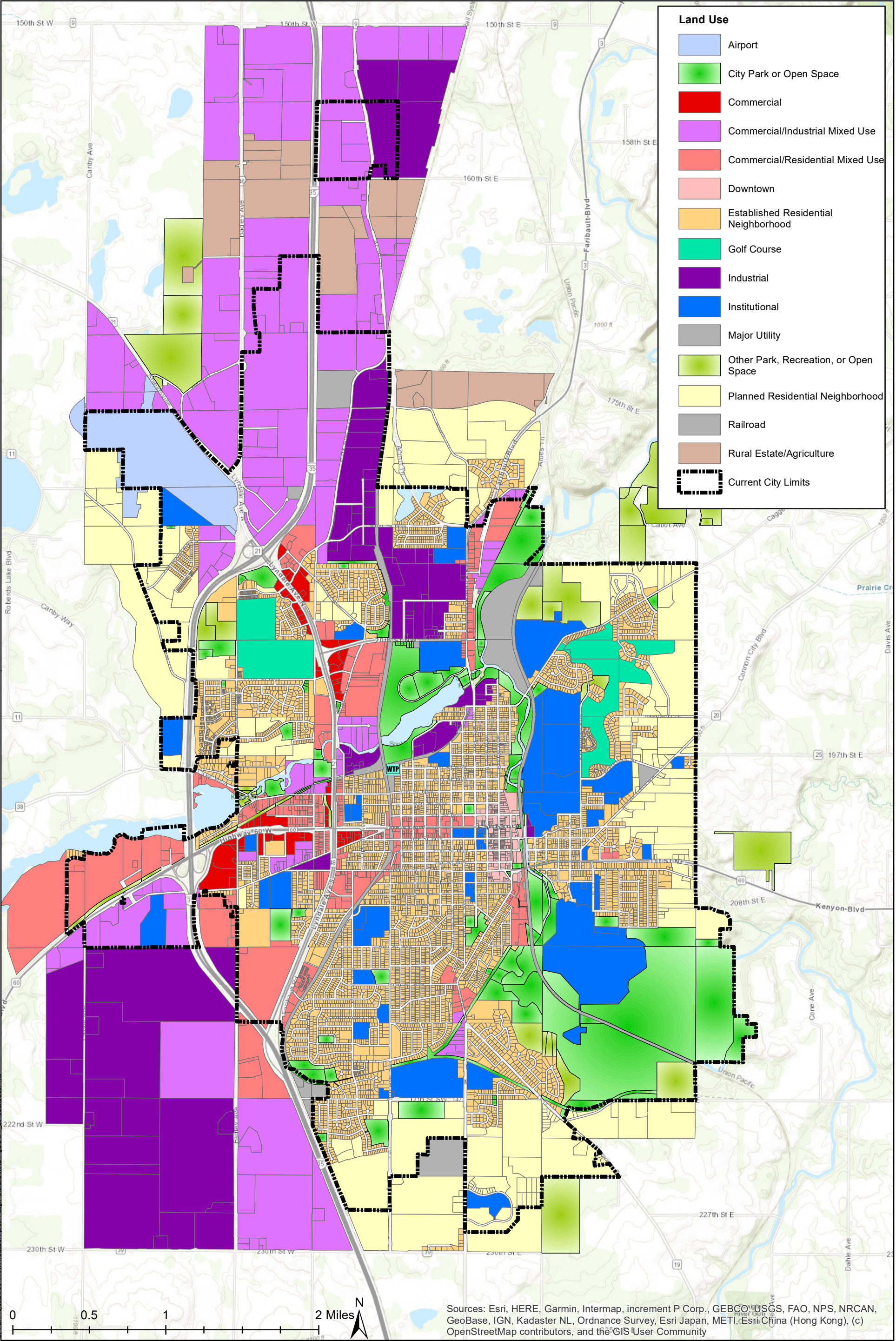
Figures



	3535 VADNAIS CENTER DR. ST. PAUL, MN 55110 PHONE: (651) 490-2000 FAX: (651) 908-8166 TF: (800) 325-2055 www.sehinc.com	Project: FARIT 158326 Print Date: 11/10/2021 Map by: ckatzemberger Projection: Source:	Existing Water Distribution System Comprehensive Water Plan Faribault, Minnesota	Figure 2-1
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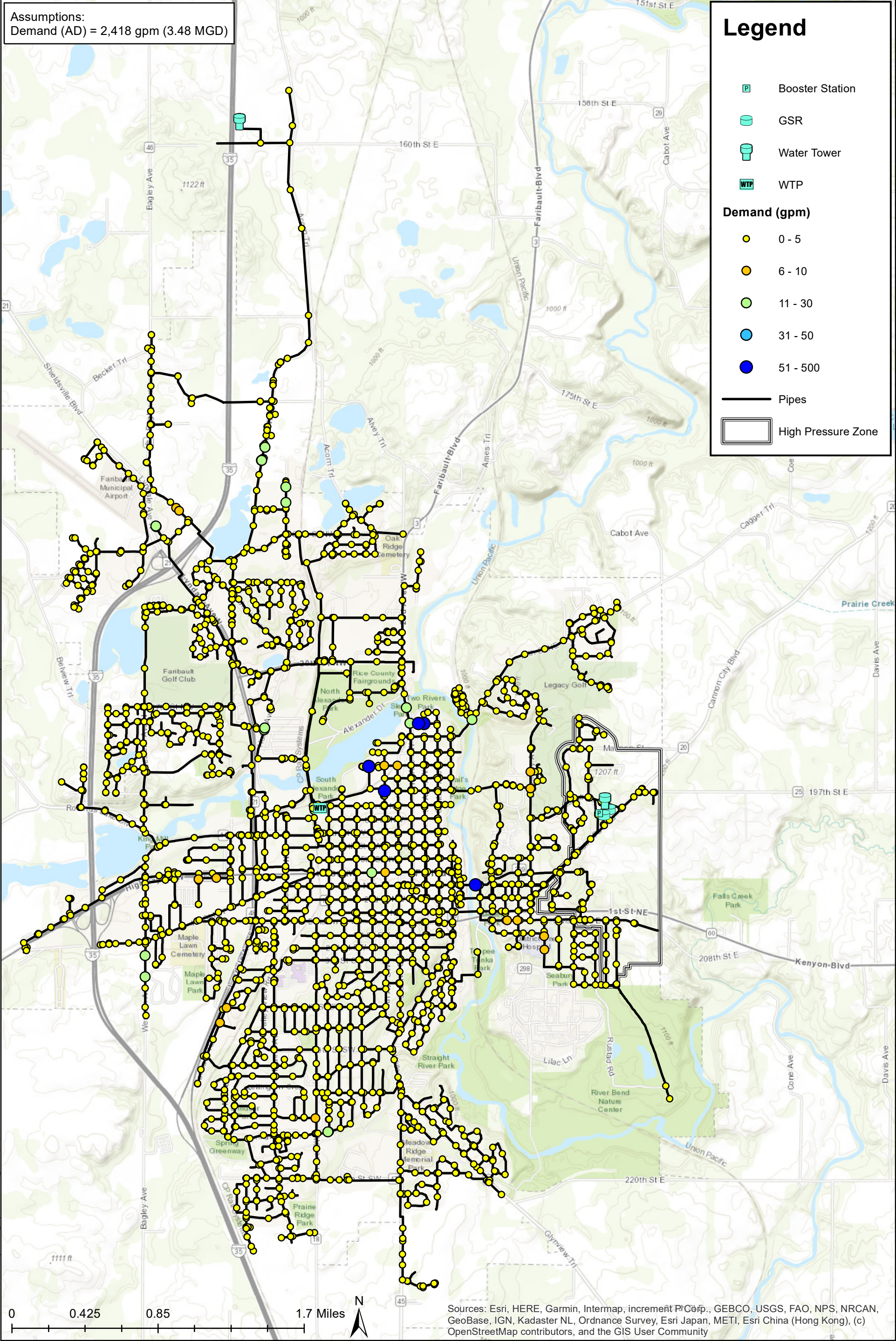
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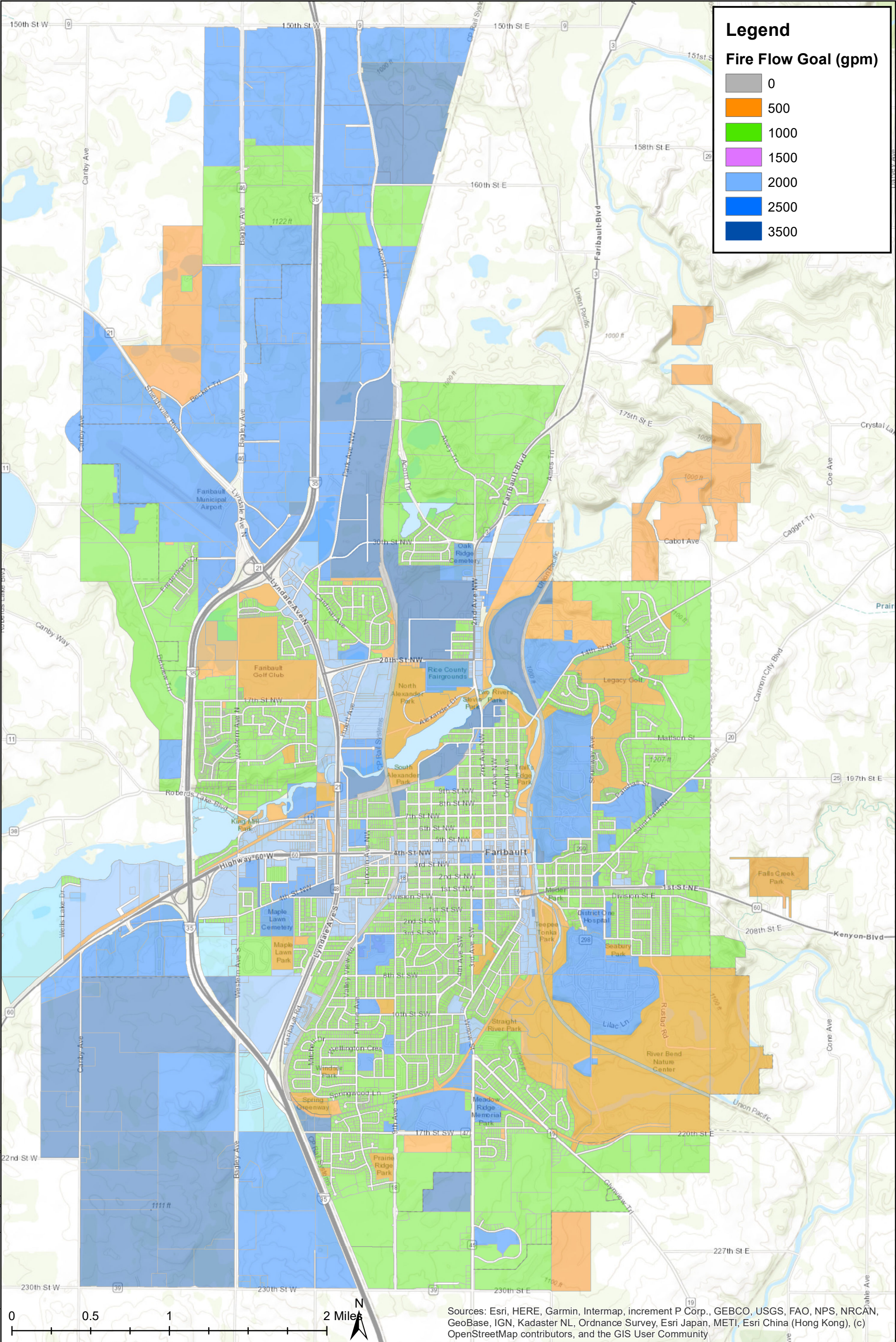




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Assumptions:
High Zone HGL = 1,305 ft
Main Zone HGL = 1,226.5 ft
WTP Flow = 2,976 gpm
Booster Station Flow = 625 gpm
Demand (AD) = 2,418 gpm

Legend

WTP

Booster Station

GSR

Water Tower

Pipes

High Pressure Zone

Pressure (psi)

< 20

21 - 25

26 - 30

31 - 35

36 - 40

41 - 45

46 - 50

51 - 55

56 - 60

61 - 65

66 - 70

71 - 75

76 - 80

81 - 85

86 - 90

91 - 95

96 - 100

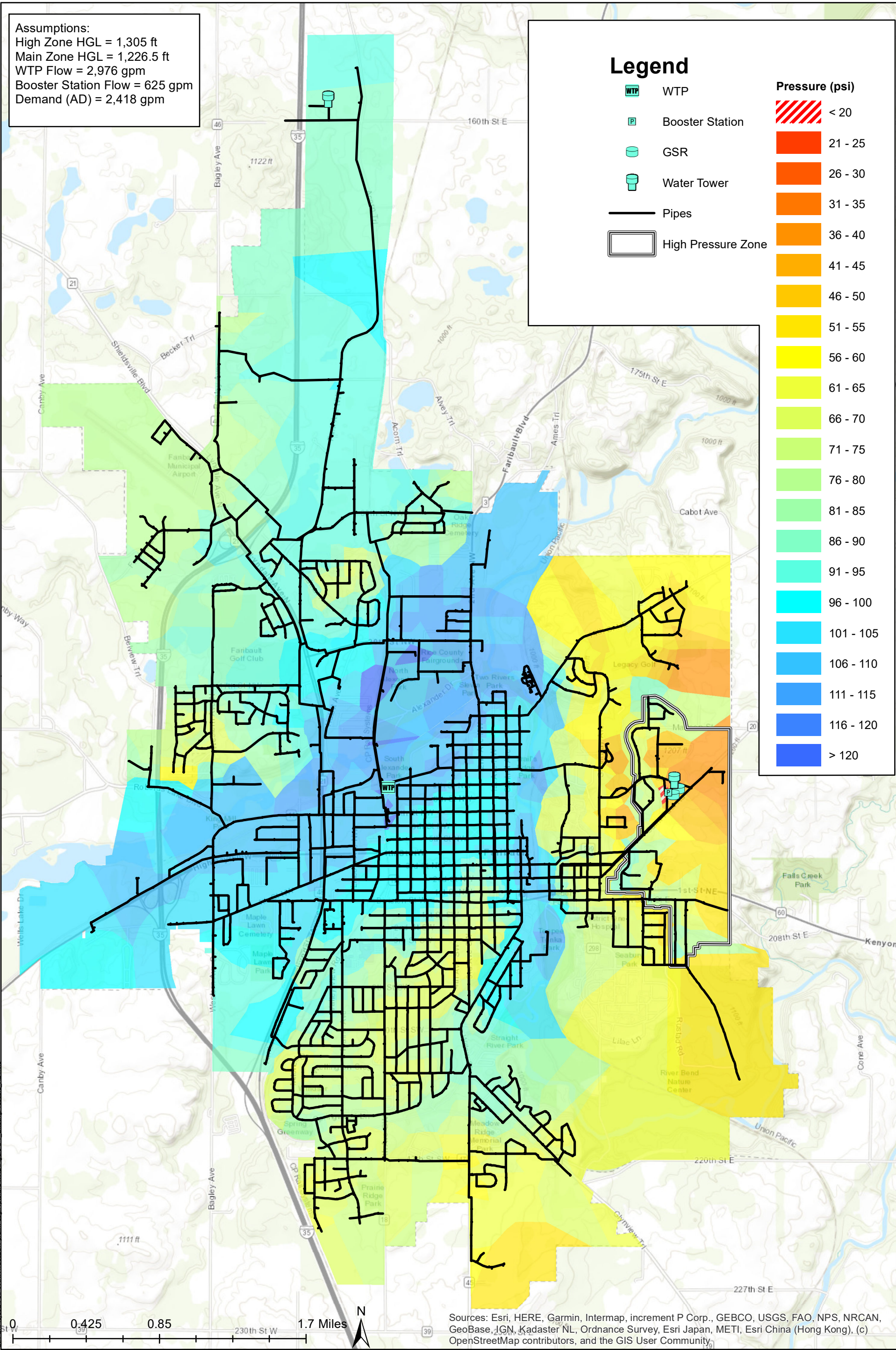
101 - 105

106 - 110

111 - 115

116 - 120

> 120



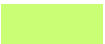
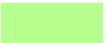
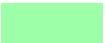
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

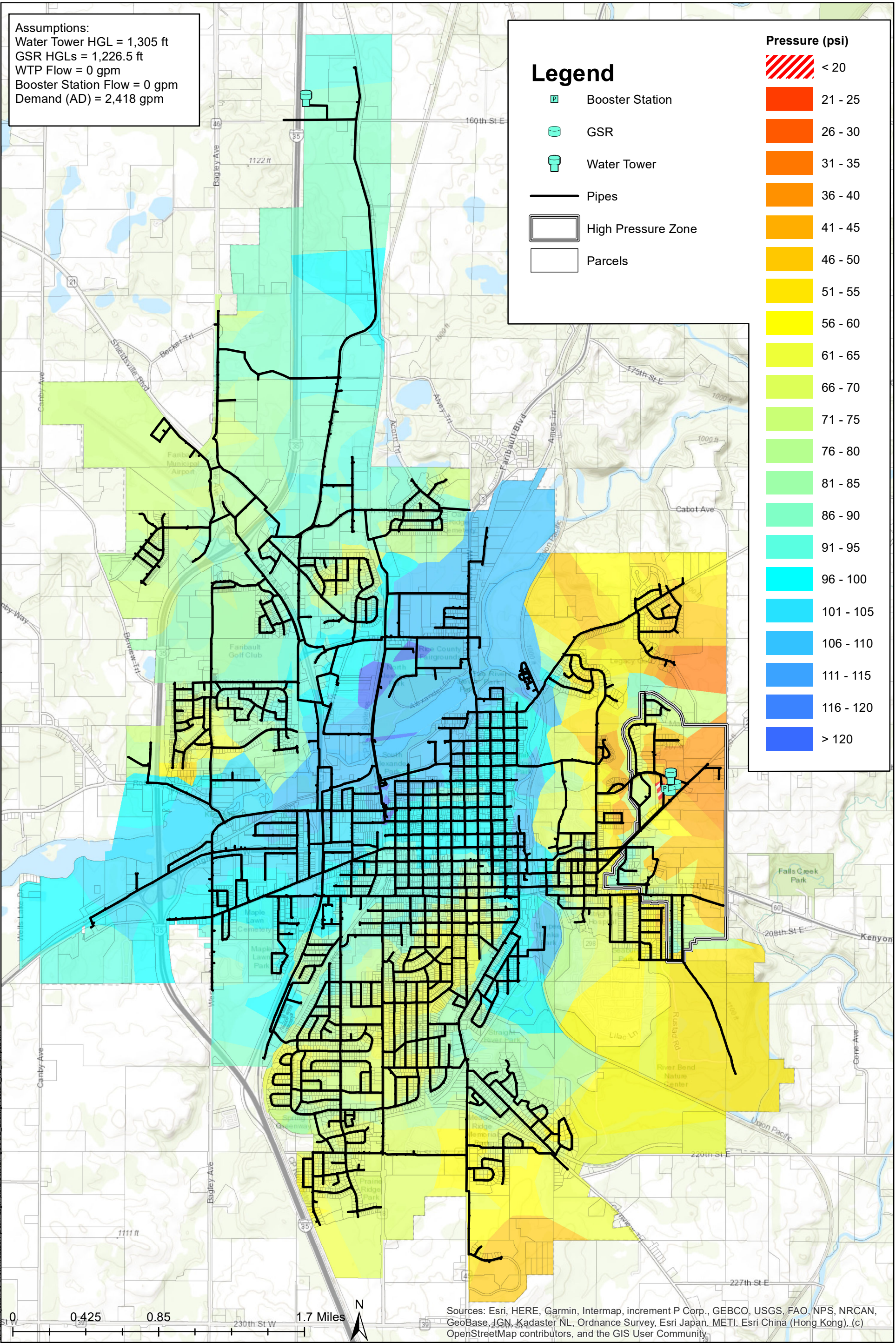
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Assumptions:
Water Tower HGL = 1,305 ft
GSR HGLs = 1,226.5 ft
WTP Flow = 0 gpm
Booster Station Flow = 0 gpm
Demand (AD) = 2,418 gpm

Legend

- Booster Station
- GSR
- Water Tower
- Pipes
- High Pressure Zone
- Parcels

Pressure (psi)	
	< 20
	21 - 25
	26 - 30
	31 - 35
	36 - 40
	41 - 45
	46 - 50
	51 - 55
	56 - 60
	61 - 65
	66 - 70
	71 - 75
	76 - 80
	81 - 85
	86 - 90
	91 - 95
	96 - 100
	101 - 105
	106 - 110
	111 - 115
	116 - 120
	> 120



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



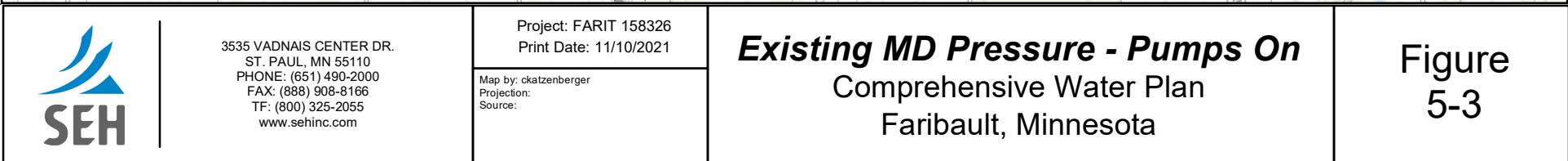
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Project: FARIT 158326
Print Date: 11/10/2021

Map by: ckatzberger
Projection:
Source:

Existing AD Pressure - Pumps Off
Comprehensive Water Plan
Faribault, Minnesota

Figure
5-2

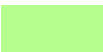
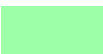


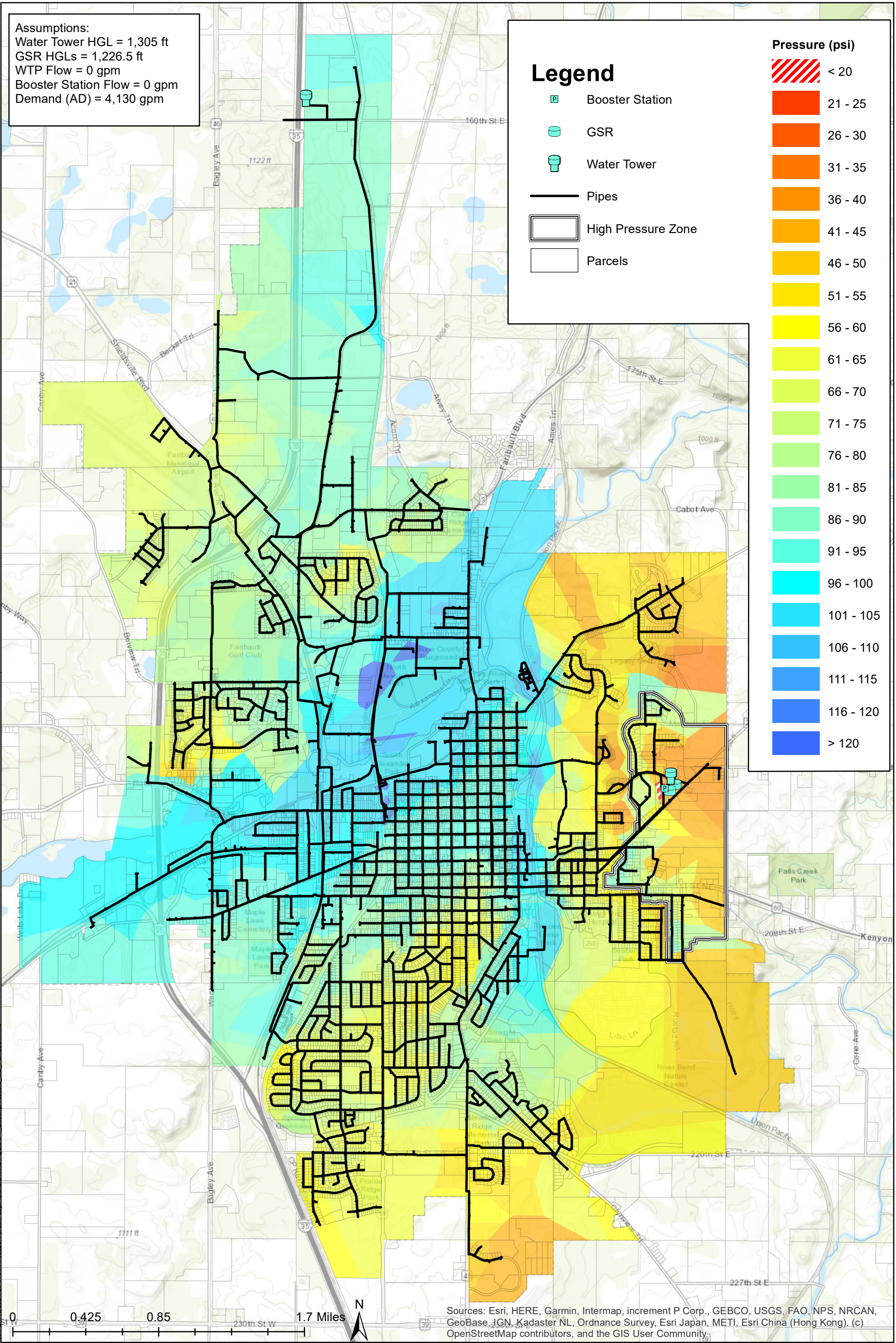
Assumptions:
Water Tower HGL = 1,305 ft
GSR HGLs = 1,226.5 ft
WTP Flow = 0 gpm
Booster Station Flow = 0 gpm
Demand (AD) = 4,130 gpm

Legend

- Booster Station
- GSR
- Water Tower

- Pipes
- High Pressure Zone
- Parcels

Pressure (psi)	
	< 20
	21 - 25
	26 - 30
	31 - 35
	36 - 40
	41 - 45
	46 - 50
	51 - 55
	56 - 60
	61 - 65
	66 - 70
	71 - 75
	76 - 80
	81 - 85
	86 - 90
	91 - 95
	96 - 100
	101 - 105
	106 - 110
	111 - 115
	116 - 120
	> 120



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



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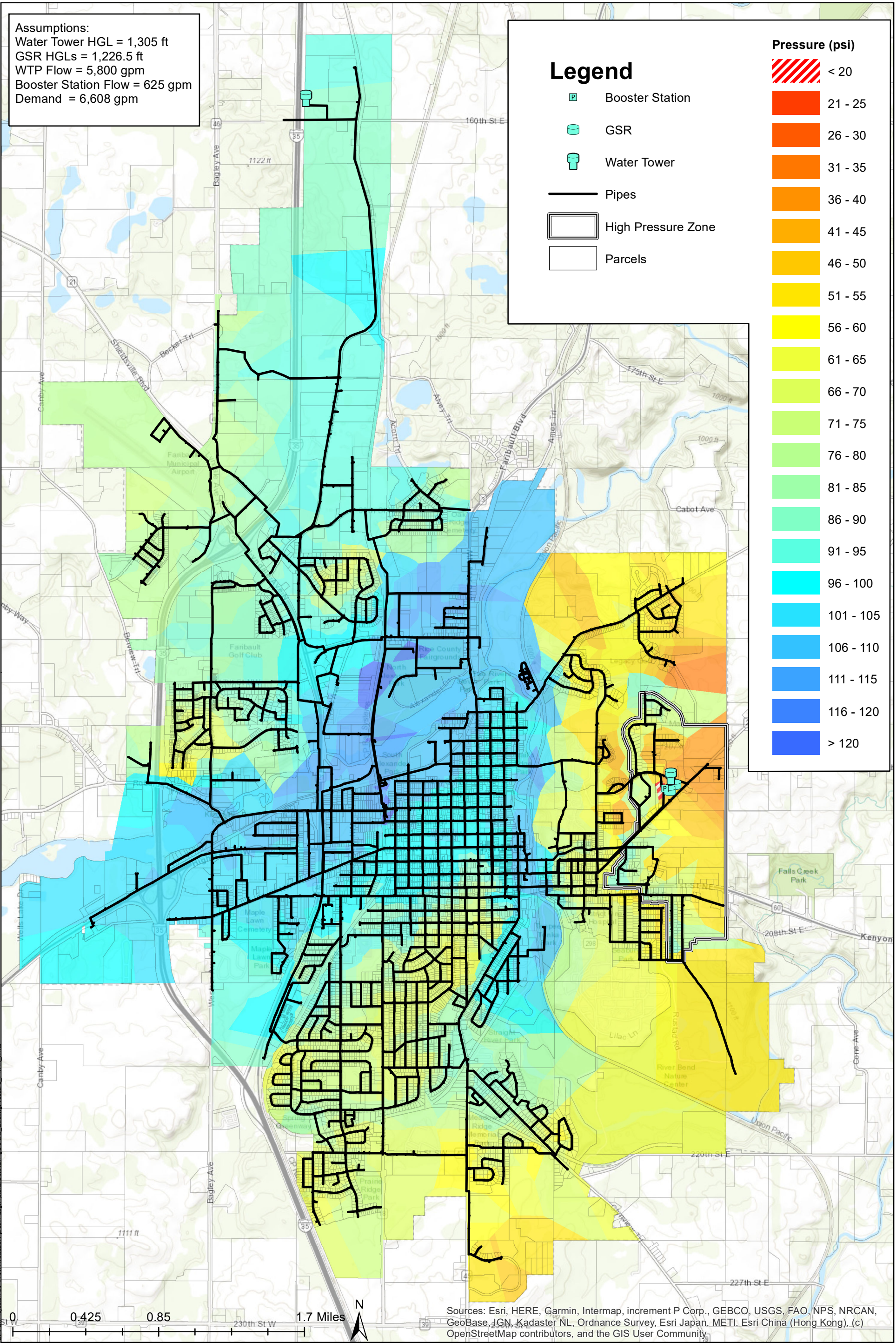
Project: FARIT 158326
Print Date: 11/10/2021

Map by: katzzenberger
Projection:
Source:

Existing MD Pressure - Pumps off
Comprehensive Water Plan
Faribault, Minnesota

Figure
5-4

Assumptions:
Water Tower HGL = 1,305 ft
GSR HGLs = 1,226.5 ft
WTP Flow = 5,800 gpm
Booster Station Flow = 625 gpm
Demand = 6,608 gpm



Assumptions:
High Zone HGL = 1,305 ft
Main Zone HGL = 1,226.5 ft
WTP Flow = 5,773 gpm
Booster Station Flow = 625 gpm
Demand (PKHR) = 6,608 gpm

Legend

 Booster Station

 GSR

 Water Tower

 High Pressure Zone

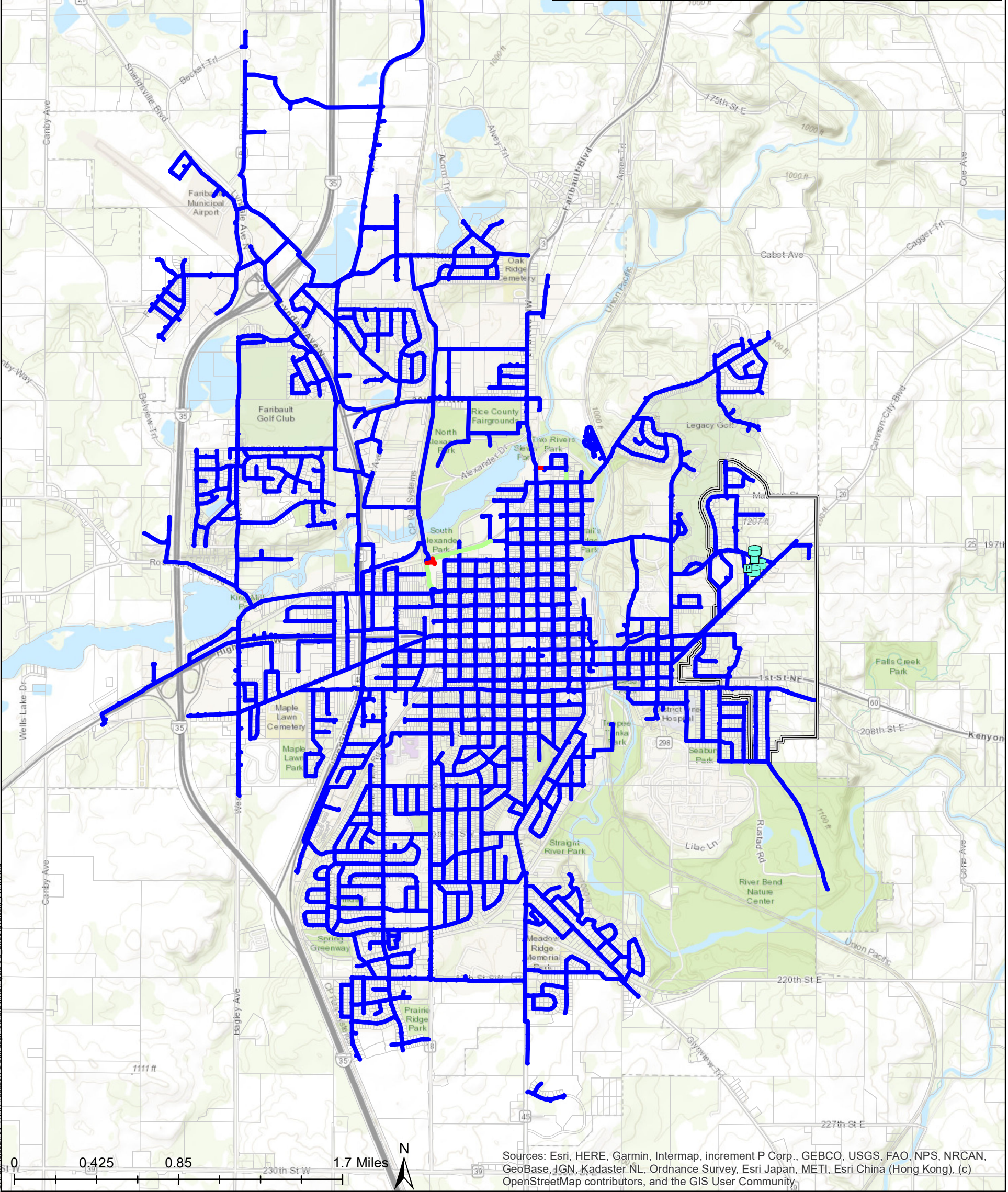
 Parcels

Velocity (fps)

 < 3

 4 - 5

 > 5



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



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TF: (800) 325-2055
www.sehinc.com

Project: FARIT 158326
Print Date: 11/10/2021

Map by: katzenberger
Projection:
Source:

Existing Peak Hour Velocity
Comprehensive Water Plan
Faribault, Minnesota

Figure 5-6

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Assumptions:
Water Tower HGL = 1,300 ft
GSR HGLs = 1,221.5 ft
WTP Flow = 0 gpm
Booster Station Flow = 0 gpm
Demand (MD) = 4,130 gpm

Legend

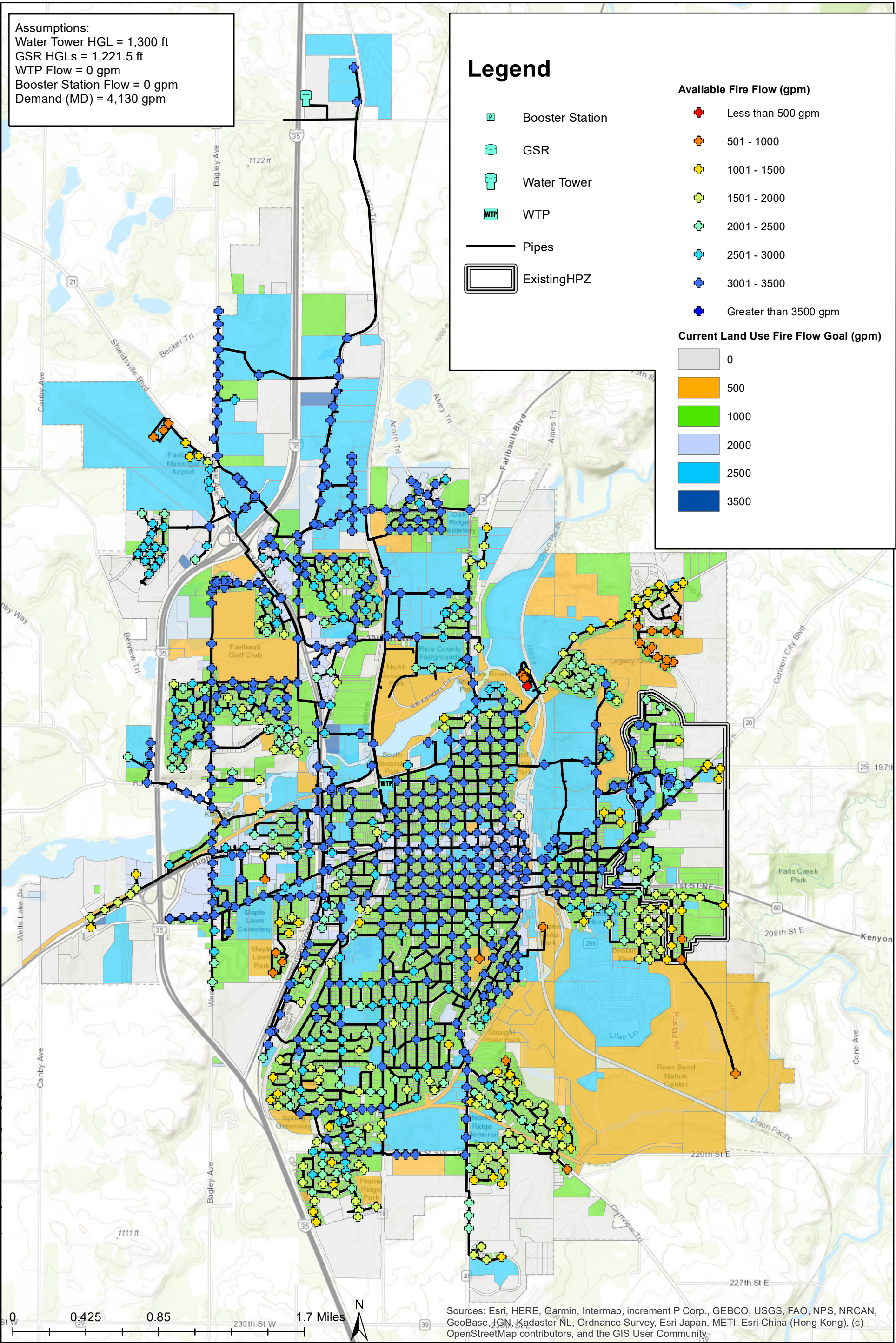
- Booster Station
- GSR
- Water Tower
- WTP
- Pipes
- ExistingHPZ

Available Fire Flow (gpm)

- Less than 500 gpm
- 501 - 1000
- 1001 - 1500
- 1501 - 2000
- 2001 - 2500
- 2501 - 3000
- 3001 - 3500
- Greater than 3500 gpm

Current Land Use Fire Flow Goal (gpm)

- 0
- 500
- 1000
- 2000
- 2500
- 3500



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBSCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



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www.sehinc.com

Project: FARIT 158326
Print Date: 11/10/2021

Map by: katzzenberger
Projection:
Source:

Existing Fire Flow
Comprehensive Water Plan
Faribault, Minnesota

Figure
5-7

Assumptions:
High Zone HGL = 1,300 ft
Main Zone HGL = 1,221.5 ft
WTP Flow = 0 gpm
Booster Station Flow = 0 gpm
Demand (MD) = 4,130 gpm

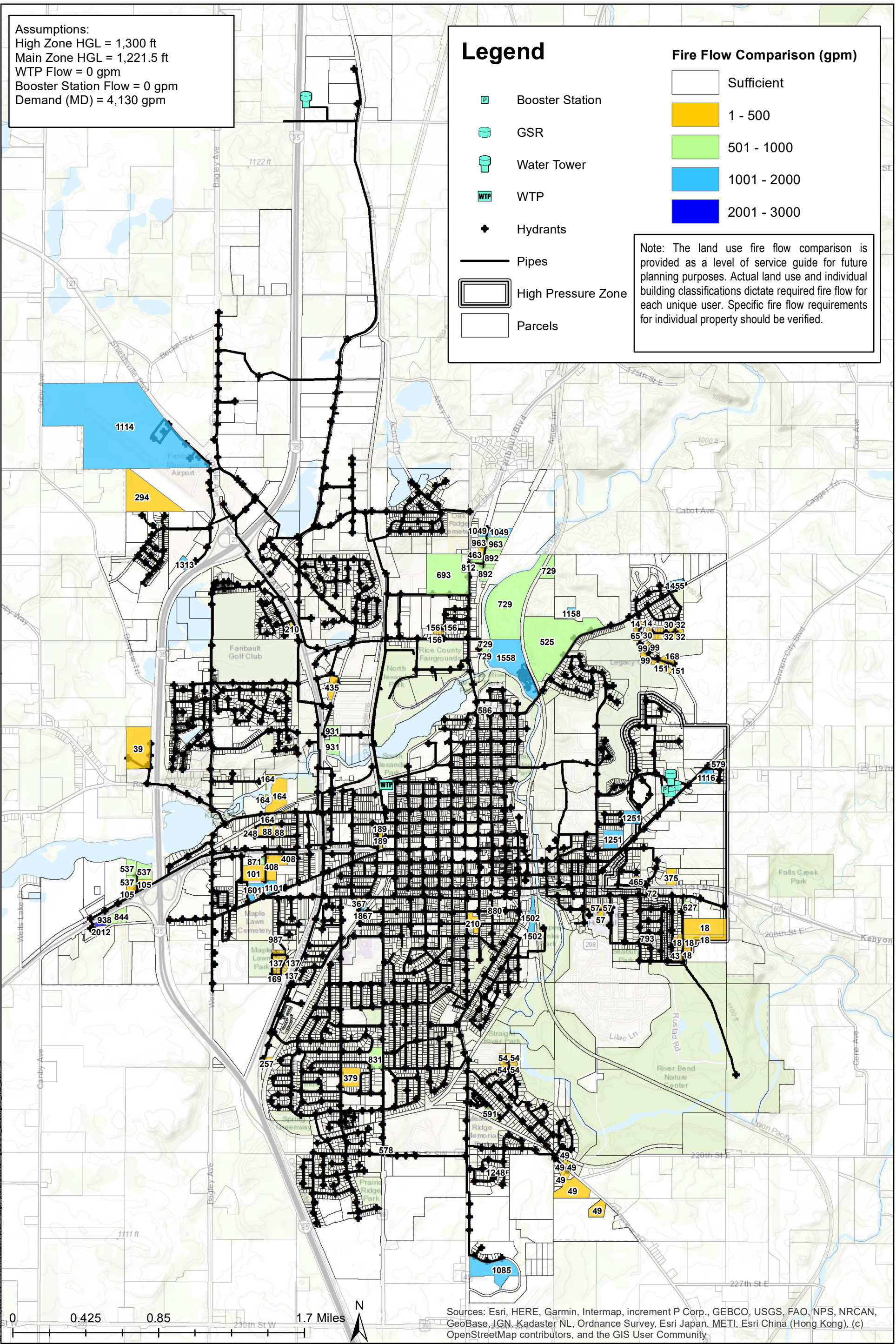
Legend

- Booster Station
- GSR
- Water Tower
- WTP
- Hydrants
- Pipes
- High Pressure Zone
- Parcels

Fire Flow Comparison (gpm)

- Sufficient
- 1 - 500
- 501 - 1000
- 1001 - 2000
- 2001 - 3000

Note: The land use fire flow comparison is provided as a level of service guide for future planning purposes. Actual land use and individual building classifications dictate required fire flow for each unique user. Specific fire flow requirements for individual property should be verified.



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



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Map by: katztenberger
Projection:
Source:

**Existing Fire Flow
Land Use Goal Comparison**
Comprehensive Water Plan
Faribault, Minnesota

**Figure
5-8**

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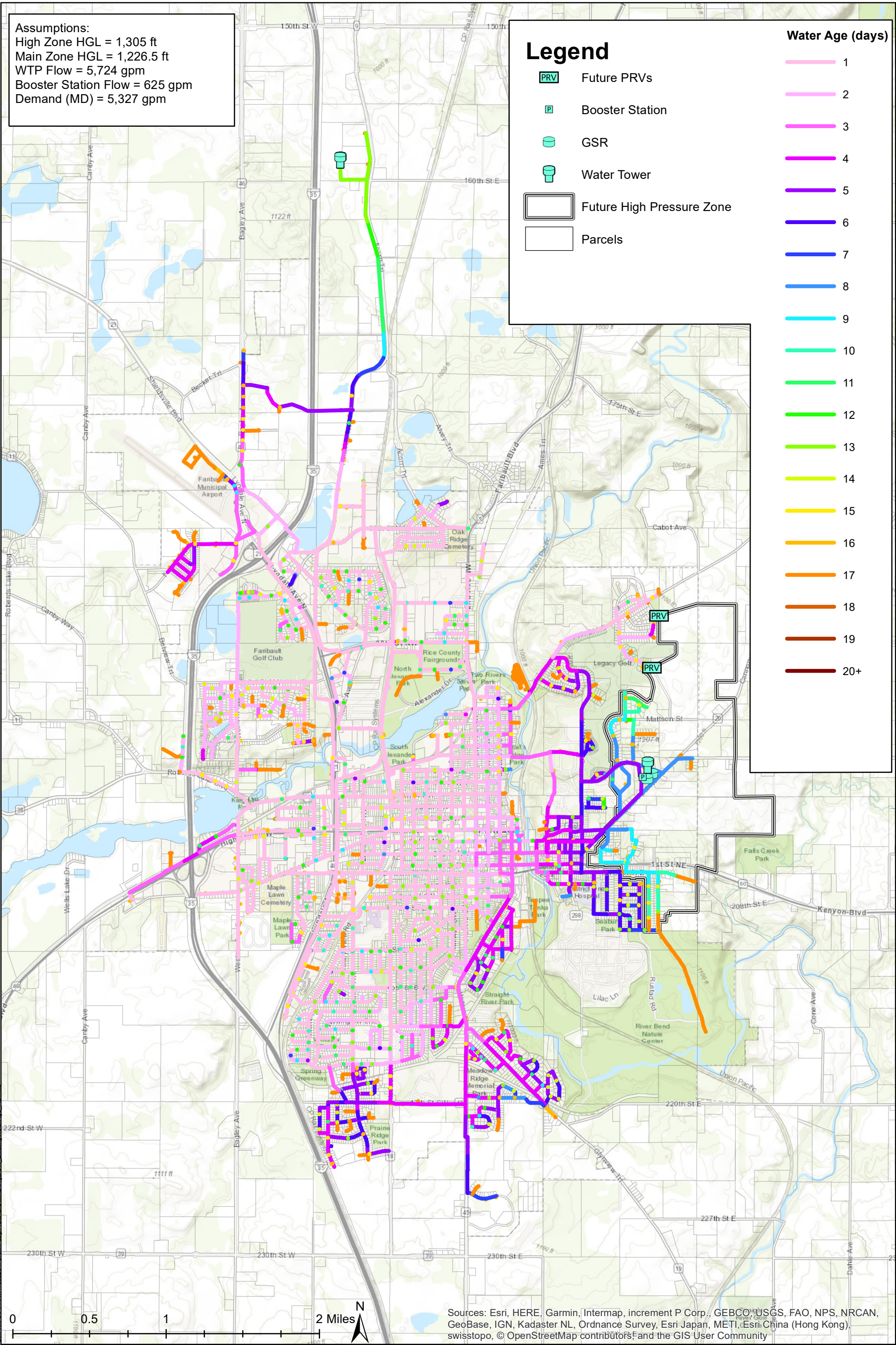
Assumptions:
High Zone HGL = 1,305 ft
Main Zone HGL = 1,226.5 ft
WTP Flow = 5,724 gpm
Booster Station Flow = 625 gpm
Demand (MD) = 5,327 gpm

Legend

- PRV Future PRVs
- Booster Station
- GSR
- Water Tower
- Future High Pressure Zone
- Parcels

Water Age (days)

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- 19
- 20+



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community



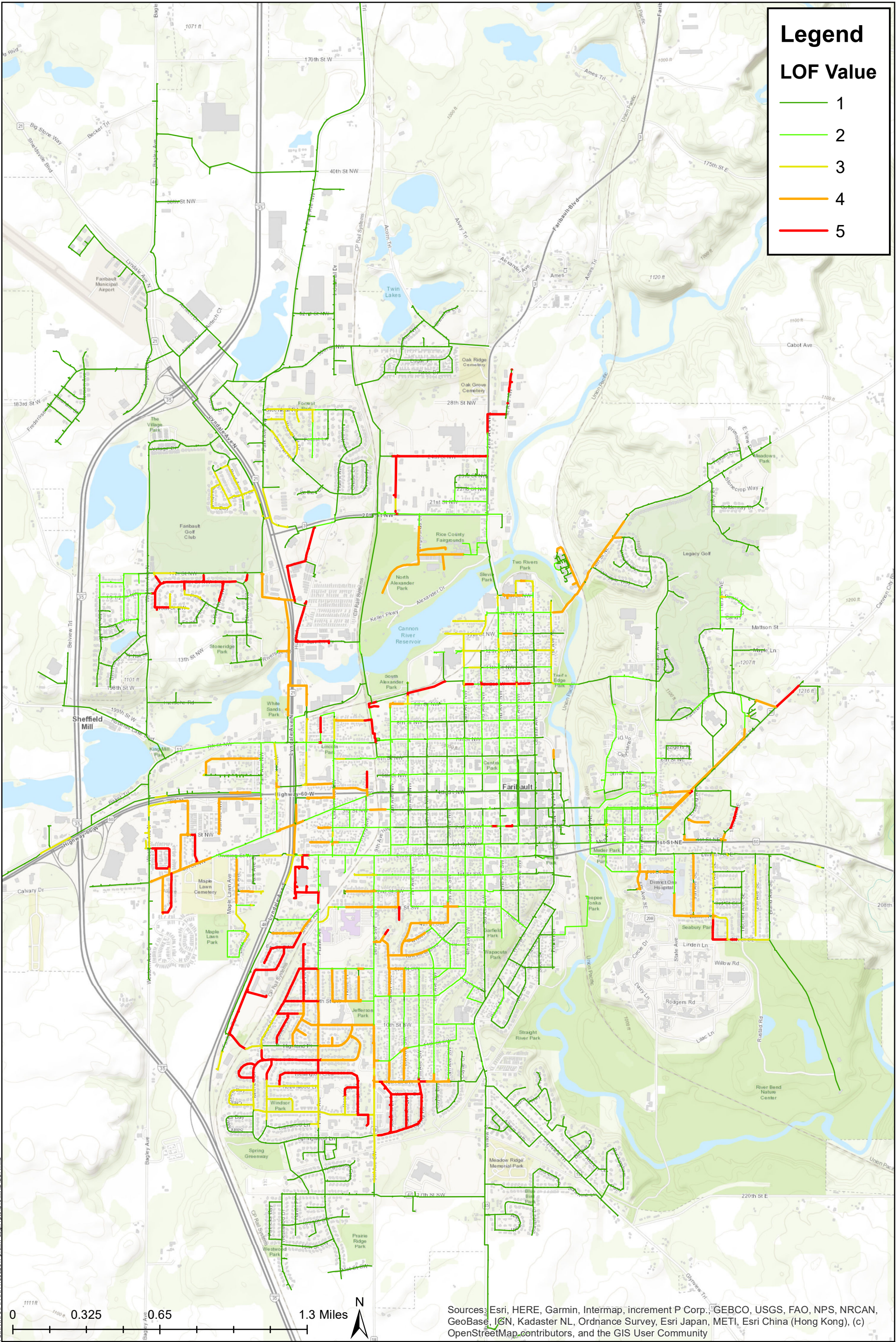
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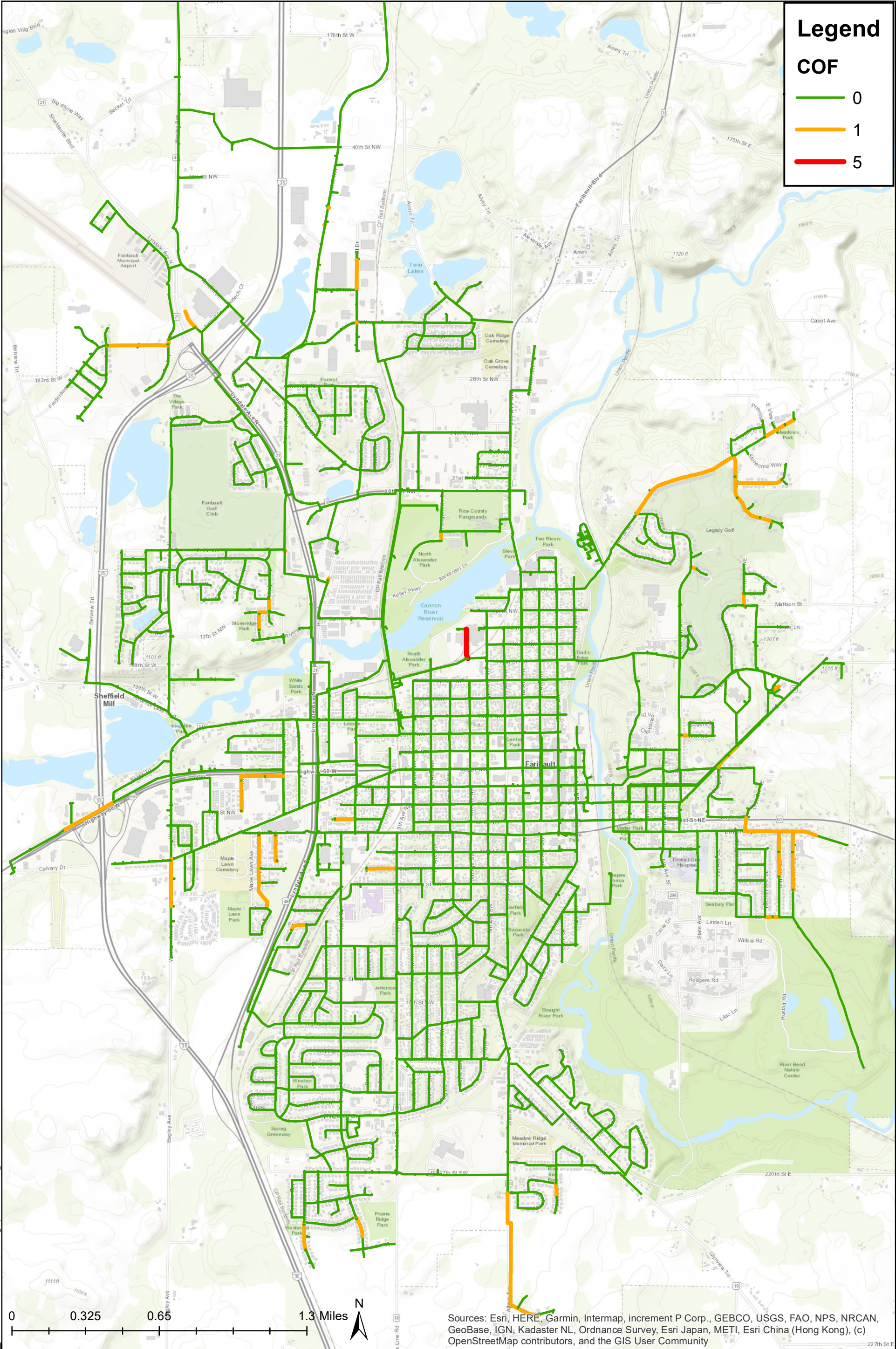
Project: FARIT 158326
Print Date: 8/4/2021

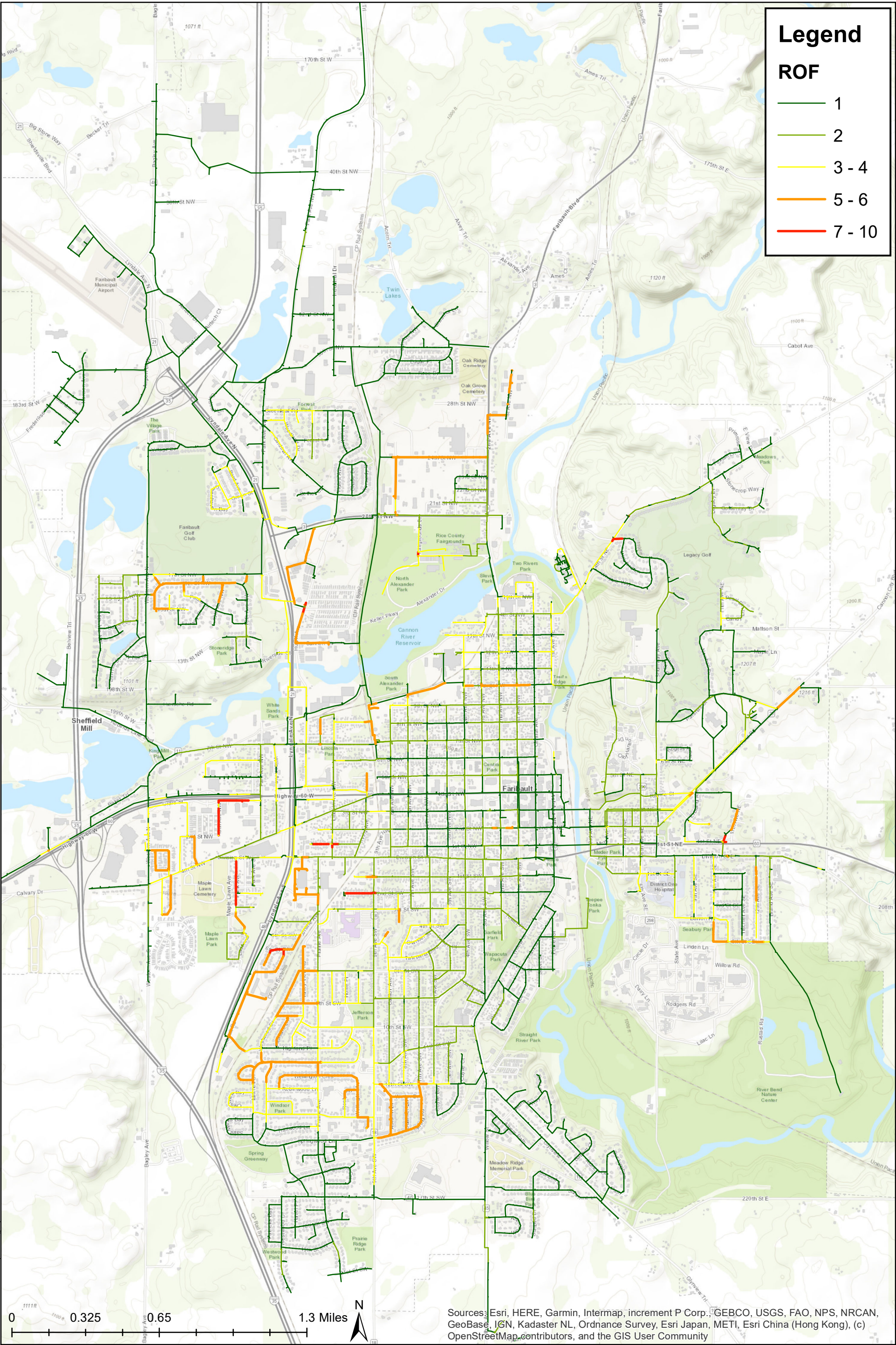
Map by: hylle
Projection:
Source:

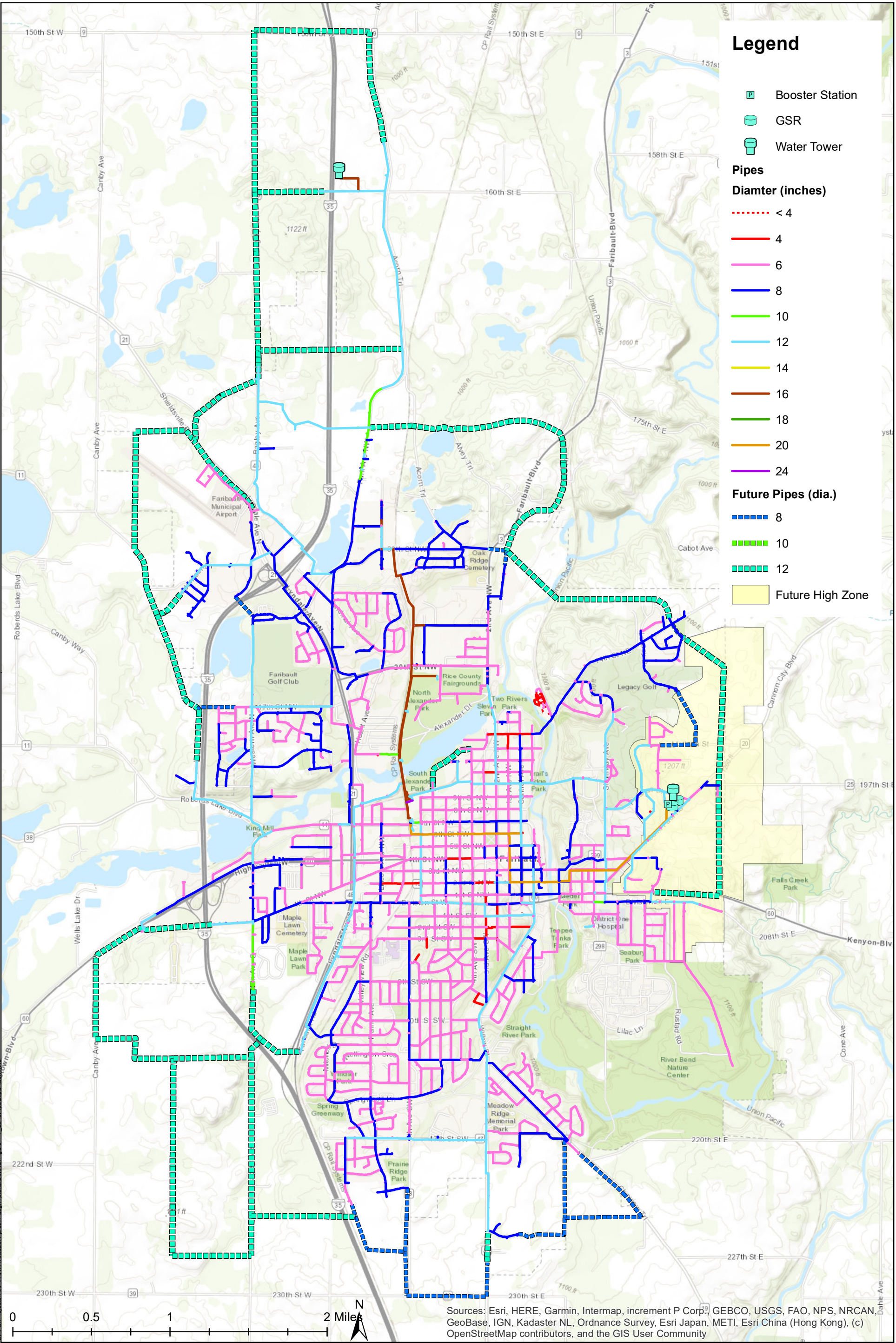
Existing AD Average Water Age
Comprehensive Water Plan
Faribault, Minnesota

Figure
5-9

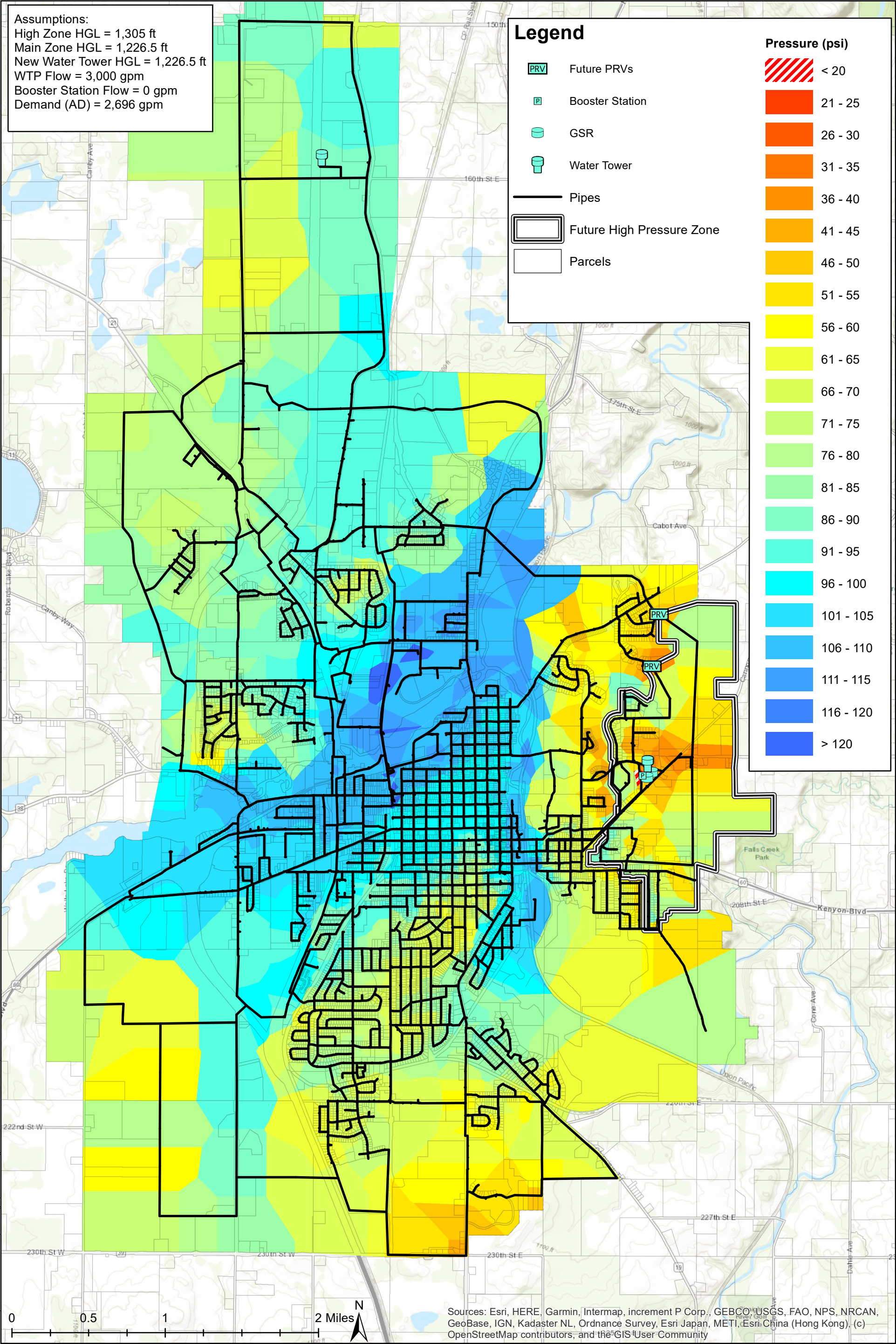


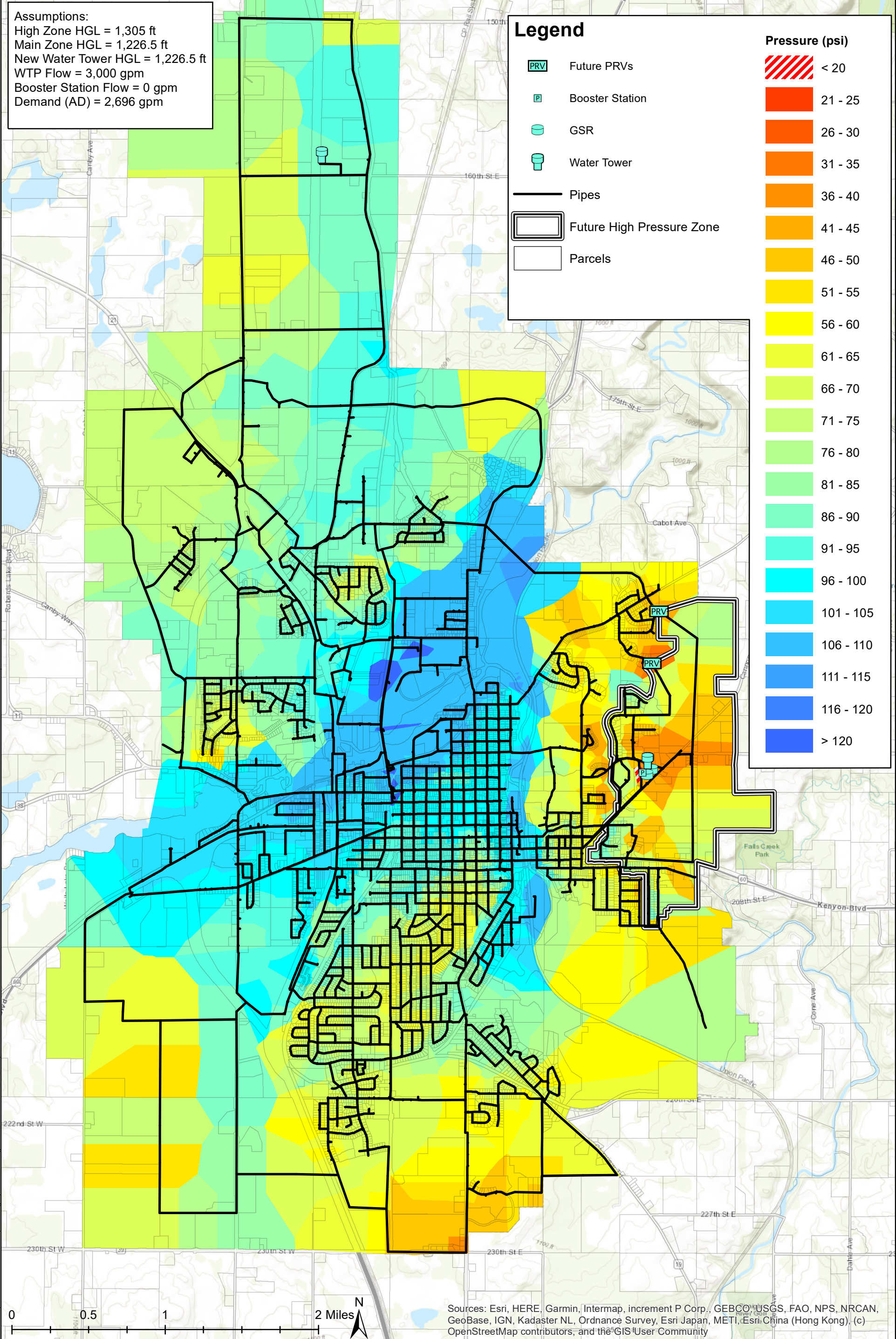


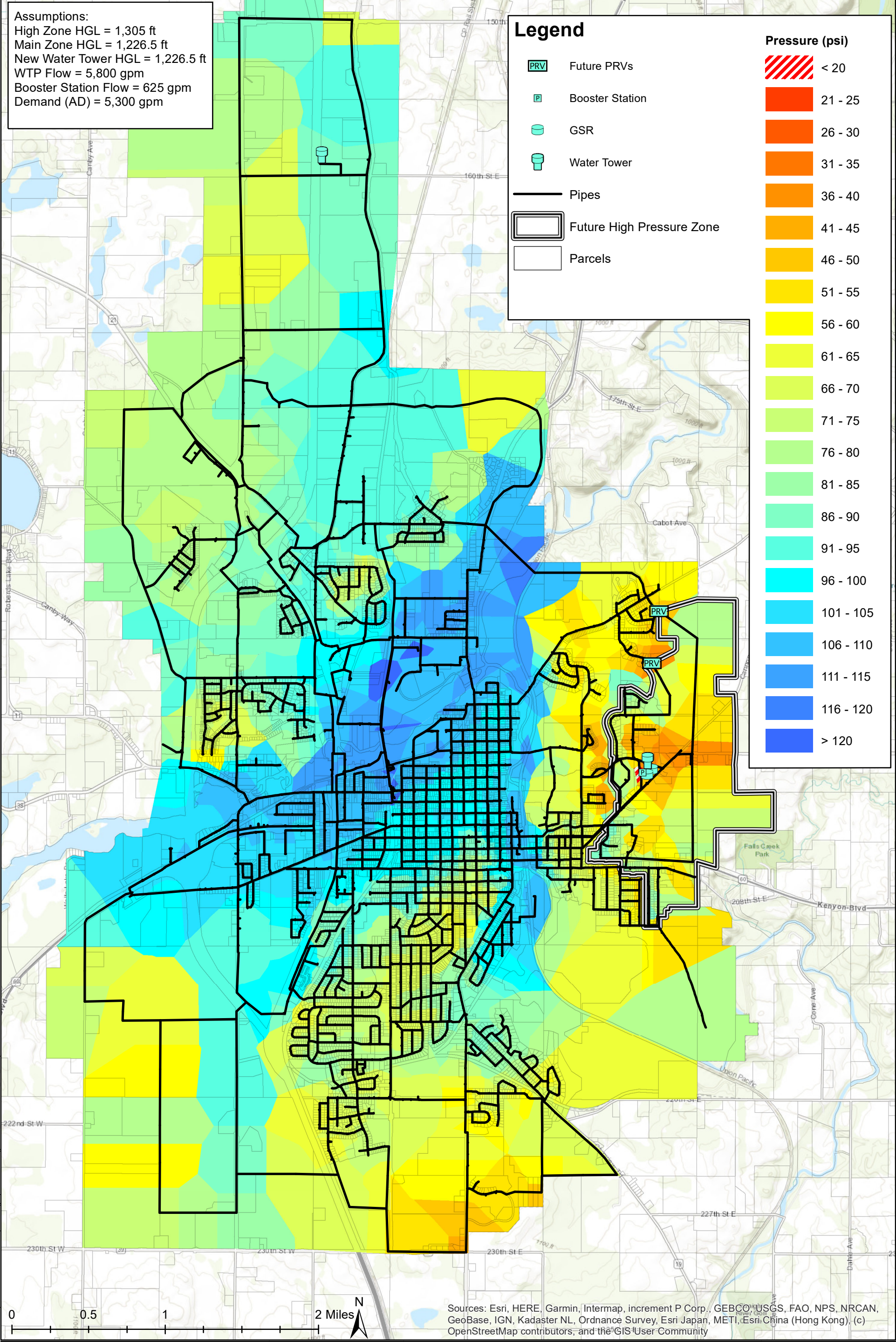




	3535 VADNAIS CENTER DR. ST. PAUL, MN 55110 PHONE: (651) 490-2000 FAX: (888) 908-8166 TF: (800) 325-2055 www.sehinc.com	Project: FARIT 158326 Print Date: 11/10/2021 Map by: kcatzenberger Projection: Source:	Future Pipe Expansion Comprehensive Water Plan Faribault, Minnesota	Figure 7-1
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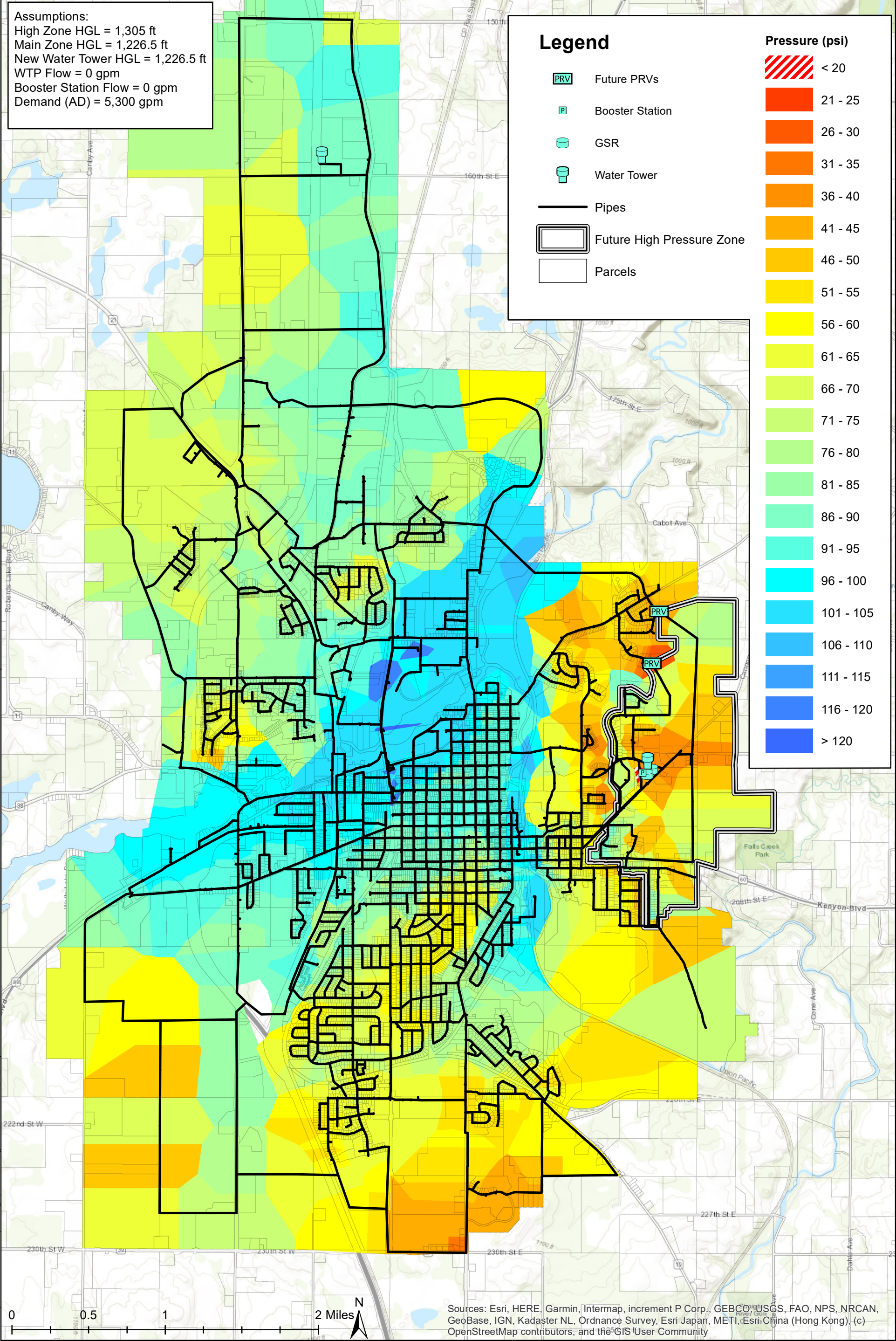
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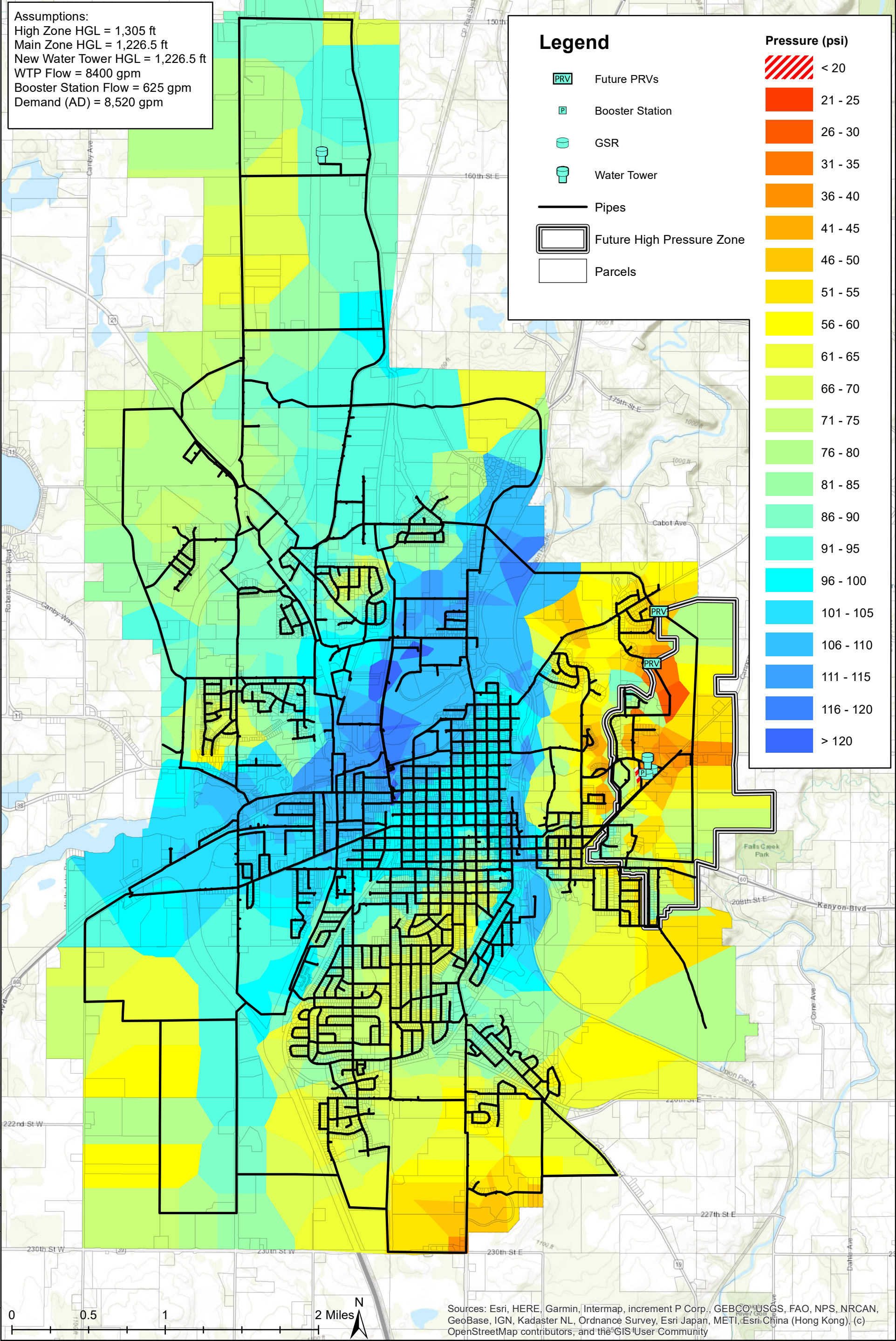
Project: FARIT 158326
Print Date: 11/10/2021

Map by: ckatzenberger
Projection:
Source:

2040 MD Pressure - Pumps Off
Comprehensive Water Plan
Faribault, Minnesota

**Figure
7-4**





Assumptions:
High Zone HGL = 1,305 ft
Main Zone HGL = 1,226.5 ft
WTP Flow = 8,450 gpm
Booster Station Flow = 625 gpm
Demand (PKHR) = 8,500 gpm

Legend

P

Booster Station

GSR

Water Tower

High Pressure Zone

Parcels

0-3

3-5

5-7

7-9

9+



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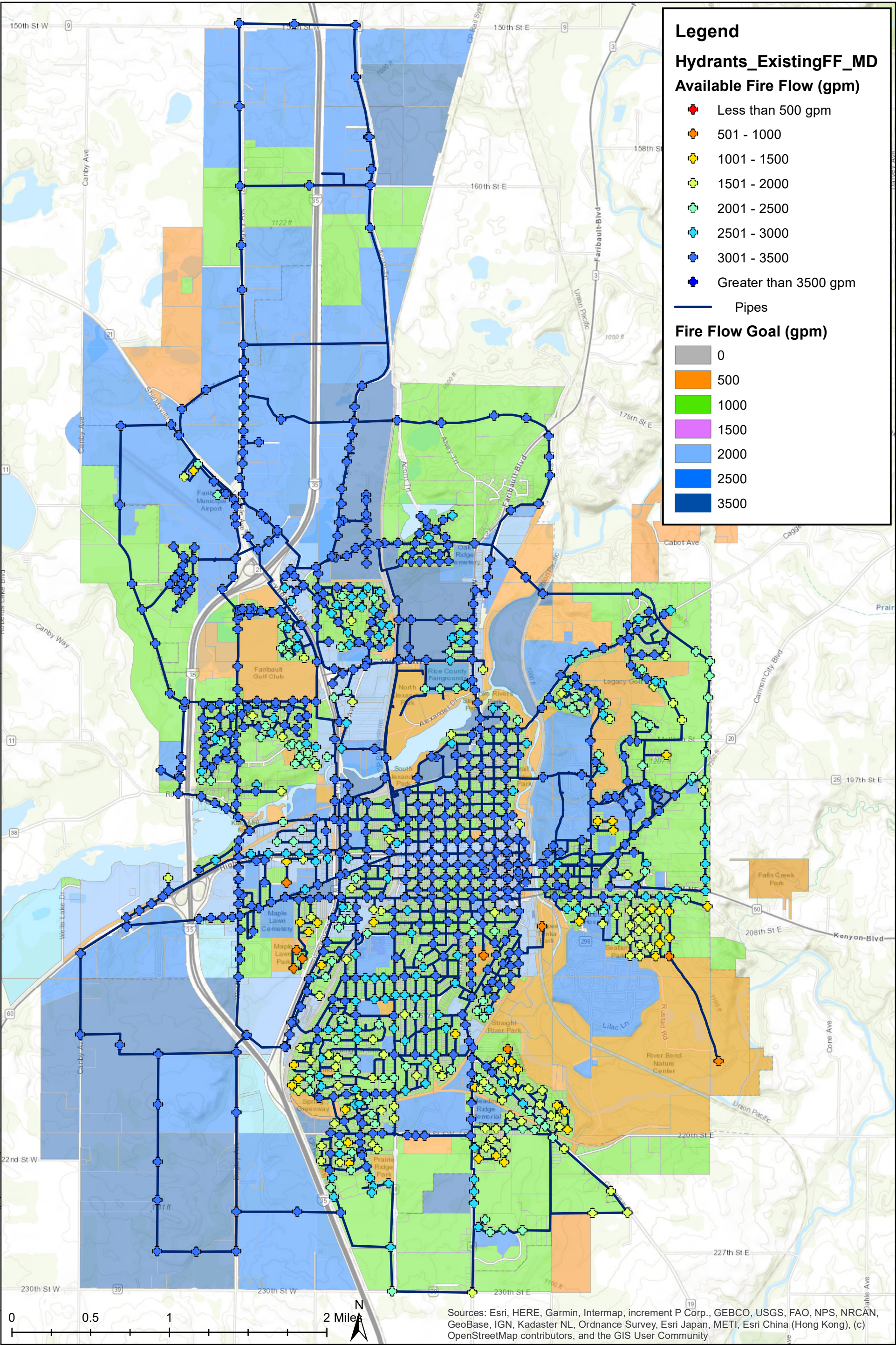
Map by: katztenberger
Projection:
Source:

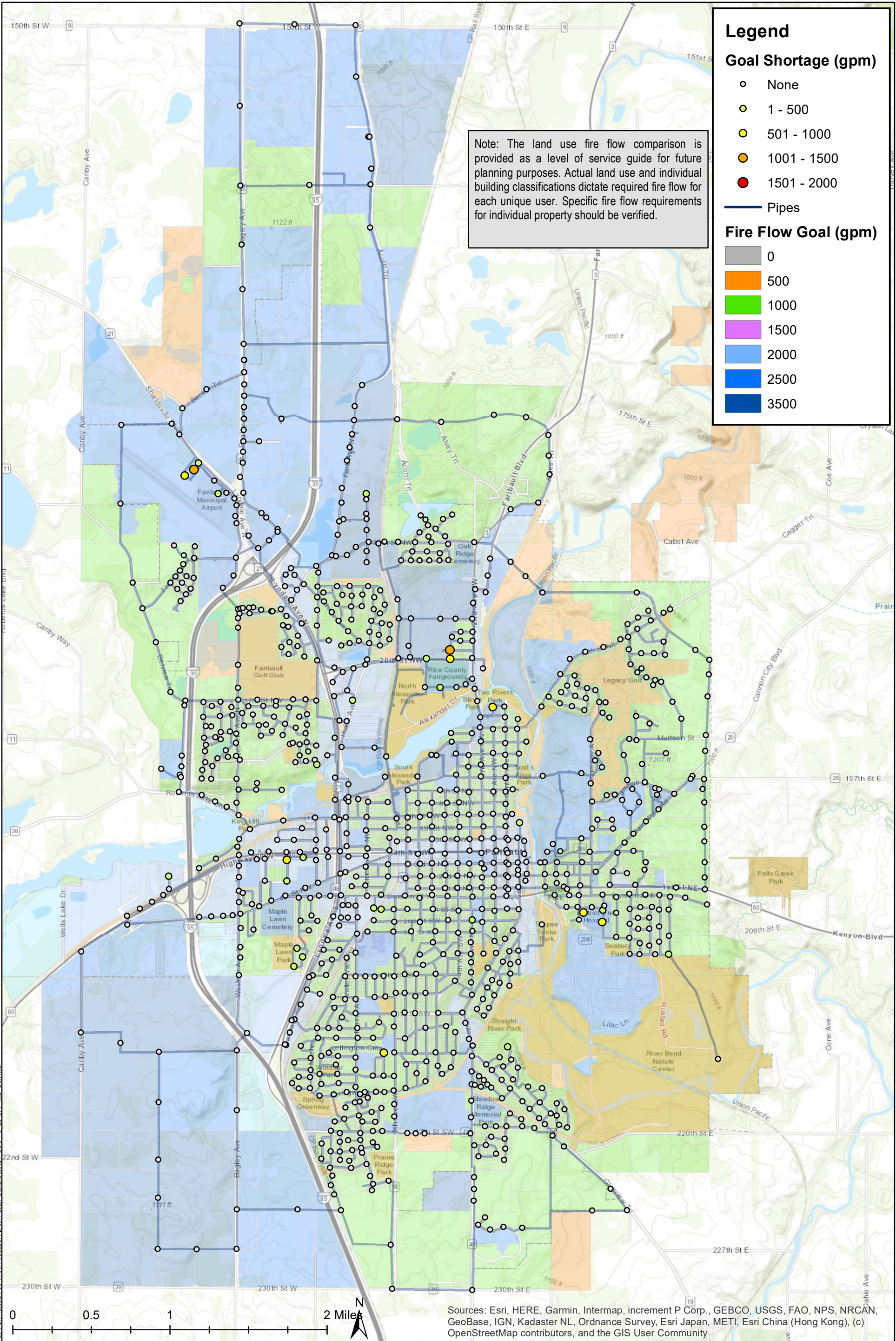
2040 Peak Hour Velocity
Comprehensive Water Plan
Faribault, Minnesota

Figure
7-7

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Appendix B

Water Model Documentation



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MEMORANDUM

TO: Mark DuChene, PE
Director of Engineering, City of Faribault, Minnesota

FROM: Chad Katzenberger, PE (Lic. MN)
Heather Yelle, EIT

DATE: March 29, 2019

RE: Faribault Water System Modeling Review
SEH No. FARIT 147406 14.00

This memo is intended to summarize a modeling analysis related to available water system fire flow in the northern part of the City. Recently, a new water main extension to Met Con Companies was installed along Acorn Trail to provide water service to the area. Specific businesses in the area have expressed a desire to have fire protection flow (fire flow) available from the water main at levels of 2,250 gpm + (and a residual of pressure 20 psi). Recent flow tests indicated that current available flow at the end of the main is in the vicinity of 1,600 gpm (at a residual pressure of 20 psi). This memo will analyze the ability of the existing water system to delivery desired flows, as well as various improvement alternatives, which may increase available fire flow in the area to desired levels of 2,250 gpm.

Existing Water Distribution System Model

A water system delivery and distribution model was developed for the City of Faribault as a deliverable of the City's Water Treatment Plant design project. The completed water model was constructed from a combination of information from the City staff, field testing data, and a model calibration process.

This water model depicts the entirety of the Faribault water distribution system including all major water mains, supply facilities, storage tanks, and booster stations. The use of this water model allows for various scenarios to be operated in the model, such that water system operations and performance can be better understood. The City's water model was constructed and calibrated with the latest industry leading water distribution modeling software, Bentley WaterGEMS v8i.

Existing Available Fire Flow

Water system planning for fire protection is an important consideration. In most instances, water main sizes are designed specifically to supply desired fire flows. Guidelines for determining fire flow requirements are provided by the ISO. ISO is the insurance service organization responsible for evaluating and classifying municipalities for fire insurance rating purposes.

Fire protection needs vary with the physical characteristics of each building to be protected. For example, needed fire flows for a specific building can vary from 500 gpm to as high as 12,000 gpm, depending on habitual classifications, separation distances between buildings, height, materials of construction, size of the building, and the presence or absence of building sprinklers. Municipal fire insurance ratings are partially based on the City's ability to provide needed fire flows up to 3,500 gpm. If a specific building has a needed fire flow greater than this amount, the community's fire insurance rating will only be based on the water system's ability to provide 3,500 gpm. For purposes of water system modeling analysis, only results up to 3,500 gpm are provided.

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As previously mentioned, the business in question has expressed the need to have fire flow available in the vicinity of 2,250 gpm. The water distribution system model has the capability to estimate available fire flow throughout the water system. City staff also conducted fire flow testing in the area which confirmed the fire flow estimates provided by the model. Consistency between the City provided field testing results and the model provide confidence that the model is producing reliable information and can be utilized to analyze potential water system improvement alternatives.

Infrastructure Improvement Alternatives

Through discussions with City staff, potential water system improvement alternatives were identified, which may have a positive impact on fire flow available in the vicinity of Acorn Trail. Each alternative is described below, simulated in the model and assessed for its ability to support more robust fire flow to the northern reaches of the water system. The alternatives analyzed include the following: Install a parallel 12-inch pipe along Acorn Trail, add an additional pipe loop from the west side of I-35 to the east connecting to the 12-inch main along Acorn Trail, construct a new water tower in the area, or extend a new 16-inch trunk water main from the core of the City connecting to the area water main. Each of these Alternative is documented in Figure 1.

Alternative 1 – Parallel Piping

This alternative would involve the construction of a new 12-inch water main right next to the existing 12-inch main along Acorn Trail from the intersection of Acorn and Park to the Met Con Companies site. The purpose of this alternative is to identify the main factor that is limiting fire flow to the area in question whether related to the overall water system limitations or more local water main constrictions. Figure 2 documents simulated available fire flow for the existing water system in addition to each alternative, for the identified location at Met Con Companies.

The water modeling results indicate that even with the additional local water main, there would not be a substantial increase of fire flow available to the site in question. This simulation then can establish that the limited fire flow is related to overall water system limitations as opposed to undersize local water main. Besides the size of water main, proximity to water supply and storage sources can heavily influence flow capacities. Given the distance from the water pumping station and water storage reservoir, headloss across the greater water system is notable when substantial flow volumes are required. Additionally for water to reach the project area from the supply source, it must cross the Cannon River, which has limited crossings which also limit flow.

Alternative 2 – Additional Pipe Looping

This alternative explores the option of adding an additional water deliver route by virtue of a section water main from the east side of I-35 along 170th Street West. As before, simulated flow results for this alternative are presented in Figure 2. Again, this alternative provides a marginal increase in available flow when compared to exiting available flow. As with the first alternative, headloss across the water system limits the water flow available.

Alternative 3 – Water Tower

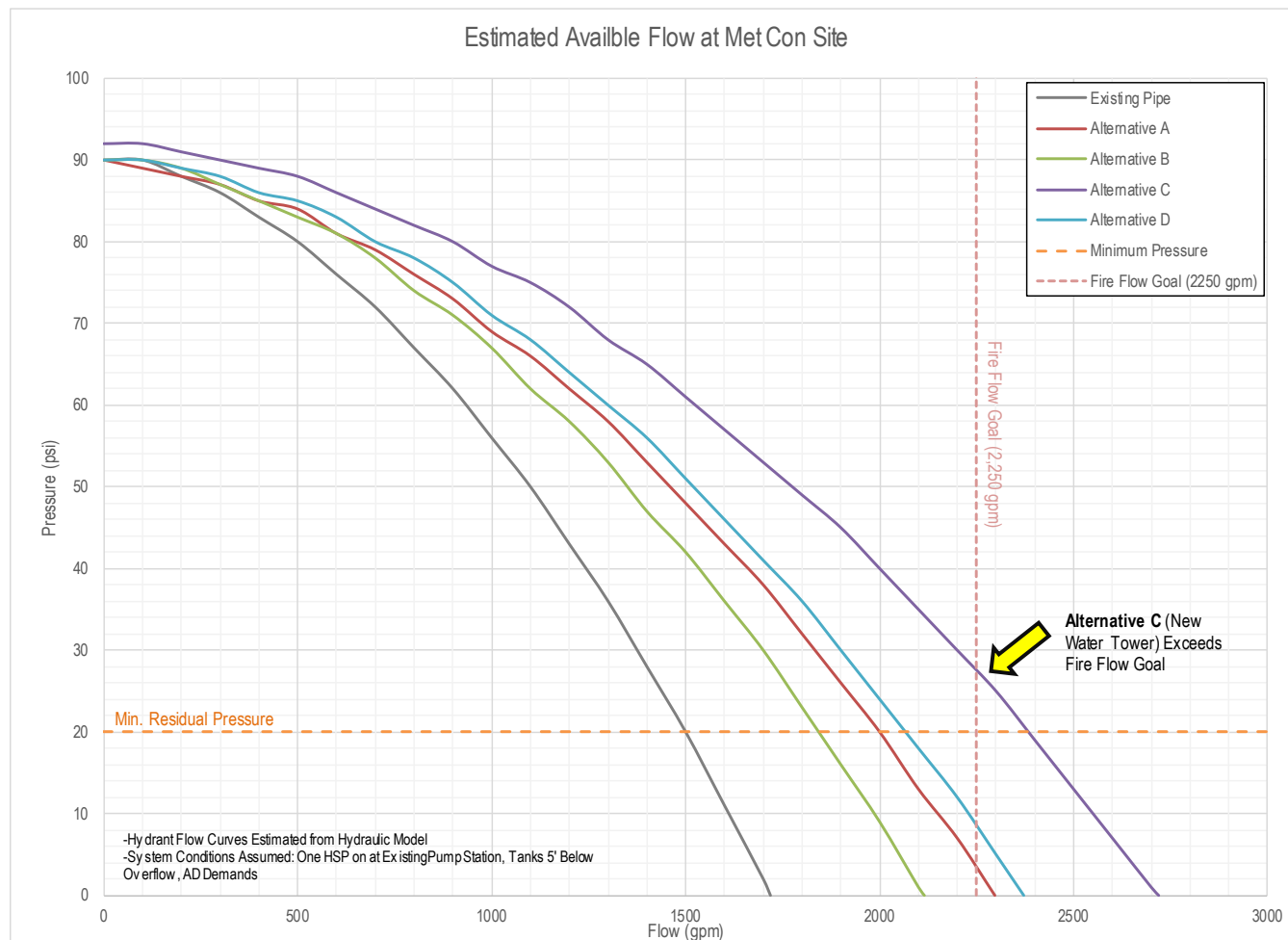
This alternative explores the option of constructing a new water storage facility in the vicinity of the project area. Previous planning efforts have identified a new water tower as a potential improvement. As such, the proposed water tower operation was simulated in the model to determine the impact to available fire flow. This alternative would provide water supply via storage very near the project area. As a result, water has to only travel a short distance from the supply point (water tower) to the area of need, which limits the headloss and could support more robust flow. Additional, the looped section of water main identified in alternative 2 was included in this simulation to assure water and be efficiently delivered to and from the new water tower.

As desired, the water model simulation indicates that the tower addition has a positive influence on fire flow available in the project area and helps to achieve the desired fire flow of 2,250 gpm in the project area (see Figure 2). This option appears to be a valid alternative to support desired levels of fire flow in the area.

Alternative 4 – Extending Trunk Main

Previous water system planning documents have identified a potential 16-inch trunk water main to be installed along the Railroad Grade from 30th Street NW to the intersection Acorn/Park. The potential for this particular water system improvement was also analyzed with the model to determine the ability of this alternative to provide an increase in available flow to the area. Again the ability of large volumes of water to be delivered across the system appear to be limited due to the proximity of the project area in relation to the existing pumping station and storage reservoir (see Figure 1).

Figure 2 – Water Model Results – Estimated Flow Available at Met Con Site



CONCLUSION

The result of the water model analysis documented above indicate the alternative with the most potential for delivering desired fire flows would be the installation of a new water tower in the vicinity of the project area. Beyond an increase in local fire flow a new water tower would help satisfy overall water system storage needs, support regional water system pressures and provide a redundant pressure/supply source north of the Cannon River.

hy/mrb
 Attachments

s:\fj\farit\147406\4-prelim-dsgn-rpts\water model\memo\2019.03.29 m city alternative analysis.docx

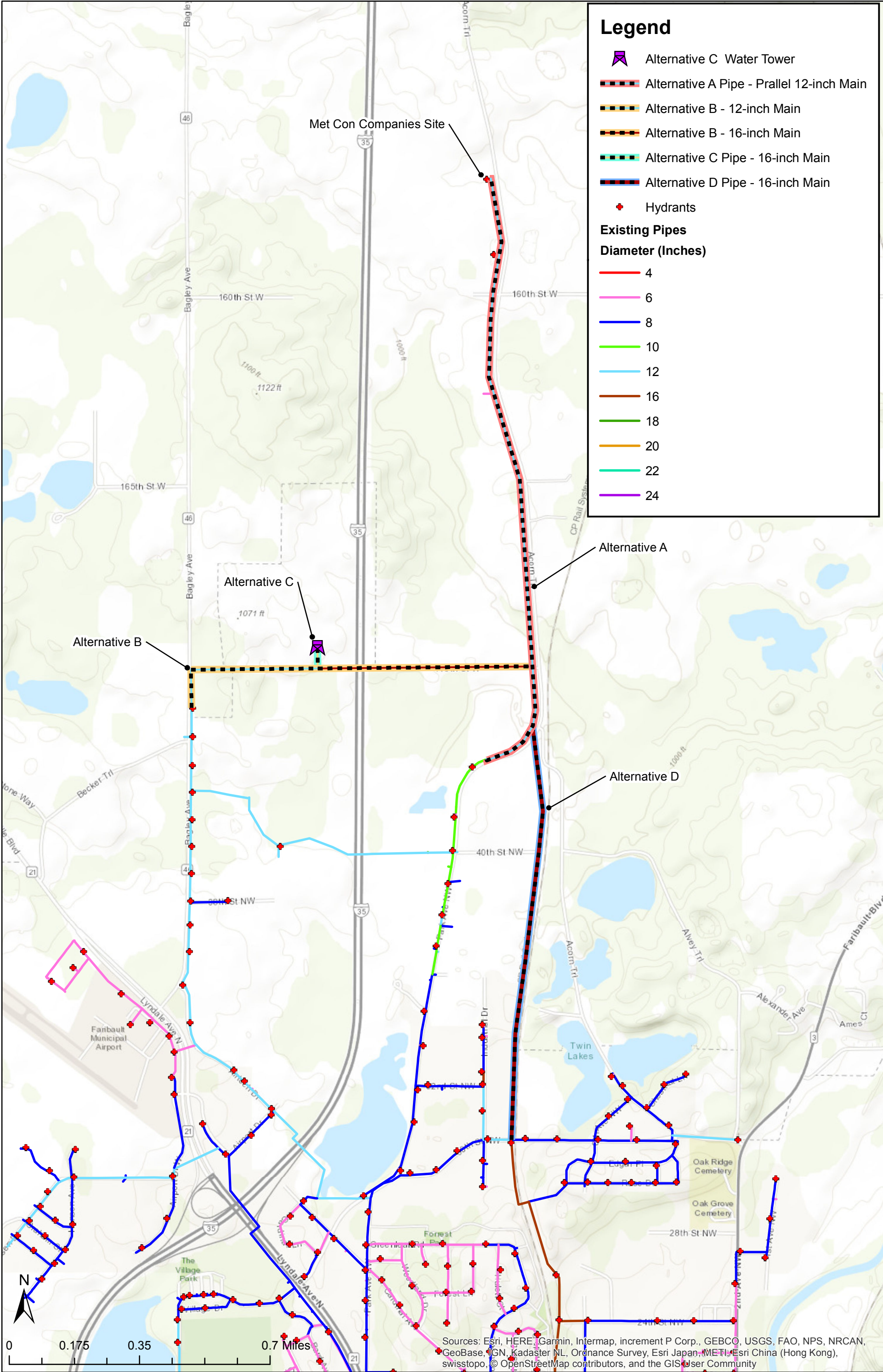


TABLE 1
FARIBAULT - FIELD FLOW TESTING RESULTS OCTOBER 2018

Test Location	EPS Interval	Date	Time	FIELD TESTING							Boundry Conditions			Booster Station Flow (gpm)	MODEL SIMULATION			CALIBRATION RESULTS		
				R Static Pressure (psi)	R Residual Pressure (psi)	Pressure Difference (psi)	Flow Meter Size (inch)	Flow Meter pitot pressure (psi)	Field Flow (gpm)	Calc. Fire Flow @ 20 psi	Main Reservoir Level (HGL)	High Zone Tower Level (HGL)	PH HSP Flow (gpm)		Static Pressure (psi)	Residual Pressure (psi)	Pressure Difference (psi)	Static Pressure (psi)	Residual Pressure (psi)	Calibration Pressure Difference (psi)
01F	1	10/25/2018	9:40 AM	68	42	26	3.90	9	1,225	1,706	1225.0	1306.1	2,500		67	42	25	-1	0	-1
02F	2	10/25/2018	10:06 AM	53	31	22	3.90	9	1,225	1,525	1225.0	1306.3	2,500		53	31	22	0	0	0
03F	3	10/25/2018	10:22 AM	74	34	40	3.90	12	1,415	1,663	1225.0	1307.4	2,500		72	33	39	-2	-1	-1
04F	4	10/25/2018	10:34 AM	83	70	13	3.90	15	1,582	3,708	1225.0	1308.5	2,500		81	70	11	-2	0	-2
05F	5	10/25/2018	11:12 AM	89	84	5	2.50	-	1,325	5,467	1225.0	1311.6	2,500		88	83	5	-1	-1	0
06F	6	10/25/2018	11:29 AM	88	88	1	2.50	-	1,100	15,614	1225.0	1311.5	2,500		87	87	0	-1	-1	-1
07F	7	10/25/2018	11:50 AM	62	48	14	2.50	-	920	1,665	1225.0	1311.2	2,500		62	47	15	0	-1	1
08F	8	10/25/2018	12:02 PM	87	43	44	2.50	-	870	1,092	1227.4	1311.1	2,500		86	43	43	-1	0	-1
09F	9	10/25/2018	1:30 PM	88	70	18	2.50	-	1,150	2,357	1225.0	1310.0	2,500		88	69	19	0	-1	1
10F	10	10/25/2018	1:42 PM	54	33	21	2.50	-	840	1,090	1225.0	1309.7	2,500		52	30	22	-2	-3	1
11F	11	10/25/2018	2:00 PM	81	73	8	2.50	-	1,190	3,564	1225.0	1309.5	2,500		81	69	12	0	-4	4
12F	12	10/25/2018	2:17 PM	80	58	22	3.90	16.5	1,659	2,851	1227.4	1309.4	2,500		80	59	21	0	1	-1
13F	13	10/25/2018	2:30 PM	76	67	9	2.50	-	1,130	3,033	1227.4	1309.4	2,500		76	64	12	0	-3	3
14F	14	10/25/2018	2:47 PM	67	59	8	2.50	-	920	2,394	1227.4	1309.2	2,500		67	60	7	0	1	-1
15F	15	10/25/2018	2:59 PM	92	73	19	2.50	-	1,270	2,608	1227.4	1309.2	2,500		94	73	21	2	0	2
											Estimated based on Telog 1269									

HGL High Zone
HGL High Zone

1315
1235

Residual Pres:

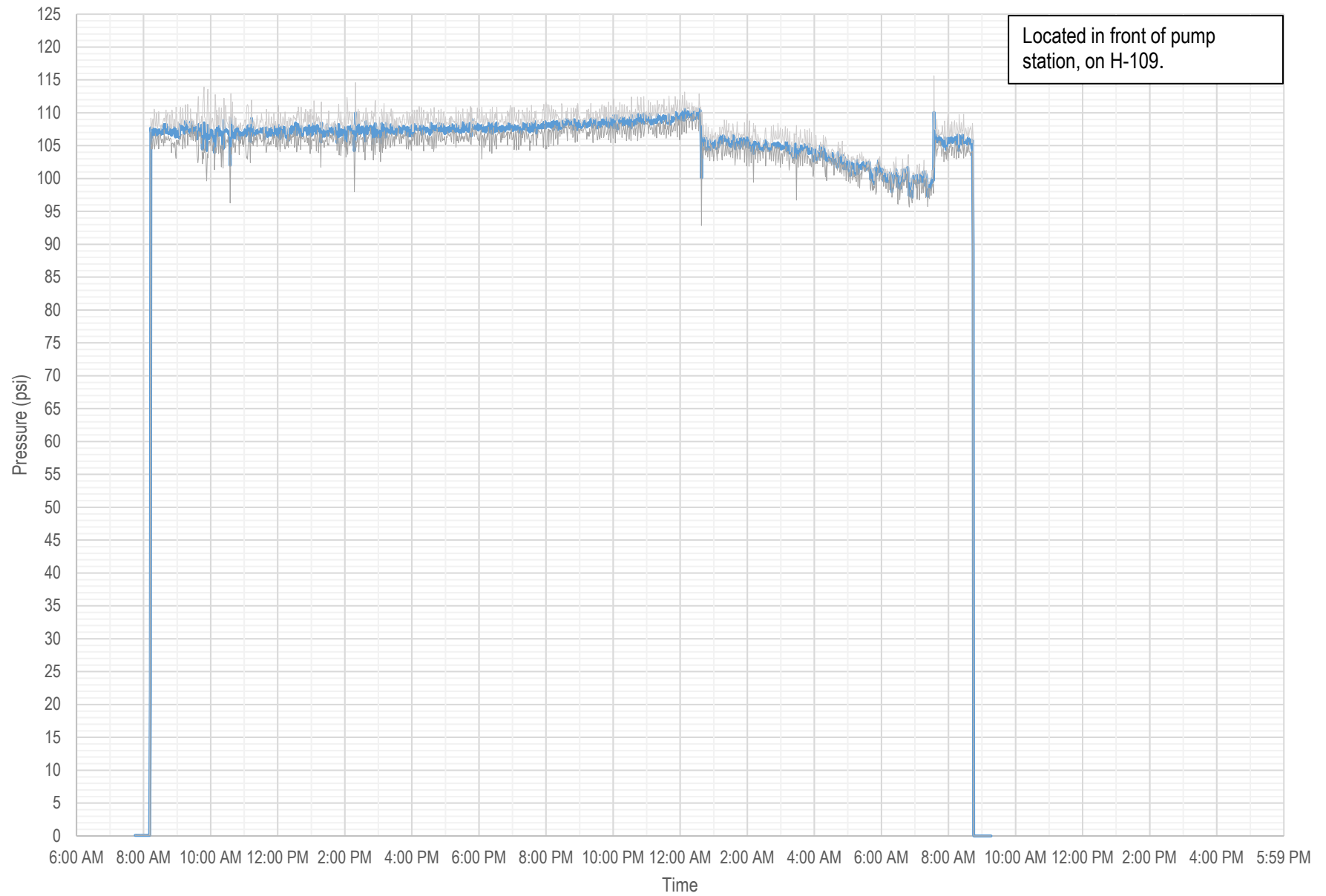
Uncalibrated C=130 everywhere

1	66	54	12	-2
2	52	36	16	-1
3	70	45	25	-4
4	80	74	6	-3
5	87	83	4	-2
6	87	86	1	-1
7	61	43	18	-1
8	84	49	35	-3
9	86	66	20	-2
10	52	24	28	-2
11	79	66	13	-2
12	78	62	16	-2
13	74	63	11	-2
14	65	60	5	-2
15	91	64	27	-1

* See flow testing map for locations of flow tests

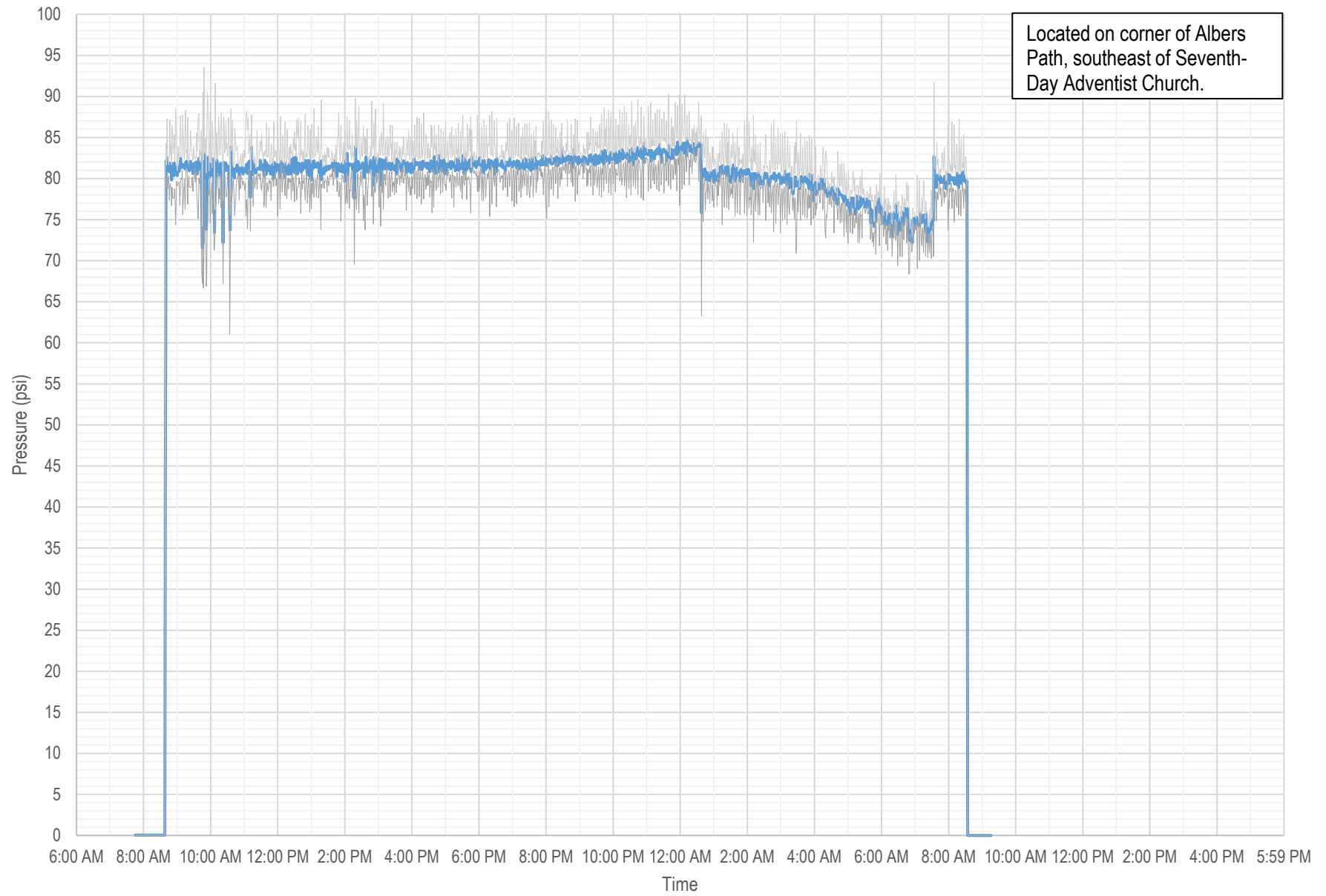
Pressure Log - 6335 - Main Pump Station

Located in front of pump
station, on H-109.



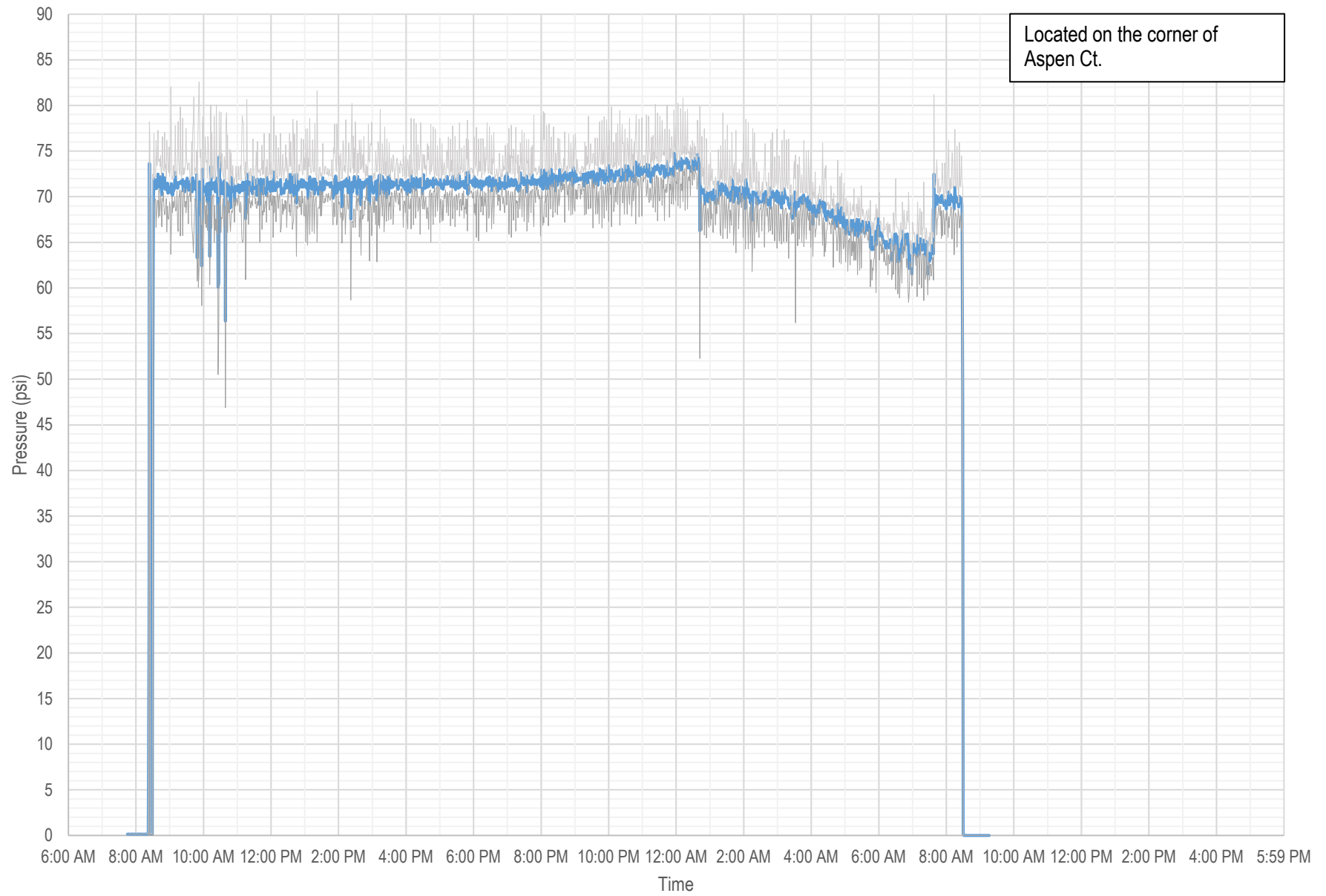
Pressure Log - 6336 -

Located on corner of Albers
Path, southeast of Seventh-
Day Adventist Church.

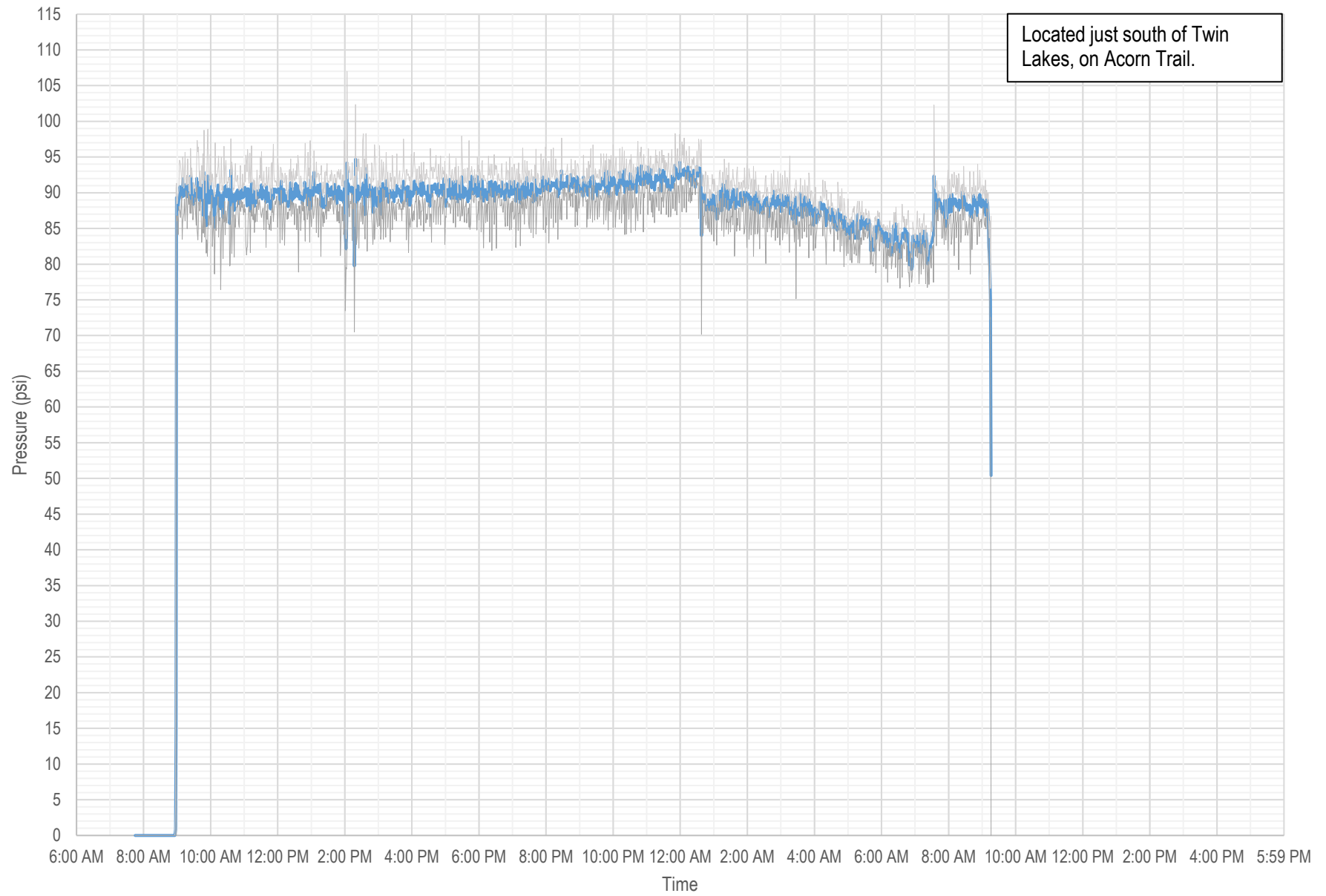


Pressure Log - 6337 -

Located on the corner of
Aspen Ct.

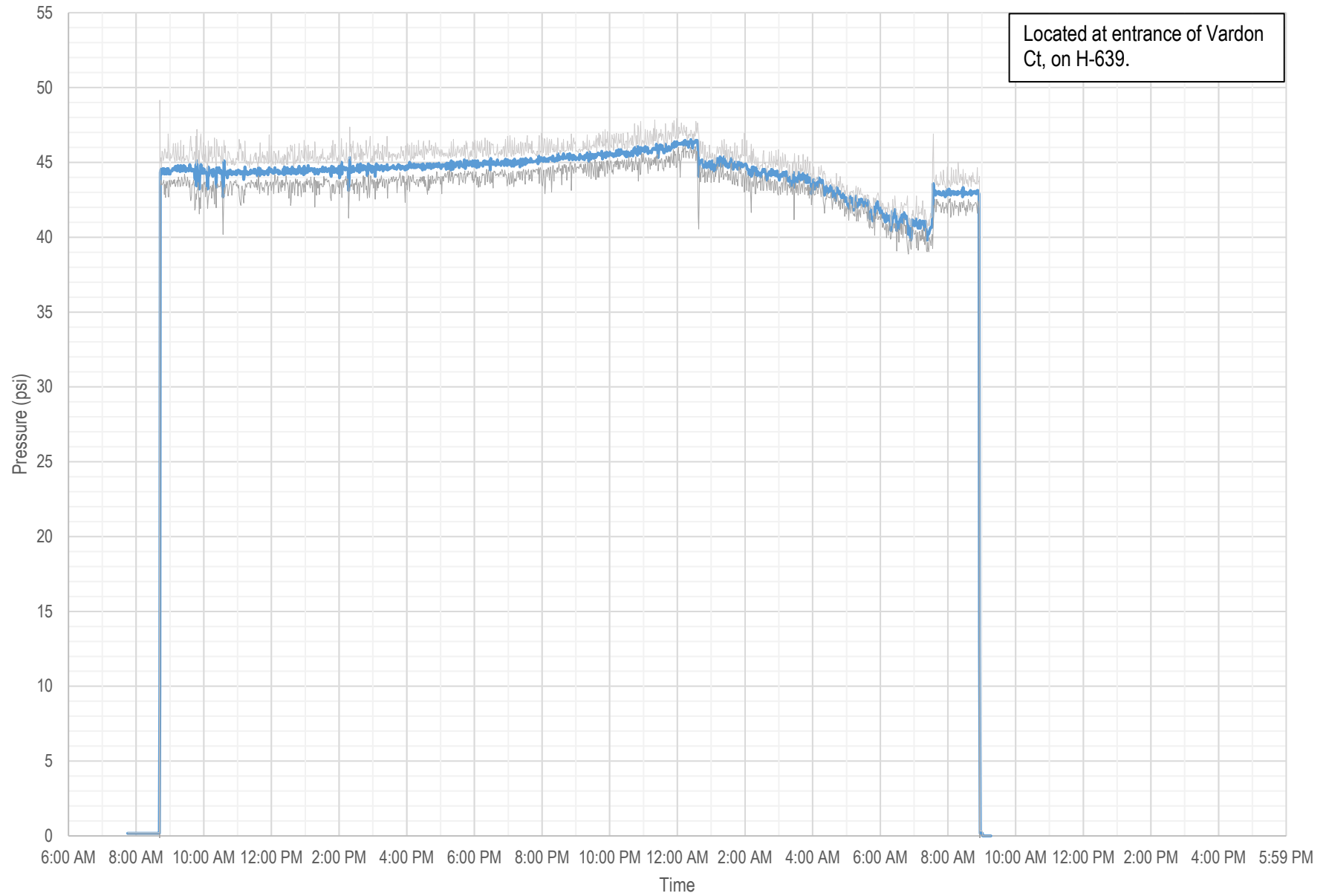


Pressure Log - 6338 -



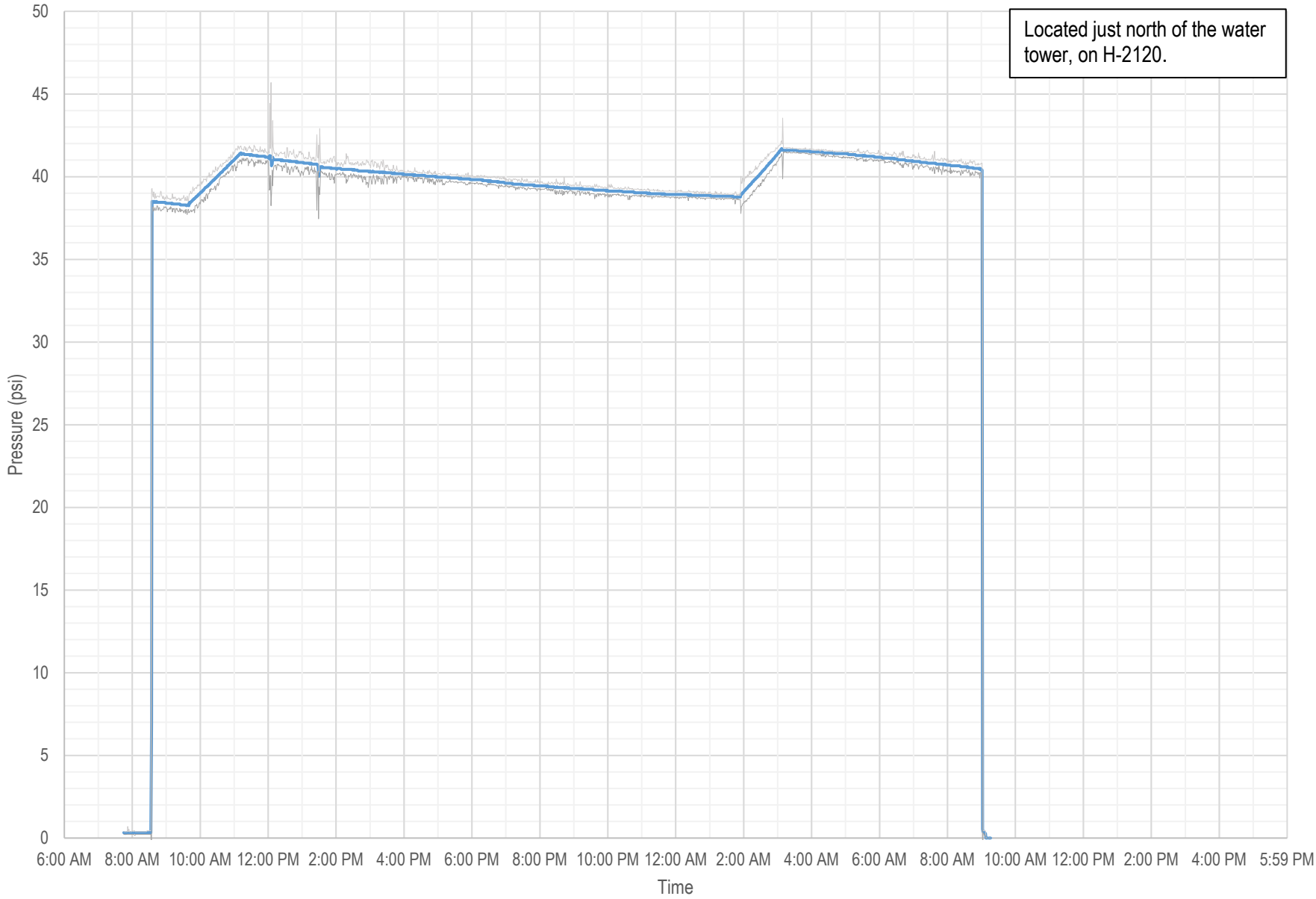
Pressure Log - 1270 -

Located at entrance of Vardon Ct, on H-639.



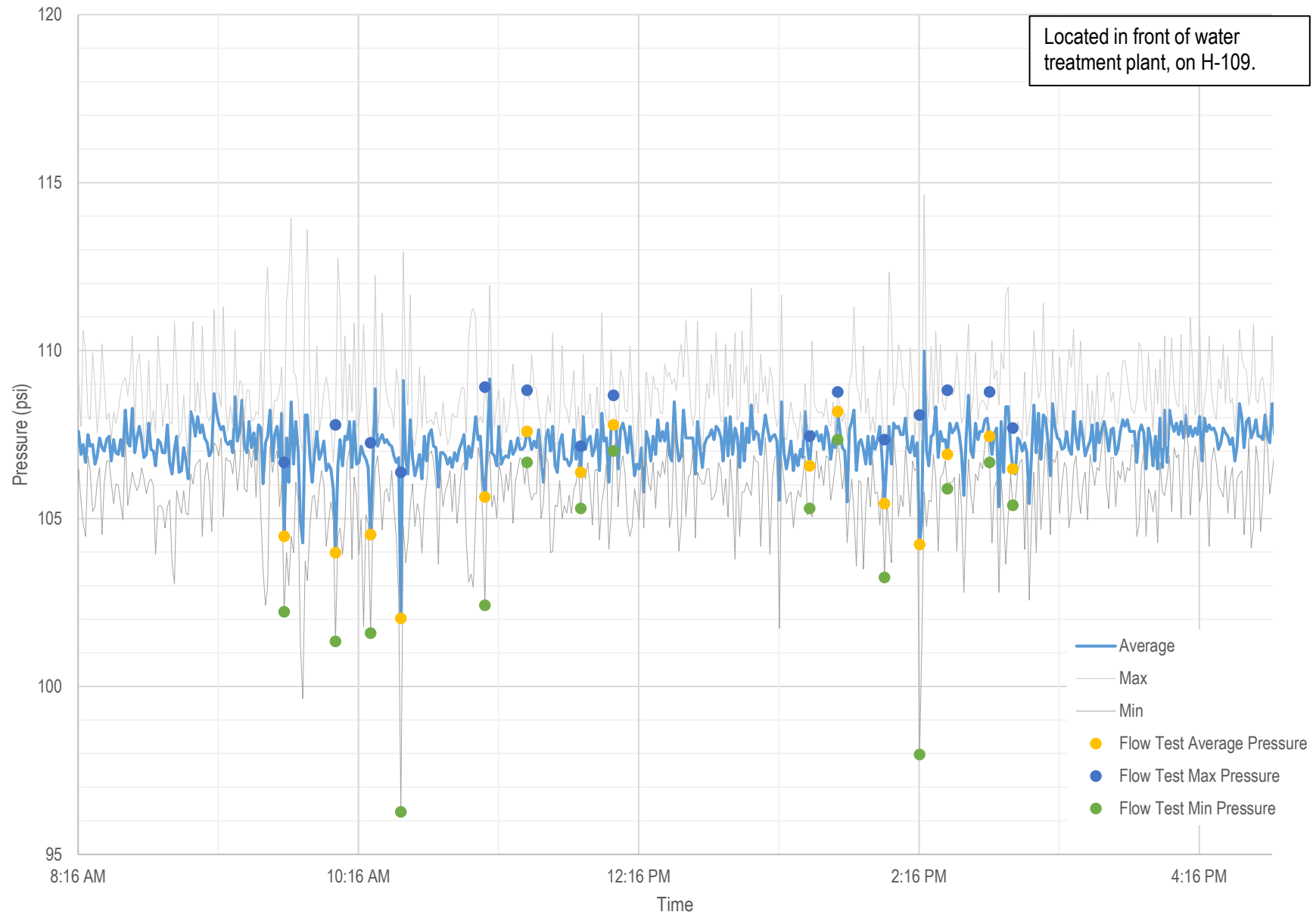
Pressure Log - 1269-

Located just north of the water tower, on H-2120.



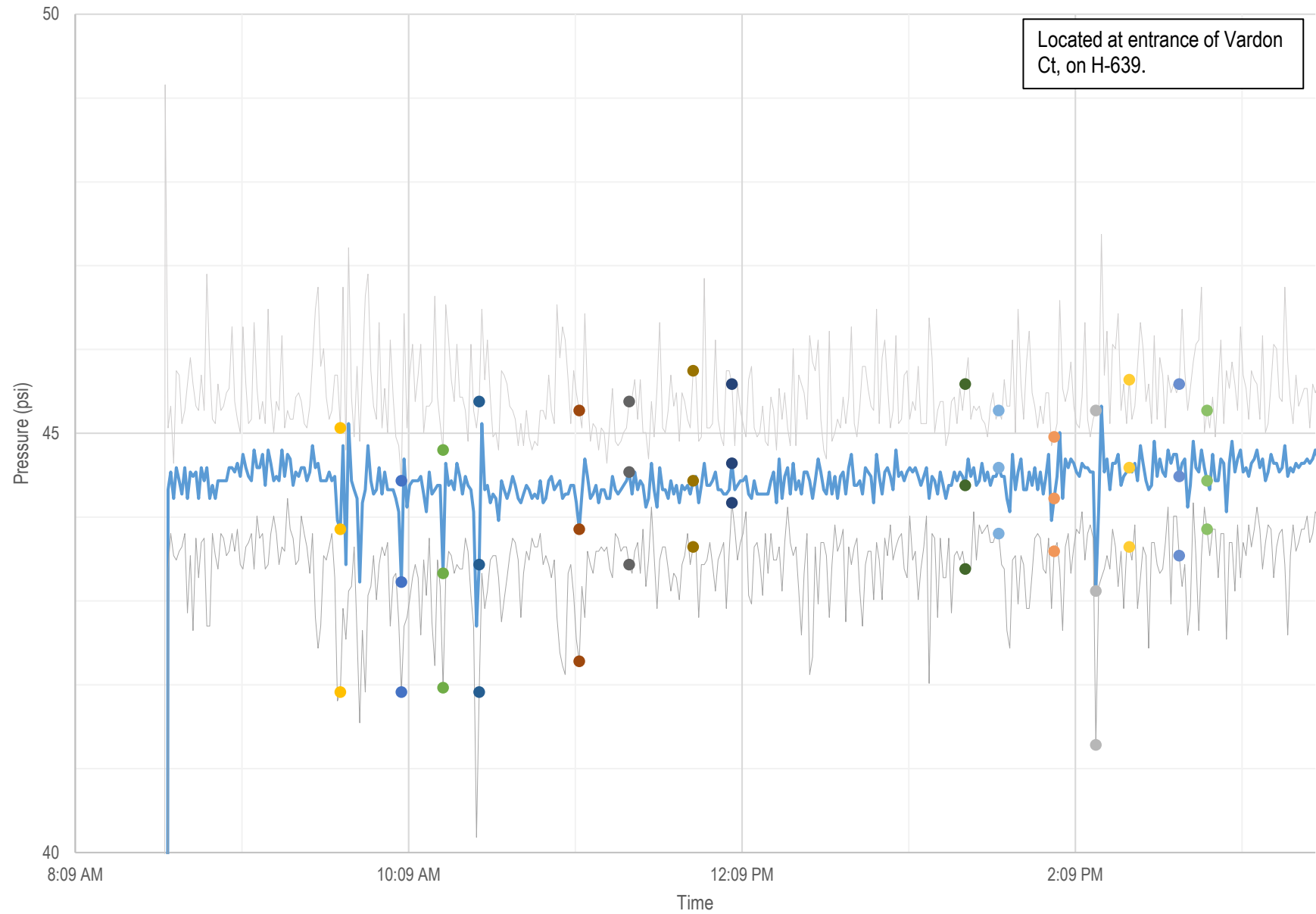
Pressure Log - 6335 - Main Pump Station

Located in front of water treatment plant, on H-109.



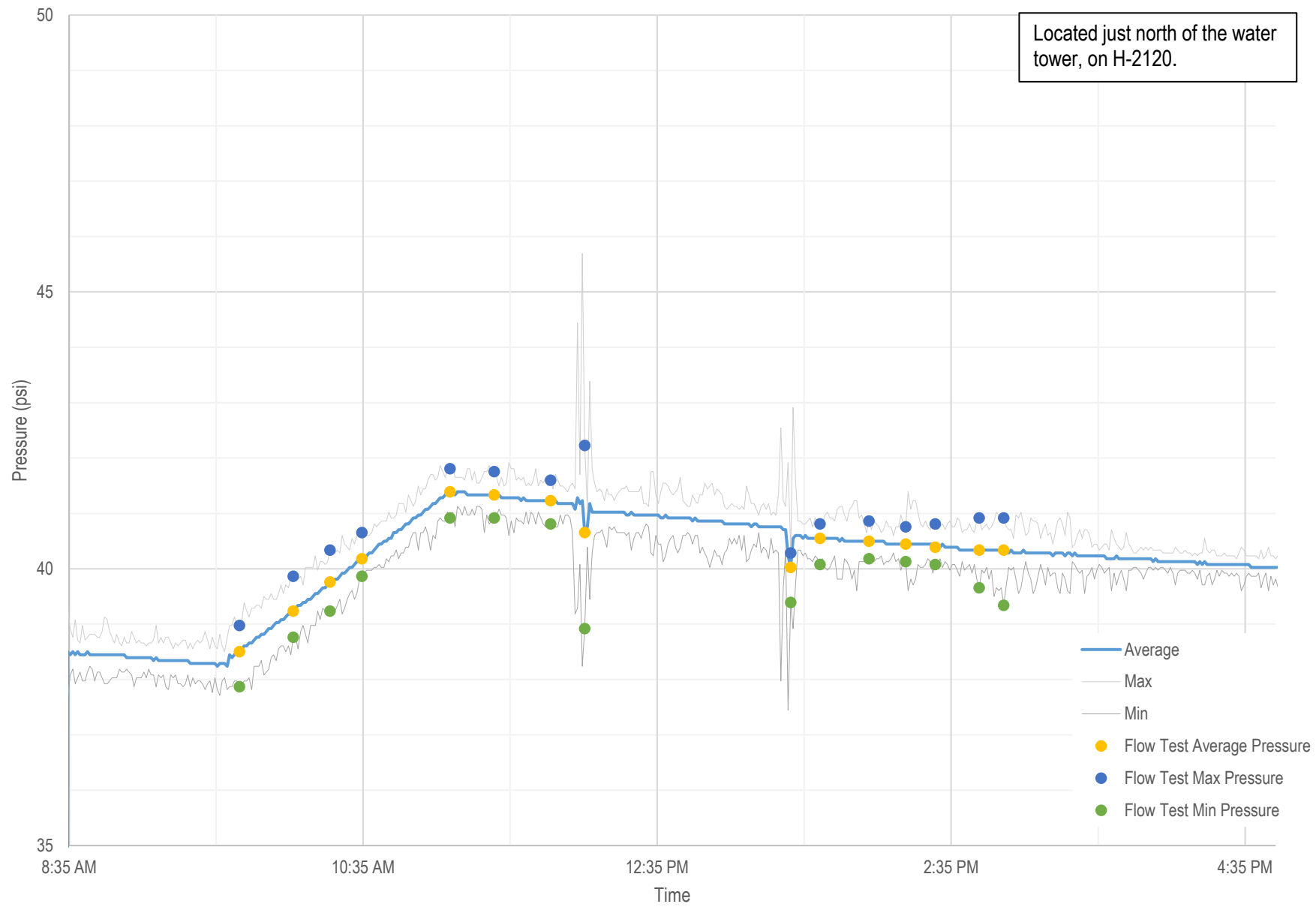
Pressure Log - 1270 -

Located at entrance of Vardon Ct, on H-639.



Pressure Log - 1269- North of Water Tower

Located just north of the water tower, on H-2120.



Appendix C

Water Supply Plan

CITY OF FARIBAULT

Local Water Supply Plan

Third Generation for 2016-2018

Revised April 10, 2017

Formerly called Water Emergency & Water Conservation Plan



Cover photo by Molly Shodeen



For more information on this Water Supply Plan Template, please contact the DNR Division of Ecological and Water Resources at (651) 259-5034 or (651) 259-5100.

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DEPARTMENT OF NATURAL RESOURCES – DIVISION OF ECOLOGICAL AND WATER RESOURCES AND METROPOLITAN COUNCIL

INTRODUCTION TO WATER SUPPLY PLANS (WSP)

Who needs to complete a Water Supply Plan

Public water suppliers serving more than 1,000 people, large private water suppliers in designated Groundwater Management Areas, and all water suppliers in the Twin Cities metropolitan area are required to prepare and submit a water supply plan.

The goal of the WSP is to help water suppliers: 1) implement long term water sustainability and conservation measures; and 2) develop critical emergency preparedness measures. Your community needs to know what measures will be implemented in case of a water crisis. A lot of emergencies can be avoided or mitigated if long term sustainability measures are implemented.

Groundwater Management Areas (GWMA)

The DNR has designated three areas of the state as Groundwater Management Areas (GWMAs) to focus groundwater management efforts in specific geographies where there is an added risk of overuse or water quality degradation. A plan directing the DNR's actions within each GWMA has been prepared. Although there are no specific additional requirements with respect to the water supply planning for communities within designated GWMAs, communities should be aware of the issues and actions planned if they are within the boundary of one of the GWMAs. The three GWMAs are the North and East Metro GWMA (Twin Cities Metro), the Bonanza Valley GWMA and the Straight River GWMA (near Park Rapids). Additional information and maps are included in the [DNR Groundwater Management Areas webpage](#).

Benefits of completing a WSP

Completing a WSP using this template, fulfills a water supplier's statutory obligations under M.S. [M.S.103G.291](#) to complete a water supply plan. For water suppliers in the metropolitan area, the WSP will help local governmental units to fulfill their requirements under M.S. 473.859 to complete a local comprehensive plan. Additional benefits of completing WSP template:

- The standardized format allows for quicker and easier review and approval
- Help water suppliers prepare for droughts and water emergencies.
- Create eligibility for funding requests to the Minnesota Department of Health (MDH) for the Drinking Water Revolving Fund.
- Allow water suppliers to submit requests for new wells or expanded capacity of existing wells.
- Simplify the development of county comprehensive water plans and watershed plans.
- Fulfill the contingency plan provisions required in the MDH wellhead protection and surface water protection plans.
- Fulfill the demand reduction requirements of Minnesota Statutes, section 103G.291 subd 3 and 4.

- Upon implementation, contribute to maintaining aquifer levels, reducing potential well interference and water use conflicts, and reducing the need to drill new wells or expand system capacity.
- Enable DNR to compile and analyze water use and conservation data to help guide decisions.
- Conserve Minnesota's water resources

WSP Approval Process

10 Basic Steps for completing a 10-Year Water Supply Plan

1. Download the DNR Water Supply Plan Template from the [DNR Water Supply Plan webpage](#).
2. Save the document with a file name with this naming convention:
WSP_cityname_permitnumber_date.doc.
3. The template is a form that should be completed electronically.
4. Compile the required water use data (Part 1) and emergency procedures information (Part 2)
5. The Water Conservation section (Part 3) may need discussion with the water department, council, or planning commission, if your community does not already have an active water conservation program.
6. All out-state water suppliers **do not** need to complete the content addressed in Part 4.
7. Use the Plan instructions and Checklist document from the [DNR Water Supply Plan webpage](#) to insure all data is complete and attachments are included. This will allow for a quicker approval process.
8. Plans should be submitted electronically using the [MPARS website](#) – no paper documents are required.
9. DNR hydrologist will review plans (in cooperation with Metropolitan Council in Metro area) and approve the plan or make recommendations.
10. Once approved, communities should complete a Certification of Adoption form, and send a copy to the DNR.

Complete **Table 1** with information about the public water supply system covered by this WSP.

Table 1. General information regarding this WSP

Requested Information	Description
DNR Water Appropriation Permit Number(s)	1976-5001
Ownership	☒ Public -- City of Faribault
Metropolitan Council Area	☒ No -- Rice County
Street Address	208 1 st Avenue NW
City, State, Zip	Faribault, MN 55021
Contact Person Name	Michael Glende
Title	Utilities Superintendent
Phone Number	507.838.5559
MDH Supplier Classification	Municipal

PART 1. WATER SUPPLY SYSTEM DESCRIPTION AND EVALUATION

The first step in any water supply analysis is to assess the current status of demand and availability. Information summarized in Part 1 can be used to develop Emergency Preparedness Procedures (Part 2) and the Water Conservation Plan (Part 3). This data is also needed to track progress for water efficiency measures.

A. Analysis of Water Demand

Complete **Table 2** showing the past 10 years of water demand data. If your customer categories are different than the ones listed in **Table 2**, please describe the differences below:

The City of Faribault converted to a new reporting and billing system in 2009/2010, which had enhanced tracking capabilities. Detailed information on water usage for individual categories and water demand data prior to 2010 were not readily available.

The City currently tracks water usage for the following general categories: residential, commercial, industrial, water supplier, and agricultural uses. Institutional uses are currently tracked within the commercial/industrial categories. The water supplier services categories includes municipal water usage for: metered City facilities, flow testing activities, municipal operations such as sewer cleaning or street sweeping, hydrant flushing activities, watermain flushing for new construction and re-development projects, water loss attributed to watermain and water service breaks, emergency services such as fire suppression, and for water distributed via the municipal water salesman.

Please note: the City is currently reviewing and implementing database improvements to more accurately document, and consistently report, water use data and customer classifications. As indicated by the data presented in **Table 2**, customer water use has not been consistently reported in the same categories from year-to-year.

Table 2. Historic water demand (see definitions in the [glossary](#) after Part 4 of this template)

Water Demand Data Summary

City of Faribault Permit 1976-5001

Year	Population Served	Total Connections	Residential Water Delivered (MG)	C/I/I Water Delivered (MG)	Agricultural Water Delivered (MG)	Water Supplier Services (MG)	Water Used Non-Essential (MG)	Total Water Delivered (MG)	Total Water Pumped (MG)	Percent Unmetered/Unaccounted	Average Daily Demand (MGD)	Maximum Daily Demand (MGD)	Date of Max Demand	Residential Per Capita Demand (GPCD)	Total Per Capita Demand (GPCD)
2005	22,605	6,801						1,256.800	1,284.449	2.2%	3.519	5.632	7/12/2005		155.7
2006	22,733	6,931						1,298.029	1,317.186	1.5%	3.609	7.011	5/29/2006		158.7
2007	22,798	6,657						1,203.092	1,225.950	1.9%	3.359	6.046	7/6/2007		147.3
2008	22,818	6,353						1,175.442	1,196.634	1.8%	3.278	5.914	7/8/2008		143.7
2009	23,312	6,324						999.474	1,116.769	10.5%	3.060	5.506	6/4/2009		131.2
2010	23,352	7,149	446.873	173.880	-	129.803		750.555	1,023.860	26.7%	2.805	4.875	7/20/2010	52.4	120.1
2011	23,409	7,966	522.716	439.164	-	88.841		1,050.720	993.459	-5.8%	2.722	4.591	10/4/2011	61.2	116.3
2012	23,436	7,206	513.968	462.295	-	162.887		1,139.151	1,052.781	-8.2%	2.884	5.299	7/10/2012	60.1	123.1
2013	23,477	7,238	513.733	590.887	-	12.011		1,116.631	1,097.032	-1.8%	3.006	5.676	8/27/2013	60.0	128.0
2014	23,631	8,193	469.745	854.698	25.593	23.644		1,373.680	1,172.993	-17.1%	3.214	5.343	8/5/2014	54.5	136.0
2015	23,700	8,047	408.169	819.492	-	10.693		1,238.354	1,078.231	-14.9%	2.954	5.094	5/7/2015	47.2	124.6
2016	23,718	7,262	451.807	831.261	-	27.273		1,310.341	1,228.165	-6.7%	3.365	5.609	5/24/2016	52.2	141.9
AVERAGE 2006-2016															
	23,308	7,211	475.287	595.954	3.656	65.022		1,139.919	1,136.642	0.1%	3.114	5.542		55.9	133.6

MG - Million Gallons

MGD - Million Gallons per Day

GPCD - Gallons per Capita per Day

See [Glossary](#) for definitions. A list of [Acronyms and Initialisms](#) can be found after the Glossary.

Complete **Table 3** by listing the top 10 water users by volume, from largest to smallest. For each user, include information about the category of use (residential, commercial, industrial, institutional, or wholesale), the amount of water used in gallons per year, the percent of total water delivered, and the status of water conservation measures.

Table 3. Large volume users

Customer	Use Category	Amount Used (Gallons per Year)	Percent of Total Annual Water Delivered	Implementing Water Conservation Measures?
1. JENNIE-O TURKEY STORE	INDUSTRIAL	277,011,185	21.14%	UNKNOWN
2. FARIBAULT FOODS	INDUSTRIAL	238,857,339	18.23%	UNKNOWN
3. FARIBAULT DAIRY	INDUSTRIAL	44,429,793	3.39%	UNKNOWN
4. SHATTUCK-ST MARY SCHOOL	INSTITUTIONAL	19,714,436	1.50%	UNKNOWN
5. GENOVA MN	INDUSTRIAL	18,585,419	1.42%	UNKNOWN
6. CANNON RIVER TRAILER COURT	RESIDENTIAL	17,823,330	1.36%	UNKNOWN
7. SAGE ELECTRONICS	INDUSTRIAL	17,816,755	1.36%	UNKNOWN
8. EVERGREEN ESTATES	RESIDENTIAL	15,128,000	1.15%	UNKNOWN
9. FOUR SEASONS APARTMENTS	RESIDENTIAL	11,690,343	0.89%	UNKNOWN
10. FBLT WOOLEN MILL	INDUSTRIAL	10,998,946	0.84%	UNKNOWN

B. Treatment and Storage Capacity

Complete **Table 4** with a description of where water is treated, the year treatment facilities were constructed, water treatment capacity, the treatment methods (i.e. chemical addition, reverse osmosis, coagulation, sedimentation, etc.) and treatment types used (i.e. fluoridation, softening, chlorination, Fe/MN removal, coagulation, etc.). Also describe the annual amount and method of disposal of treatment residuals. Add rows to the table as needed.

Table 4. Water treatment capacity and treatment processes

Treatment Site ID	Year Constructed	Treatment Capacity (GPD)	Treatment Method	Treatment Type	Annual Volume of Residuals	Disposal Process for Residuals	Do You Reclaim Filter Backwash Water?
Water Works Facility	1981	7,000,000	Chemical Injection	Ammonia Chlorination Fluoridation Sodium Silicate	0	NONE*	NO
TOTAL		7,000,000			0		

*Sodium Silicate treatment method is designed to sequester iron and manganese, and reduce leaching of lead and copper.

*Chloramine (ammonia, chlorine) treatment method is designed to maintain an adequate disinfection.

*Fluoride treatment methods are in accordance with State and Federal regulations.

The City of Faribault's current water treatment supply system is water filtration only. Disposal of residual solids is not needed.

Complete **Table 5** with information about storage structures. Describe the type (i.e. elevated, ground, etc.), the storage capacity of each type of structure, the year each structure was constructed, and the primary material for each structure. Add rows to the table as needed.

Table 5. Storage capacity, as of the end of the last calendar year

Structure Name	Type of Storage Structure	Year Constructed	Primary Material	Storage Capacity (Gallons)
CBI	Elevated storage	1996	Steele	150,000
Ground Reservoir	Ground storage	1920's	Concrete	1,000,000
Grider Reservoir	Ground storage	2002	Concrete	2,000,000
Natgun Reservoir	Ground storage	2005	Concrete	2,000,000
TOTAL				5,150,000

Treatment and storage capacity versus demand

It is recommended that total storage equal or exceed the average daily demand.

Discuss the difference between current storage and treatment capacity versus the water supplier's projected average water demand over the next 10 years (see **Table 7** for projected water demand):

The City of Faribault's water distribution system has a 10-year (2006-2016) average daily demand of 3.114 million gallons per day (MGD) and an average maximum daily demand of 5.542 MGD. Although current pumping capacity of the system is 9.6 MGD, the daily treatment capacity and storage capacity are limited to 7 MGD and 5.150 MGD, respectively.

There is not a strong trend with historical annual average daily and total per capital demands. However, both generally decreased from 2005-2011, and have been on the rise since.

Modest increases to projected annual average daily demands are estimated from 2017-2040. Projected maximum daily demands are estimated to also increase and near 6.5 MGD by 2025. Additionally, projected total per capita water demand (which was extrapolated from a regression analysis of historical annual total water pumped from 2005-2016 and projected population growth), is projected to greatly increase. However, the increase in demand appears to be largely driven by the increase in water consumption for non-residential uses.

The City of Faribault's drinking water supply is continuously replenished as it is utilized, and the water distribution system itself (e.g. pipe network) has additional capacity not factored into total storage amounts. It appears that the current system would be able to meet the next 10 year projected average daily and maximum demands.

Annual projected total per capital water demands indicate an aggressive growth/use pattern. It is likely that actual per capital water demand will not follow along this path. However, based on the extended projections (beyond 2030) the City's current water supply and distribution system may have difficulty meeting projected maximum daily demands.

C. Water Sources

Complete **Table 6** by listing all types of water sources that supply water to the system, including groundwater, surface water, interconnections with other water suppliers, or others. Provide the name of each source (aquifer name, river or lake name, name of interconnecting water supplier) and the Minnesota unique well number or intake ID, as appropriate. Report the year the source was installed or established and the current capacity. Provide information about the depth of all wells. Describe the status of the source (active, inactive, emergency only, retail/wholesale interconnection) and if the source facilities have a dedicated emergency power source.

Include copies of well records and maintenance summary for each well that has occurred since your last approved plan in **Appendix 1**.

Table 6. Water sources and status

Resource Type	Aquifer Resource Name	MN Unique Well Number	Year Installed	Capacity (GPM)	Well Depth (Feet)	Status of Normal and Emergency Operations	Does this Source have a Dedicated Emergency Power Source?
Groundwater	Jordan-Galesville	00217737	1936	1,660	750	Active	Yes
Groundwater	Prairie Du Chien-Jordan	00217741	1912	1,000	420	Active	Yes
Groundwater	Prairie Du Chien-Jordan	00217746	1969	2,000	407	Active	Yes
Groundwater	Jordan	00541549	1996	1,800	403	Active	Yes
Groundwater	Jordan	00716426	2004	1,650	414	Active	Yes
Groundwater	Prairie Du Chien-Jordan	00217736	1938	2,000	450	Emergency	Yes

Limits on Emergency Interconnections

Discuss any limitations on the use of the water sources (e.g. not to be operated simultaneously, limitations due to blending, aquifer recovery issues etc.) and the use of interconnections, including capacity limits or timing constraints (i.e. only 200 gallons per minute are available from the City of Prior Lake, and it is estimated to take 6 hours to establish the emergency connection). If there are no limitations, list none.

The collective pump capacity is limited to 7,350 GPM by the City's current water appropriation permit.

With the exception of Well 2, all wells are actively utilized. Use of Well 2 is restricted to emergency operation because active use of Well 2, impacts the level of the water table utilized by Well 1. Well 2 has not been in active operation in over 20 years.

D. Future Demand Projections – *Key Metropolitan Council Benchmark*

Water Use Trends

Use the data in **Table 2** to describe trends in 1) population served; 2) total per capita water demand; 3) average daily demand; 4) maximum daily demand. Then explain the causes for upward or downward trends. For example, over the ten years has the average daily demand trended up or down? Why is this occurring?

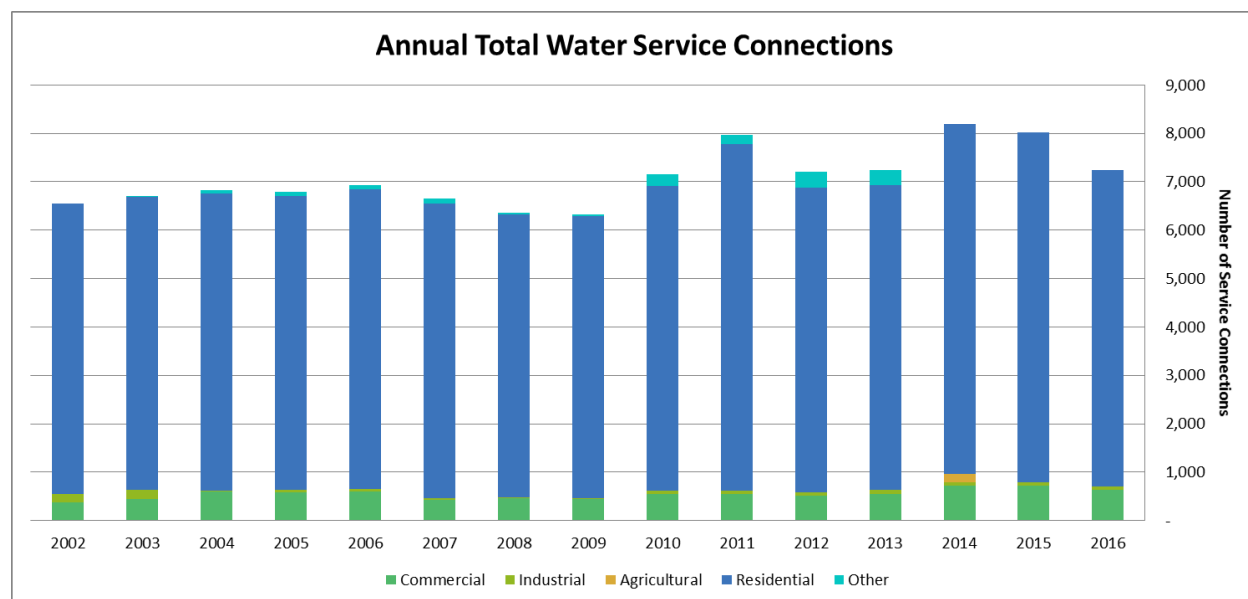
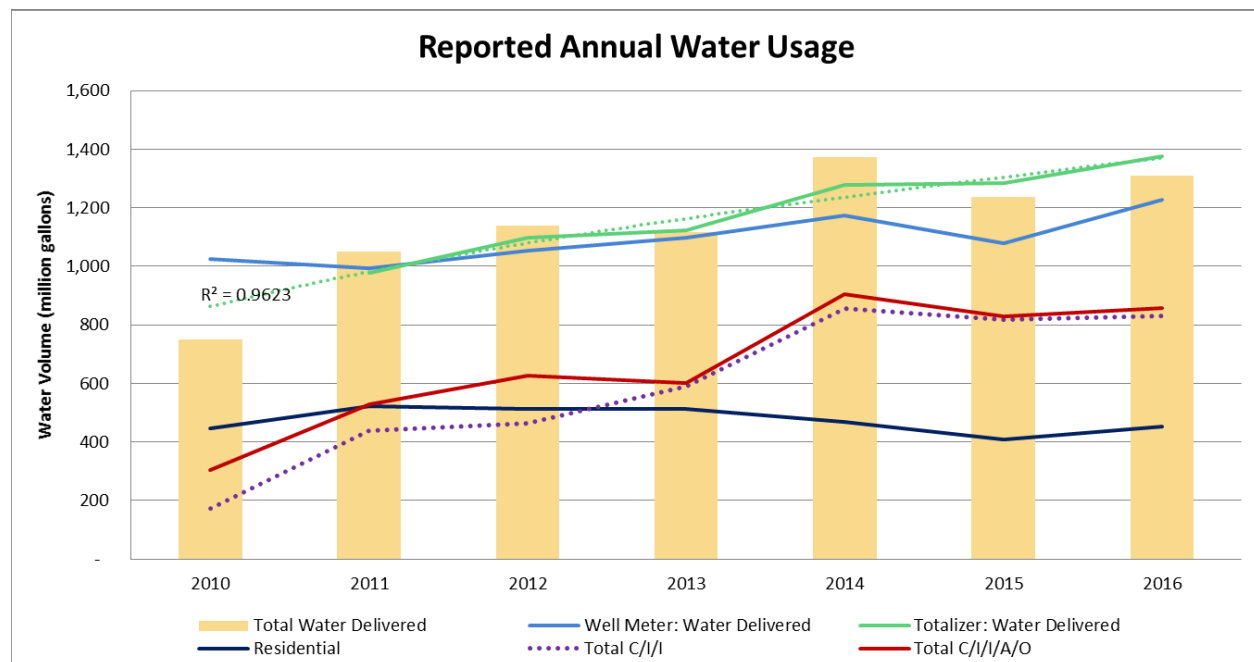
Population estimates from 2005-2016 were taken from data estimates and results published by the State Demographer office and US Census. During a 20 year time period, from 1995-2015, the average increase in the City of Faribault's population was 6%. However, the rate of growth during that same time period (in 5-year intervals), has steadily decreased – from an 11.2% population growth high from 1995-2000, to a 1.2% population growth low from 2010-2015. From 2006-2016, the City's population grew on average 0.44% each year. Recent data from the Minnesota State Demographer for Rice County, identified that the overall population of Rice County would remain fairly stable through 2025 and then observe a gradual decline through 2050.

Due to a change in water use tracking and billing software the City has limited water demand data on individual categorical water users. Analysis and trends are largely limited to a 2010-2016 (current) time period.

The City also recognizes that there have been ongoing data accuracy issues observed to begin in 2009. Data inaccuracies have been primarily attributable to inaccurate customer water meter measurements – which ultimately led to a large scale replacement of customer water meters, implementation of a meter replacement program, upgrades to the water use tracking/billing system, upgrade to an automated meter reading program, and greater scrutiny of water use data. As a result of inaccurate meter readings, customer water use was significantly under reported from 2009-2010 and since 2011, customer water use is being over reported to some extent.

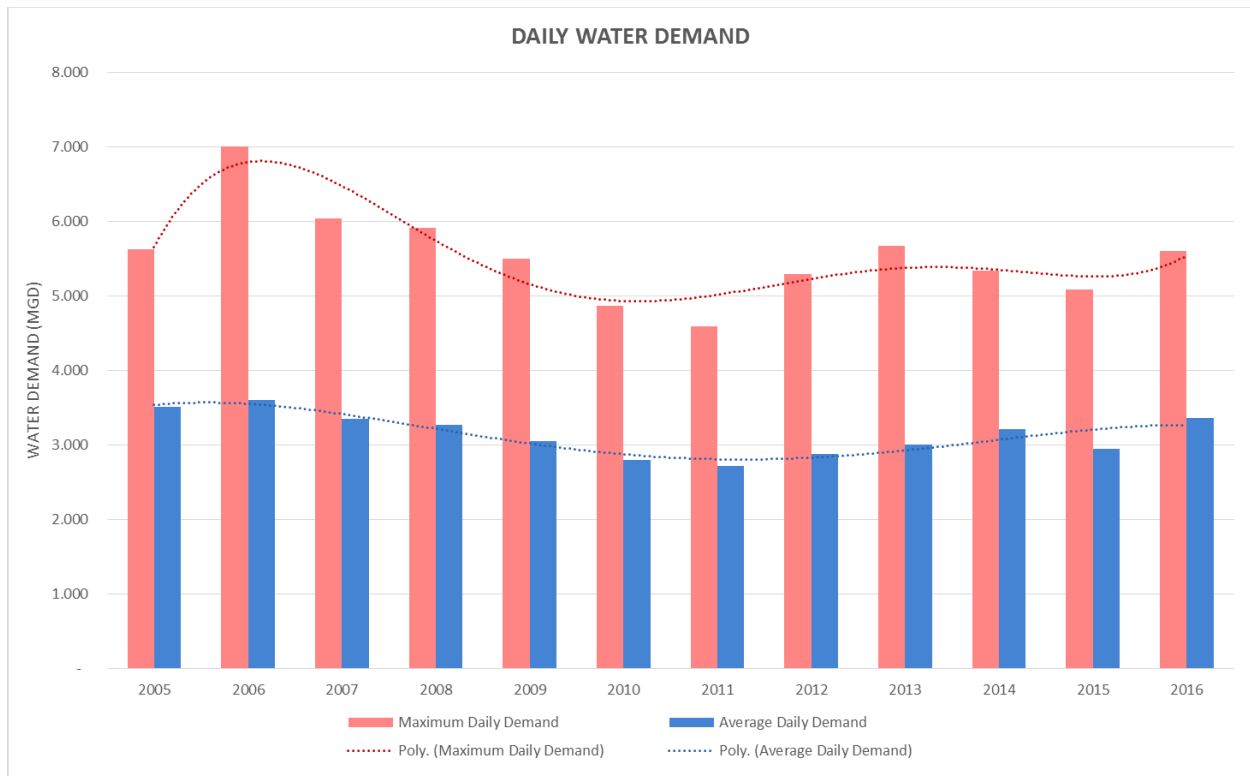
Annual residential water usage has fluctuated generally between 400-500 MG from 2010-2016, and has averaged 475 MG each year. On average 596 MG are utilized by commercial, industrial, and institutional users annually. Since 2010, reported commercial and industrial water use combined, has increased nearly 80%. This increase in demand is likely not as significant as the data indicates, as water use was under significantly under reported in 2009 and 2010 (in comparison to annual volumes of total water pumped). Residential users have by far the greatest number of service connections, however the majority of water consumed, is for non-residential uses. In 2016, two customers accounted for 40% of the annual volume of water delivered by the municipal water distribution system.

Total water volume pumped has increased by 24% since 2011. However, recent annual volumes of water pumped are fairly consistent with those annual volumes observed in the mid 2000's.



Total per capita water demand averaged 134 gallons per person per day from 2006-2016. Although there is not a strong correlation, total per capita water demand has generally decreased from 2006-2011 and is currently on the rise. Annual maximum daily water demand has fluctuated from 2005 to 2016 and was at its lowest in 2011 (4.591 MGD). Maximum daily demand has trended slightly upwards since.

The heaviest daily demands have generally been observed during the summer months (June, July, August), during periods of typical heavier outdoor water use. However, during the last two years, the maximum daily demand was observed during the month of May.



Similar to average and maximum daily demand observations, the annual volumes of total water delivered/pump and total per capita demand has generally decreased from 2005-2011 and increased from 2012-2016. It should be noted that although recent total per capita demand observations appear to be on the rise, estimates for recent years are lower than those observed 10 years ago. This overall decrease is likely attributable to advancements in water efficient technologies and the municipal implementation of water restrictions and a conservation water utility rate structure.

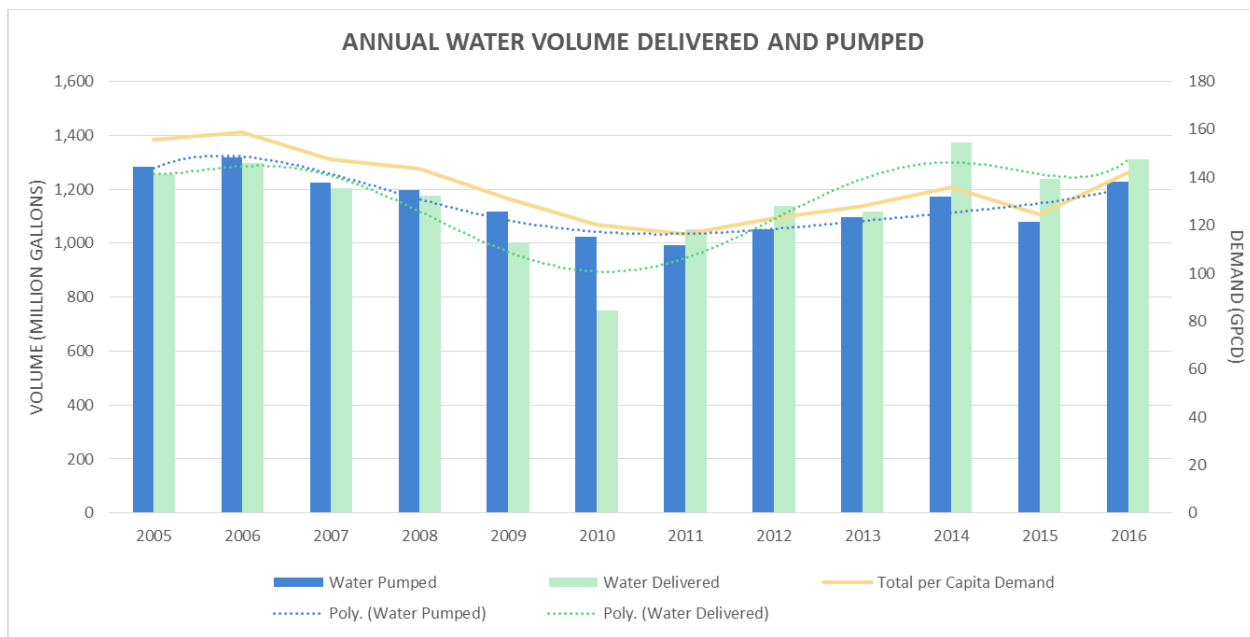


Table 7. Projected annual water demand

Year ^a	PROJECTED						
	Total Population Served	Population Served	Average Day per Capita Demand ^b (G)	Average Daily Demand (MGD)	Maximum Day to Average Day Ratio ^c	Maximum Daily Demand (MGD)	Total per Capita Water Demand (GPCD) ^d
2016	23,718	23,718	134	3.178	1.94	6.166	142
2017	23,951	23,951		3.209		6.226	179
2018	24,062	24,062		3.224		6.255	198
2019	24,173	24,173		3.239		6.284	221
2020	24,284	24,284		3.254		6.313	246
2021	24,396	24,396		3.269		6.342	273
2022	24,509	24,509		3.284		6.371	304
2023	24,622	24,622		3.299		6.401	337
2024	24,735	24,735		3.315		6.430	372
2025	24,849	24,849		3.330		6.460	410
2030	24,964	24,964		3.345		6.490	648
2040	25,079	25,079		3.361		6.519	1,332

^a 2016 values based on actual data.

^b Average day per capita demand based on a 10-year average (2006-2016).

^c Maximum day to average day ratio based on actual maximum value observed from 2001-2016

^d 2017-2040 projections are based on a quadratic regression analysis of the total annual volume of water pumped from 2005-2016.

GPCD – Gallons per Capita per Day

MGD – Million Gallons per Day

G – Gallons

Projection Method

Describe the method used to project water demand, including assumptions for population and business growth and how water conservation and efficiency programs affect projected water demand:

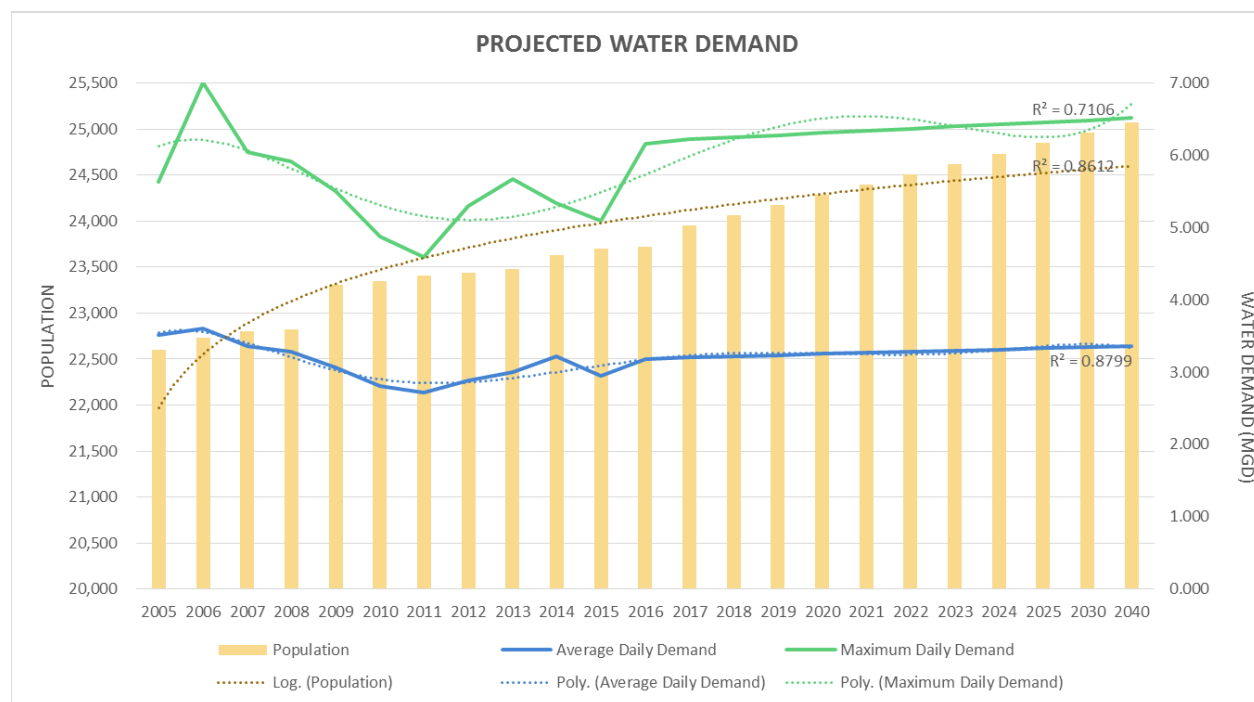
The 2003 *City of Faribault Comprehensive Plan* provided multiple population projections, based on five different growth scenarios. The historical growth rate population projection scenario most closely lined up with the actual historical City of Faribault population. This population projection method was also utilized to estimate future water demand in the City's 2016 *Water Treatment Plant Feasibility Study*. It should be noted that in the 2016 feasibility study, growth projections were estimated in 5-year intervals from 2020-2045. Population estimates provided in **Table 7** for years 2017-2024 were extrapolated using a growth projection of existing actual and estimated data.

This method of projection results in more aggressive population growth, which was recommended for estimation of future water demand within the 2016 feasibility study. However, recent data from the Minnesota State Demographer for Rice County, identified that the overall population of Rice County would likely remain fairly stable through 2025 and then observe a gradual decline through 2050.

Projected annual average daily and maximum water demand were calculated using similar methods from the 2016 feasibility study. Projected annual average daily water demand was calculated by multiplying the average annual daily demand from 2005-2016, by the projected annual total population served. To determine the projected annual maximum daily water demand, annual average daily demand

(AD) and maximum daily demand (MD) ratios were calculated from 2006-2016. The highest annual AD/MD ratio calculated (from 2006), was utilized to calculate projected maximum daily water demand (AD/MD ratio high multiplied by projected average daily water demand). These methods of extrapolation, result in fairly modest projected increases to both projected average and maximum daily demands from 2016.

There is a lack of strong correlation in the trend analysis, particularly for historical maximum daily demand. Future projections for average and maximum daily demands seem to follow a fairly conservative rise, even though an aggressive population projection method was utilized.

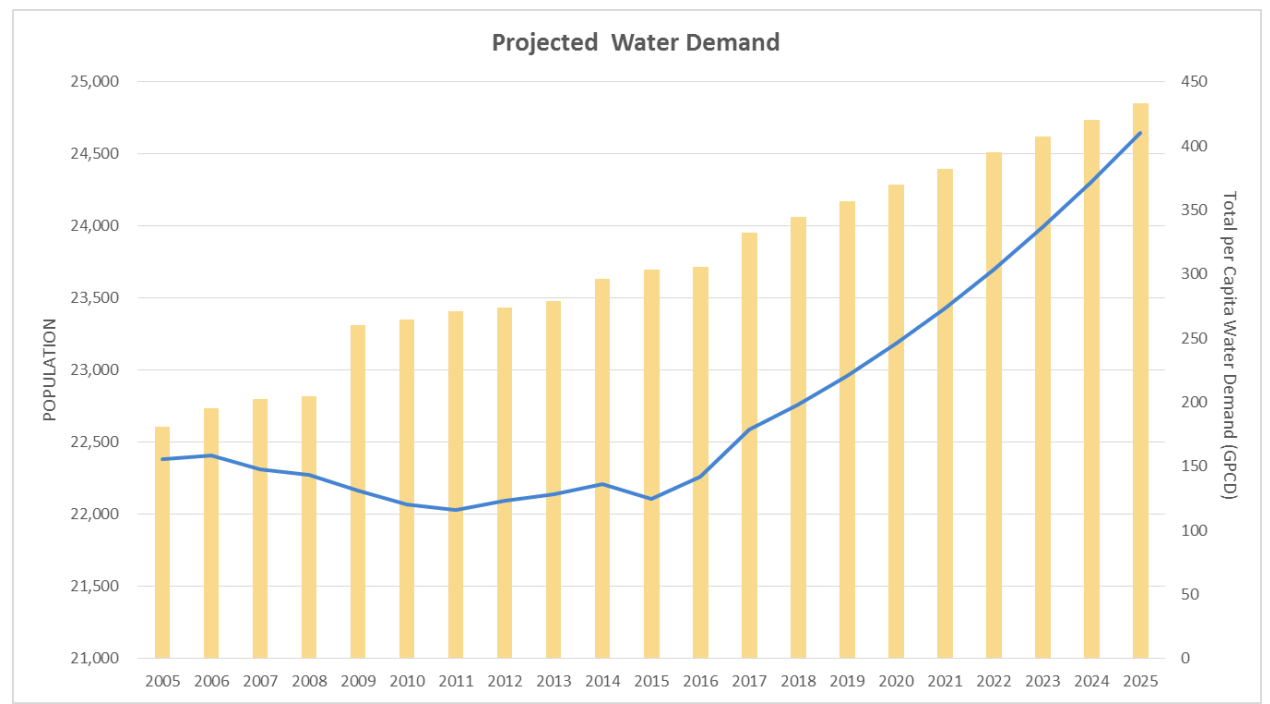


Annual estimates of projected volumes of water pumped from 2017-2025 were calculated through a quadratic regression analysis of reported annual volumes of total water pumped from 2005-2016. Total per capita water demand was determined by dividing the projected estimate of annual volume pumped, by the projected annual population.

Future projections of total per capita water demand follow a more aggressive growth pattern. Significant differences in water volume pumped from 2008-2011, and the annual increases in pumped volumes observed since 2010, have significant influence on future projections. These factors in combination with an aggressive population projection scenario – lead to high future water demand.

It is assumed that future demand will not follow this aggressive of a growth scenario. Future population estimates are anticipated to remain fairly stable (current city population growth averages 0.44%). It would be anticipated that as technology advances, water costs and infrastructure repair and replacement costs rise, and the availability of customer water conservation and efficiency rebates and incentives improve – in combination these factors would help drive reductions in water usage and total per capita water demand would likely increase at a much lower rate.

Currently, there are several hundred private water supply wells (residential and high capacity) within the City limits. As those wells go out of production and customers switch to the municipal water supply system, water demand can also be expected to increase.



E. Resource Sustainability

Monitoring – Key DNR Benchmark

Complete **Table 8** by inserting information about source water quality and quantity monitoring efforts. The list should include all production wells, observation wells, and source water intakes or reservoirs. Groundwater level data for DNR’s statewide network of observation wells are available online through the [DNR’s Cooperative Groundwater Monitoring \(CGM\) webpage](#).

Table 8. Information about source water quality and quantity monitoring

MN Unique Well # or Surface Water ID	Type of Monitoring Point	Monitoring Program	Frequency of Monitoring	Monitoring Method
Well #1 MN Well ID: 00217737	☒ Production well	☒ Routine MDH sampling	☒ Daily ☒ Monthly	☒ SCADA
Well #2 MN Well ID: 00217736	☒ Observation well	NOT MONITORED	NOT MONITORED	NOT MONITORED
Well #3 MN Well ID: 00217741	☒ Production well	☒ Routine MDH sampling	☒ Daily ☒ Monthly	☒ SCADA
Well #5 MN Well ID: 00217746	☒ Production well	☒ Routine MDH sampling	☒ Daily ☒ Monthly	☒ SCADA ☒ Steel tape

MN Unique Well # or Surface Water ID	Type of Monitoring Point	Monitoring Program	Frequency of Monitoring	Monitoring Method
Well #6 MN Well ID: 00541549	☒ Production well	☒ Routine MDH sampling	☒ Daily ☒ Monthly	☒ SCADA ☒ Steel tape
Well #7 MN Well ID: 00716426	☒ Production well	☒ Routine MDH sampling	☒ Daily ☒ Monthly	☒ SCADA ☒ Steel tape

Water Level Data

A water level monitoring plan that includes monitoring locations and a schedule for water level readings must be submitted as **Appendix 2**.

Complete **Table 9** to summarize water level data for each well being monitored. Provide the name of the aquifer and a brief description of how much water levels vary over the season (the difference between the highest and lowest water levels measured during the year) and the long-term trends for each well.

Groundwater hydrographs illustrate the historical record of aquifer water levels measured within a well and can indicate water level trends over time. For each well in your system, provide a hydrograph for the life of the well, or for as many years as water levels have been measured. Include the hydrographs in **Appendix 3**.

Table 9. Water level data

Unique Well Number or Well ID	Aquifer Name	Seasonal Variation (Feet) ^{a,b}	Long-Term Trend in Water Level Data	Water Level Measured During Well/Pumping Maintenance (Date: Feet) ^a
Well #1 MN Well ID: 00217737	Jordan-Galesville	UNKNOWN	UNKNOWN	UNKNOWN
Well #2 MN Well ID: 00217736	Prairie Du Chien-Jordan	UNKNOWN	UNKNOWN	UNKNOWN
Well #3 MN Well ID: 00217741	Prairie Du Chien-Jordan	UNKNOWN	UNKNOWN	UNKNOWN
Well #5 MN Well ID: 00217746	Prairie Du Chien-Jordan	STATIC: 5-20 PUMPING: 50-65 RANGE OF LEVELS FROM STATIC TO PUMPING: 5-65	☐ Falling ☒ Stable ☐ Rising	02/25/14: 10.3 03/21/14: 11.0 04/02/14: 12.9 02/10/16: 14.8
Well #6 MN Well ID: 00541549	Jordan	STATIC: 5-40 PUMPING: 80-125 RANGE OF LEVELS FROM STATIC TO PUMPING: 5-125.	☐ Falling ☒ Stable ☐ Rising	04/15/07: 16.75 09/23/13: 34.2 03/25/15: 17.0 04/02/15: 11.1 05/28/15: 14.8 02/09/16: 32.5 02/10/16: 32.9

Unique Well Number or Well ID	Aquifer Name	Seasonal Variation (Feet) ^{a,b}	Long-Term Trend in Water Level Data	Water Level Measured During Well/Pumping Maintenance (Date: Feet) ^a
Well #7 MN Well ID: 00716426	Jordan	STATIC: 5-35 PUMPING: 80-145 RANGE OF LEVELS FROM STATIC TO PUMPING: 5-145	☐ Falling ☒ Stable ☐ Rising	12/10/15: 8.4 02/01/16: 11.1 02/22/16: 8.1

^a Water level measurements not adjusted for offset.

^b In recent years, water level draw down during periods of pumping is decreasing in all three monitored wells.

Potential Water Supply Issues & Natural Resource Impacts – Key DNR & Metropolitan Council Benchmark

Complete **Table 10** by listing the types of natural resources that are or could potentially be impacted by permitted water withdrawals in the future. For identified resources, provide the name of specific resources that may be impacted. Identify what the greatest risks to the resource are and how the risks are being assessed. Identify any resource protection thresholds – formal or informal – that have been established to identify when actions should be taken to mitigate impacts. Provide information about the potential mitigation actions that may be taken, if a resource protection threshold is crossed.

Table 10. Natural resource impacts (*List specific resources in **Appendix 12**)

Resource Type	Resource Name	Risk	Risk Assessed Through *	Describe Resource Protection Threshold or Goal *	Mitigation Measures or Management Plan	Describe How Thresholds or Goals are Monitored
River	Cannon River (including the Cannon River Reservoir)	☒ Degrading water quality trends	☒ Monitoring (by others) ☒ WRAPS ☒ Proximity within City DWSMA	☒ Additional data is needed to establish ☒ No data available	☒ Not applicable	☒ Regular check-in with these partners: MN DNR, MPCA, MDH, MDA, CRWP, Rice County ☒ Cannon River 1W1P/ GRAPS, DNR Thresholds Study, etc.
River	Straight River	☒ Degrading water quality trends	☒ Monitoring (by others) ☒ WRAPS ☒ Proximity within City DWSMA	☒ Additional data is needed to establish ☒ No data available	☒ Not applicable	☒ Regular check-in with these partners: MN DNR, MPCA, MDH, MDA, CRWP, Rice County ☒ Cannon River 1W1P/ GRAPS, DNR Thresholds Study, etc.

Resource Type	Resource Name	Risk	Risk Assessed Through *	Describe Resource Protection Threshold or Goal *	Mitigation Measures or Management Plan	Describe How Thresholds or Goals are Monitored
Stream	Crocker's Creek	☒ Degrading water quality trends	☒ Monitoring (by others) ☒ WRAPS ☒ Proximity within City DWSMA	☒ Additional data is needed to establish ☒ No data available	☒ Not applicable	☒ Regular check-in with these partners: MN DNR, MPCA, MDH, MDA, CRWP, Rice County ☒ Cannon River 1W1P/ GRAPS, DNR Thresholds Study, etc.
Lake	Jensen Slough (Natural Environment Lake)	☒ Water level decline	☒ Other: Proximity within City DWSMA	☒ Additional data is needed to establish ☒ No data available	☒ Increase conservation	☒ Regular check-in with these partners: MN DNR, MPCA, MDH, MDA, CRWP, Rice County ☒ Cannon River 1W1P/ GRAPS, DNR Thresholds Study, etc.
Wetland	Public Water Wetland (Unnamed 66002000); Multiple other wetland resources throughout the City	☒ Water level decline	☒ Proximity within City DWSMA	☒ Additional data is needed to establish ☒ No data available	☒ Increase conservation	☒ Regular check-in with these partners: MN DNR, MPCA, MDH, MDA, CRWP, Rice County, Rice County SWCD ☒ Cannon River 1W1P/ GRAPS, DNR Thresholds Study, etc.
Aquifer	Jordan-Galesville, Prairie Du Chien-Jordan, Jordan	☒ Flow/water level decline ☒ Degrading water quality trends	☒ Monitoring (by others) ☒ Proximity (obwell < 5 miles)	☒ Additional data is needed to establish	☒ Change groundwater pumping ☒ Increase conservation	☒ Newly collected data will be analyzed ☒ Regular check-in with these partners: MN DNR, MPCA, MDH, MDA, CRWP, Rice County ☒ Cannon River 1W1P/ GRAPS, DNR Thresholds Study, etc.

NOTE: There are no known active Karst or calcareous fen areas within the City of Faribault.

Natural and water resources that could be adversely impacted by municipal groundwater pumping activities were determined through a review of the City's Wellhead Protection (WHP) and Drinking Water Supply Management Area (DWSMA) and also included those major resources within the City of Faribault, historically monitored by local/State agencies and featured within local, regional, and State water and natural resources planning efforts.

Very limited resources are currently available which identify specific natural resources impacts as a result of groundwater pumping or threshold limits currently assigned to the above listed natural resources. The City largely relies on those State agencies providing regulatory oversight on the various City municipal operations: to provide supplemental monitoring, analysis and modeling exercises; notify the City of potential resource impacts and threshold limits; and establish and assign natural resource limits. When provided the opportunity, the City is involved local, regional, and State resource planning efforts.

As a result and for the purposes of this plan, the City identified those significant natural resources utilized by or within the City limits; the possible impacts each resource was at risk for, and potential impact mitigation strategies. A list and summary of reference resources reviewed for the risk assessment exercise may be found in **Appendix 12**. An expanded summary of natural resource risk assessment and mitigation strategies is provided below.

CANNON RIVER, STRAIGHT RIVER, CROCKER'S CREEK. The Cannon River is a classified *Outstanding Resource Value Water* at the City's northeastern limits. The Shattuck Saint Mary campus, along the Straight River corridor, is home to the endangered Dwarf Trout Lily wildflower.

Segments of these water resources have observed a decline in water quality (for some parameters) and have multiple water quality impairments. The Cannon and Straight Rivers are major water resources that are monitored by State and Federal agencies and often featured within local, regional, and State planning efforts. The length of the river and stream corridors for all three resources within the City, lie within the Drinking Water Supply Management Area (DWSMA) high vulnerability to contamination zone.

It is not known if, or how, municipal groundwater use impacts these resources or what threshold limits may be – at this time, it is unlikely that any exist. However, degrading surface water quality may potentially impact the quality of groundwater resources (and vice versa) through the groundwater/surface water interactions along these stream and river corridors. Mitigation strategies could be developed once more data and information is available. The City will continue to work with State agencies as issues and strategies emerge.

JENSEN SLOUGH, WETLANDS. A classified natural environment lake (Jensen Slough) and public water wetlands reside within the City limits. Resources are generally within the City's DWSMA low vulnerability to contamination zone. No information is known about the existing quality of these resources and the City is not aware of any current or proposed efforts to monitor water quality or water levels. Although shallow aquifers and surface runoff most likely feed these resources, and quality and water levels of these resources would most likely be impacted by land use changes and development; municipal groundwater use could potentially impact resource water levels. The City could periodically conduct a high level review of available aerial imagery to determine how resource water levels change over time and promote water use efficiency and conservation strategies.

GROUNDWATER AQUIFERS. The City's drinking water is supplied by multiple groundwater aquifers and declining water availability or degrading water quality would have, by far, the most significant impact. Available reports on groundwater quality for southeastern Minnesota in general, indicate that

groundwater quality issues are emerging for a variety of contaminants. It should be noted that the quality of the Faribault's drinking water supply is currently meeting standards.

Groundwater availability trends or reports, are not as widely available. However, available data on the Prairie du Chien-Jordan aquifer in the 11-county Twin Cities metro area indicate that groundwater levels are generally declining. Additionally, a DNR observation well (Well Number 66015) on the northeast side of the City in the Oak Grove Cemetery, is indicating a groundwater elevation decline – approximately 10 feet of decline since the late 1990's.

Multiple State agencies are cooperatively monitoring and assessing groundwater quality and quantity. The City currently regularly submits water supply well water level monitoring and water quality sampling results as required, and also relies on State agencies assess and communicate source water health and availability concerns and issues. If potential source water availability or quality issues arise, the City could potentially modify groundwater pumping practices or more heavily promote or regulate water usage and efficiency and conservation mitigation strategies.

Wellhead Protection (WHP) and Source Water Protection (SWP) Plans

Complete **Table 11** to provide status information about WHP and SWP plans.

The emergency procedures in this plan are intended to comply with the contingency plan provisions required in the Minnesota Department of Health's (MDH) Wellhead Protection (WHP) Plan and Surface Water Protection (SWP) Plan.

Table 11. Status of Wellhead Protection and Source Water Protection Plans

Plan Type	Status	Date Adopted	Date for Update
WHP	☒ Completed	July 13, 2010	2020
SWP	☒ Not Applicable		

WHP – Wellhead Protection Plan **SWP** – Source Water Protection Plan

F. Capital Improvement Plan (CIP)

Please note that any wells that received approval under a ten-year permit, but that were not built, are now expired and must submit a water appropriations permit.

Adequacy of Water Supply System

Complete **Table 12** with information about the adequacy of wells and/or intakes, storage facilities, treatment facilities, and distribution systems to sustain current and projected demands. List planned capital improvements for any system components, in chronological order.

The assessment can be the general status by category; it is not necessary to identify every single well, storage facility, treatment facility, lift station, and mile of pipe.

Please attach your latest Capital Improvement Plan as **Appendix 4**.

Table 12. Adequacy of Water Supply System

System Component	Planned action	Timeframe (YYYY)	Notes
Wells/Intakes	☐ No action planned - adequate ☒ Repair/replacement ☒ Expansion/addition	2018-2028	- Each well is tested annually. Maintenance/repairs are completed as necessary, based on testing results. - Motor/shaft/pipe/pump components for each well are pulled, inspected, and repaired/replaced (as necessary) on an alternating, rotational schedule. Each well is completed every 5 years. - Construction of an additional water supply well is anticipated within the next 10 years, however, the timeframe is yet to be determined.
Water Storage Facilities	☐ No action planned - adequate ☒ Repair/replacement ☒ Expansion/addition	2018-2028	- Each storage facility is inspected on an alternating, rotational schedule. Each facility is completed every 2 years. Maintenance/repair activities are completed as necessary, based on the results of the inspection. - Liner repair/replacement is anticipated in the Griddier Reservoir in 2019/2020. - Construction of an additional water storage facility is anticipated within the next 10 years, however, the timeframe is yet to be determined.
Water Treatment Facilities	☒ No action planned - adequate ☐ Repair/replacement ☐ Expansion/addition		
Distribution Systems (Pipes, valves, etc.)	☐ No action planned - adequate ☒ Repair/replacement ☐ Expansion/addition	2018-2022 2018-2028	2018, 2020 – Watermain replacement 2019, 2022 –Watermain looping improvements 2021 – Improve system distribution and pressure, eliminate long ‘dead-end’ watermain 2018-2028: The City completes street reconstruction projects annually. Any underlying municipal utilities in these areas are also replaced.
Pressure Zones	☐ No action planned - adequate ☐ Repair/replacement ☒ Expansion/addition	2020	2020 – Expansion of high pressure zone
Other:	☐ No action planned - adequate ☐ Repair/replacement ☐ Expansion/addition		

NOTE: The City of Faribault plans capital improvement projects five years in advance.

Proposed Future Water Sources

Complete **Table 13** to identify new water source installation planned over the next ten years. Add rows to the table as needed.

Table 13. Proposed future installations/sources

Source	Installation Location (Approximate)	Resource Name	Proposed Pumping Capacity (GPM)	Planned Installation Year	Planned Partnerships
Groundwater*	North Side of City	Prairie du Chien-Jordan	To Be Determined	To Be Determined	MN DNR, MDH
Surface Water	NONE				
Interconnection to another supplier	NONE				

*Construction of another municipal water supply well is anticipated within the next 10 years. However, specific details are unknown at this time.

Water Source Alternatives - Key Metropolitan Council Benchmark

Do you anticipate the need for alternative water sources in the next 10 years? Yes ☐ No ☒

For metro communities, will you need alternative water sources by the year 2040? Yes ☐ No ☐ NA ☒

If you answered yes for either question, then complete Table 14. If no, insert NA.

Complete **Table 14** by checking the box next to alternative approaches that your community is considering, including approximate locations (if known), the estimated amount of future demand that could be met through the approach, the estimated timeframe to implement the approach, potential partnerships, and the major benefits and challenges of the approach. Add rows to the table as needed.

Table 14. Alternative water sources

Alternative Source Considered	Source and/or Installation Location (Approximate)	Estimated Amount of Future Demand (%)	Timeframe to Implement (YYYY)	Potential Partners	Benefits	Challenges
☐ Groundwater	NA					
☐ Surface Water	NA					
☐ Reclaimed stormwater	NA					
☐ Reclaimed wastewater	NA					
☐ Interconnection to another supplier	NA					

PART 2. EMERGENCY PREPAREDNESS PROCEDURES

The emergency preparedness procedures outlined in this plan are intended to comply with the contingency plan provisions required by MDH in the WHP and SWP. Water emergencies can occur as a result of vandalism, sabotage, accidental contamination, mechanical problems, power failings, drought, flooding, and other natural disasters. The purpose of emergency planning is to develop emergency

response procedures and to identify actions needed to improve emergency preparedness. In the case of a municipality, these procedures should be in support of, and part of, an all-hazard emergency operations plan. Municipalities that already have written procedures dealing with water emergencies should review the following information and update existing procedures to address these water supply protection measures.

A. Emergency Response Plan

Section 1433(b) of the Safe Drinking Water Act, (Public Law 107-188, Title IV- Drinking Water Security and Safety) requires community water suppliers serving over 3,300 people to prepare an Emergency Response Plan. MDH recommends that Emergency Response Plans are updated annually.

Do you have an Emergency Response Plan? Yes ☒ No ☐

Have you updated the Emergency Response Plan in the last year? Yes ☐ No ☒

When did you last update your Emergency Response Plan? 2017

Complete **Table 15** by inserting the noted information regarding your completed Emergency Response Plan.

Table 15. Emergency Response Plan contact information

Emergency Response Plan Role	Contact Person	Contact Phone Number	Contact Email
Emergency Response Lead	Mike Glende	507-838-5559	mglende@ci.faribault.mn.us
Alternate Emergency Response Lead	Jim Valek	507-491-0216	jvalek@ci.faribault.mn.us

B. Operational Contingency Plan

All utilities should have a written operational contingency plan that describes measures to be taken for water supply mainline breaks and other common system failures as well as routine maintenance.

Do you have a written operational contingency plan? Yes ☒ No ☐

At a minimum, a water supplier should prepare and maintain an emergency contact list of contractors and suppliers.

C. Emergency Response Procedures

Water suppliers must meet the requirements of MN Rules 4720.5280. Accordingly, the Minnesota Department of Natural Resources (DNR) requires public water suppliers serving more than 1,000 people to submit Emergency and Conservation Plans. Water emergency and conservation plans that have been approved by the DNR, under provisions of Minnesota Statute 186 and Minnesota Rules, part 6115.0770, will be considered equivalent to an approved WHP contingency plan.

Emergency Telephone List

Prepare and attach a list of emergency contacts, including the MN Duty Officer (1-800-422-0798), as

Appendix 5. An [Emergency Contact List template](#) is available at the [MnDNR Water Supply Plans webpage](#).

The list should include key utility and community personnel, contacts in adjacent water suppliers, and appropriate local, state and federal emergency contacts. Please be sure to verify and update the contacts on the emergency telephone list and date it. Thereafter, update on a regular basis (once a year is recommended). In the case of a municipality, this information should be contained in a notification and warning standard operating procedure maintained by the Emergency Manager for that community. Responsibilities and services for each contact should be defined.

Current Water Sources and Service Area

Quick access to concise and detailed information on water sources, water treatment, and the distribution system may be needed in an emergency. System operation and maintenance records should be maintained in secured central and back-up locations so that the records are accessible for emergency purposes. A detailed map of the system showing the treatment plants, water sources, storage facilities, supply lines, interconnections, and other information that would be useful in an emergency should also be readily available. It is critical that public water supplier representatives and emergency response personnel communicate about the response procedures and be able to easily obtain this kind of information both in electronic and hard copy formats (in case of a power outage).

Do records and maps exist? Yes ☒ No ☐

Can staff access records and maps from a central secured location in the event of an emergency?
Yes ☒ No ☐

Does the appropriate staff know where the materials are located? Yes ☒ No ☐

Procedure for Augmenting Water Supplies

Complete **Tables 16 – 17** by listing all available sources of water that can be used to augment or replace existing sources in an emergency. Add rows to the tables as needed.

In the case of a municipality, this information should be contained in a notification and warning standard operating procedure maintained by the warning point for that community. Municipalities are encouraged to execute cooperative agreements for potential emergency water services and copies should be included in **Appendix 6**. Outstate Communities may consider using nearby high capacity wells (industry, golf course) as emergency water sources.

WSP should include information on any physical or chemical problems that may limit interconnections to other sources of water. Approvals from the MDH are required for interconnections or the reuse of water.

Table 16. Interconnections with other water supply systems to supply water in an emergency

Other Water Supply System Owner	Capacity (GPM & MGD)	Note Any Limitations On Use	List of Services, Equipment, Supplies Available to Respond
Minnesota Correction Facility	1,700 GPM 2,448,000 MGD	Water Supply Limited to District One Hospital Only	Water Supply
City of Northfield			Equipment, Supplies, Personnel

Other Water Supply System Owner	Capacity (GPM & MGD)	Note Any Limitations On Use	List of Services, Equipment, Supplies Available to Respond
City of Owatonna			Equipment, Supplies, Personnel

GPM – Gallons per minute MGD – million gallons per day

Table 17. Utilizing surface water as an alternative source

Surface Water Source Name	Capacity (GPM)	Capacity (MGD)	Treatment Needs	Note Any Limitations On Use
Insert name of surface water source here				

If not covered above, describe additional emergency measures for providing water (obtaining bottled water, or steps to obtain National Guard services, etc.)

If the City of Faribault is unable to meet water supply demands through prioritization and allocation during emergency situations, and/or unable to supplement water supply demand through mutual aid agreements/partnerships with nearby public water suppliers, the City of Faribault Emergency Management team would take steps to contact the Rice County Emergency Management team and State Agencies to seek support and National Guard Services.

Allocation and Demand Reduction Procedures

Complete **Table 18** by adding information about how decisions will be made to allocate water and reduce demand during an emergency. Provide information for each customer category, including its priority ranking, average day demand, and demand reduction potential for each customer category. Modify the customer categories as needed, and add additional lines if necessary.

Water use categories should be prioritized in a way that is consistent with Minnesota Statutes 103G.261 (#1 is highest priority) as follows:

1. Water use for human needs such as cooking, cleaning, drinking, washing and waste disposal; use for on-farm livestock watering; and use for power production that meets contingency requirements.
2. Water use involving consumption of less than 10,000 gallons per day (usually from private wells or surface water intakes)
3. Water use for agricultural irrigation and processing of agricultural products involving consumption of more than 10,000 gallons per day (usually from private high-capacity wells or surface water intakes)
4. Water use for power production above the use provided for in the contingency plan.
5. All other water use involving consumption of more than 10,000 gallons per day.
6. Nonessential uses – car washes, golf courses, etc.

Water used for human needs at hospitals, nursing homes and similar types of facilities should be designated as a high priority to be maintained in an emergency. Lower priority uses will need to address

water used for human needs at other types of facilities such as hotels, office buildings, and manufacturing plants. The volume of water and other types of water uses at these facilities must be carefully considered. After reviewing the data, common sense should dictate local allocation priorities to protect domestic requirements over certain types of economic needs. Water use for lawn sprinkling, vehicle washing, golf courses, and recreation are legislatively considered non-essential.

Table 18. Water use priorities

Customer Category	Allocation Priority	Average Daily Demand* (GPD)	Short-Term Emergency Demand Reduction Potential* (GPD)
Residential	1	1,099,395	1,099,395
Institutional	2	90,542	90,542
Commercial	3	426,035	426,035
Industrial	4	1,692,007	1,692,007
Irrigation	5	67,801	0
Wholesale	NA		
Non-Essential	6	67,768	0
TOTAL		3,443,548	3,307,979

*Represents data from 2015 and 2016.

GPD – Gallons per Day

Tip: Calculating Emergency Demand Reduction Potential

The emergency demand reduction potential for all uses will typically equal the difference between maximum use (summer demand) and base use (winter demand). In extreme emergency situations, lower priority water uses must be restricted or eliminated to protect priority domestic water requirements. Emergency demand reduction potential should be based on average day demands for customer categories within each priority class. Use the tables in Part 3 on water conservation to help you determine strategies.

Complete **Table 19** by selecting the triggers and actions during water supply disruption conditions.

Table 19. Emergency demand reduction conditions, triggers and actions (Select all that may apply and describe)

Emergency Triggers	Short-Term Actions	Long-Term Actions
☒ Contamination ☒ Loss of production ☒ Infrastructure failure ☒ Executive order by Governor ☒ Other: Natural Disasters (i.e. flooding)	☒ Supply augmentation through other public water suppliers/high capacity wells. ☒ Adopt (if not already) and enforce a critical water deficiency ordinance to penalize lawn watering, vehicle washing, golf course and park irrigation & other nonessential uses. ☐ Water allocation through____ ☒ Meet with large water users to discuss their contingency plan.	☒ Supply augmentation through other public water suppliers/high capacity wells. ☒ Adopt (if not already) and enforce a critical water deficiency ordinance to penalize lawn watering, vehicle washing, golf course and park irrigation & other nonessential uses. ☐ Water allocation through____ ☒ Meet with large water users to discuss their contingency plan.

Notification Procedures

Complete **Table 20** by selecting trigger for informing customers regarding conservation requests, water use restrictions, and suspensions; notification frequencies; and partners that may assist in the notification process.

Table 20. Plan to inform customers regarding conservation requests, water use restrictions, and suspensions

Notification Trigger(s)	Methods (select all that apply)	Update Frequency	Partners
☒ Short-term demand reduction declared (< 1 year)	☒ Website ☐ Email list serve ☒ Social media (e.g. Twitter, Facebook) ☒ Direct customer mailing ☒ Press release (TV, radio, newspaper) ☒ Meeting with large water users (> 10% of total city use) ☒ Other: Everbridge	☒ Daily ☐ Weekly ☐ Monthly ☐ Annually	State Agencies, Rice County, Media (see emergency contact list Appendix 5).
☒ Long-term Ongoing demand reduction declared	☒ Website ☐ Email list serve ☒ Social media (e.g. Twitter, Facebook) ☒ Direct customer mailing ☒ Press release (TV, radio, newspaper) ☒ Meeting with large water users (> 10% of total city use) ☒ Other: Everbridge	☐ Daily ☒ Weekly ☐ Monthly ☐ Annually	State Agencies, Rice County, Media (see emergency contact list Appendix 5).
☒ Governor's critical water deficiency declared	☒ Website ☐ Email list serve ☒ Social media (e.g. Twitter, Facebook) ☐ Direct customer mailing ☒ Press release (TV, radio, newspaper) ☒ Meeting with large water users (> 10% of total city use) ☒ Other: Everbridge	☐ Daily ☒ Weekly ☐ Monthly ☐ Annually	Governor's Office, State Agencies, Rice County, Media (see emergency contact list Appendix 5).

Enforcement

Prior to a water emergency, municipal water suppliers must adopt regulations that restrict water use and outline the enforcement response plan. The enforcement response plan must outline how conditions will be monitored to know when enforcement actions are triggered, what enforcement tools will be used, who will be responsible for enforcement, and what timelines for corrective actions will be expected.

Affected operations, communications, and enforcement staff must then be trained to rapidly implement those provisions during emergency conditions.

Important Note:

Disregard of critical water deficiency orders, even though total appropriation remains less than permitted, is adequate grounds for immediate modification of a public water supply authority's water use permit (2013 MN Statutes 103G.291)

Does the city have a critical water deficiency restriction/official control in place that includes provisions to restrict water use and enforce the restrictions? (This restriction may be an ordinance, rule, regulation, policy under a council directive, or other official control) Yes ☒ No ☐

If yes, attach the official control document to this WSP as **Appendix 7**.

If no, the municipality must adopt such an official control within 6 months of submitting this WSP and submit it to the DNR as an amendment to this WSP.

Irrespective of whether a critical water deficiency control is in place, does the public water supply utility, city manager, mayor, or emergency manager have standing authority to implement water restrictions? Yes ☒ No ☐

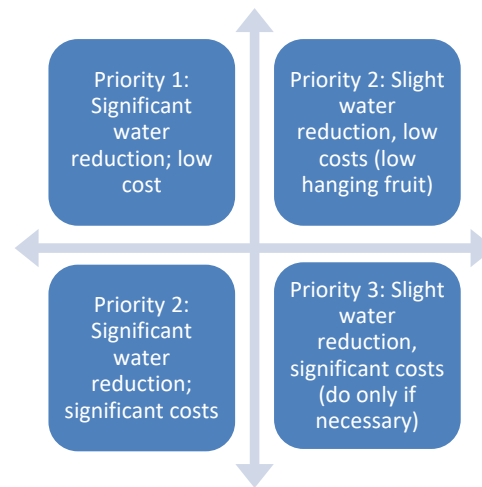
If yes, cite the regulatory authority reference: [City of Faribault Municipal Code Sec. 28-21\(c\)](#).

If no, who has authority to implement water use restrictions in an emergency?

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PART 3. WATER CONSERVATION PLAN

Minnesotans have historically benefited from the state's abundant water supplies, reducing the need for conservation. There are however, limits to the available supplies of water and increasing threats to the quality of our drinking water. Causes of water supply limitation may include: population increases, economic trends, uneven statewide availability of groundwater, climatic changes, and degraded water quality. Examples of threats to drinking water quality include: the presence of contaminant plumes from past land use activities, exceedances of water quality standards from natural and human sources, contaminants of emerging concern, and increasing pollutant trends from nonpoint sources.



There are many incentives for conserving water; conservation:

- reduces the potential for pumping-induced transfer of contaminants into the deeper aquifers, which can add treatment costs
- reduces the need for capital projects to expand system capacity
- reduces the likelihood of water use conflicts, like well interference, aquatic habitat loss, and declining lake levels
- conserves energy, because less energy is needed to extract, treat and distribute water (and less energy production also conserves water since water is used to produce energy)
- maintains water supplies that can then be available during times of drought

It is therefore imperative that water suppliers implement water conservation plans. The first step in water conservation is identifying opportunities for behavioral or engineering changes that could be made to reduce water use by conducting a thorough analysis of:

- Water use by customer
- Extraction, treatment, distribution and irrigation system efficiencies
- Industrial processing system efficiencies
- Regulatory and barriers to conservation
- Cultural barriers to conservation
- Water reuse opportunities

Once accurate data is compiled, water suppliers can set achievable goals for reducing water use. A successful water conservation plan follows a logical sequence of events. The plan should address both conservation on the supply side (leak detection and repairs, metering), as well as on the demand side (reductions in usage). Implementation should be conducted in phases, starting with the most obvious and lowest-cost options. In some cases, one of the early steps will be reviewing regulatory constraints to water conservation, such as lawn irrigation requirements. Outside funding and grants may be available for implementation of projects. Engage water system operators and maintenance staff and customers in brainstorming opportunities to reduce water use. Ask the question: “How can I help save water?”

Progress since 2006

Is this your community's first Water Supply Plan? Yes ☐ No ☒ *However, the previously submitted plan did not receive State approval.*

If yes, describe conservation practices that you are already implementing, such as: pricing, system improvements, education, regulation, appliance retrofitting, enforcement, etc.

If no, complete **Table 21** to summarize conservation actions taken since the adoption of the 2006 water supply plan.

Table 21. Implementation of previous ten-year Conservation Plan

2006 Plan Commitments	Action Taken?
Change water rates structure to provide conservation pricing	☒ Yes ☐ No
Water supply system improvements (e.g. leak repairs, valve replacements, etc.)	☒ Yes ☐ No
Educational efforts	☒ Yes ☐ No
New water conservation ordinances	☒ Yes ☐ No
Rebate or retrofitting Program (e.g. for toilet, faucets, appliances, showerheads, dish washers, washing machines, irrigation systems, rain barrels, water softeners, etc.	☐ Yes ☒ No
Enforcement	☒ Yes ☐ No
Describe other	☐ Yes ☐ No

What are the results you have seen from the actions in Table 21 and how were results measured?

The City has retained copies of various water conservation educational materials distributed. The City will develop and implement a more structured water conservation and efficiency educational program moving forward. As part of that educational program, the City will improve tracking mechanisms to better determine the quantity and effectiveness of educational information distributed and educational program activities implemented.

The City additionally tracks water restriction enforcement actions and requests for variances, and will make improvements to better train staff and more effectively enforce and track violations to water restrictions ordinance. From 2006 to 2016, a total of 57 lawn watering violation notices were issued and 95 water restriction variance requests were received and approved.

Gauging the effectiveness of previously implemented water conservation programs, through customer and water use data, has been difficult due to the previously discussed inaccuracies of water use data.

However, annual residential per capita water demand has generally decreased since 2010. The City continually makes efforts to improve water conservation and efficiency education and outreach, and processes for tracking unmetered, municipal and customer water use, detecting and repairing leaks, and implementing municipal capital improvement projects.

A. Triggers for Allocation and Demand Reduction Actions

Complete **Table 22** by checking each trigger below, as appropriate, and the actions to be taken at various levels or stages of severity. Add in additional rows to the table as needed.

Table 22. Short and long-term demand reduction conditions, triggers and actions

Objective	Triggers	Actions
Protect surface water flows	☐ Low stream flow conditions ☒ Reports of declining wetland and lake levels	☒ Increase promotion of conservation measures
Short-term demand reduction (less than 1 year)	☒ Extremely high seasonal water demand (more than double winter demand) ☒ Loss of treatment capacity ☐ Lack of water in storage ☒ State drought plan ☒ Well interference	☒ Adopt (if not already) and enforce the critical water deficiency ordinance to restrict or prohibit lawn watering, vehicle washing, golf course and park irrigation & other nonessential uses. ☐ Supply augmentation through _____ ☐ Water allocation through _____ ☒ Meet with large water users to discuss user's contingency plan.
Long-term demand reduction (>1 year)	☒ Per capita demand increasing ☒ Total demand increase (higher population or more industry)	☒ Develop a critical water deficiency ordinance that is or can be quickly adopted to penalize lawn watering, vehicle washing, golf course and park irrigation & other nonessential uses. ☐ Enact a water waste ordinance that targets overwatering (causing water to flow off the landscape into streets, parking lots, or similar), watering impervious surfaces (streets, driveways or other hardscape areas), and negligence of known leaks, breaks, or malfunctions. ☒ Meet with large water users to discuss user's contingency plan. ☒ Enhanced monitoring and reporting: audits, meters, billing, etc.
Governor's "Critical Water Deficiency Order" declared	☒ Describe: Notification from the MN DNR and/or Governor's office	☒ Describe: Limit and allocate water supply to high priority and essential use categories, consistent with Minnesota Statutes.

B. Conservation Objectives and Strategies – Key benchmark for DNR

This section establishes water conservation objectives and strategies for eight major areas of water use.

Objective 1: Reduce Unaccounted (Non-Revenue) Water loss to Less than 10%

The Minnesota Rural Water Association, the Metropolitan Council and the Department of Natural Resources recommend that all water uses be metered. Metering can help identify high use locations and times, along with leaks within buildings that have multiple meters.

It is difficult to quantify specific unmetered water use such as that associated with firefighting and system flushing or system leaks. Typically, water suppliers subtract metered water use from total water pumped to calculate unaccounted or non-revenue water loss.

Is your ten-year average (2005-2014) unaccounted Water Use in Table 2 higher than 10%?

Yes ☐ No ☒

What is your leak detection monitoring schedule? (e.g. Monitor 1/3rd of the city lines per year)

The City of Faribault conducts leak detection surveys every other year and monitors all municipal lines each time. The most recent leak detection survey was conducted in 2017.

Water Audits - are designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. The American Water Works Association (AWWA) has a recommended water audit methodology which is presented in [AWWA's M36 Manual of Water Supply Practices: Water Audits and Loss Control Programs](#). AWWA also provides a free spreadsheet-based water audit tool that water suppliers can use to conduct their own water audits. This free water audit tool can be found on AWWA's [Water Loss Control webpage](#). Another resource for water audit and water loss control information is [Minnesota Rural Water Association](#).

What is the date of your most recent water audit? April 2017 for the 2016 Fiscal Year. The City of Faribault completes a water audit exercise as part of the City's annual audit. The annual audit is performed by an independent auditing firm.

Frequency of water audits: ☒ yearly ☐ other (specify frequency) _____

Leak detection and survey: ☐ every year ☒ every other year ☐ periodic as needed

Year last leak detection survey completed: 2017

If **Table 2** shows annual water losses over 10% or an increasing trend over time, describe what actions will be taken to reach the <10% loss objective and within what timeframe

Unmetered and unaccounted water has significantly fluctuated since 2009 – largely attributable to inaccurate meter readings as previously discussed. In 2009 and 2010, water usage was largely underreported which led to a high percentage of water loss shown (10.5% in 2009 and 26.7% in 2010). Since 2011, data indicates that water use is being over reported. As a result the annual volume of total water delivered has actually exceeded the annual volume of total water pumped – resulting in a negative percentage of water loss.

As previously mentioned, the City of Faribault is taking action to: 1) implement a more rigorous well meter and pump maintenance program, 2) develop and implement a regimented customer meter

testing and replacement program, 3) implement measures to more consistently document and report customer classification categories and water use data, 4) implement measures to install/utilize water meters and better estimate water usage for known sources of unmetered water and unmetered water utilized for municipal operations, 5) implement regular leak detection surveys, and 6) implement practices to more closely and frequently review customer water use and well pumping data.

Metering -AWWA recommends that every water supplier install meters to account for all water taken into its system, along with all water distributed from its system at each customer's point of service. An effective metering program relies upon periodic performance testing, repair, maintenance or replacement of all meters. Drinking Water Revolving Loan Funds are available for purchase of new meters when new plants are built. AWWA also recommends that water suppliers conduct regular water audits to account for unmetered unbilled consumption, metered unbilled consumption and source water and customer metering inaccuracies. Some cities install separate meters for interior and exterior water use, but some research suggests that this may not result in water conservation.

Complete **Table 23** by adding the requested information regarding the number, types, testing and maintenance of customer meters.

Table 23. Information about customer meters

Customer Category	Number of Customers	Number of Metered Connections	Number of Automated Meter Readers	Meter Testing Intervals* (Years)	Average Age/Meter Replacement Schedule* (Years/Years)
Residential	6,536	6,536	6536		4 / -
Irrigation Meters					8 / -
Institutional					8 / -
Commercial	641	641	641		8 / -
Industrial	65	65	65		8 / -
Public facilities	20	20	20		8 / -
Other					8 / -
TOTALS	7,262	7,262	7,262		

* Customer meters are currently tested and replaced on an as needed basis. The City is currently exploring the establishment of a regimented meter testing program.

For unmetered systems, describe any plans to install meters or replace current meters with advanced technology meters. Provide an estimate of the cost to implement the plan and the projected water savings from implementing the plan.

Current unmetered connections within the City of Faribault are generally limited to unmetered water use for municipal operations, construction activities, or watermain or water service breaks. The City is currently working to improve reporting and documentation of unmetered water use (i.e. emergency response, hydrant flushing, watermain and water service breaks). Where feasible, meters will be installed at current unmetered water source connection points, and hydrant meters will be utilized to track water use for new construction activities, flow testing, and temporary water services.

In 2009/2010, the City of Faribault invested approximately \$1.8 million to transition to an advanced technology metering system which also included the replacement of all residential water meters and meters less than 1.5 inches, and approximately half of all meters 2 inches or larger. It was estimated that through the upgrade, the City could reduce unaccounted water losses by approximately 2-3% annually.

In 2013, The City invested approximately \$400,000 to replace nearly 7,000 water meters. The City completed software upgrades and invested approximately \$100,000 to replace 302 water meters 1.5 inches and larger in 2016/2017.

Table 24. Water source meters

	Number of Meters	Meter Testing Schedule (Years)	Number of Automated Meter Readers	Average Age/Meter Replacement Schedule (Years/Years)
Water Source (wells/intakes)	5	Yearly	5	20 / -
Treatment Plant	1	Yearly	1	1 / 5

Objective 2: Achieve Less than 75 Residential Gallons per Capita Demand (GPCD)

The 2002 average residential per capita demand in the Twin Cities Metropolitan area was 75 gallons per capita per day.

Is your average 2010-2015 residential per capita water demand in Table 2 more than 75? Yes ☐ No ☒

What was your 2010 – 2015 five-year average residential per capita water demand? 55.9 GPCD

Describe the water use trend over that timeframe:

The average City of Faribault residential per capital demand is nearly 20 gallons less than the 2002 average residential per capita demand in the Twin Cities Metropolitan area. Annual residential water use and per capita demand generally increased from 2010 to 2011 and decreased from 2011 to 2015. The estimated number of citizens, increased by 348 from 2010 to 2015.

Complete **Table 25** by checking which strategies you will use to continue reducing residential per capita demand and project a likely timeframe for completing each checked strategy (Select all that apply and add rows for additional strategies):

Table 25. Strategies and timeframe to reduce residential per capita demand

Strategy to Reduce Residential per Capita Demand	Timeframe for Completing Work
☐ Revise city ordinances/codes to encourage or require water efficient landscaping.	
☒ Revise city ordinance/codes to permit water reuse options, especially for non-potable purposes like irrigation, groundwater recharge, and industrial use. Check with plumbing authority to see if internal	2017/2018. The City's stormwater ordinances are currently being updated. Development and re-development projects of a certain threshold, are required to manage stormwater runoff with priority to green infrastructure practices (including stormwater

Strategy to Reduce Residential per Capita Demand	Timeframe for Completing Work
buildings reuse is permitted	harvest & reuse).
☐ Revise ordinances to limit irrigation. Describe the restricted irrigation plan:	
☐ Revise outdoor irrigation installations codes to require high efficiency systems (e.g. those with soil moisture sensors or programmable watering areas) in new installations or system replacements.	
☒ Make water system infrastructure improvements	2018-2028 – Various improvements are made annually.
☐ Offer free or reduced cost water use audits for residential customers.	
☒ Implement a notification system to inform customers when water availability conditions change.	2018
☒ Provide rebates or incentives for installing water efficient appliances and/or fixtures indoors (e.g., low flow toilets, high efficiency dish washers and washing machines, showerhead and faucet aerators, water softeners, etc.)	2017 – Program development. 2018-2028 – Program implementation.
☒ Provide rebates or incentives to reduce outdoor water use (e.g., turf replacement/reduction, rain gardens, rain barrels, smart irrigation, outdoor water use meters, etc.)	2017 – Program development. 2018-2028 – Program implementation.
☐ Identify supplemental Water Resources	
☒ Conduct audience-appropriate water conservation education and outreach.	2017 – Program development. 2018-2028 – Program implementation.
☐ Describe other plans	

Objective 3: Achieve at least 1.5% annual reduction in non-residential per capita water use

(For each of the next ten years, or a 15% total reduction over ten years.) This includes commercial, institutional, industrial and agricultural water users.

Complete **Table 26** by checking which strategies you will used to continue reducing non-residential customer use demand and project a likely timeframe for completing each checked strategy (add rows for additional strategies).

Where possible, substitute recycled water used in one process for reuse in another. (For example, spent rinse water can often be reused in a cooling tower.) Keep in mind the true cost of water is the amount on the water bill PLUS the expenses to heat, cool, treat, pump, and dispose of/discharge the water. Don't just calculate the initial investment. Many conservation retrofits that appear to be prohibitively expensive are actually very cost-effective when amortized over the life of the equipment. Often reducing water use also saves electrical and other utility costs. Note: as of 2015, water reuse, and is not allowed by the state plumbing code, M.R. 4715 (a variance is needed). However, several state agencies are addressing this issue.

Table 26. Strategies and timeframe to reduce institutional, commercial industrial, and agricultural and non-revenue use demand

Strategy to Reduce Total Business, Industry, Agricultural Demand	Timeframe for Completing Work
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Strategy to Reduce Total Business, Industry, Agricultural Demand	Timeframe for Completing Work
☐ Conduct a facility water use audit for both indoor and outdoor use, including system components	
☒ Install enhanced meters capable of automated readings to detect spikes in consumption	Enhanced meters are currently installed.
☐ Compare facility water use to related industry benchmarks, if available (e.g., meat processing, dairy, fruit and vegetable, beverage, textiles, paper/pulp, metals, technology, petroleum refining etc.)	
☒ Install water conservation fixtures and appliances or change processes to conserve water	Ongoing
☒ Repair leaking system components (e.g., pipes, valves)	Ongoing
☒ Investigate the reuse of reclaimed water (e.g., stormwater, wastewater effluent, process wastewater, etc.)	2018-2028: Ongoing as it pertains to stormwater, as facility development/redevelopment and modification to facility operations are proposed.
☒ Reduce outdoor water use (e.g., turf replacement/reduction, rain gardens, rain barrels, smart irrigation, outdoor water use meters, etc.)	2018-2028: Ongoing as facility development/redevelopment and modification to facility operations are proposed.
☒ Train employees how to conserve water	Ongoing
☒ Implement a notification system to inform non-residential customers when water availability conditions change.	2018-2028
☒ Nonpotable rainwater catchment systems intended to supply uses such as water closets, urinals, trap primers for floor drains and floor sinks, industrial processes, water features, vehicle washing facilities, cooling tower makeup, and similar uses shall be approved by the commissioner. Plumbing code 4714.1702, Published October 31, 2016	2018-2028: Ongoing as facility development/redevelopment and modification to facility operations are proposed.
☐ Describe other plans:	

Objective 4: Achieve a Decreasing Trend in Total Per Capita Demand

Include as **Appendix 8** one graph showing total per capita water demand for each customer category (i.e., residential, institutional, commercial, industrial) from 2005-2014 and add the calculated/estimated linear trend for the next 10 years.

Describe the trend for each customer category; explain the reason(s) for the trends, and where trends are increasing.

The City of Faribault has limited water use data by customer classification – data is largely limited to the 2010-2016 timeframe. Data inconsistencies (i.e. inaccurate meter data, year-to-year variation in customer classifications) and the limited number of data samples, overall results in a general lack of confidence in the regression analysis performed and high rates of projected increases for most customer categories. Please note, there were not enough years of data available for agricultural water demand to perform a regression analysis.

The residential per capita water demand is overall displaying a decreasing trend from 2010-2016. The linear regression analysis, although low confidence ($r^2 = 0.2573$), also indicates a decreasing trend for the residential customer category over the next 10 years. Although there is limited data available and

low confidence in the regression analysis, the City of Faribault has observed a slow rate of population growth (the City population grew by an estimated 366 citizens from 2010 to 2016) and a general decline in residential per capita water demand.

The largest water demands are generated by industrial (average per capita demand 16,353: GPCD) and commercial (average per capita demand: 814 GPCD) customers. Please note that due to scale, industrial customer demand data was plotted on the secondary axis. The number of industrial customers is relatively low (65 connections in 2016) and have high volumes of water demand – industrial users alone accounted for 52% of the total water volume delivered in 2016.

Water demand by both industrial and commercial customer classifications has generally increased from 2010 to 2016 and both are projected to continue to rise over the next 10 years.

It is suspected that in 2015, customers that were previously reported in the industrial category, were reported in the commercial category. There is a significant increase in the annual total volume of commercial water delivered from 2014 to 2015 and decrease from 2015 to 2016. The opposite is also observed in the annual total volume of industrial water delivered. The 2015 annual volume of commercial water delivered, skews the rate of increase (slope) of the linear trend analysis much higher than what would be anticipated. The confidence in this regression analysis is also fairly low ($r^2 = 0.3542$). With the 2015 sample point removed, per capita commercial customer water use is still projected to rise, however, at a more modest rate of increase. The level of confidence in the regression analysis also greatly increases ($r^2 = 0.8625$) with the 2015 sample point removed. Inclusion of the 2015 sample point, nearly doubles the 2025 projected commercial customer per capita demand (30,000 GPCD) versus if the sample point was removed (15,000 GPCD).

Commercial customer per capita water demand observed a sharp increase from 2010 to 2011 and again from 2013 to 2016 – increasing from 379 GPCD in 2010, to 2,243 GPCD high in 2015. This represents a nearly five times increase in commercial per capita water use. These sharp inclines, result in a steep rate of increase for the projected per capita demand. However the significant variation in commercial per capita water demand from 2013-2016 and limited number of sample points available, results in somewhat low confidence of the linear regression analysis ($r^2 = 0.4028$).

Objective 5: Reduce Ratio of Maximum day (peak day) to the Average Day Demand to Less Than 2.6

Is the ratio of average 2005-2014 maximum day demand to average 2005-2014 average day demand reported in Table 2 more than 2.6? Yes ☐ No ☒

Calculate a ten-year average (2005 – 2014) of the ratio of maximum day demand to average day demand: 1.776

The position of the DNR has been that a peak day/average day ratio that is above 2.6 for in summer indicates that the water being used for irrigation by the residents in a community is too large and that efforts should be made to reduce the peak day use by the community.

It should be noted that by reducing the peak day use, communities can also reduce the amount of infrastructure that is required to meet the peak day use. This infrastructure includes new wells, new water towers which can be costly items.

Objective 6: Implement Demand Reduction Measures

Water Conservation Program

Municipal water suppliers serving over 1,000 people are required to adopt demand reduction measures that include a conservation rate structure, or a uniform rate structure with a conservation program that achieves demand reduction. These measures must achieve demand reduction in ways that reduce water demand, water losses, peak water demands, and nonessential water uses. These measures must be approved before a community may request well construction approval from the Department of Health or before requesting an increase in water appropriations permit volume ([Minnesota Statutes, section 103G.291, subd. 3 and 4](#)). Rates should be adjusted on a regular basis to ensure that revenue of the system is adequate under reduced demand scenarios. If a municipal water supplier intends to use a Uniform Rate Structure, a community-wide Water Conservation Program that will achieve demand reduction must be provided.

Current Water Rates

Include a copy of the actual rate structure in **Appendix 9** or list current water rates including base/service fees and volume charges below.

Volume included in base rate or service charge: NONE

Frequency of billing: ☒ Monthly ☐ Bimonthly ☐ Quarterly ☐ Other: _____

Water Rate Evaluation Frequency: ☒ every year ☐ every ___ years ☐ no schedule

Date of last rate change: 2011

Table 27. Rate structures for each customer category (Select all that apply and add additional rows as needed)

Customer Category	Conservation Billing Strategies in Use *	Conservation Neutral Billing Strategies in Use **	Non-Conserving Billing Strategies in Use ***
Residential	☒ Monthly billing ☒ Increasing block rates (volume tiered rates) ☐ Seasonal rates ☐ Time of use rates ☒ Water bills reported in gallons ☐ Individualized goal rates ☐ Excess use rates ☐ Drought surcharge ☐ Use water bill to provide comparisons ☐ Service charge not based on water volume	☐ Uniform ☒ Odd/even day watering	☐ Service charge based on water volume ☐ Declining block ☐ Flat ☐ Other (describe)

Customer Category	Conservation Billing Strategies in Use *	Conservation Neutral Billing Strategies in Use **	Non-Conserving Billing Strategies in Use ***
	☐ Other (describe)		
Commercial/ Industrial/ Institutional	☒ Monthly billing ☒ Increasing block rates (volume tiered rates) ☐ Seasonal rates ☐ Time of use rates ☒ Water bills reported in gallons ☐ Individualized goal rates ☐ Excess use rates ☐ Drought surcharge ☐ Use water bill to provide comparisons ☐ Service charge not based on water volume ☐ Other (describe)	☐ Uniform	☐ Service charge based on water volume ☐ Declining block ☐ Flat ☐ Other (describe)

*** Rate Structures components that may promote water conservation:**

- **Monthly billing:** is encouraged to help people see their water usage so they can consider changing behavior.
- **Increasing block rates (also known as a tiered residential rate structure):** Typically, these have at least three tiers: should have at least three tiers.
 - The first tier is for the winter average water use.
 - The second tier is the year-round average use, which is lower than typical summer use. This rate should be set to cover the full cost of service.
 - The third tier should be above the average annual use and should be priced high enough to encourage conservation, as should any higher tiers. For this to be effective, the difference in block rates should be significant.
- **Seasonal rate:** higher rates in summer to reduce peak demands
- **Time of Use rates:** lower rates for off peak water use
- **Bill water use in gallons:** this allows customers to compare their use to average rates
- **Individualized goal rates:** typically used for industry, business or other large water users to promote water conservation if they keep within agreed upon goals. **Excess Use rates:** if water use goes above an agreed upon amount this higher rate is charged
- **Drought surcharge:** an extra fee is charged for guaranteed water use during drought
- **Use water bill to provide comparisons:** simple graphics comparing individual use over time or compare individual use to others.
- **Service charge or base fee that does not include a water volume** – a base charge or fee to cover universal city expenses that are not customer dependent and/or to provide minimal water at a lower rate (e.g., an amount less than the average residential per capita demand for the water supplier for the last 5 years)
- **Emergency rates** -A community may have a separate conservation rate that only goes into effect when the community or governor declares a drought emergency. These higher rates can help to protect the city budgets during times of significantly less water usage.

****Conservation Neutral****

- **Uniform rate:** rate per unit used is the same regardless of the volume used
- **Odd/even day watering** –This approach reduces peak demand on a daily basis for system operation, but it does not reduce overall water use.

***** Non-Conserving *****

- **Service charge or base fee with water volume:** an amount of water larger than the average residential per capita demand for the water supplier for the last 5 years
- **Declining block rate:** the rate per unit used decreases as water use increases.
- **Flat rate:** one fee regardless of how much water is used (usually unmetered).

Provide justification for any conservation neutral or non-conserving rate structures. If intending to adopt a conservation rate structure, include the timeframe to do so:

None in use.

Objective 7: Additional strategies to Reduce Water Use and Support Wellhead Protection Planning

Development and redevelopment projects can provide additional water conservation opportunities, such as the actions listed below. If a Uniform Rate Structure is in place, the water supplier must provide a Water Conservation Program that includes at least two of the actions listed below. Check those actions that you intent to implement within the next 10 years.

Table 28. Additional strategies to Reduce Water Use & Support Wellhead Protection

☒	Participate in the GreenStep Cities Program, including implementation of at least one of the 20 “Best Practices” for water*
☐	Prepare a master plan for smart growth (compact urban growth that avoids sprawl)
☐	Prepare a comprehensive open space plan (areas for parks, green spaces, natural areas)
☐	Adopt a water use restriction ordinance (lawn irrigation, car washing, pools, etc.)
☒	Adopt an outdoor lawn irrigation ordinance*
☐	Adopt a private well ordinance (private wells in a city must comply with water restrictions)
☒	Implement a stormwater management program*
☒	Adopt non-zoning wetlands ordinance (can further protect wetlands beyond state/federal laws-for vernal pools, buffer areas, restrictions on filling or alterations) *
☐	Adopt a water offset program (primarily for new development or expansion)
☒	Implement a water conservation outreach program
☐	Hire a water conservation coordinator (part-time)
☒	Implement a rebate program for water efficient appliances, fixtures, or outdoor water management

* The City of Faribault is currently implementing program.

Objective 8: Tracking Success: How will you track or measure success through the next ten years?

The City currently tracks performance and statistics on implemented structural stormwater BMP improvements. The City will additionally track: progress through the Minnesota GreenStep Cities Program, and user category water usage and per capita water demand. For the rebate program, the City will track customer use of the program and types and quantity of rebates issued.

Tip: The process to monitor demand reduction and/or a rate structure includes:

- a) The DNR Hydrologist will call or visit the community the first 1-3 years after the water supply plan is completed.
- b) They will discuss what activities the community is doing to conserve water and if they feel their actions are successful. The Water Supply Plan, Part 3 tables and responses will guide the discussion. For example, they will discuss efforts to reduce unaccounted for water loss if that is a problem, or go through Tables 33, 34 and 35 to discuss new initiatives.
- c) The city representative and the hydrologist will discuss total per capita water use, residential per capita water use, and business/industry use. They will note trends.
- d) They will also discuss options for improvement and/or collect case studies of success stories to share with other communities. One option may be to change the rate structure, but there are many other paths to successful water conservation.
- e) If appropriate, they will cooperatively develop a simple work plan for the next few years, targeting a couple areas where the city might focus efforts.

C. Regulation

Complete **Table 29** by selecting which regulations are used to reduce demand and improve water efficiencies. Add additional rows as needed.

Copies of adopted regulations or proposed restrictions or should be included in **Appendix 10** (a list with hyperlinks is acceptable).

Table 29. Regulations for short-term reductions in demand and long-term improvements in water efficiencies

Regulations Utilized	When is it applied (in effect)?
☐ Rainfall sensors required on landscape irrigation systems	☐ Ongoing ☐ Seasonal ☐ Only during declared Emergencies
☐ Water efficient plumbing fixtures required	☐ New development ☐ Replacement ☐ Rebate Programs
☒ Critical/Emergency Water Deficiency ordinance	☒ Only during declared Emergencies
☒ Watering restriction requirements (time of day, allowable days, etc.)	☒ Odd/even ☐ 2 days/week ☐ Only during declared Emergencies
☐ Water waste prohibited (for example, having a fine for irrigators spraying on the street)	☐ Ongoing ☐ Seasonal ☐ Only during declared Emergencies
☒ Limitations on turf areas (requiring lots to have 10% - 25% of the space in natural areas)	☐ New development ☒ Shoreland/zoning ☒ Other: Planned Unit Developments
☒ Soil preparation requirements (after construction, requiring topsoil to be applied to promote good root growth)	☐ New Development ☒ Construction Projects: Dedicated Parkland Areas ☐ Other
☒ Tree ratios (requiring a certain number of trees per square foot of lawn)	☐ New development ☐ Shoreland/zoning ☒ Other: Landscaping requirements (the number of

Regulations Utilized	When is it applied (in effect)?
	trees/shrubs required, increases with lot impervious surface coverage) for any request for City site plan review and approval.
☐ Permit to fill swimming pool and/or requiring pools to be covered (to prevent evaporation)	☐ Ongoing ☐ Seasonal ☐ Only during declared Emergencies
☒ Ordinances that permit stormwater irrigation, reuse of water, or other alternative water use (Note: be sure to check current plumbing codes for updates)	☒ Describe: The City's stormwater ordinances are currently being updated. Development and re-development projects of a certain threshold, are required to manage stormwater runoff with priority to green infrastructure practices (including stormwater harvest & reuse).

D. Retrofitting Programs

Education and incentive programs aimed at replacing inefficient plumbing fixtures and appliances can help reduce per capita water use, as well as energy costs. It is recommended that municipal water suppliers develop a long-term plan to retrofit public buildings with water efficient plumbing fixtures and appliances. Some water suppliers have developed partnerships with organizations having similar conservation goals, such as electric or gas suppliers, to develop cooperative rebate and retrofit programs.

A study by the AWWA Research Foundation (Residential End Uses of Water, 1999) found that the average indoor water use for a non-conserving home is 69.3 gallons per capita per day (GPCD). The average indoor water use in a conserving home is 45.2 GPCD and most of the decrease in water use is related to water efficient plumbing fixtures and appliances that can reduce water, sewer and energy costs. In Minnesota, certain electric and gas providers are required (Minnesota Statute 216B.241) to fund programs that will conserve energy resources and some utilities have distributed water efficient showerheads to customers to help reduce energy demands required to supply hot water.

Retrofitting Programs

Complete **Table 30** by checking which water uses are targeted, the outreach methods used, the measures used to identify success, and any participating partners.

Table 30. Retrofitting programs (Select all that apply)

Water Use Targets	Outreach Methods	Partners
☒ Low flush toilets* ☒ Toilet leak tablets ☒ Low flow showerheads* ☐ Faucet aerators	☒ Education about ☒ Free distribution of ☒ Rebate for* ☐ Other	☒ Gas company* ☒ Electric company* ☐ Watershed organization
☒ Water conserving washing machines* ☒ Dish washers* ☒ Water softeners*	☒ Education about* ☐ Free distribution of ☒ Rebate for* ☐ Other	☒ Gas company* ☒ Electric company* ☐ Watershed organization

Water Use Targets	Outreach Methods	Partners
☒ Rain gardens ☒ Rain barrels ☒ Native/drought tolerant landscaping, etc.	☒ Education about ☐ Free distribution of ☒ Rebate for* ☐ Other	☐ Gas company ☐ Electric company ☐ Watershed organization

* Indicates future program target area, outreach method, and potential partner.

Briefly discuss measures of success from the above table (e.g. number of items distributed, dollar value of rebates, gallons of water conserved, etc.):

The City of Faribault currently distributes educational information on detecting toilet leaks, water conservation methods, benefits of landscaping with Minnesota native plant species, and function and how-to-construct and maintain raingardens and rain barrels.

In 2016, the City of Faribault distributed 170 leak detection handouts and toilet leak tablets and distributed information on raingardens, rain barrels, native plants, and water conservation through other educational mechanisms (distribution of other educational materials, participation at educational events, utility bill inserts, articles and advertisements in the local newspaper and community newsletters) -- with a total of 182,000 impressions made and materials distributed to the Faribault community.

Moving forward the City anticipates implementing a rebate/incentive program for water efficient appliances/fixtures, raingardens, and rain barrels. The City currently does not have mechanisms in place to determine the volume of water conserved through retrofitting/installation of these types of practices. *(Volume reduction for installation of stormwater BMPs is tracked as a function of the City's construction stormwater program for development/redevelopment projects, which does not include residential applications.)* The City will utilize the rebate program to track effectiveness and anticipates working in conjunction with local gas/electric companies to help customers maximize program benefits.

E. Education and Information Programs

Customer education should take place in three different circumstances. First, customers should be provided information on how to conserve water and improve water use efficiencies. Second, information should be provided at appropriate times to address peak demands. Third, emergency notices and educational materials about how to reduce water use should be available for quick distribution during an emergency.

Proposed Education Programs

Complete **Table 31** by selecting which methods are used to provide water conservation and information, including the frequency of program components. Select all that apply and add additional lines as needed.

Table 31. Current and Proposed Education Programs

Education Methods	General Summary of Topics	#/Year	Frequency
-------------------	---------------------------	--------	-----------

Education Methods	General Summary of Topics	#/Year	Frequency
Billing inserts or tips printed on the actual bill	Availability of consumer confidence report, watermain flushing, water restrictions, water analysis results, well sealing/maintenance, education workshops & events, rebate program*, water conservation tips*, rusty water (water quality) homeowner insert*	4	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Consumer Confidence Reports	Summary of monitoring results, FAQs, water restrictions, water conservation tips, compliance with federal regulations,	1	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Press releases to traditional local news outlets (e.g., newspapers, radio and TV)	Watermain flushing, water restrictions, education workshops, rebate program*, water conservation tips*, rusty water (water quality) homeowner information*	3	☒ Ongoing ☒ Seasonal ☒ Only during declared emergencies
Social media distribution (e.g., emails, Facebook, Twitter)	Watermain flushing, watermain breaks, water restrictions, education workshops & events, water conservation tips*, rebate program*, rusty water (water quality) homeowner information*, leak detection*	12	☒ Ongoing ☒ Seasonal ☐ Only during declared emergencies
Paid advertisements (e.g., billboards, print media, TV, radio, web sites, etc.)	Availability of consumer confidence report, water analysis results, watermain flushing, water restrictions, education workshops, rebate program*	2	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Presentations to community groups	Water conservation tips, leak detection, municipal water supply system	As Requested	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Staff training	Water restrictions	Annual	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Facility tours	Municipal water supply and treatment system	As Requested	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Displays and exhibits	Interactive groundwater model*	Utilized at Education Events*	☒ Ongoing * ☐ Seasonal ☐ Only during declared emergencies
Marketing rebate programs (e.g., indoor fixtures & appliances and outdoor practices)	Program to be developed (likely to be marketed through education methods identified in this table)*		☒ Ongoing* ☐ Seasonal ☐ Only during declared emergencies

Education Methods	General Summary of Topics	#/Year	Frequency
Community newsletters	Availability of consumer confidence report, water analysis results, watermain flushing, water restrictions, education workshops and events, rebate program*, water conservation tips*, rusty water (water quality) homeowner information*	4	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Direct mailings/distribution (water audit/retrofit kits, showerheads, brochures)	Water restrictions notice, water use change/possible leak/leak detection*, rusty water (water quality) homeowner information*	As Needed	☒ Ongoing* ☐ Seasonal ☐ Only during declared emergencies
Information kiosk at utility and public buildings	Public Works – consumer confidence report, water analysis results, watermain flushing, water restrictions, water conservation tips, raingarden, rain barrels, benefits of native plants, education workshops and events, rusty water (water quality) homeowner information*, rebate program*	Continuously Updated	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Public service announcements			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Cable TV Programs	Water conservation*, leak detection*, well maintenance/sealing*, raingardens*, rain barrels*, rebate program*, rusty water (water quality) homeowner information*	As Allowed	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Demonstration projects (landscaping or plumbing)	Raingarden demonstration projects*	As Allowed	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
K-12 education programs (Project Wet, Drinking Water Institute, presentations)	Water conservation*, stormwater BMPs	Annual	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Community events (children's water festivals, environmental fairs)	Leak detection, water conservation, municipal water supply system, raingardens, rain barrels, benefits of native plants, rebate program*	4	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Community education classes	Water conservation*, leak detection*, raingardens, rain barrels, benefits of native plants	Annual	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Water week promotions*	Water conservation*, leak detection*, rebate program*	Annual	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies

Education Methods	General Summary of Topics	#/Year	Frequency
Website www.faribault.org , www.ci.faribault.mn.us	Watermain Flushing, water restrictions, consumer confidence report, water analysis results, wellhead protection, raingardens, rain barrels, benefits of native plants, education workshops and events	As Needed	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Targeted efforts (large volume users, users with large increases)	Water conservation, water efficiency, and water re-use opportunities*	As Needed*	☒ Ongoing* ☐ Seasonal ☐ Only during declared emergencies
Notices of ordinances			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Emergency conservation notices	Water Use Restrictions	As Needed	☐ Ongoing ☐ Seasonal ☒ Only during declared emergencies
Other:			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies

* Indicates future educational program activity/topic.

Briefly discuss what future education and information activities your community is considering in the future:

The City of Faribault will be establishing and implementing a more regimented education and outreach program. The program's event and activities will be conducted with clear goals and measurements identified, to track and evaluate the program event/activity's effectiveness and impacts. Education events and activities will adhere to a routine schedule from year-to-year.

The City also anticipates the development and implementation of a water conservation/water efficiency/energy program for utility customers in 2018. Specific outreach activities to individual large volume customers, to discuss and review water conservation, water efficiency, and re-use opportunities are also anticipated.

PART 4. ITEMS FOR METROPOLITAN AREA COMMUNITIES

Minnesota Statute 473.859 requires WSPs to be completed for all local units of government in the seven-county Metropolitan Area as part of the local comprehensive planning process.



Much of the information in Parts 1-3 addresses water demand for the next 10 years. However, additional information is needed to address water demand through 2040, which will make the WSP consistent with the Metropolitan Land Use Planning Act, upon which the local comprehensive plans are based.

This Part 4 provides guidance to complete the WSP in a way that addresses plans for water supply through 2040.

The City of Faribault is outside the Metropolitan Area. Completion this section is not required.

A. Water Demand Projections through 2040

Complete **Table 7** in Part 1D by filling in information about long-term water demand projections through 2040.

B. Potential Water Supply Issues

Complete **Table 10** in Part 1E by providing information about the potential water supply issues in your community, including those that might occur due to 2040 projected water use.

C. Proposed Alternative Approaches to Meet Extended Water Demand Projections

Complete **Table 12** in Part 1F with information about potential water supply infrastructure impacts (such as replacements, expansions or additions to wells/intakes, water storage and treatment capacity, distribution systems, and emergency interconnections) of extended plans for development and redevelopment, in 10-year increments through 2040.

Complete **Table 14** in Part 1F by checking each approach your community is considering to meet future demand. For each approach your community is considering, provide information about the amount of future water demand to be met using that approach, the timeframe to implement the approach, potential partners, and current understanding of the key benefits and challenges of the approach.

D. Value-Added Water Supply Planning Efforts (Optional)

The following information is not required to be completed as part of the local water supply plan, but completing this can help strengthen source water protection throughout the region and help Metropolitan Council and partners in the region to better support local efforts.

Source Water Protection Strategies

Does a Drinking Water Supply Management Area for a neighboring public water supplier overlap your community? Yes ☐ No ☐

If you answered no, skip this section. If you answered yes, please complete **Table 32** with information about new water demand or land use planning-related local controls that are being considered to provide additional protection in this area.

Table 32. Local controls and schedule to protect Drinking Water Supply Management Areas

Local Control	Schedule to Implement	Potential Partners
☐ None at this time		
☐ Comprehensive planning that guides development in vulnerable drinking water supply management areas		
☐ Zoning overlay		
☐ Other:		

Technical assistance

From your community's perspective, what are the most important topics for the Metropolitan Council to address, guided by the region's Metropolitan Area Water Supply Advisory Committee and Technical Advisory Committee, as part of its ongoing water supply planning role?

- ☐ Coordination of state, regional and local water supply planning roles
- ☐ Regional water use goals
- ☐ Water use reporting standards
- ☐ Regional and sub-regional partnership opportunities
- ☐ Identifying and prioritizing data gaps and input for regional and sub-regional analyses
- ☐ Others: _____

GLOSSARY

Agricultural/Irrigation Water Use - Water used for crop and non-crop irrigation, livestock watering, chemigation, golf course irrigation, landscape and athletic field irrigation.

Average Daily Demand - The total water pumped during the year divided by 365 days.

Calcareous Fen - Calcareous fens are rare and distinctive wetlands dependent on a constant supply of cold groundwater. Because they are dependent on groundwater and are one of the rarest natural communities in the United States, they are a protected resource in MN. Approximately 200 have been located in Minnesota. They may not be filled, drained or otherwise degraded.

Commercial/Institutional Water Use - Water used by motels, hotels, restaurants, office buildings, commercial facilities and institutions (both civilian and military). Consider maintaining separate institutional water use records for emergency planning and allocation purposes. Water used by multi-family dwellings, apartment buildings, senior housing complexes, and mobile home parks should be reported as Residential Water Use.

Commercial/Institutional/Industrial (C/I/I) Water Sold - The sum of water delivered for commercial/institutional or industrial purposes.

Conservation Rate Structure - A rate structure that encourages conservation and may include increasing block rates, seasonal rates, time of use rates, individualized goal rates, or excess use rates. If a conservation rate is applied to multifamily dwellings, the rate structure must consider each residential unit as an individual user. A community may have a separate conservation rate that only goes into effect when the community or governor declares a drought emergency. These higher rates can help to protect the city budgets during times of significantly less water usage.

Date of Maximum Daily Demand - The date of the maximum (highest) water demand. Typically this is a day in July or August.

Declining Rate Structure - Under a declining block rate structure, a consumer pays less per additional unit of water as usage increases. This rate structure does not promote water conservation.

Distribution System - Water distribution systems consist of an interconnected series of pipes, valves, storage facilities (water tanks, water towers, reservoirs), water purification facilities, pumping stations, flushing hydrants, and components that convey drinking water and meeting fire protection needs for cities, homes, schools, hospitals, businesses, industries and other facilities.

Flat Rate Structure - Flat fee rates do not vary by customer characteristics or water usage. This rate structure does not promote water conservation.

Industrial Water Use - Water used for thermonuclear power (electric utility generation) and other industrial use such as steel, chemical and allied products, paper and allied products, mining, and petroleum refining.

Low Flow Fixtures/Appliances - Plumbing fixtures and appliances that significantly reduce the amount of water released per use are labeled “low flow”. These fixtures and appliances use just enough water to be effective, saving excess, clean drinking water that usually goes down the drain.

Maximum Daily Demand - The maximum (highest) amount of water used in one day.

Metered Residential Connections - The number of residential connections to the water system that have meters. For multifamily dwellings, report each residential unit as an individual user.

Percent Unmetered/Unaccounted For - Unaccounted for water use is the volume of water withdrawn from all sources minus the volume of water delivered. This value represents water “lost” by miscalculated water use due to inaccurate meters, water lost through leaks, or water that is used but unmetered or otherwise undocumented. Water used for public services such as hydrant flushing, ice skating rinks, and public swimming pools should be reported under the category “Water Supplier Services”.

Population Served - The number of people who are served by the community's public water supply system. This includes the number of people in the community who are connected to the public water supply system, as well as people in neighboring communities who use water supplied by the community's public water supply system. It should not include residents in the community who have private wells or get their water from neighboring water supply.

Residential Connections - The total number of residential connections to the water system. For multifamily dwellings, report each residential unit as an individual user.

Residential Per Capita Demand - The total residential water delivered during the year divided by the population served divided by 365 days.

Residential Water Use - Water used for normal household purposes such as drinking, food preparation, bathing, washing clothes and dishes, flushing toilets, and watering lawns and gardens. Should include all water delivered to single family private residences, multi-family dwellings, apartment buildings, senior housing complexes, mobile home parks, etc.

Smart Meter - Smart meters can be used by municipalities or by individual homeowners. Smart metering generally indicates the presence of one or more of the following:

- Smart irrigation water meters are controllers that look at factors such as weather, soil, slope, etc. and adjust watering time up or down based on data. Smart controllers in a typical summer will reduce water use by 30%-50%. Just changing the spray nozzle to new efficient models can reduce water use by 40%.
- Smart Meters on customer premises that measure consumption during specific time periods and communicate it to the utility, often on a daily basis.
- A communication channel that permits the utility, at a minimum, to obtain meter reads on demand, to ascertain whether water has recently been flowing through the meter and onto the premises, and to issue commands to the meter to perform specific tasks such as disconnecting or restricting water flow.

Total Connections - The number of connections to the public water supply system.

Total Per Capita Demand - The total amount of water withdrawn from all water supply sources during the year divided by the population served divided by 365 days.

Total Water Pumped - The cumulative amount of water withdrawn from all water supply sources during the year.

Total Water Delivered - The sum of residential, commercial, industrial, institutional, water supplier services, wholesale and other water delivered.

Ultimate (Full Build-Out) - Time period representing the community's estimated total amount and location of potential development, or when the community is fully built out at the final planned density.

Unaccounted (Non-revenue) Loss - See definitions for "percent unmetered/unaccounted for loss".

Uniform Rate Structure - A uniform rate structure charges the same price-per-unit for water usage beyond the fixed customer charge, which covers some fixed costs. The rate sends a price signal to the customer because the water bill will vary by usage. Uniform rates by class charge the same price-per-unit for all customers within a customer class (e.g. residential or non-residential). This price structure is generally considered less effective in encouraging water conservation.

Water Supplier Services - Water used for public services such as hydrant flushing, ice skating rinks, public swimming pools, city park irrigation, back-flushing at water treatment facilities, and/or other uses.

Water Used for Nonessential Purposes - Water used for lawn irrigation, golf course and park irrigation, car washes, ornamental fountains, and other non-essential uses.

Wholesale Deliveries - The amount of water delivered in bulk to other public water suppliers.

ACRONYMS AND INITIALISMS

AWWA – American Water Works Association

C/I/I – Commercial/Institutional/Industrial

CIP – Capital Improvement Plan

GIS – Geographic Information System

GPCD – Gallons per capita per day

GWMA – Groundwater Management Area – North and East Metro, Straight River, Bonanza,

MDH – Minnesota Department of Health

MGD – Million gallons per day

MG – Million gallons

MGL – Maximum Contaminant Level

MnTAP – Minnesota Technical Assistance Program
(University of Minnesota)

MPARS – MN/DNR Permitting and Reporting System
(new electronic permitting system)

MRWA – Minnesota Rural Waters Association

SWP – Source Water Protection

WHP – Wellhead Protection

APPENDICES TO BE SUBMITTED BY THE WATER SUPPLIER

Appendix 1: Well records and maintenance summaries

Go to [Part 1C](#) for information on what to include in appendix

Appendix 2: Water level monitoring plan

Go to [Part 1E](#) for information on what to include in appendix

Appendix 3: Water level graphs for each water supply well

Go to [Part 1E](#) for information on what to include in appendix

Appendix 4: Capital Improvement Plan

Go to [Part 1E](#) for information on what to include in appendix

Appendix 5: Emergency Telephone List

Go to [Part 2C](#) for information on what to include in appendix

Appendix 6: Cooperative Agreements for Emergency Services

Go to [Part 2C](#) for information on what to include in appendix

Appendix 7: Municipal Critical Water Deficiency Ordinance

Go to [Part 2C](#) for information on what to include in appendix

Appendix 8: Graph of Ten Years of Annual Per Capita Water Demand for Each Customer Category

Go to [Objective 4 in Part 3B](#) for information on what to include in appendix

Appendix 9: Water Rate Structure

Go to [Objective 6 in Part 3B](#) for information on what to include in appendix

Appendix 10: Ordinances or Regulations Related to Water Use

Go to [Objective 7 in Part 3B](#) for information on what to include in appendix

Appendix 11: Implementation Checklist

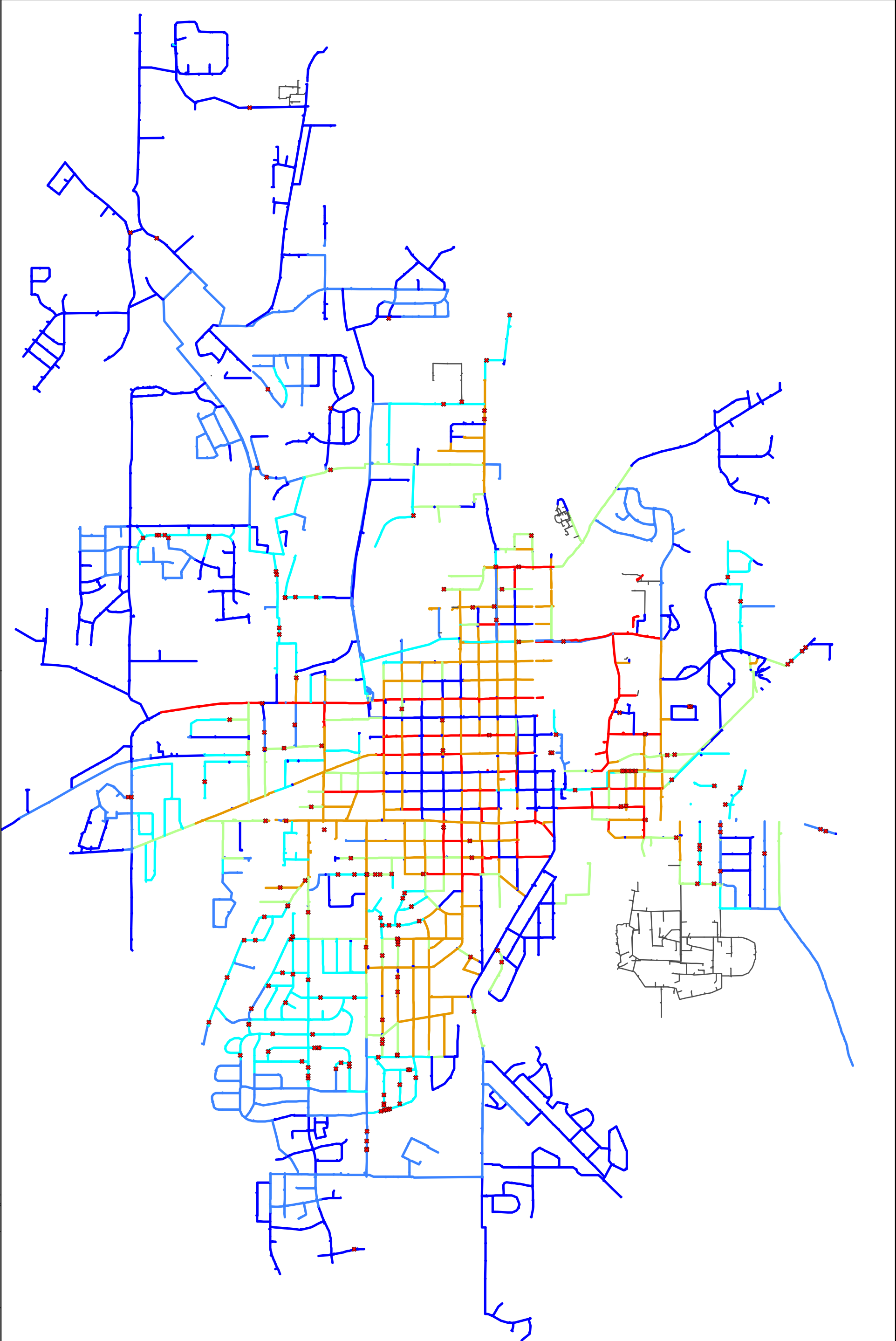
Provide a table that summarizes all the actions that the public water supplier is doing, or proposes to do, with estimated implementation dates.

Appendix 12: Sources of Information for Table 10

Provide links or references to the information used to complete Table 10. If the file size is reasonable, provide source information as attachments to the plan.

Appendix D

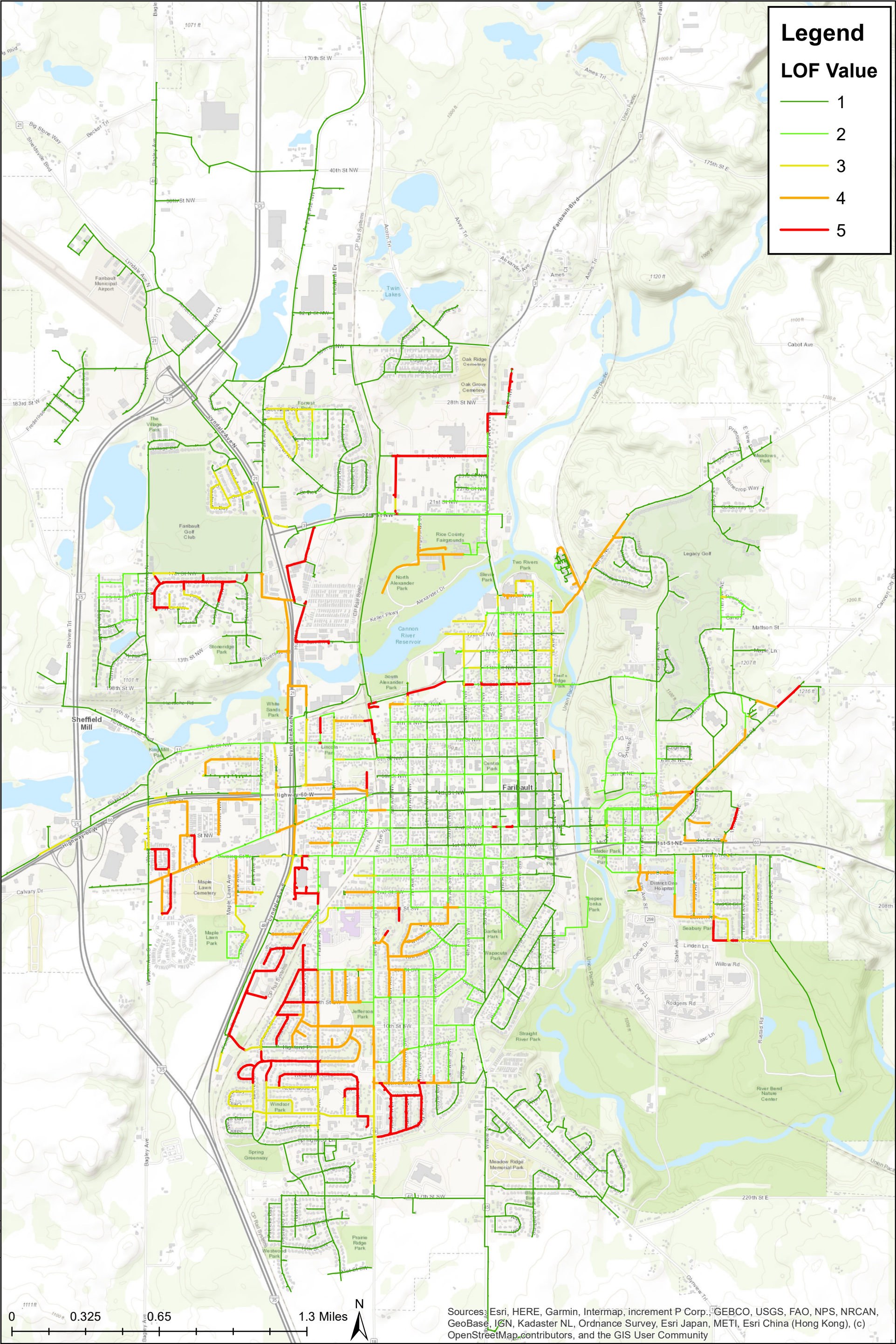
Water Main Risk Analysis Data

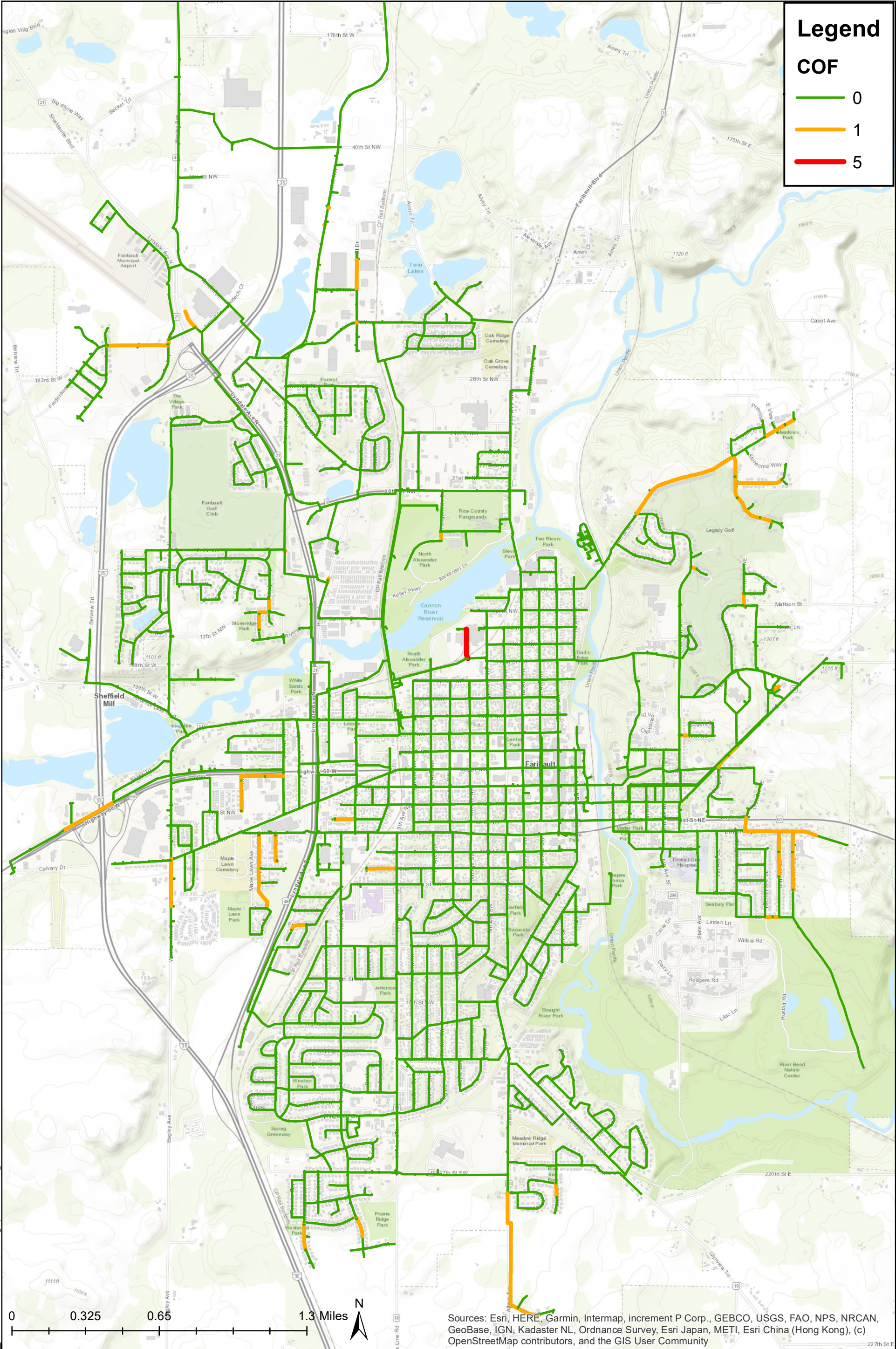


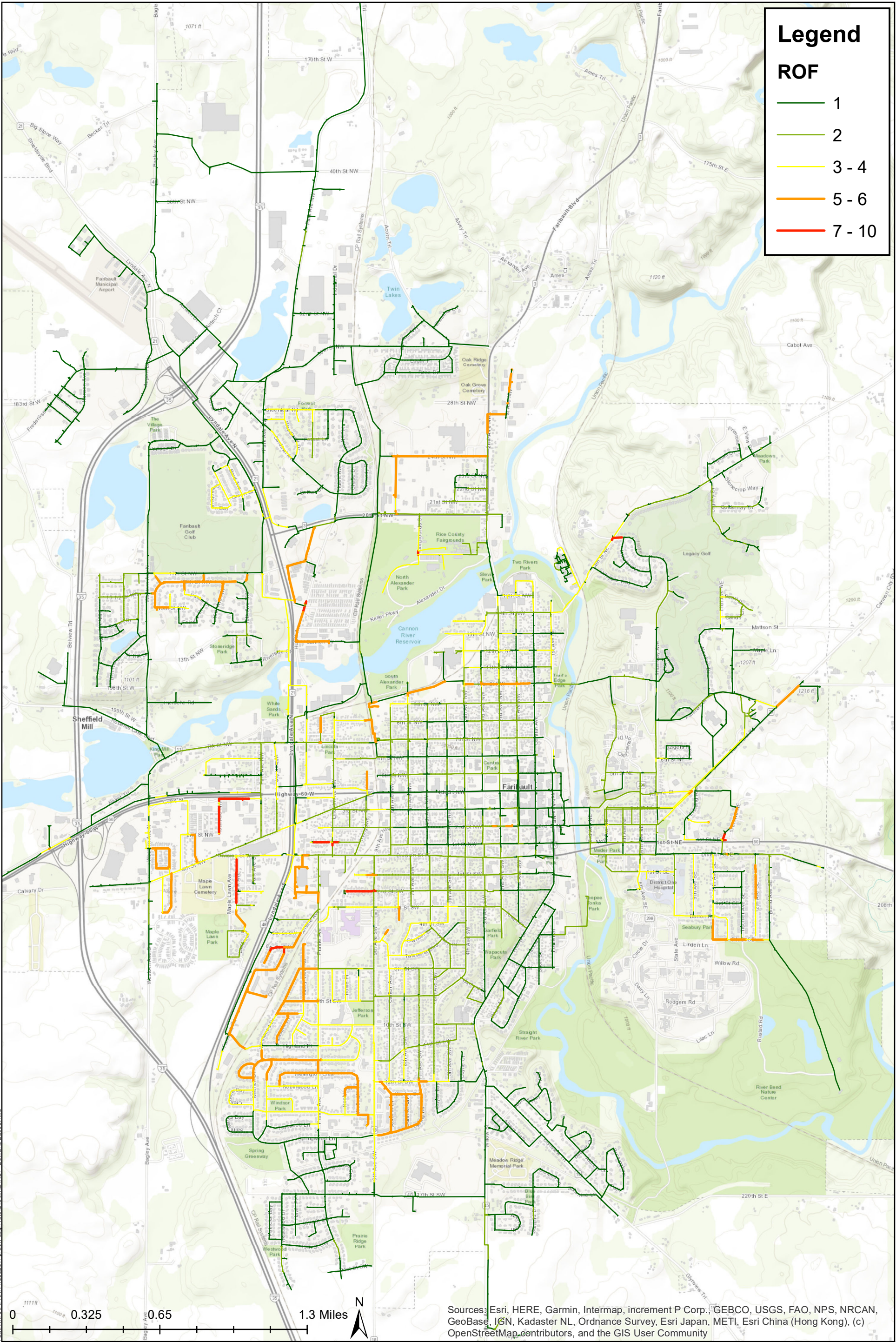
Path: C:\Projects\FARIBAUT\15832614-prelim-dsnp-rus\GIS\MXD\Break Data.mxd

	3535 VADNAIS CENTER DR. ST. PAUL, MN 55110 PHONE: (651) 490-2000 FAX: (888) 908-8166 TF: (800) 325-2055 www.sehinc.com	Project: XXXXX 000000 Print Date: 8/3/2021 Map by: ckatzenberger Projection: Source:	Pipe Vintage and Historical Breaks Faribault, Minnesota	Figure D1
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This map is neither a legally recorded map nor a survey map and is not intended to be used as one. This map is a compilation of records, information, and data gathered from various sources listed on this map and is to be used for reference purposes only. SEH does not warrant that the Geographic Information System (GIS) Data used to prepare this map are error free, and SEH does not represent that the GIS Data can be used for navigational, tracking, or any other purpose requiring exacting measurement of distance or direction or precision in the depiction of geographic features. The user of this map acknowledges that SEH shall not be liable for any damages which arise out of the user's access or use of data provided.









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Request for Council Action

TO: Mayor and City Council
THROUGH: Tim Murray, City Administrator
FROM: Mark DuChene, City Engineer
MEETING DATE: January 11, 2022
SUBJECT: Adopt Sanitary Sewer Comprehensive Plan Update

Background:

Following the completion of the City's Journey to 2040 Comprehensive Plan, the City began the process of updating the comprehensive plans for the City's Water, Sanitary Sewer and Storm Sewer systems to make sure that these critical infrastructure plans aligned with the Journey to 2040 plans to provide utility systems that can accommodate the City's growth and development visions. The previous Sanitary Sewer Comprehensive plan was last updated in 2004 as part of the Urban Growth Study. Many improvements from the previous plan have been completed, but given the dramatic change in population growth estimates and development trends since the 2004 plan, it was important to compare the Journey to 2040 Comprehensive Plan to the existing sanitary sewer system and identify future capital improvements.

The main purposes of the update of the comprehensive plan were:

- Evaluate existing and future sanitary sewer trunk lines in coordination with the City's recently adopted 2040 Comprehensive Plan
- Evaluate the possible effect of a connection from Medford
- Evaluate current and future lift station capacity needs
- Develop a dynamic digital model of the sanitary sewer system that can be updated and evaluated as new development proposals come in that are different from the assumptions made at the time of the report.

City Staff presented a high level overview of the results of the Compressive Sanitary Sewer Plan update at the April 6, 2021 Council Work Session. Since that time, no changes have been made.

Recommendation:

Adopt Sanitary Sewer Comprehensive Plan Update

Attachments:

1. Sanitary Sewer Comprehensive Plan Update



Real People. Real Solutions.

Engineer's Report for

Sanitary Sewer Comprehensive Plan Update Faribault, MN

March 05, 2021

Submitted by:

Bolton & Menk, Inc.
2035 County Road D East
Maplewood, MN 55109
P: 651-704-9970
F: 651-704-9971

Certification

Engineer's Report

For

Sanitary Sewer Comprehensive Plan Update

City of Faribault
Faribault, MN
N14.119669

03/05/2021

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

By:



Timothy J. Olson, P.E.
License No. 49129

Date: March 5, 2021

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I. BACKGROUND

The Sanitary Sewer Comprehensive Plan Update is a concentrated effort to provide the City of Faribault with working knowledge of the flow characteristics of the sanitary sewer system, identify issues, concerns, or deficiencies with the collection system, and recommend changes or improvements that would address issues and benefit system operation for the long term. Potential changes in land use, i.e. commercial to mixed use residential or residential to commercial could change sanitary sewer flow rates. Therefore, understanding the current sanitary sewer system capacity is critical in planning for future sewer connections to the system. Figure 1 in Appendix A is a map showing the study extents.

Existing sanitary flow gaging data, collected from the months of January 2020 – June 2020, was used to analyze the current sanitary sewer system and daily flow variations. The existing and future sanitary sewer system was then analyzed using a hydrodynamic hydraulic model within Autodesk's Storm and Sanitary Analysis (SSA) software.

II. PREVIOUS PLANS

A City Sanitary Sewer System Plan was prepared and adopted in the early 1990's. The plan included:

- Quantification of the magnitude of deterioration and capacity within the trunk and interceptor system.
- Cost estimate of improvements to correct the deterioration and capacity problems.
- Determination of the extent of required trunk and interceptor replacements and extensions as well as their associated costs.
- A database of existing sanitary sewer conditions and parameters.

The 1990's Sewer Plan contained a list of improvements and recommendations to be constructed over the next 20 years. Below is a list of the priority 1 recommendations and improvements. The remaining list of priorities are in Table 1. The original list is included in "Section XII – Priorities" in the 1993 Comprehensive Sanitary Sewer Study.

- Priority 1 Improvements
 - Locate/Correct State School Inflow
 - Completion is Unknown.
 - Further I/I Study
 - A brief I/I analysis is included within this update. The I/I analysis included within this report should not be considered as a comprehensive I/I analysis for the Faribault sanitary sewer system.
 - Additional Manhole Data Collection
 - Faribault has GIS data that contains these attributes.
 - Eliminate I/I Sources
 - Completion is Unknown

Table 1: 1993 Comprehensive Sanitary Sewer Study Priority List

Priority 2 Improvements				
Trunk Line ID	Segment ID	1993 Pipe Size (in)	2010 Recommended Pipe Size (in)	2020 Existing Pipe Size (in)
A	A-29, A-30	Not Constructed	15	15
A-2	A2-7, A2-8	Not Constructed	12	15
B	B-1 through B-11	8, 10, 12, 15, 18, 24	8, 12, 16, 18, 21, 24, 30	10, 12, 15, 16, 18, 27
C-2	C2-2	8	12	12
I	I-11 through I-13	Not Constructed	24	24
Priority 3 Improvements				
A-2	A-9 through A-14	18, 21, 24	24, 27	27, 30
B-2	B2-1 through B2-4	Not Constructed	12, 15	12, 15
C	C-1 through C-5	12, 18	15, 18, 21, 24	12, 27
Priority 4 Improvements				
A	A-3, A-4, A-5	24	30	24, 30
B-3	B3-1, B3-2	10	15	10
C-1	C1-6	Not Constructed	10	8
E	E-4 through E-13	10, 12	15	12
F	F-1 through F-7	12, 15	15, 18, 21	18, 21, 24
Priority 5 Improvements				
B-1	B1-1, B1-2	12	15	10, 12
F-1	F1-1 through F1-5	Not Constructed	12, 15	8

Comparing the existing 2020 pipe sizes to the recommended 2010 and 1993 pipe sizes, most of the segments that were identified in the 1990 Sanitary Sewer Plan were upsized and reconstructed. Segments B1-1, B1-2, B3-1, B3-2, and E-4 through E-13 were the only segments that were not upsized based off of a comparison between the City's GIS data and the 1993 recommendations.

In late 2006, an Urban Growth Study was completed to plan for effective and economical management of infrastructure to serve the City of Faribault's future growth needs. The existing and proposed sanitary sewer system plan was analyzed and updated. The Sanitary Sewer section of the Urban Growth Study outlines the following:

- Sanitary Sewer Districts
- Design Criteria
 - Average Wastewater Flow
 - Design Peak Wastewater Flow
 - Existing System Flows

- System Design
- Proposed Trunk System
- Cost Analysis
 - Cost Estimates
 - Area Charges

Comparing the existing 2020 sanitary sewer system to the future trunk lines proposed within the 2006 Urban Growth Study, very few of the proposed trunk lines have been constructed. The 2020 Comprehensive Sanitary Sewer Plan update works to improve and update both the 1993 Comprehensive Sanitary Sewer Study and the 2006 Urban Growth Study Sanitary Sewer section.

III. SANITARY SEWER FLOW MONITORING

A flow monitoring study was conducted in 2020 throughout the City. Twelve manholes were metered for approximately 5 months, January 24th to June 25th. Flow rate data was recorded at 15-minute intervals throughout the monitoring study. Precipitation data was downloaded from the Faribault weather station using National Oceanic and Atmospheric Administration's (NOAA) historical climate data service. The precipitation data was used to differentiate between dry and wet weather days. Sanitary data from dry weather days were used to determine flows that represent the sanitary sewer system on a typical day, without precipitation. Sanitary data from wet weather days were used to determine flows that represent the sanitary sewer system during rainfall events. The data was used to ultimately create diurnal flow patterns for each of the gaged sewersheds and to calibrate the model accordingly. Locations of the gages are listed below and a map showing the twelve flow monitoring locations is included in Figure 2 in Appendix A.

- Gage 1 – Intersection of Industrial Drive and 30th Street NW
- Gage 2 – Intersection of Park Avenue NW and 17th Street NW
- Gage 3 – Intersection of Park Avenue NW and 17th Street NW
- Gage 4 – 570 feet N of Hulett Avenue and 7th Street NW Intersection
- Gage 5 – 420 feet N of 8th Street NW and 8th Avenue NW Intersection
- Gage 6 – 815 feet W of Prairie Avenue and Springwood Lane Intersection
- Gage 7 – 405 feet W of 9th Avenue SW and Spring Road SW Intersection
- Gage 8 – 150 feet W of Willow Street and 10th Street SW Intersection
- Gage 9 – 3,000 feet S of WWTP along Railroad Tracks
- Gage 10 – At WWTP
- Gage 11 – At WWTP
- Gage 12 – Intersection of Central Avenue and 15th Street NW

IV. LAND USE

The City of Faribault has geographic information system (GIS) shapefiles describing the existing land use. Table 2 shows the breakdown of the total acreage for each land use for the existing scenario. Figure 3 in Appendix A is a map showing the existing land use.

Table 2: Existing Land Use

Existing Land Use	
Land Use Classification	Acres
Commercial Downtown	25
Commercial Highway	330
Industrial	534
Park	1,064
Public/Semi-Public Land	1,097
Multi-Family Residential	225
Single Family Residential	1,821
Mobile Home Park	114
Waterbodies	294
ROW	1,605
Railroad ROW	132
Schools	429
Vacant Agricultural	2,200
Total Existing City Limits	9,870

V. SANITARY SEWER ANALYSIS CRITERIA

A. SEWERSHEDS

Sanitary sewersheds were delineated at strategic locations to define critical service flows in the sanitary sewer system. For each individual parcel, sewer service connections were provided by the City. The sanitary sewer system was evaluated and broken up into critical design segments. Each end of a design segment had a node assigned to it. Generally, the nodes were designated for the following reasons:

1. Simplification of the sanitary sewer system.
2. Change in pipe size.
3. Change in pipe direction.
4. Sewershed size.
5. Flow meter location.

Following these criteria, 151 major nodes were identified throughout the sanitary sewer system. Sewersheds were delineated to these nodes using current Faribault parcel data. Figure 4 in Appendix A is a map showing the 151 node locations and sewersheds.

B. SANITARY SEWER FLOW ESTIMATION

Municipal wastewater is made up of a mixture of domestic sewage, commercial and industrial wastes, groundwater infiltration, and surface water inflows. With proper design and construction, groundwater infiltration and surface water inflows, referred to as I/I, can be minimized. Sanitary sewer base flowrates for both existing and future conditions were estimated based on the following approach.

For most land uses, unit rates/acre were used to generate base flow estimations. The exception being existing residential areas, in which households were counted and base flows were estimated on a rate/unit basis. The flow rate per household was developed using the current 2010 census data to determine the average residents per household and using flow data from a sanitary meter that was located in a predominantly residential area. The sanitary meter that was selected for the calculation was located within an area that was approximately 95% residential, based on parcel area. The residential flowrate calculation is summarized in Table 3.

Table 3: Residential Flowrate Calculation

Residential Flowrate Calculation	
2010 Census Population	23,352
Total number of Households	8,317
People/Household	2.8
Average flow from metered sewershed (gpd)	77,623
# of Households in metered sewershed	273
Residential Base Flow (gpd/household)	284

Residential flowrates were estimated at 284 gallons per household per day. It was assumed that this flowrate was representative of all residential units in Faribault. Table 4 was used to estimate flowrates from all other land uses based on a generalized volume per day per acre.

Table 4: Waste Generation Rates

Waste Generation Rates		
Land Use	Updated Gal/acre-day	2006 Urban Growth Study Gal/acre-day
High Density Residential	2,700	2,205
Medium Density Residential	1,575	1,512
General Industrial	1,500	1,000
Industrial/Mixed Use	1,500	1,000
Commercial	1,000	1,000
Corporate Campus	1,000	1,000
Waste Management	1,000	1,000
Downtown	1,000	1,000
Regional Commercial	1,000	1,000
Public Institutional	1,000	800
Neighborhood Commercial	1,000	1,000
Agriculture	0	0
Existing Parks/Open Space	0	0

C. DAILY FLOW VARIATION

Flow rate data from the flow monitoring study was used to create accurate daily flow distributions, known as diurnal curves, as shown in Exhibit 1 and Exhibit 2.

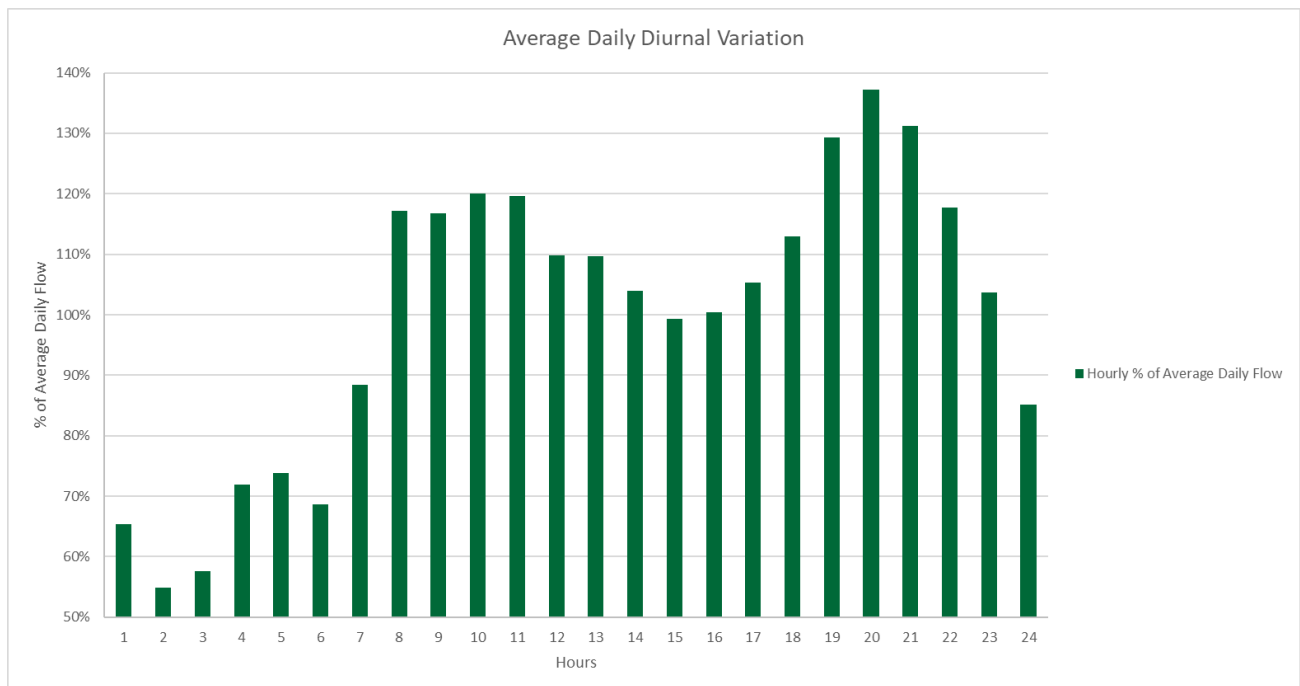


Exhibit 1: Residential Diurnal Curve Variation

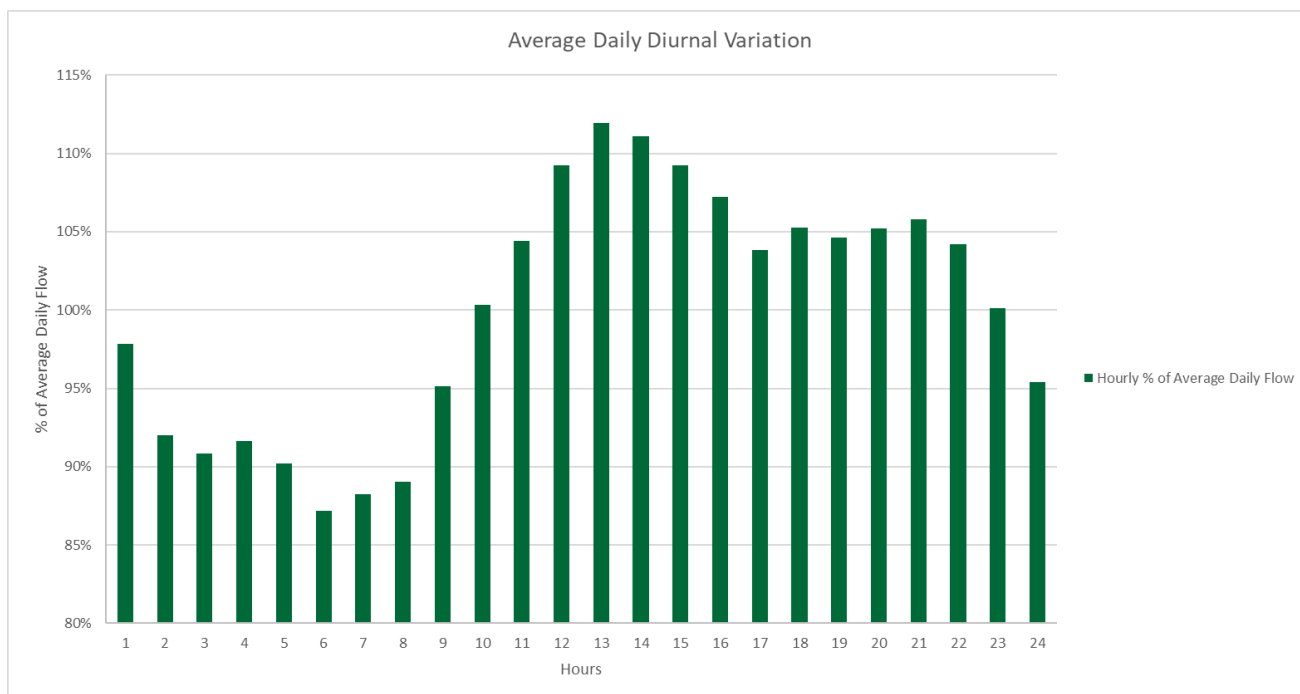


Exhibit 2: Industrial Diurnal Curve Variation

These curves represent the hourly variation in flow as a percent of the daily average flowrate. Diurnal curves allow for the creation of a hydrodynamic model which accounts for the travel time in the sanitary sewer instead of assuming a constant peak flowrate. The curve in Exhibit 1 shows a diurnal curve from a residential area which peaks in both the morning and evening when residential production of wastewater is at its highest. The curve in Exhibit 2 shows a diurnal curve from an industrial area which sees a more consistent flow pattern throughout the working day. Diurnal curves were created for each metered sewershed for both dry and wet weather scenarios. The dry weather diurnal curves were created by including flow meter data from days without any recorded precipitation. The wet weather diurnal curves were created by including flow meter data from days with captured rainfall data and the following day to account for the travel time of inflow and infiltration within the sanitary sewer system.

VI. HYDRAULIC MODELING

Existing GIS data was used to populate rim, invert, and pipe size information. Areas with missing data were assumed based on adjacent system geometry and assuming minimum grade on pipes (based on the 10 State Standards for Wastewater Facilities, Table 5). The flow data was then populated into the model and the flow meter diurnal curves were added to vary the influent sanitary flows throughout the day.

Table 5: 10 State Standards - Recommended Minimum Pipe Slopes

Recommended Minimum Pipe Slopes	
Pipe Size (in)	Minimum Slope (ft/100ft)
8	0.40
10	0.28
12	0.22
15	0.15
18	0.12
21	0.10
24	0.08
27	0.067
30	0.058
33	0.052

Model calibration was achieved by comparing the model simulated flows with measured flows at each of the flow meter locations. The model was calibrated to match observed flows by iteratively adjusting model parameters, such as adding additional flow factors. The dry weather scenario was calibrated to match observed flows during a typical dry weather day. For this study, the days of 2/24/2020-2/28/2020 were selected to calibrate the dry weather modeled data. Exhibit 3 shows the dry weather calibration for flow meter location 9.

The wet weather scenario was calibrated to match observed flows during the day with the largest captured rainfall. For this study, the largest rain event of approximately 2.35", captured on 5/17/2020 followed by approximately 1.17" captured on 5/18/2020, was used to calibrate the wet weather modeled data. Exhibit 4 shows the wet weather calibration for flow meter location 9. Graphs of modeled versus measured dry and wet weather flows, for each flow meter sewershed, were analyzed to confirm that the model adequately simulates the sanitary sewer system flow characteristics. The flow meter at location 11 was not operating properly during the 5/17 and 5/18 rainfall events and did not capture accurate data. For the wet weather calibration of the flow meter 11 sewershed; wastewater treatment plant (WWTP) inflows from July 2017-August 2019 were analyzed and compared against precipitation data. A similar rainfall event of 4.07", captured on 9/4/2018, was used to calibrate the flow meter 11 sewershed. The sewershed 11 diurnal curve was iteratively adjusted so that the peak inflow at the WWTP in the model closely matched the WWTP peak inflow on 9/4/2018.

Additional flow factors were also added to the sewersheds that contribute to the 11 lift stations located throughout the City. One year of weekly lift station pump runtime data was analyzed to determine a dry and wet weather average flow rate discharged from each lift station.



Exhibit 3: Dry Weather Calibration

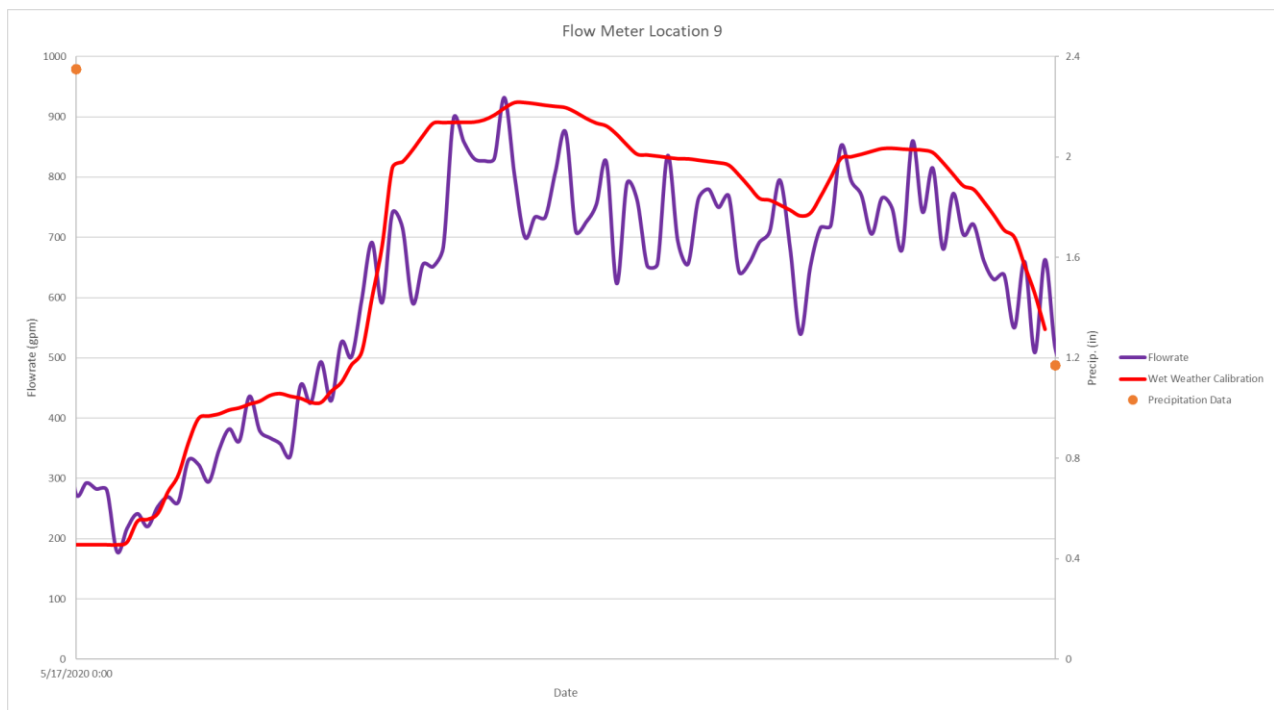


Exhibit 4: Wet Weather Calibration

VII. MODELING RESULTS

The sanitary sewer system was analyzed to locate segments that are currently undersized and segments that are operating above 50% of the full pipe capacity. For our evaluation, 50% of full pipe capacity was used as a design goal to identify pipes that are nearing their design capacity. A pipe is operating at its most efficient at 80% full.

A. EXISTING DRY WEATHER

The existing dry weather model describes the City's existing sanitary sewer system calibrated with dry weather flows and diurnal curves observed during the flow monitoring study. Figure 6 in Appendix A is a map showing the existing dry weather pipe capacity. Table 1 in Appendix C is a pipe capacity table for the existing dry weather scenario. Table 1 describes the dry weather flowrates, pipe size, length, upstream and downstream invert elevations, pipe slope, and designed pipe capacity.

B. EXISTING WET WEATHER

The existing wet weather model describes the City's existing sanitary sewer system calibrated with peak wet weather flows and the diurnal curve observed during the largest recorded rainfall. Capacity issues present in the dry weather scenario are magnified within the wet weather scenario. Additional capacity issues are also present within the wet weather scenario. Figure 7 in Appendix A is a map showing the existing wet weather pipe capacity. Table 2 in Appendix C is a pipe capacity table for the existing wet weather scenario.

C. EXISTING WET WEATHER WITH MEDFORD INFLOWS

City of Faribault is considering connecting the City of Medford to their sanitary sewer system. A future average peak flow of 250,000 gallons per day would be discharged to the system at the proposed connection point near the Divine Mercy Church on County Road 45. The additional flow during this scenario was added to the existing conditions modeling. A peaking factor was not applied to the City of Medford's inflow because it was already accounted for when calculating the future flow from Medford. The existing wet weather with Medford inflows model describes the City's existing sanitary sewer system calibrated with peak wet weather flows, the diurnal curve observed during the largest recorded rainfall, and the future Medford inflow. Capacity issues present in the wet weather scenario are magnified within the wet weather with Medford inflows scenario. Figure 8 in Appendix A is a map showing the existing wet weather pipe capacity with Medford inflows. Table 3 in Appendix C is a pipe capacity table for the existing wet weather with Medford inflows scenario.

VIII. EXISTING CAPACITY ISSUES

The City of Faribault was split into three distinct districts, North, South, and East to analyze issues within the sanitary sewer system. Figure 9 in Appendix A is a map showing the three sanitary districts. The following capacity issues are based on the existing wet weather model with Medford inflows.

A. NORTH DISTRICT

1.SLOPE ISSUES

Table 6 describes pipes constructed with shallow slopes that create capacity issues within the sanitary sewer system. These segments of pipe have been identified on Figure 10 in Appendix A.

Table 6: North District Slope Issues

North District – Slope Issues				
Upstream MH ID	Downstream MH ID	Modeled Slope (%)	Length (ft)	Pipe Diameter (in)
1027	89	0.11	190	10
2764	2312	0.08	1,725	18

2.PIPE CAPACITY

Initial modeling indicates that there are multiple segments of pipe that are nearing their designed capacity and may be undersized. Table 7 summarizes the capacity issues.

Table 7: North District Capacity Issues

North District – Capacity Issues				
Upstream MH ID	Downstream MH ID	Modeled Pipe Capacity (%)	Length (ft)	Pipe Diameter (in)
413	1529	53-177	10,280	10
1529	1549	81	1,090	12
9117	9098	58-145	1,430	12
9098	2764	39-139	6,110	15
2764	2177	72-120	2,485	18
2177	2171	30-66	2,350	21

B. SOUTH DISTRICT

1.SLOPE ISSUES

Table 8 describes pipes constructed with shallow slopes that create capacity issues within the sanitary sewer system. These segments of pipe have been identified on Figure 10 in Appendix A.

Table 8: South District Slope Issues

South District – Slope Issues				
Upstream MH ID	Downstream MH ID	Modeled Slope (%)	Length (ft)	Pipe Diameter (in)
2464	2466	0.01	415	10
2802	1198	0.03	345	12
1363	1353	0.10	270	12
2469	2468	0.06	190	12
1501	1502	0.11	365	15
268	1505	0.06	500	15
2902	1841	0.07	270	15
1238	1239	0.02	390	21
2835	2836	0.00	210	24
2840	2831	0.00	145	24
2449	2857	0.01	201	30

2.PIPE CAPACITY

Besides the slope issues mentioned above, the initial modeling indicates that the sanitary sewer system located within the South District is operating below capacity. The South District sanitary sewer has plenty of available capacity to convey the 250,000 gpd, 174 gpm, inflow from Medford.

C. EAST DISTRICT

1.SLOPE ISSUES

Table 9 describes pipes constructed with shallow slopes that create capacity issues within the sanitary sewer system. These segments of pipe have been identified on Figure 10 in Appendix A.

Table 9: East District Slope Issues

East District – Slope Issues				
Upstream MH ID	Downstream MH ID	Modeled Slope (%)	Length (ft)	Pipe Diameter (in)
2934	2932	0.10	190	15

2.PIPE CAPACITY

Initial modeling indicates that there are multiple segments of pipe that are nearing their designed capacity and may be undersized. Table 10 summarizes the capacity issues.

Table 10: East District Capacity Issues

East District – Capacity Issues				
Upstream MH ID	Downstream MH ID	Modeled Pipe Capacity (%)	Length (ft)	Pipe Diameter (in)
2150	661	46-77	1935	18

Future land use changes and City expansion scenarios were analyzed separately and are discussed below.

IX. FUTURE CITY EXPANSION AND REDEVELOPMENT

The City of Faribault maintains parcel data describing future land use, both inside and outside of the existing city limits. Future land use changes and City expansion, per the 2040 Comprehensive plan, were built into a future conditions model. As redevelopment and expansion occurs, the effective sanitary sewer service flows will also change. These flow changes could occur in multiple forms.

- Magnitude – changing land use could change the number of employees and/or homeowners/renters in a building, which may increase or decrease the expected amount of sanitary flow. Further, expanding the city and constructing future developments will ultimately affect and increase sanitary flow rates.
- Pattern – conversion of commercial space to mixed use/residential will also change timing of daily peak flow rates. Commercial uses tend to stretch sanitary flow over the course of the operating hours, while residential areas often see a peak flow in the morning and evening. These new coincidental peaks through the course of the daily diurnal curve could impact the sewer’s ability to manage the daily peak and/or the wet weather or special event peak flow (represented by a peaking factor).

Table 11 below shows the breakdown of the total acreage for each land use for the future scenario. Figure 11 in Appendix A is a map showing the future land use. Table 4 was used to quantify future flowrates from redevelopment sites and future developments. According to the City’s GIS data, the average residential property size for “Established Residential Neighborhoods” is a third of an acre. It was assumed that three residential properties would be constructed per acre and a future flowrate of 852 gpd/acre was used to estimate flows from the land use called “Planned Residential Neighborhoods”.

A peaking factor was applied to the flows throughout the sanitary sewer system where future development is planned and where land uses have changed. A peaking factor is an empirically derived variable used to estimate the peak flow in a pipe based on the average flow calculated in the pipe. Metropolitan Council Environmental Services (MCES) values from the 2016 Inflow & Infiltration Task Force Report were used when determining peaking factors, Table 12.

Table 11: Future Land Use

Future Land Use	
Land Use Classification	Acres
Airport	295
City Park/Open Space	1,208
Commercial	126
Commercial/Industrial Mixed Use	2,647
Commercial/Residential Mixed Use	909
Downtown	56
Established Residential Neighborhood	2,034
Golf Course	261
Industrial	1,874
Institutional	888
Major Utility	208
Other Park/Recreation/Open Space	910
Planned Residential Neighborhood	2,242
Rural Estate/Agriculture	557
Railroad	128
Total City Limits	14,343

Table 12: Peaking Factors

MCES Peak Hourly Flow Factor*	
Average Flow (MGD)	Peaking Factor
0.00 – 0.11	4.0
0.12 – 0.18	3.9
0.19 – 0.23	3.8
0.24 – 0.29	3.7
0.30 – 0.39	3.6
*Truncated Table	

X. FUTURE RECOMMENDATIONS

The future land use changes discussed above were used to create a future conditions model. The future sanitary model describes the City's future sanitary sewer system after future development and improvements made to the existing sanitary sewer system. The future conditions model also includes the inflow from Medford. Figure 12 in Appendix A is a map showing the future conditions pipe capacity after improvements to the existing sanitary sewer system. Table 4 in Appendix C is a pipe capacity table for the future condition scenario after improvements. The pipes operating above 100% capacity in Figure 12 describe pipes constructed with shallow slopes that create capacity issues within the sanitary sewer system. These pipes have been identified in Section IX "Existing Recommendations" and are identified on Figure 10 in Appendix A.

The future alignments shown generally follow the natural drainage of the land to minimize pipe depth and the use of lift stations. Existing and future lateral systems will deliver flow to the pipe network at multiple locations. Lateral systems were not specifically identified within this study. All future pipes were placed at slopes equal to or greater than the recommended minimum pipe slopes based on the 10 State Standards for Wastewater Facilities.

The City of Faribault was split into three distinct districts, North, South, and East to help describe the new construction and improvements that will need to be made to convey the flow from the future build out scenario. Table 13 contains brief descriptions of new construction needed within each district. Table 14 describes improvements that will need to be made to the existing sanitary sewer system in order to adequately convey the flow from the future build out scenario. Figure 13 in Appendix A is a map showing the future pipe sizes of the sanitary sewer system.

Table 13: Future New Construction

Future New Construction – North District			
Pipe Diameter (in)	Length (ft)	Forcemain (ft)	Lift Station
8	16,470	2,350	1
10	12,940		
12	6,830		
15	6,355		
18	8,985		
21	4,595		
24	3,210		
30	6,550		
Future New Construction – South District			
12	1,620	1,990	1
15	1,200		
21	6,835		
27	3,610		
30	4,990		
Future New Construction – East District			
No New Construction Proposed			

Table 14: Future Improvements to the Existing Sanitary Sewer System

North District Improvements				
Upstream MH ID	Downstream MH ID	Length (ft)	Existing Diameter (in)	Future Diameter (in)
2149	2180	520	8	12
2230	2243	2,380	10	12
Jun-351	225	1,510	8, 10	15
2243	412	1,535	10	15
2254	2	525	8, 10	18
Jun-477	412	2,840	10	18
9117	9098	1,430	10, 12	18
412	88	5,270	8, 10	21
2184	1070	4,295	12	21
88	863	3,290	10	24
1796 (Sanitary Siphon under River)	1797 (Sanitary Siphon under River)	180	12	24
1796 (Sanitary Siphon under River)	1797 (Sanitary Siphon under River)	180	16	24
9179	1072	2,015	8, 12	27
863	2169	3,345	10, 12, 15, 18	27
1066	2764	7,230	12, 15	36
2764	2177	2,490	18	42
2177	1796	3,280	21, 24, 27	48
1797	1803	1,220	27	48
South District Improvements				
845	456	4,280	8	12
1361	1362	390	8	15
1362	1363	380	10	18
2462	2423	1,640	10, 12	18
2423	2414	3,045	15	21
2361	204	2,190	10, 12	24
205	208	2,570	12	24

South District Improvements Continued				
Upstream MH ID	Downstream MH ID	Length (ft)	Existing Diameter (in)	Future Diameter (in)
2414	124	2,770	15	24
124	1506	2,120	15	27
1506	1238	5,800	21	30
1238	2443	5,950	21	33
1182	208	3,990	8, 12	36
529	2746	1,860	24	36
208	2802	780	12	39
2802	226	1,080	12	42
226	2443	1,910	27	48
2443	2746	7,660	24, 30, 33	60
East District Improvements				
992	9132	4,030	10, 12	15
2152	661	2,630	18	21

XI. LIFT STATION CAPACITY ANALYSIS

One year of weekly lift station runtime data was provided by the City. An analysis of existing dry weather flows (December-February) and existing wet weather flows (March-November) was completed. Table 15 and Table 16 contains the existing dry and wet weather results.

Table 15: Dry Weather Lift Station Capacity Analysis

Lift Station Capacity Analysis – Dry Weather						
Lift Station Name	GIS ID	Pump #	Pump Capacity (gpm)	Average Pump Runtime (min/day)	Total Lift Station Runtime (min/day)	Total Average Volume Pumped (gpd)
7 th St.	225	1	200	23.38	47.41	9,482
		2		24.03		
Cannon River	1299	1	372	37.08	71.49	26,595
		2		34.41		
Frink	309	1	375	16.45	30.46	11,423
		2		14.01		
Glynview	503	1	196	136.41	252.02	49,396
		2		115.61		
Hwy 60	204	1	300	8.17	16.99	5,097
		2		8.82		
Lind	2917	1	320	10.13	21.43	6,858
		2		11.30		
Matteson	9163	1	250	1.68	3.45	863
		2		1.77		
MetCon	9162	1	358	11.31	21.98	7,869
		2		10.67		
Park Ave.	1072	1	250	216.73	406.94	101,735
		2		190.21		
Viaduct	217	1	200	3.77	7.55	1,510
		2		3.78		
Willow	2936	1	200	33.94	69.33	13,866
		2		35.39		

Table 16: Wet Weather Lift Station Capacity Analysis

Lift Station Capacity Analysis – Wet Weather						
Lift Station Name	GIS ID	Pump #	Pump Capacity (gpm)	Average Pump Runtime (min/day)	Total Lift Station Runtime (min/day)	Total Average Volume Pumped (gpd)
7 th St.	225	1	200	35.55	72.74	14,548
		2		37.19		
Cannon River	1299	1	372	38.18	70.51	26,230
		2		32.33		
Frink	309	1	375	18.91	37.11	13,916
		2		18.20		
Glynview	503	1	196	143.98	265.75	52,087
		2		121.77		
Hwy 60	204	1	300	10.30	21.34	6,402
		2		11.04		
Lind	2917	1	320	10.68	18.31	5,859
		2		7.63		
Matteson	9163	1	250	1.68	3.45	863
		2		1.77		
MetCon	9162	1	358	16.05	30.25	10,830
		2		14.20		
Park Ave.	1072	1	250	270.32	524.23	131,058
		2		253.91		
Viaduct	217	1	200	5.62	14.32	2,864
		2		8.70		
Willow	2936	1	200	30.42	62.00	12,400
		2		31.58		

Given the results from the analyses above, the lift stations have a run time ranging from approximately 0.06 hours per day to approximately 6.78 hours per day during dry weather conditions and approximately 0.06 hours per day to approximately 8.74 hours per day during wet weather conditions. Given the daily average pump runtime, average daily pumped volume, and the pump capacities, the existing lift stations, in both the dry and wet weather conditions, appear to be operating below their designed capacities. An analysis of the future lift station capacities is included in Table 17.

Table 17: Future Conditions Lift Station Analysis

Lift Station Capacity Analysis – Future Conditions						
Lift Station Name	GIS ID	Pump #	Pump Capacity (gpm)	Maximum Pump Runtime (min/day)	Maximum Pumped Volume of Existing Lift Station (gpd)	Future Volume Needing to be Pumped (gpd)
7 th St.	225	1	200	720	288,000	1,250,000
		2		720		
Cannon River	1299	1	372	720	535,680	26,510
		2		720		
Frink	309	1	375	720	540,000	33,120
		2		720		
Glynview	503	1	196	720	282,240	671,000
		2		720		
Hwy 60	204	1	300	720	432,000	2,750,000
		2		720		
Lind	2917	1	320	720	460,800	9,432
		2		720		
Matteson	9163	1	250	720	360,000	Lift station not included in modeling
		2		720		
MetCon	9162	1	358	720	515,520	10,872
		2		720		
Park Ave.	1072	1	250	720	360,000	8,710,000
		2		720		
Viaduct	217	1	200	720	288,000	Lift station not included in modeling
		2		720		
Willow	2936	1	200	720	288,000	12,528
		2		720		
The lift stations highlighted with red text indicate that they will not have enough capacity to accommodate future flows.						

Given the lift station pump capacities and assuming that the lift stations are operating 24 hours per day during peak flows; a maximum pumped volume was calculated for the existing lift stations. In order to determine which lift stations must be upsized in the future; the existing lift station maximum pumped volume was compared to the volume that needs to be pumped in the future. The lift stations that will have to be upsized as the City continues to expand to its future growth boundaries include:

- 7th St. Lift Station
- Glynview Lift Station
- Hwy 60 Lift Station
- Park Ave. Lift Station

Lift station design criteria allows for a lift station to run 24 hours per day to pump the peak flows, assuming the peak flow does not happen all that often. Ideally, the City should continue to monitor lift station records as the City continues to grow. It is recommended that the City start to look into upsizing their lift stations as they near or exceed a total of 10 hours of runtime per day during dry weather scenarios. The lift station should then be upsized to handle the future peak design flows.

Within the future build-out scenario, we have identified that 2 additional lift stations will be needed to convey future flow. Due to the size of proposed LS 2, multiple pumps will be needed to convey the peak flow. Table 18 describes the future peak flows.

Table 18: Future Lift Station Capacity Analysis

Future Lift Station Capacity Analysis		
Lift Station Name	GIS ID	Future Volume Needing to be Pumped (gpd)
Proposed LS 1	Jun-467	405,000
Proposed LS 2	Jun-471	5,060,000

XII. INFLOW AND INFILTRATION (I/I) ANALYSIS

Infiltration is water that enters the sanitary sewer system by entering through defects in the sewer pipes, joints, manholes, and service laterals. Water that enters the sewer system from cross connections with storm sewer, sump pumps, roof drains, manhole covers, or by deliberate connection of building foundation drains is considered inflow. Water from I/I can consume available capacity in the wastewater collection system and increase the hydraulic load on the treatment facility. In extreme cases, the added hydraulic load can cause bypasses or overflows of raw wastewater. This extra hydraulic load also necessitates larger capacity collection and treatment components, which result in increased capital, operation and maintenance, and replacement costs. As sewer systems age and deteriorate, I/I can become an increasing problem. Therefore, it is imperative that I/I be reduced whenever it is cost effective to do so.

A high-level analysis of the City's I/I was performed using flow meter data from the 2020 flow monitoring study. I/I was estimated by comparing dry weather flow periods to wet weather flow periods. Table 19 shows the percent change in sanitary flowrates at the 12 flow meter locations caused by wet weather events. Figures comparing daily sanitary flowrates to rainfall are included in Appendix B.

Table 19: Wet vs Dry Weather I/I Analysis Summary – Flow Meters

I/I Analysis Summary – Flow Meters				
Flow Meter Location	Average Dry Flow (gpm)	Average Wet Flow (gpm)	% Change	Pipe Capacity at Flow Meter (gpm)
MH 9104	565.29	561.88	0.0	1,628
MH 88	131.98	137.78	4.4	539
MH 88	62.68	67.26	7.3	552
MH 2443	619.12	660.60	6.7	4,221
MH 1576	25.91	29.65	14.4	470
MH 1506	50.16	60.65	20.9	4,075
MH 1501	100.53	112.42	11.8	2,397
MH 9071	28.45	30.61	7.6	297
MH 661	429.61	458.65	6.8	2,002
MH 1811	590.27	615.03	4.2	3,173
MH 1799	792.92	800.72	1.0	4,173
MH 1831	249.65	257.38	3.1	3,917

A second high-level analysis of the City's I/I was performed using lift station data from 2020. I/I was estimated by comparing dry weather flow periods to wet weather flow periods. Table 20 shows the percent change in sanitary flowrates at the 11 lift station locations caused by wet weather events.

Table 20: Wet vs Dry Weather I/I Analysis Summary – Lift Stations

I/I Analysis Summary – Lift Stations			
Lift Station Name	Average Dry Flow (gpd)	Average Wet Flow (gpd)	% Change
7 th St.	9,482	14,548	53.4
Cannon River	26,595	26,231	0.0
Frink	11,422	13,917	21.8
Glynview	49,396	52,087	5.4
Hwy 60	5,097	6,402	25.6
Lind	6,857	5,859	0.0
Matteson	863	863	0.0
MetCon	7,868	10,832	37.7
Park Ave.	101,736	131,057	28.8
Viaduct	1,510	2,864	89.7
Willow	13,867	12,401	0.0

The data indicates that nearly every sewershed that contributed to a flow meter manhole or lift station was affected by I/I. Out of approximately 700,000 ft of sanitary sewer, 35% of the gravity sewer pipe is constructed out of vitrified clay pipe (VCP). VCP is a brittle pipe that tends to crack and breakdown due to expanding and settling soils, tree roots, etc. The amount of VCP pipe within the sanitary sewer system could be the leading cause of I/I within the system. Figure 5 in Appendix A is a map showing the VCP pipe located throughout the sanitary sewer system.

XIII. COST ESTIMATE

Preliminary cost estimates were put together for the new construction and improvements needed to convey the flow from the future build out scenario within each district. The cost estimates for the future sanitary sewer system are in Appendix D.

XIV. CONCLUSION

A. EXISTING WET WEATHER WITH MEDFORD INFLOWS MODELING

Initial modeling indicates that the modeled sanitary sewer is likely operating below its designed capacity throughout most of the system. The South District sanitary sewer has plenty of available capacity to convey the 250,000 gpd, 174 gpm, inflow from Medford. Table 21 lists the pipe segments that may be operating close to or above their designed capacity.

Table 21: Existing Capacity Issues

Existing Capacity Issues	
Slope Issues	
Upstream MH ID	Downstream MH ID
1027	89
2764	2312
2464	2466
2802	1198
1363	1353
2469	2468
1501	1502
268	1505
2902	1841
1238	1239
2835	2836
2840	2831
2449	2857
2934	2932
Pipe Capacity Issues	
413	1549
9117	2171
2150	661

Table 22 describes the equivalent amount of acreage that could be developed within the southern part of the city if the flow from Medford, 250,000 gpd, 174 gpm, was not added to the City of Faribault's sanitary sewer system. Any combination of land uses could be analyzed to determine the equivalent amount of flow equal to 250,000 gpd.

Table 22: Medford Equivalent Development

Medford Equivalent Development			
Land Use	Flowrate (gal/acre-day)	Area (acres)	Total Flow (gpd)
Planned Residential Neighborhood	852	294	250,000
Commercial	1,000	250	250,000
Industrial	1,500	167	250,000
50% Industrial, 50% Commercial	1,500, 1,000	83, 125	250,000
50% Commercial, 50% Residential	1,000, 852	125, 147	250,000

B. FUTURE CONDITIONS MODELING

It is important that each area is re-evaluated at the time of final design to confirm the criteria used in this study and to make any appropriate updates and/or changes to the models. Table 23 is a summary of pipe lengths needed to convey the flows from the full build out scenario.

Based off of the City's GIS data, there are multiple segments of pipe constructed with shallow slopes and create capacity issues within the sanitary sewer system. The pipe segments have been identified on Figure 10 in Appendix A. These segments of pipe should be replaced with future street reconstruction projects and placed at the recommended minimum pipe slopes according to the 10 State Standards Guidelines. Increasing the slope within these pipe segments will increase the available pipe capacity and will benefit system operation in the long term. There are also multiple segments of pipe that were constructed as vitrified clay pipe (VCP), approximately 35% of the whole system. These segments of pipe should be replaced with future street reconstruction projects and replaced with an appropriately sized PVC pipe. Replacing the older VCP pipe could also remove potential I/I sources and benefit system operation for the long term.

Table 23: Summary of Future Improvements

Summary of Future Improvements	
Pipe Size (in)	Pipe Length (ft)
8	16,470
10	12,940
12	15,630
15	15,020
18	15,800
21	26,670
24	14,390
27	11,090
30	17,340
33	5,950
36	13,080
39	780
42	3,570
48	6,410
60	7,660
Forcemain	4,340
Structure ID	# of structures
Lift Station	2

C. FUTURE MODEL UPDATES

It is important to note that these models can be used by the City or updated by Bolton & Menk to maintain an accurate existing conditions model and simulate proposed developments as they are planned throughout the City. The models are easily adjustable and updatable. When future development is planned and proposed, future flows can be added to the existing model on a case by case basis to analyze downstream impacts. Keeping the models up to date will help the City determine when and where improvements need to be made in order to convey flows from a future development project.

D. I/I REDUCTION PLAN

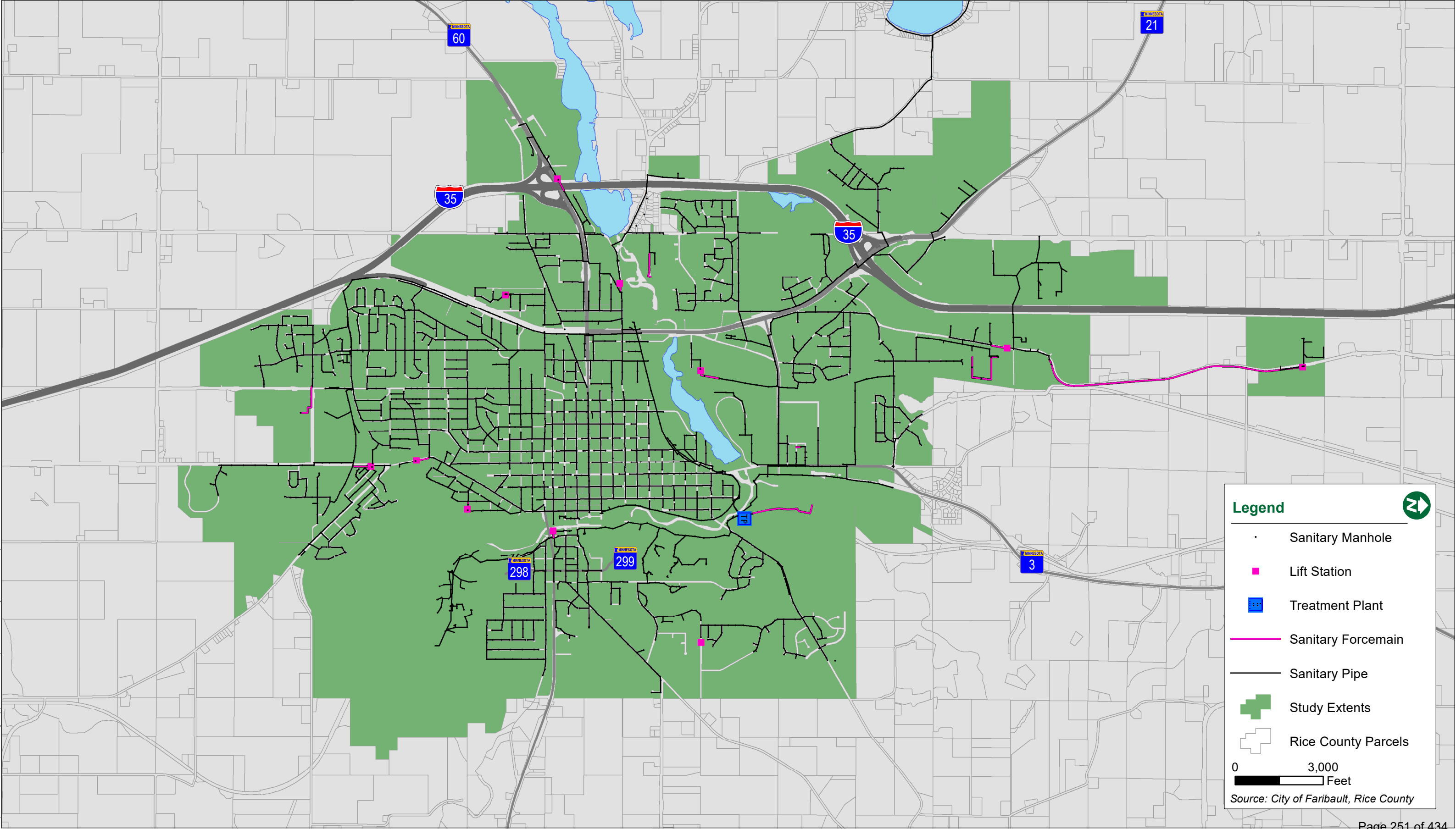
If no procedures are currently in place, the City may benefit from taking a proactive approach by introducing and creating a plan to reduce the amount of I/I throughout the City. The following procedures could be implemented to locate sources of I/I and reduce flow values:

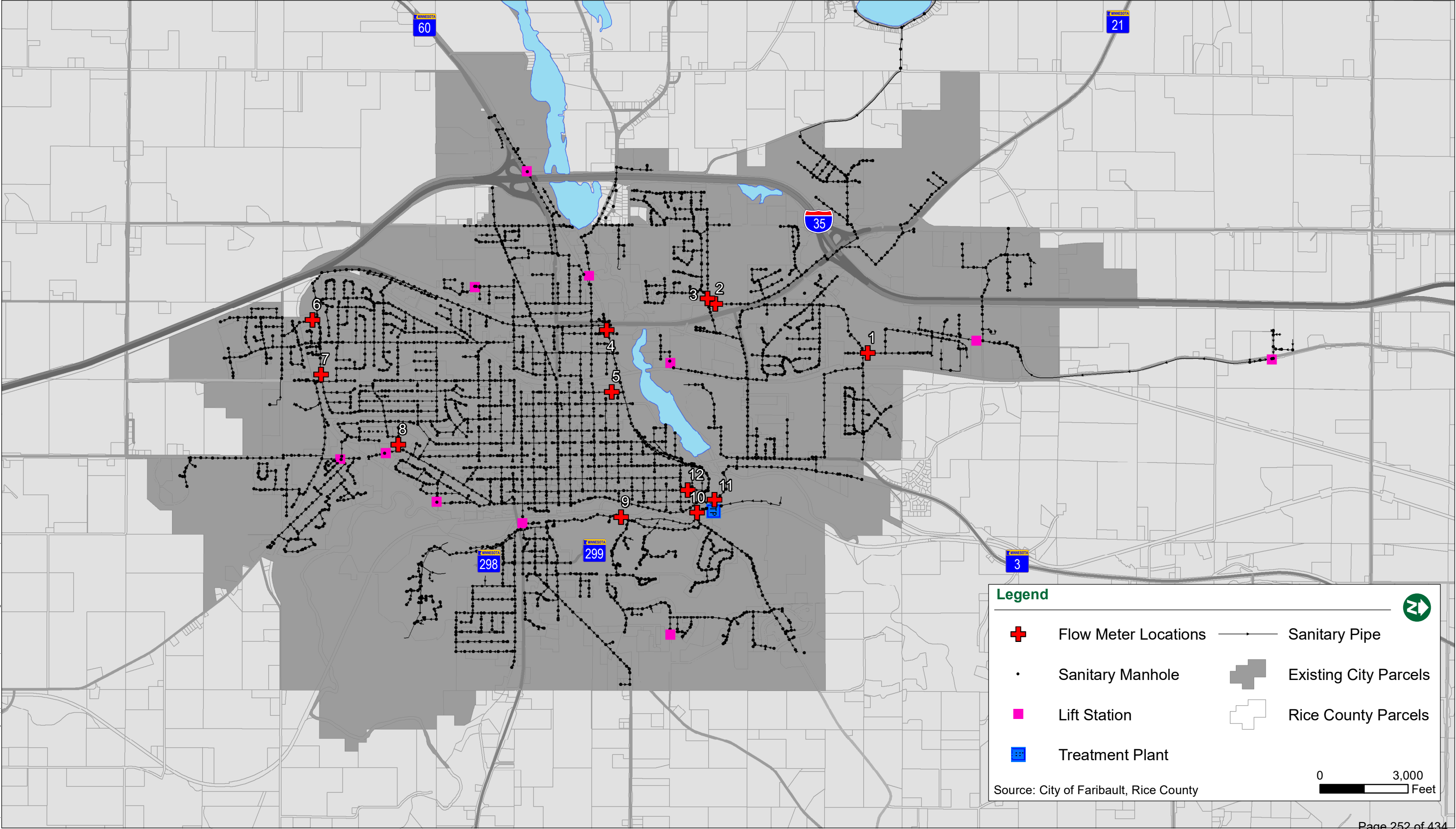
- In conjunction with street reconstruction/improvement projects the City can recommend cleaning and televising all sanitary sewer mains and inventory all structures for deficiencies including inflow and infiltration. The repair work can then be incorporated into the project.
- When potential problems are found to be coming from private property, the City can further investigate the possibility of illicit discharge of stormwater by sump pump or roof leader connections. Coordination with the affected property owners and appropriate corrective action can be initiated.
- Implement requirements for new sanitary sewer and home construction. New sewer construction can be pressure tested prior to approval and acceptance by City staff. New developments can also be required to implement flow meters after construction. This will help the City determine the actual flow coming from the developments and to keep the sanitary models up to date.

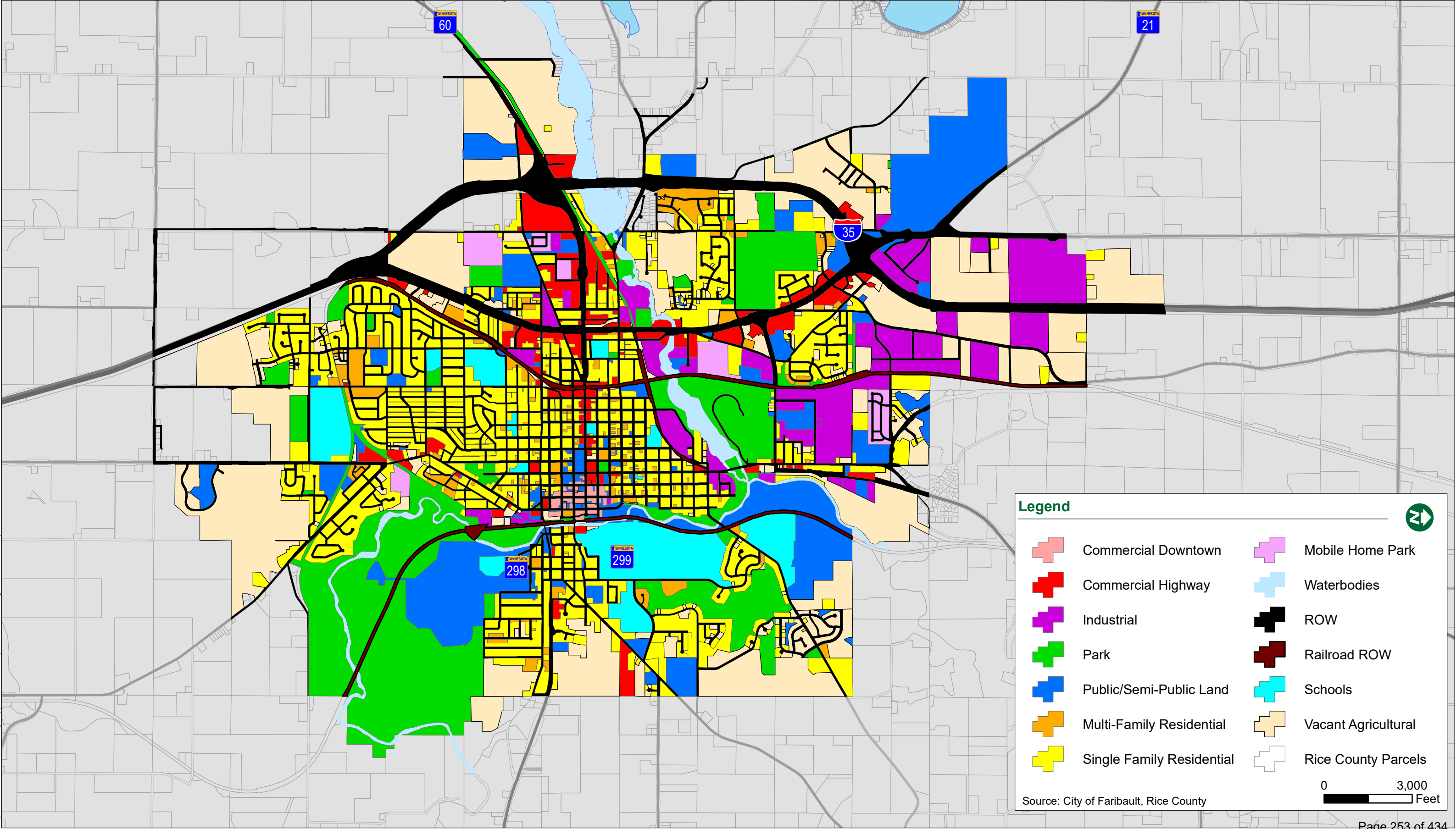
E. FUTURE SANITARY SEWER ALIGNMENT ALTERNATIVES

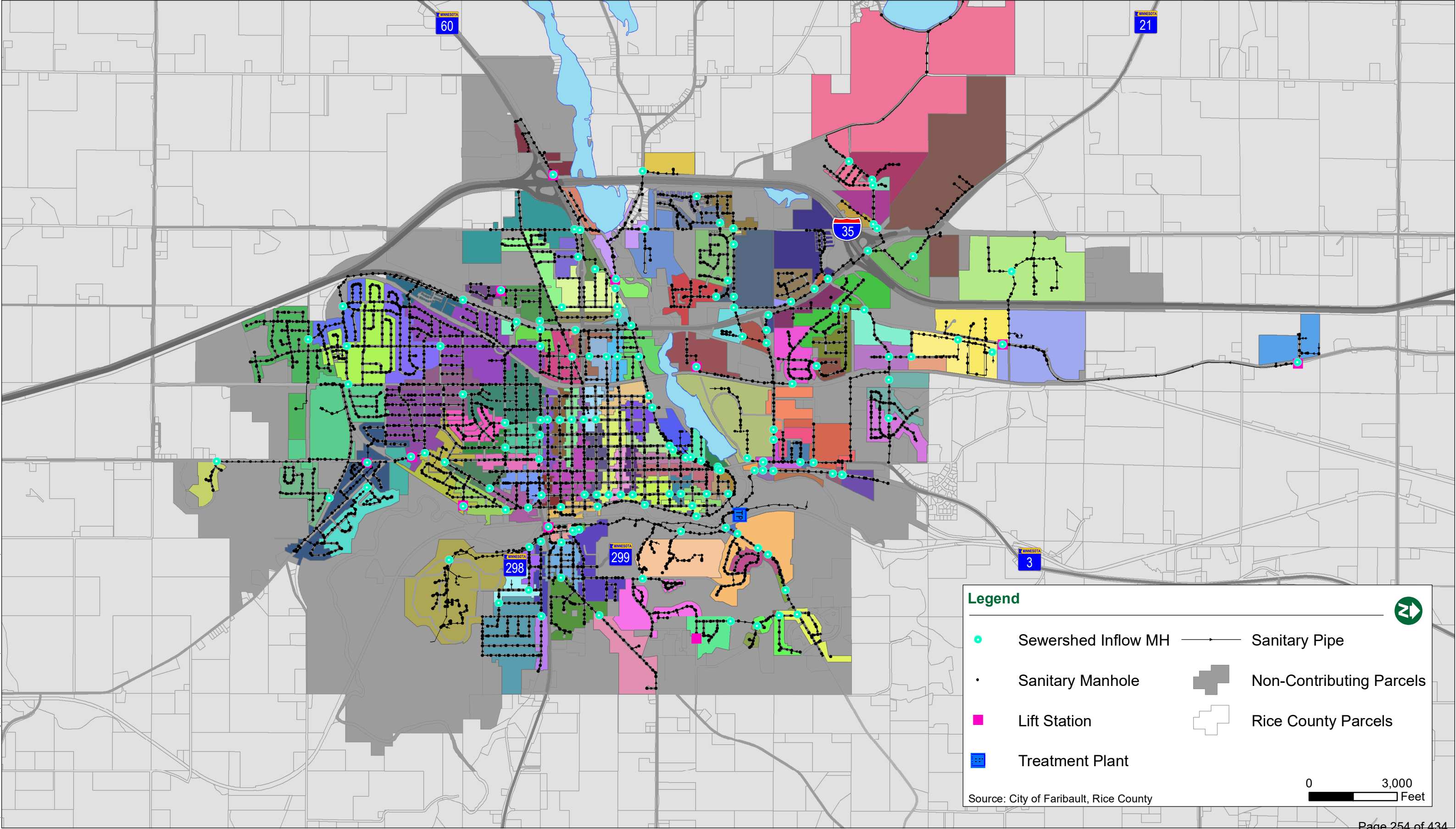
Two future alignment alternatives were discussed with the City. Figure 14 and Figure 15 in Appendix A are maps showing the two different alternative scenarios. Figure 14 and 15 were put together to graphically represent the two alternatives. These alternatives were not modeled nor analyzed further.

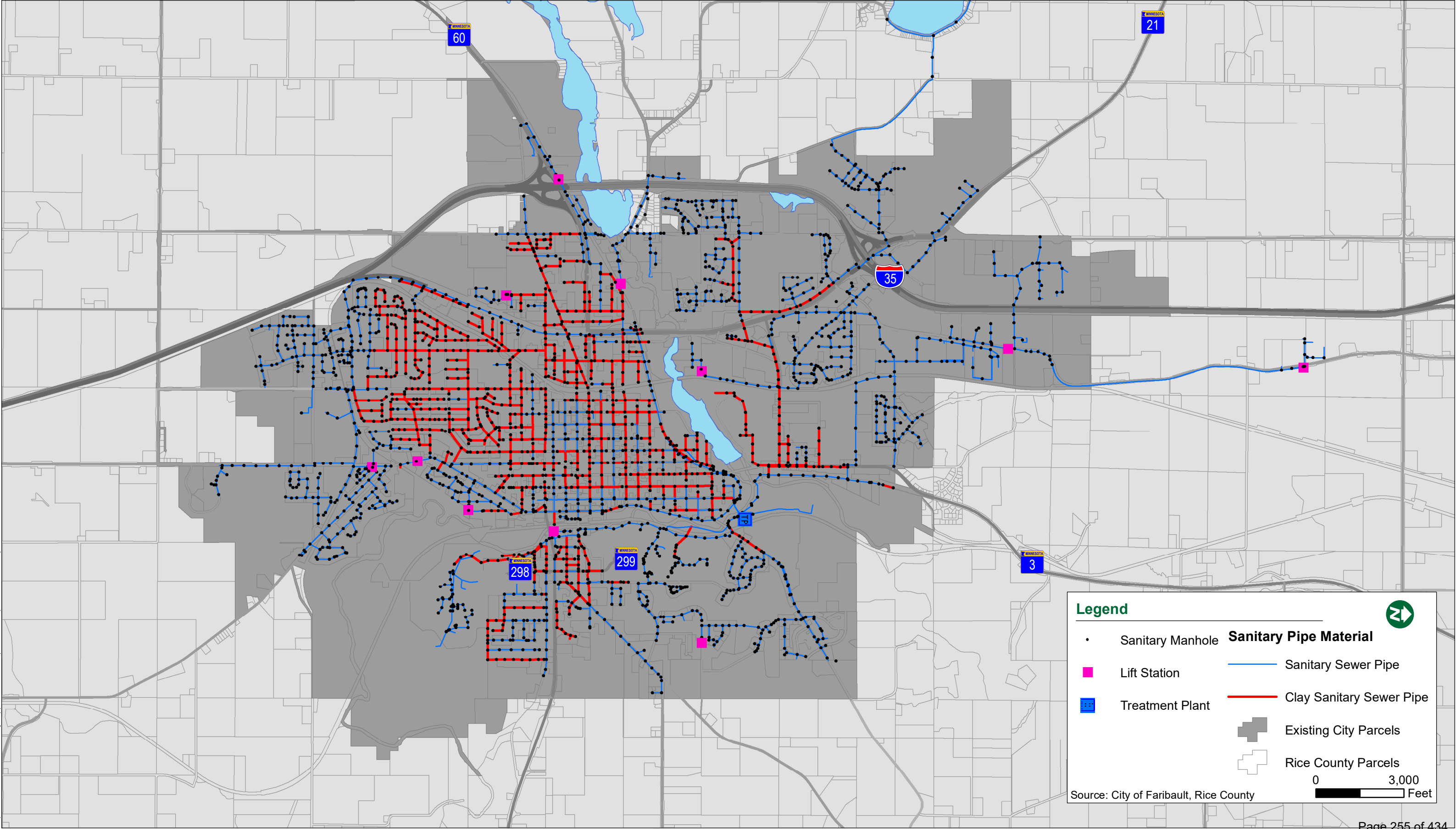
Appendix A: Figures

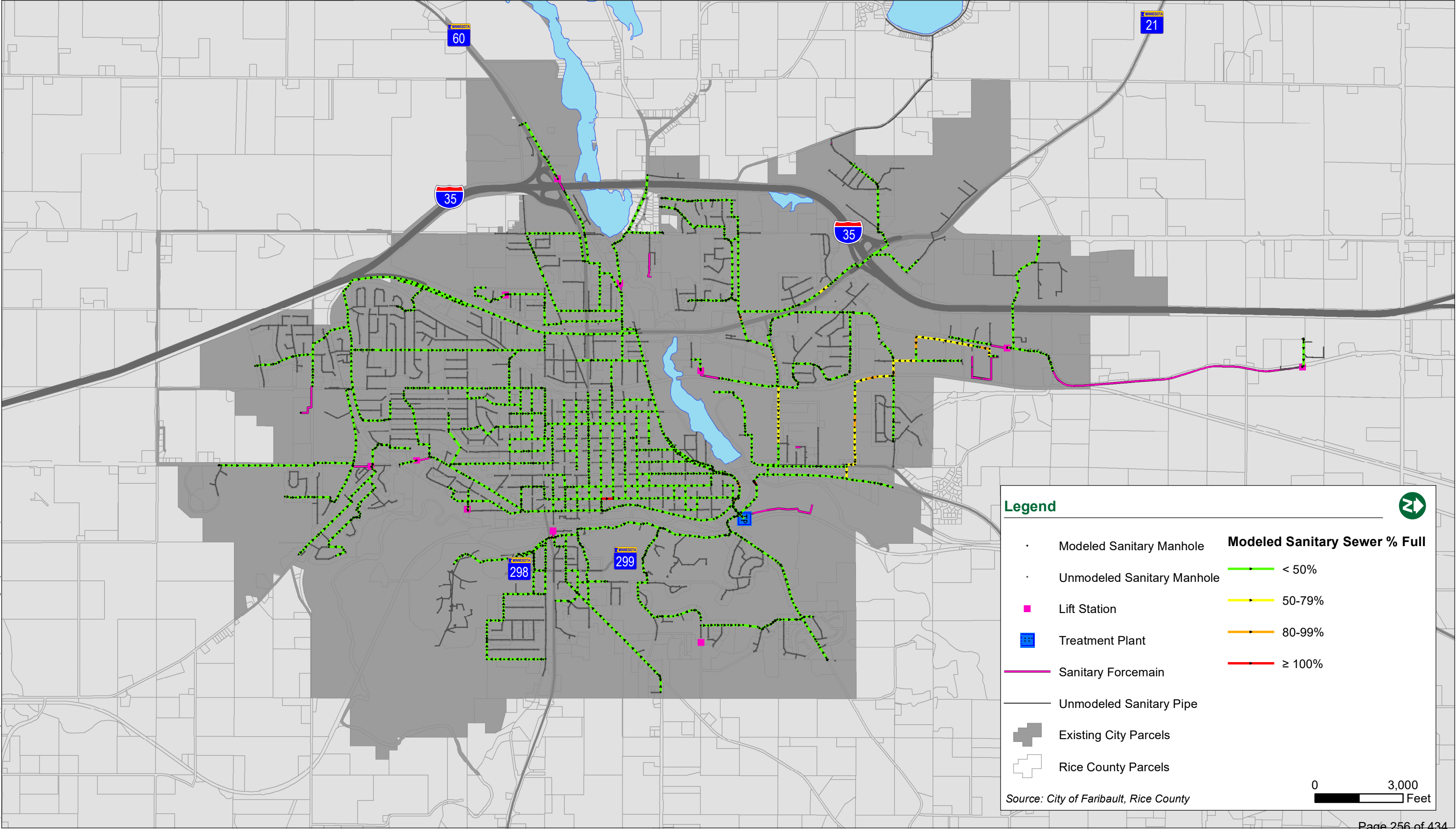


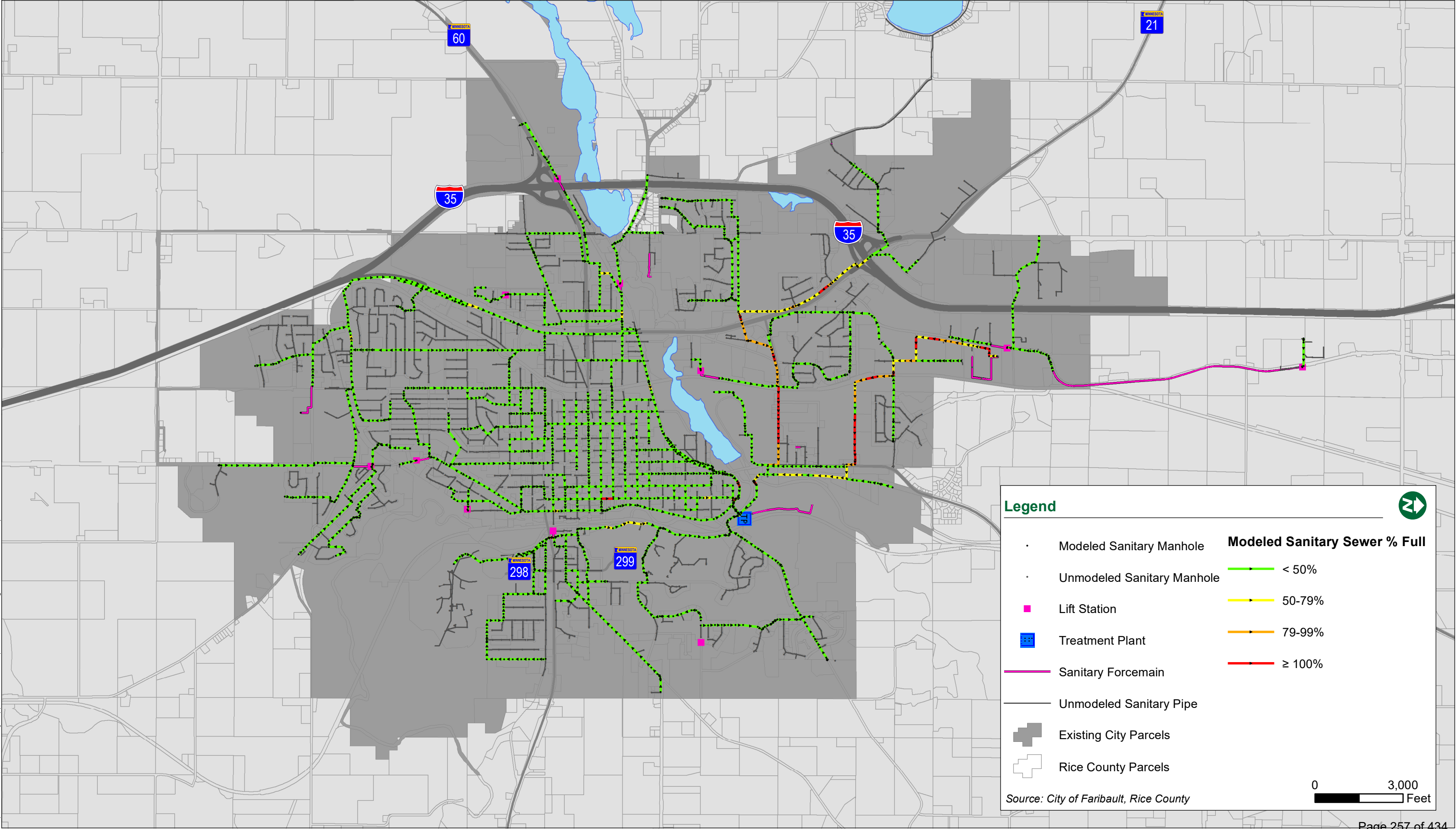


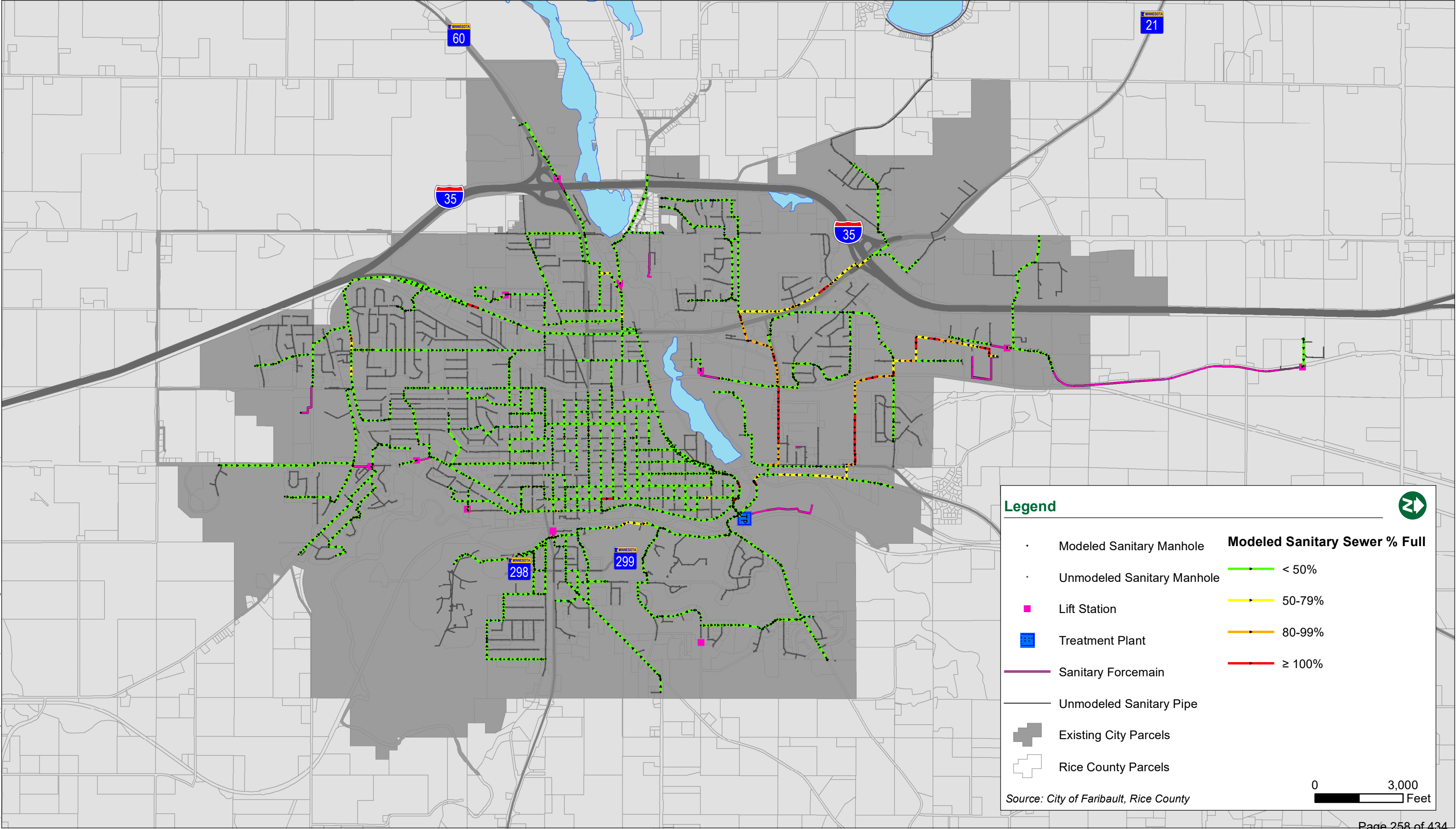


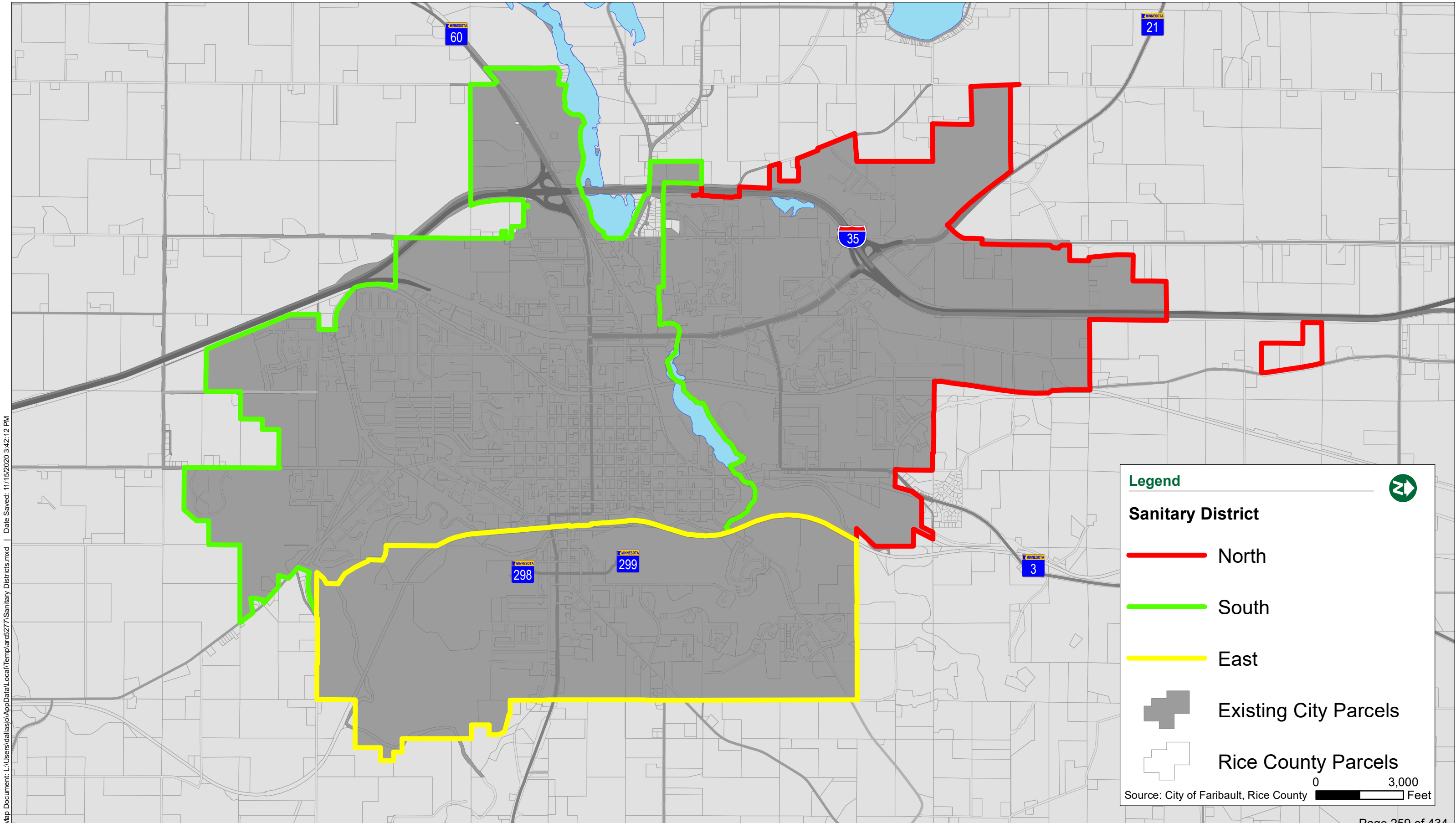


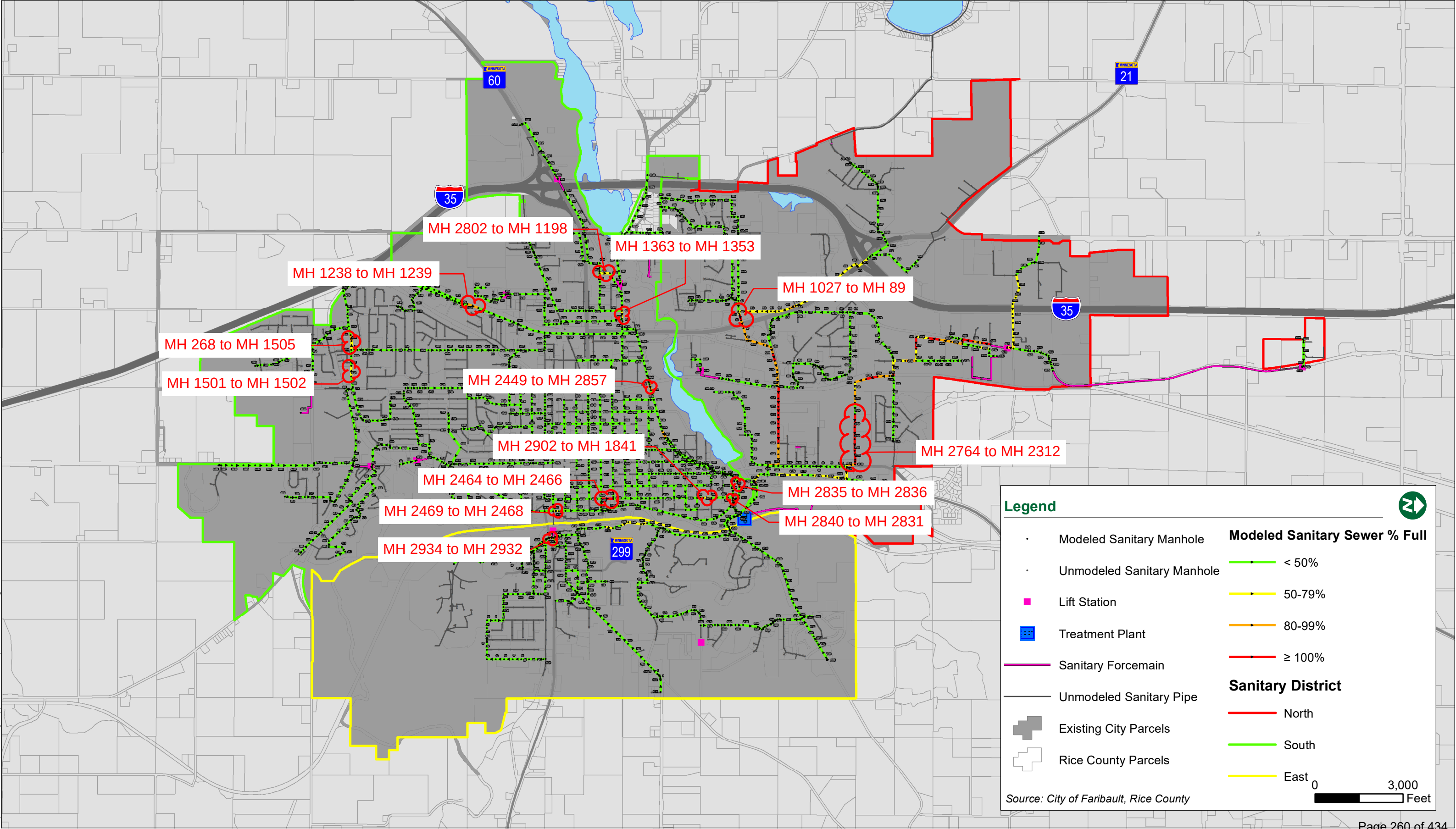


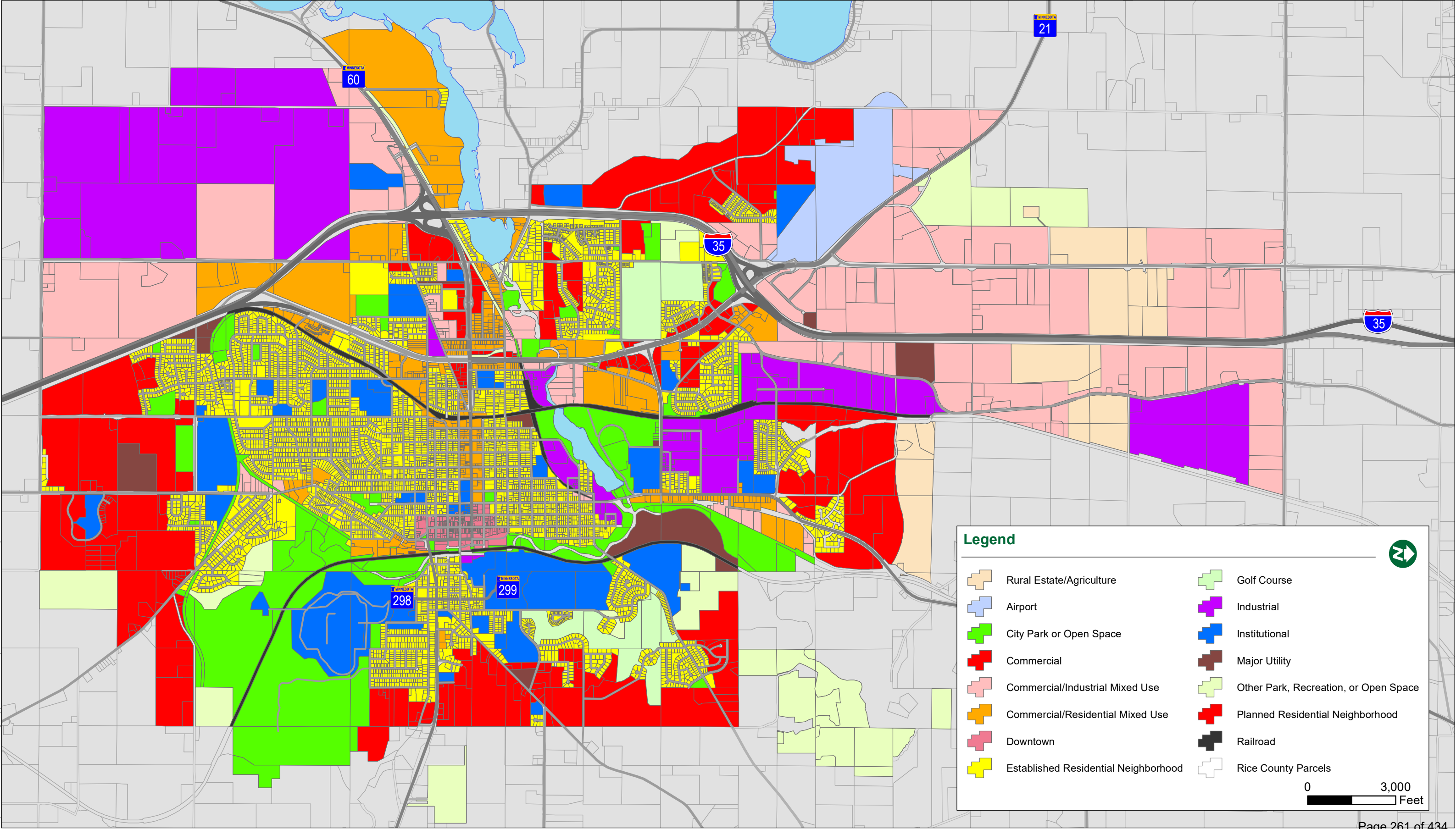


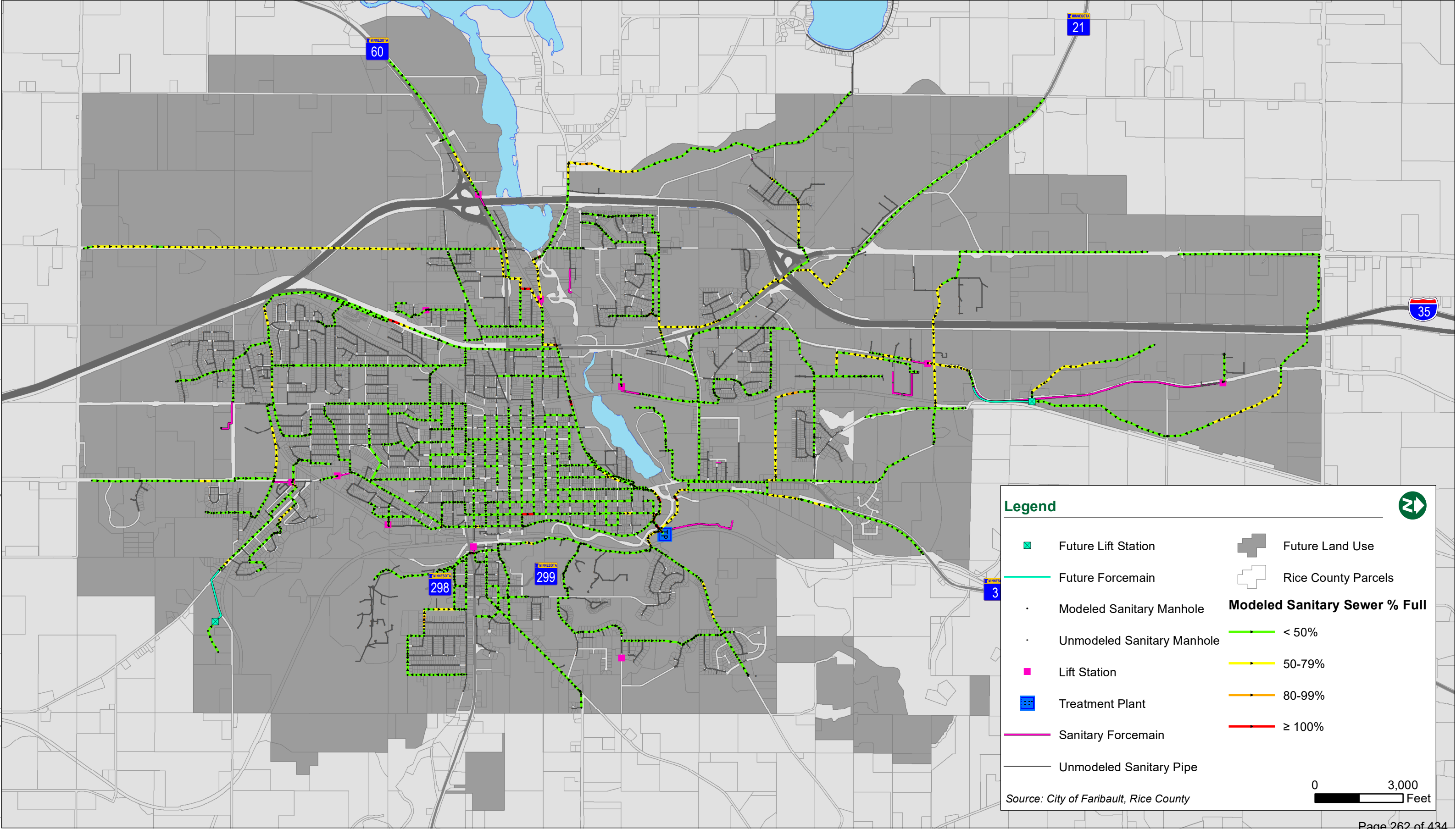


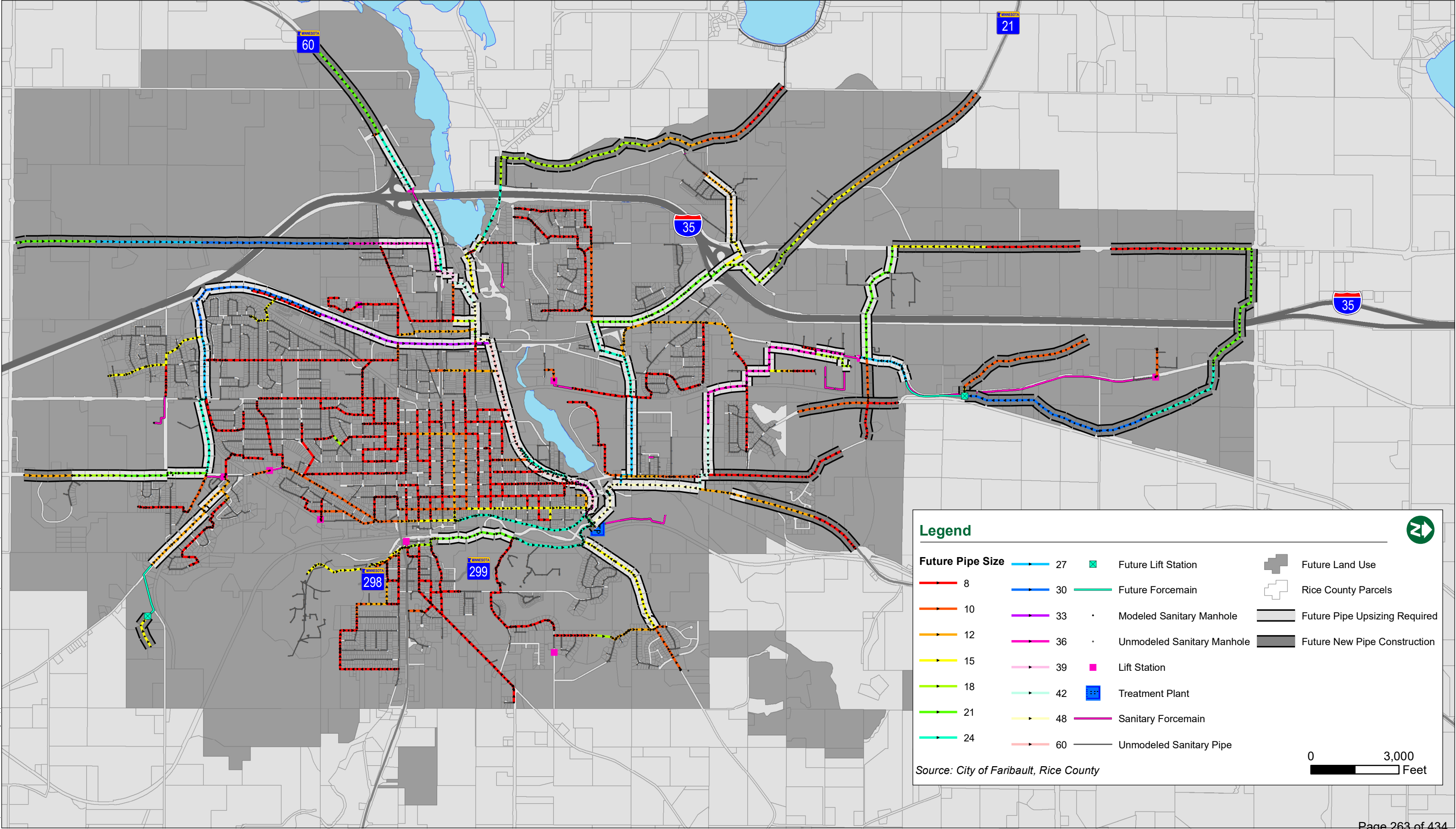


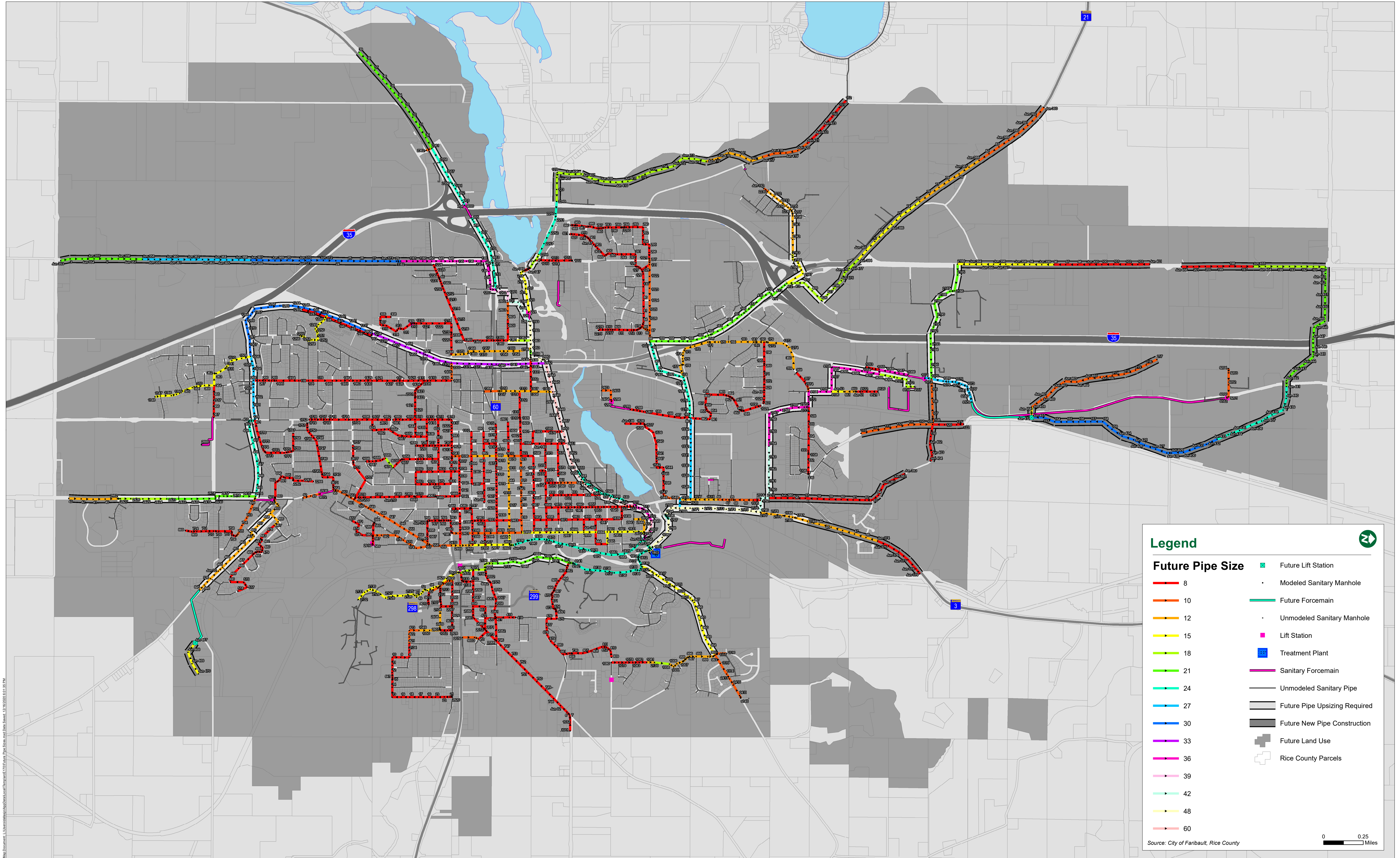


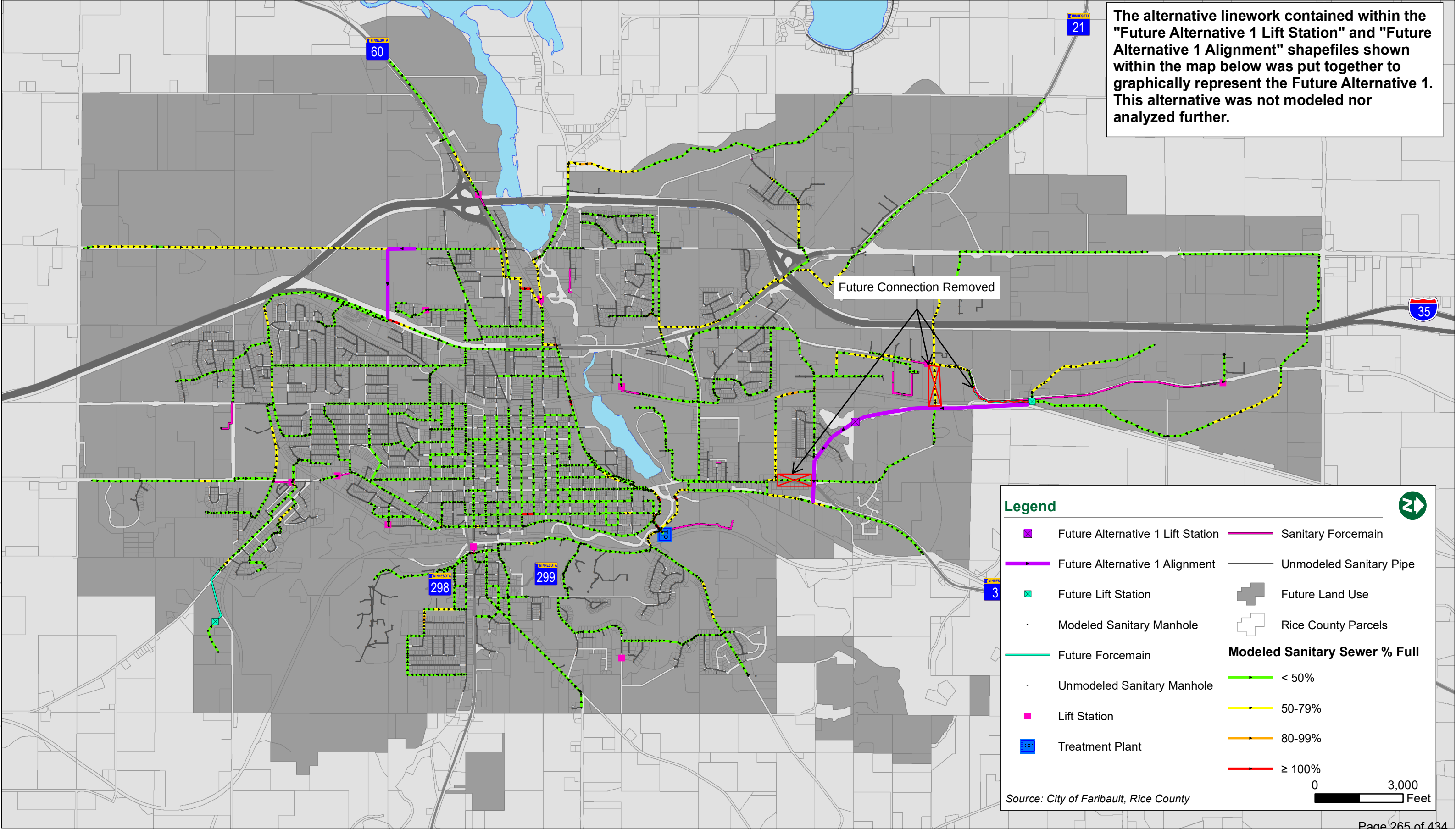


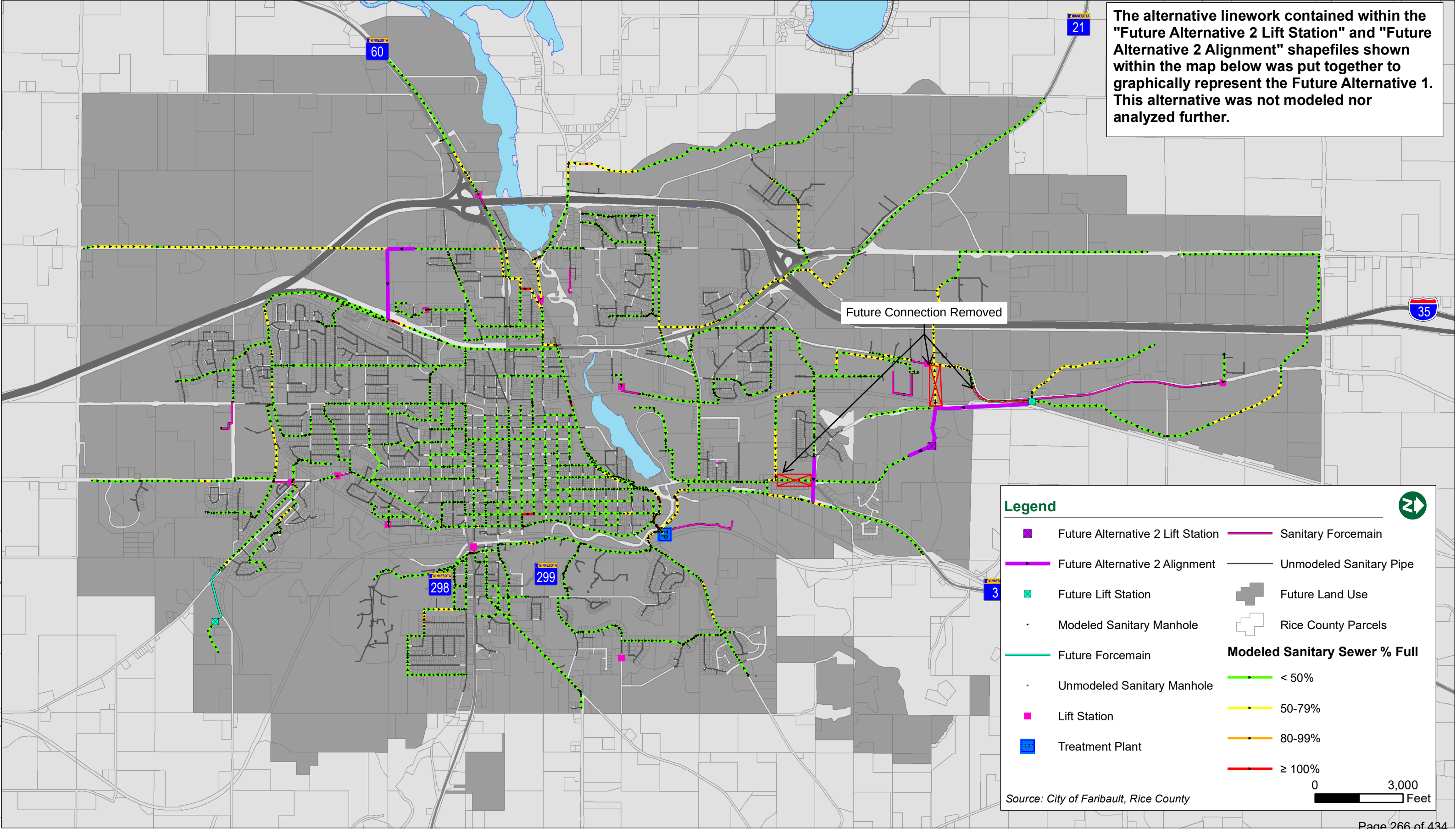




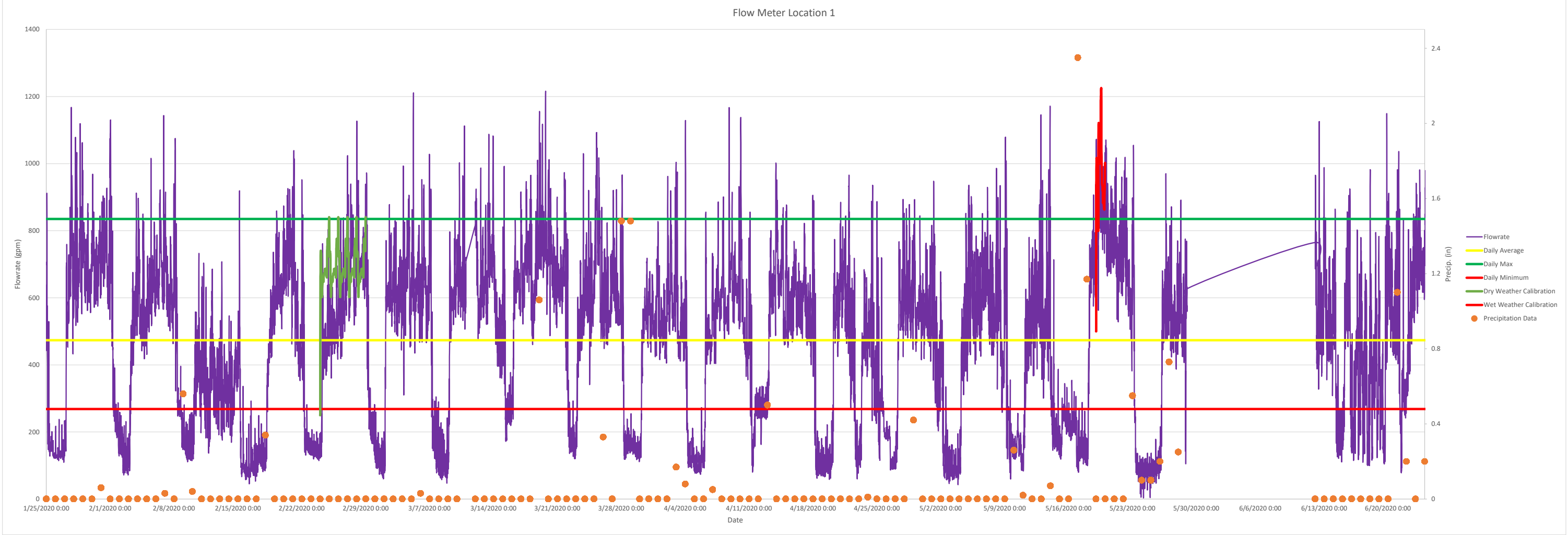


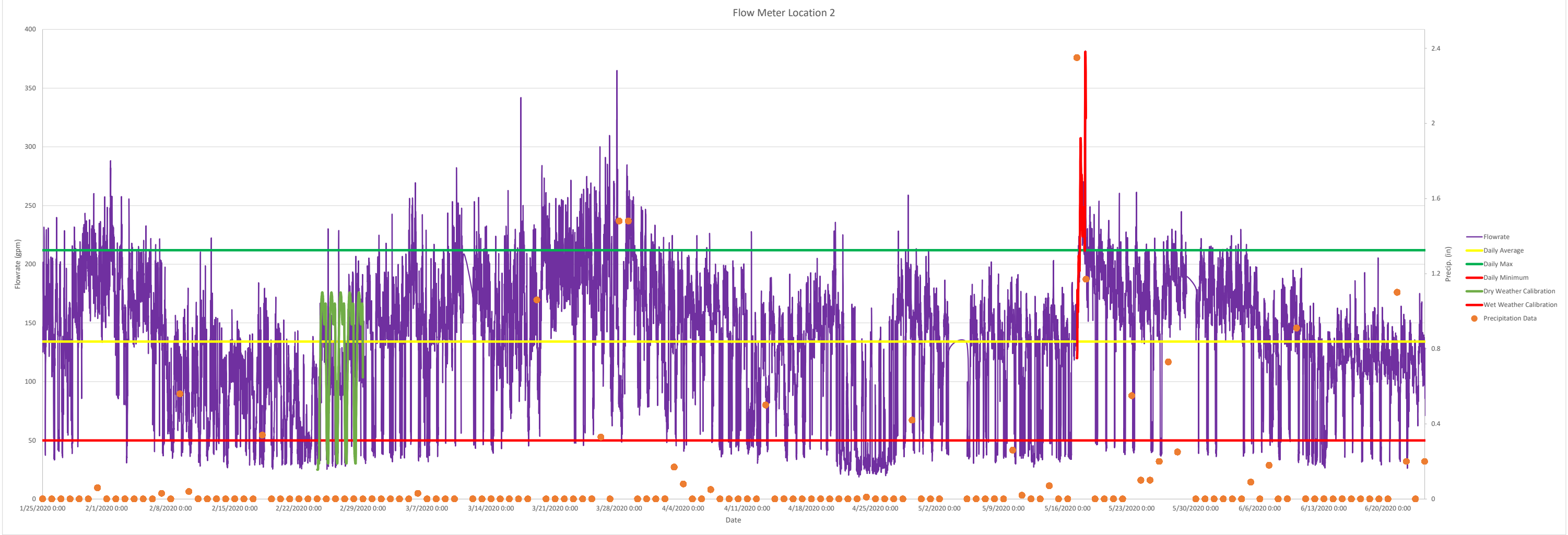


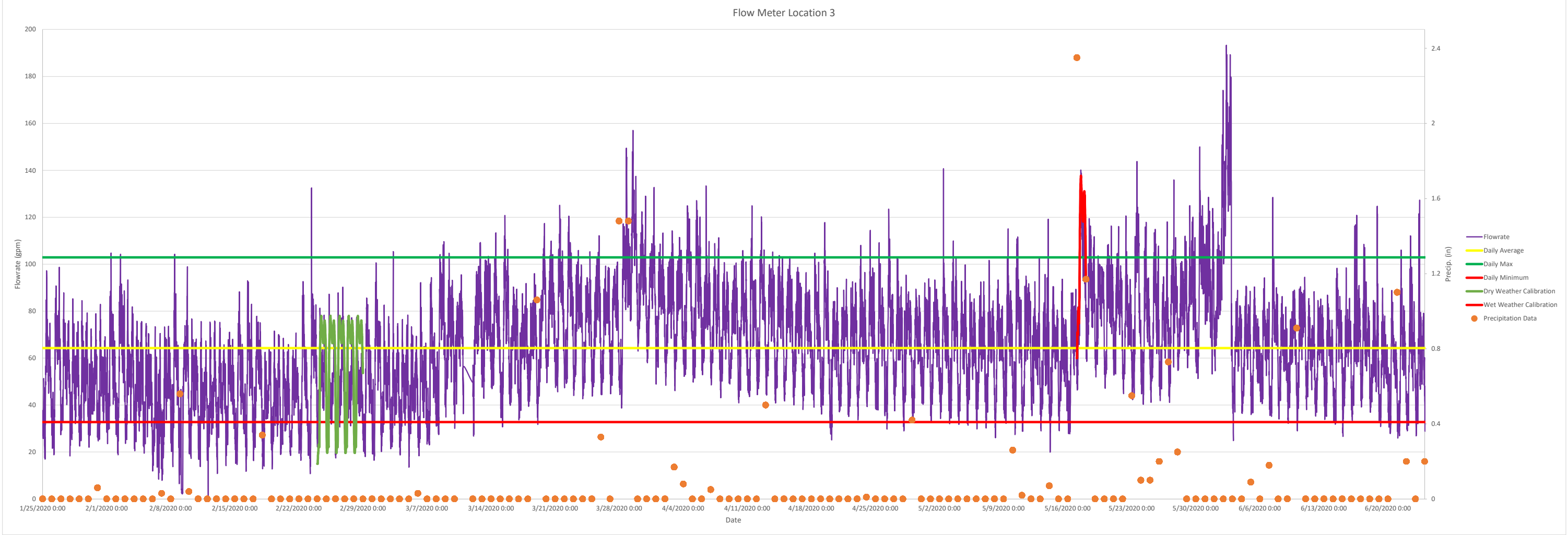


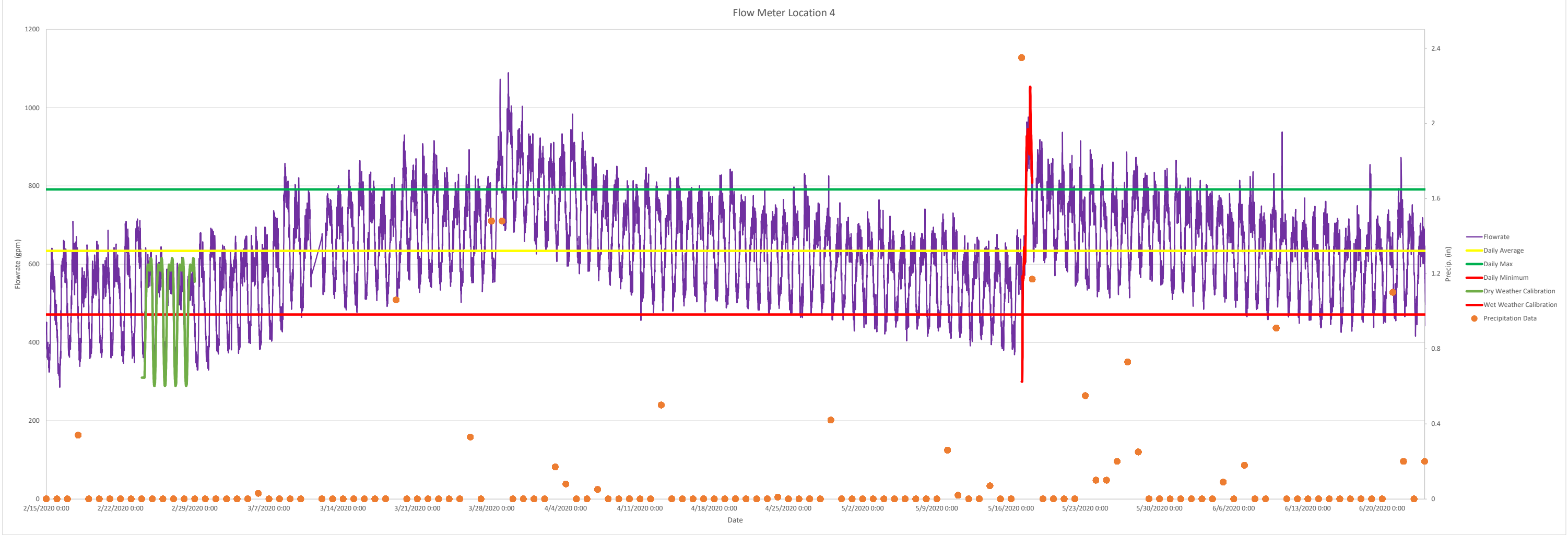


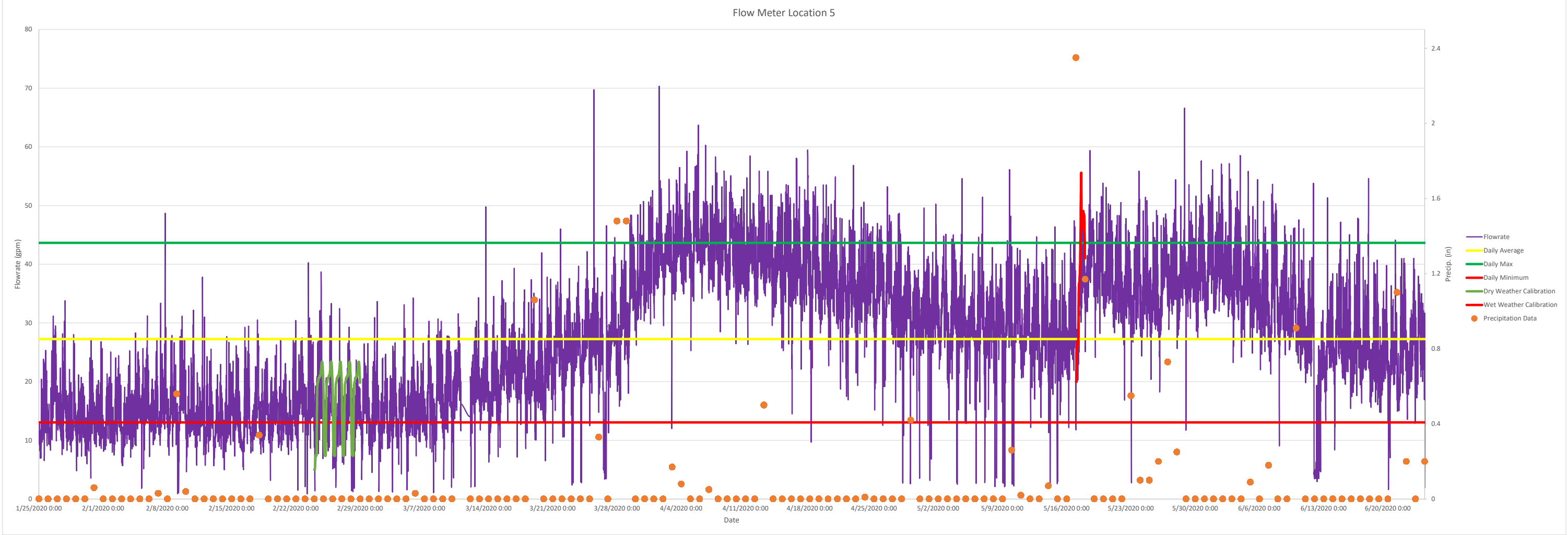
Appendix B: Flowrate and Rainfall Comparison

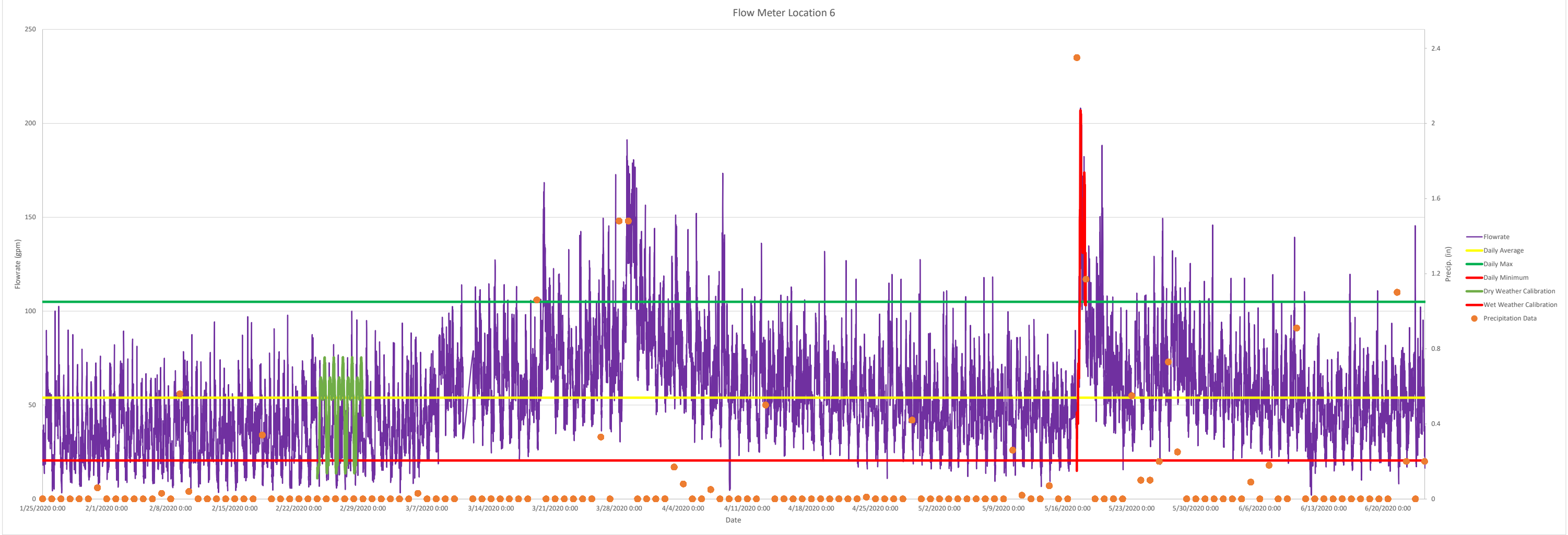


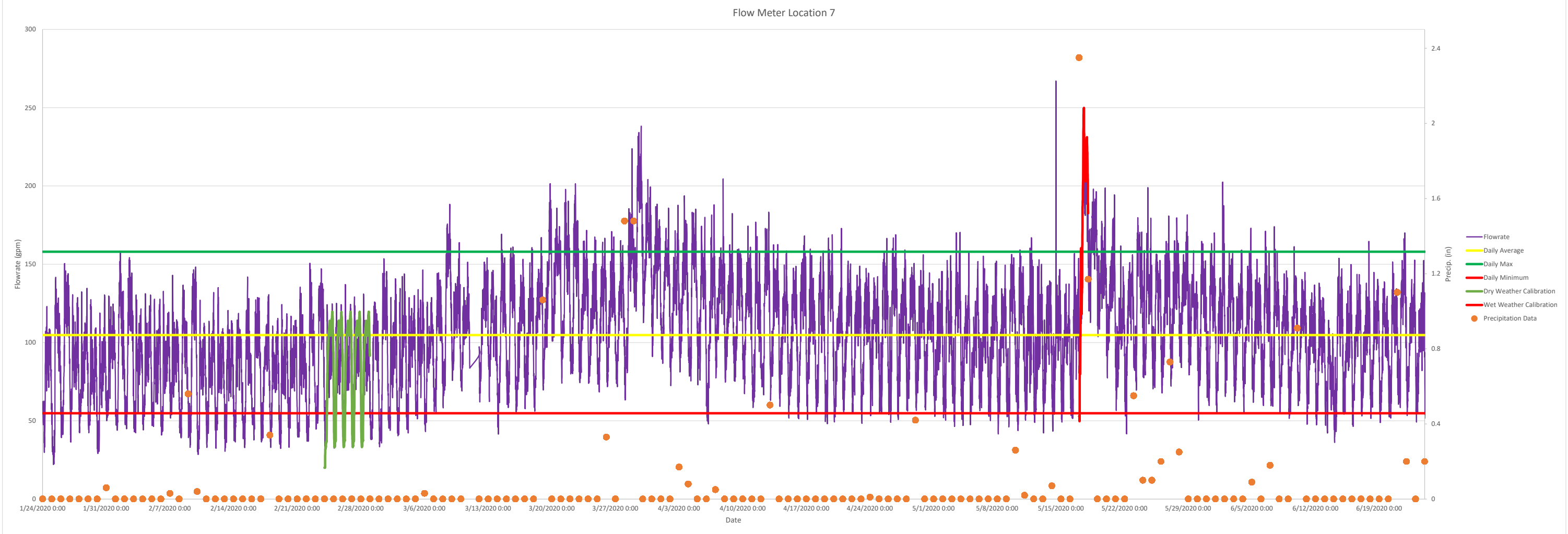


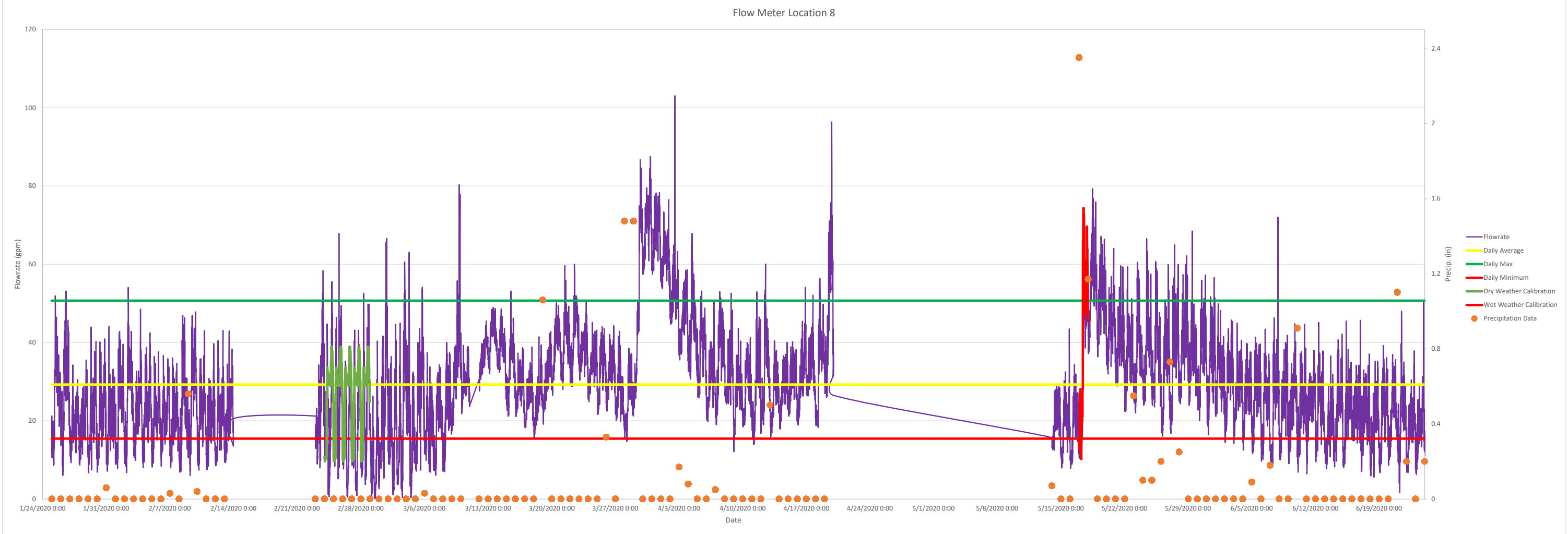


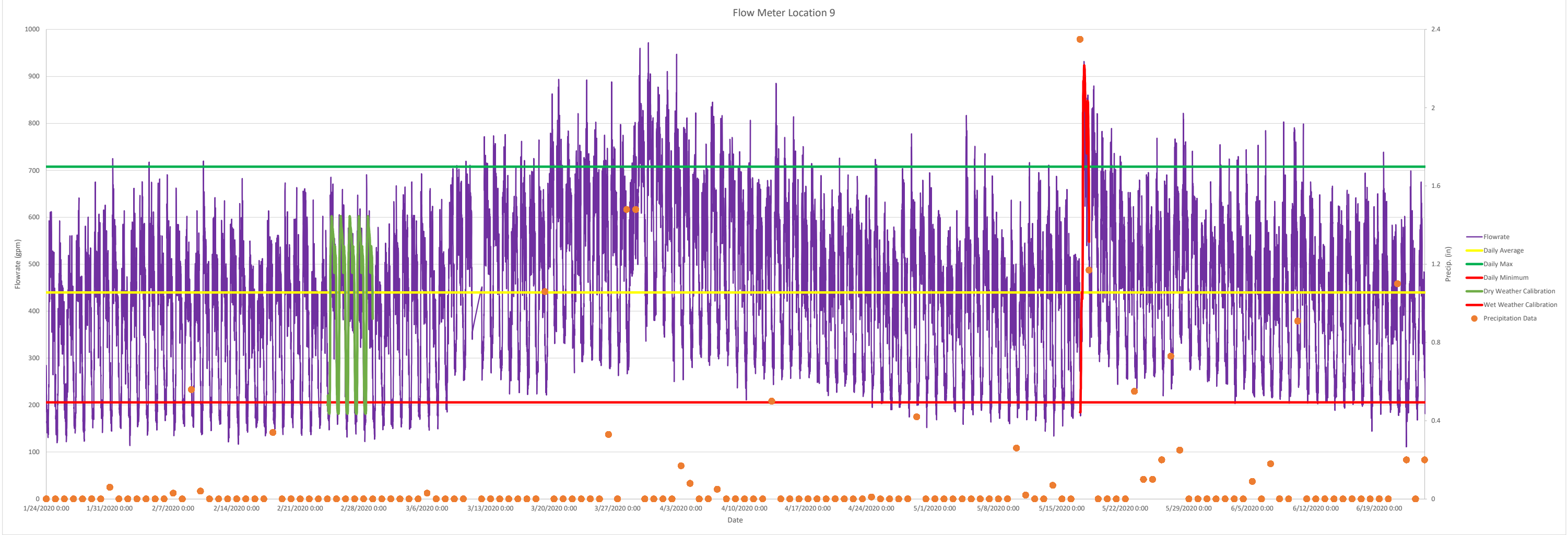


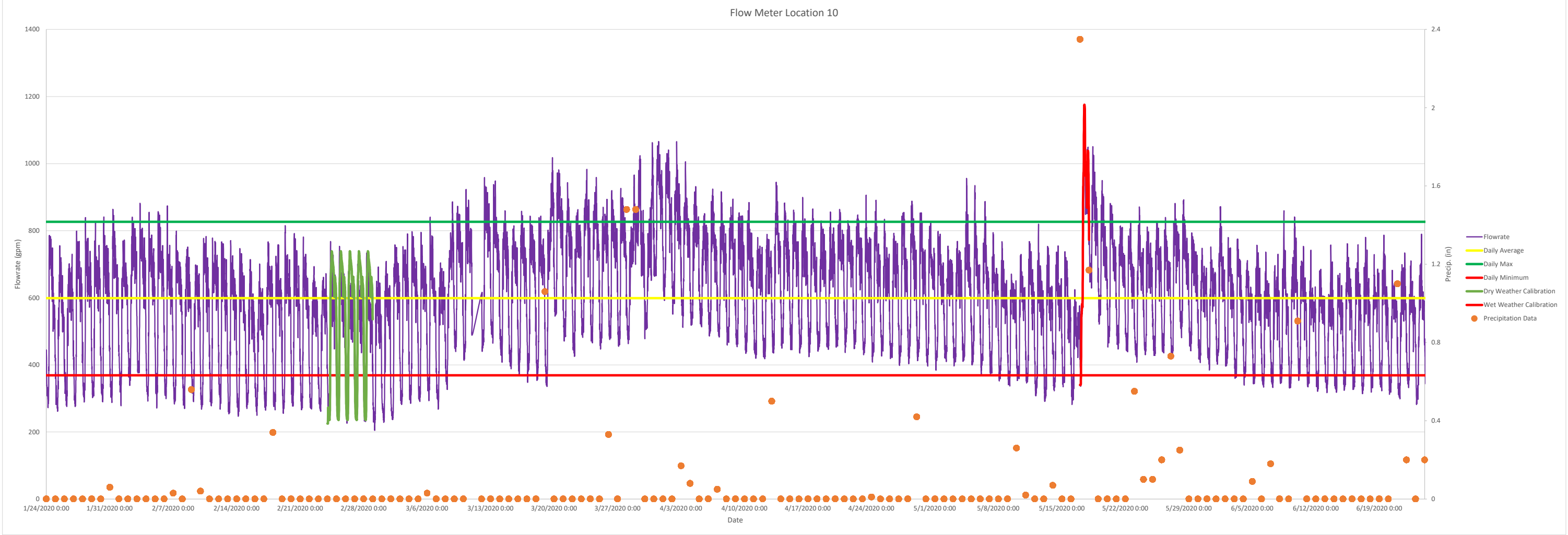


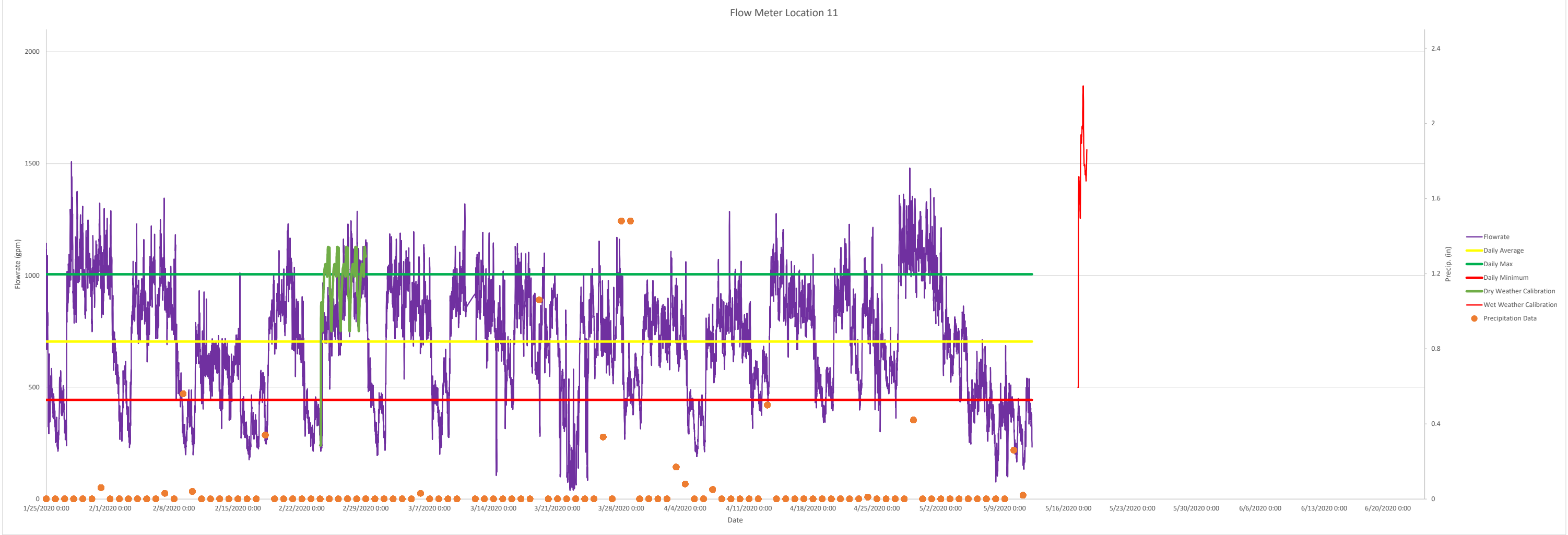




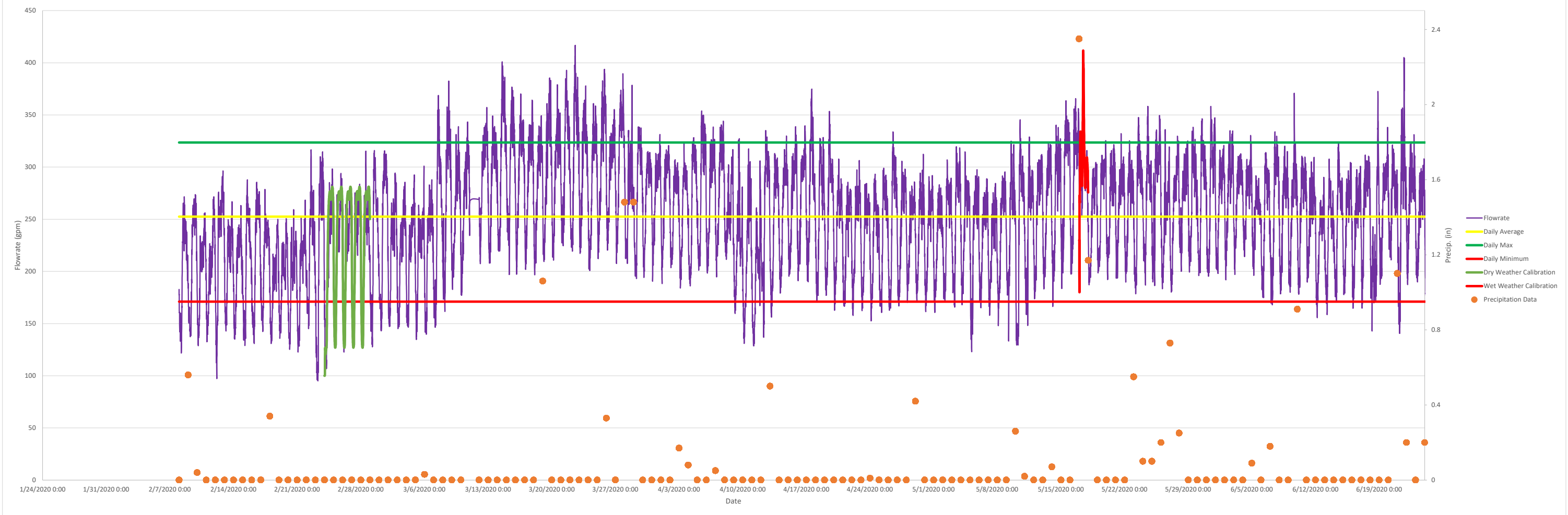








Flow Meter Location 12



Appendix C: Pipe Capacity Tables

Table 1: Existing Conditions - Dry Weather Pipe Capacity												
Node ID #		Peak Flow		Size	Length	US Invert	DS Invert	Slope	Capacity		Sanitary Sewer % Full	Notes
From	To	(gpm)	(MGD)	(in)	(ft)	(ft)	(ft)	(%)	(gpm)	(MGD)	(%)	
Jun-341	Jun-343	603.43	0.87	12	100	946.00	946.00	0.00	43.83	0.06	1377%	Sanitary Siphon under River
Jun-342	Jun-344	524.56	0.76	16	100	946.00	946.00	0.00	94.38	0.14	556%	Sanitary Siphon under River
2464	2466	131.69	0.19	10	414	979.83	979.80	0.01	72.54	0.10	182%	
9102	9101	408.50	0.59	10	324	1005.39	1004.63	0.23	413.09	0.59	99%	
2769	2768	905.19	1.30	15	400	987.83	987.25	0.14	956.81	1.38	95%	
1796	Jun-339	603.43	0.87	12	14	956.13	956.10	0.21	641.54	0.92	94%	Sanitary Siphon under River
2835	2836	564.62	0.81	24	208	955.63	955.62	0.00	609.78	0.88	93%	
1027	89	250.53	0.36	10	188	985.63	985.43	0.11	278.33	0.40	90%	
2840	2831	197.91	0.28	24	143	954.84	954.84	0.00	232.65	0.34	85%	
2772	2771	901.75	1.30	15	158	991.14	990.84	0.19	1095.03	1.58	82%	
2764	2763	903.66	1.30	18	452	964.58	964.25	0.07	1104.19	1.59	82%	Interpolated
649	9107	771.38	1.11	15	398	998.27	997.68	0.15	966.92	1.39	80%	
2763	2762	902.12	1.30	18	401	964.25	963.93	0.08	1154.79	1.66	78%	Interpolated
2762	2761	900.93	1.30	18	400	963.93	963.61	0.08	1155.15	1.66	78%	Interpolated
2761	2760	900.23	1.30	18	287	963.61	963.38	0.08	1155.91	1.66	78%	Interpolated
2760	2312	899.96	1.30	18	185	963.38	963.23	0.08	1163.49	1.68	77%	Interpolated
1530	1529	297.20	0.43	10	337	960.84	960.10	0.22	399.34	0.58	74%	MinimumSlope
1532	1531	294.91	0.42	10	288	962.22	961.59	0.22	398.49	0.57	74%	MinimumSlope
9118	9102	408.50	0.59	10	238	1006.39	1005.39	0.42	552.48	0.80	74%	
1531	1530	294.90	0.42	10	341	961.59	960.84	0.22	399.57	0.58	74%	MinimumSlope
1533	1532	294.91	0.42	10	286	962.85	962.22	0.22	400.34	0.58	74%	MinimumSlope
863	1534	294.92	0.42	10	394	964.36	963.49	0.22	400.56	0.58	74%	MinimumSlope
1534	1533	294.91	0.42	10	290	963.49	962.85	0.22	400.57	0.58	74%	MinimumSlope
9096	9095	772.02	1.11	15	381	1000.28	999.55	0.19	1100.29	1.58	70%	
2312	2314	899.86	1.30	18	287	963.23	962.91	0.11	1364.82	1.97	66%	
2768	2767	904.76	1.30	15	400	987.19	985.90	0.32	1427.02	2.05	63%	
9098	9097	772.87	1.11	15	400	1002.30	1001.29	0.25	1262.65	1.82	61%	
9097	9096	772.48	1.11	15	400	1001.29	1000.28	0.25	1262.65	1.82	61%	
161	162	153.60	0.22	8	390	999.31	998.14	0.30	257.62	0.37	60%	
2770	2769	905.56	1.30	15	400	989.38	987.89	0.37	1533.62	2.21	59%	
2766	2765	904.35	1.30	15	404	982.86	981.28	0.39	1571.90	2.26	58%	220 L.F. 24" STEEL CASING
9106	9105	840.55	1.21	15	368	995.86	994.58	0.35	1481.39	2.13	57%	
9108	649	771.52	1.11	15	35	998.16	998.27	-0.31	1407.08	2.03	55%	
2934	2933	438.51	0.63	15	97	984.10	984.00	0.10	807.43	1.16	54%	
1791	2177	899.78	1.30	18	404	962.67	961.99	0.17	1677.09	2.42	54%	
2933	2932	438.50	0.63	15	91	982.27	982.17	0.11	832.47	1.20	53%	
1281	1280	270.96	0.39	10	274	976.72	975.70	0.37	520.35	0.75	52%	
9095	9108	771.74	1.11	15	395	999.55	998.16	0.35	1489.68	2.15	52%	
9105	9104	840.29	1.21	15	395	994.58	992.90	0.42	1638.08	2.36	51%	
9099	9098	408.50	0.59	12	374	1003.54	1002.30	0.33	798.48	1.15	51%	
9104	2772	902.18	1.30	15	356	992.90	991.14	0.49	1766.69	2.54	51%	
2150	1946	602.71	0.87	18	265	962.79	962.56	0.09	1203.48	1.73	50%	
1278	1279	270.95	0.39	10	298	974.12	972.89	0.41	547.73	0.79	49%	
2314	1791	899.80	1.30	18	69	962.81	962.67	0.20	1834.82	2.64	49%	
1280	1278	270.96	0.39	10	318	975.56	974.19	0.43	559.50	0.81	48%	
90	91	250.53	0.36	10	441	984.29	982.52	0.40	539.69	0.78	46%	
1279	185	270.95	0.39	10	238	972.78	971.65	0.47	587.36	0.85	46%	
89	90	250.54	0.36	10	279	985.43	984.29	0.41	545.24	0.79	46%	
1519	1549	297.87	0.43	12	352	958.48	957.71	0.22	648.52	0.93	46%	MinimumSlope
1528	1519	297.88	0.43	12	365	959.28	958.48	0.22	649.12	0.93	46%	MinimumSlope
1529	1528	297.88	0.43	12	371	960.10	959.28	0.22	651.21	0.94	46%	MinimumSlope
9107	9106	771.18	1.11	15	399	997.68	995.86	0.46	1696.95	2.44	45%	
2175	2174	900.27	1.30	21	430	961.18	960.72	0.11	2015.71	2.90	45%	
2173	2172	899.82	1.30	21	410	958.77	958.31	0.11	2064.50	2.97	44%	
2176	2175	900.52	1.30	21	400	961.63	961.18	0.11	2067.28	2.98	44%	
9101	9099	408.50	0.59	12	232	1004.63	1003.54	0.47	948.98	1.37	43%	
2177	2176	900.59	1.30	21	311	961.99	961.63	0.12	2097.04	3.02	43%	
178	1281	270.96	0.39	10	232	978.18	976.88	0.56	638.58	0.92	42%	
1282	178	252.52	0.36	10	260	979.51	978.18	0.51	609.08	0.88	41%	Interpolated
1283	1282	252.53	0.36	10	460	981.86	979.51	0.51	609.13	0.88	41%	Interpolated
91	1283	252.53	0.36	10	129	982.52	981.86	0.51	609.40	0.88	41%	Interpolated
1238	1239	315.74	0.45	21	390	984.28	984.22	0.02	764.66	1.10	41%	
160	161	153.62	0.22	8	190	1000.52	999.31	0.64	374.86	0.54	41%	
2902	1841	271.47	0.39	15	270	973.51	973.32	0.07	665.98	0.96	41%	
2449	2857	639.17	0.92	30	201	962.12	962.10	0.01	1591.54	2.29	40%	Interpolated
9117	9118	408.50	0.59	12	263	1007.83	1006.39	0.55	1026.35	1.48	40%	
2469	2468	131.41	0.19	12	192	973.47	973.36	0.06	331.59	0.48	40%	
88	1027	250.54	0.36	10	121	986.35	985.68	0.55	634.51	0.91	39%	
254	165	175.97	0.25	10	231	994.33	993.68	0.28	452.18	0.65	39%	MinimumSlope
1808	1803	739.06	1.06	15	101	951.59	951.00	0.59	1925.00	2.77	38%	Interpolated
2172	2171	899.66	1.30	21	421	958.31	957.69	0.15	2366.10	3.41	38%	
2845	2831	288.38	0.42	15	86	955.47	955.39	0.09	766.26	1.10	38%	
2802	1198	92.80	0.13	12	345	968.25	968.13	0.03	258.34	0.37	36%	Interpolated
2767	2766	904.74	1.30	15	280	985.80	982.90	1.04	2557.07	3.68	35%	
2771	2770	905.75	1.30	15	138	990.84	989.38	1.06	2584.21	3.72	35%	
164	254	155.59	0.22	10	144	994.73	994.33	0.28	448.78	0.65	35%	MinimumSlope
165	166	175.96	0.25	10	375	993.68	992.29	0.37	519.17	0.75	34%	
2807	1052	9.09	0.01	8	30	1060.14	1060.14	0.00	27.16	0.04	33%	
1363	1353	146.78	0.21	12	269	966.39	966.12	0.10	439.25	0.63	33%	
1504	1505	205.23	0.30	15	201	1021.94	1021.82	0.06	614.63	0.89	33%	
1945	1944	602.69	0.87	18	264	961.92	961.40	0.20	1815.09	2.61	33%	
1944	1942	602.72	0.87	18	435	961.40	960.54	0.20	1816.64	2.62	33%	
1942	1941	602.68	0.87	18	212	960.54	960.12	0.20	1820.37	2.62	33%	
2382	2851	193.42	0.28	24	23	957.32	957.32	0.00	585.23	0.84	33%	
167	168	175.96	0.25	10	304	991.23	990.03	0.40	535.82	0.77	33%	
168	169	175.95	0.25	10	405	990.03	988.43	0.40	535.88	0.77	33%	
2168	1794	1128.00	1.62	27	270	956.69	956.47	0.08	3438.82	4.95	33%	
169	88	175.94	0.25	10	401	988.43	986.83	0.40	538.66	0.78	33%	
166	167	175.96	0.25	10	265	992.29	991.23	0.40	539.44	0.78	33%	
1946	1945	602.71	0.87	18	309	962.56	961.92	0.21	1858.26	2.68	32%	
415	416	136.13	0.20	10	337	1007.31	1006.47	0.25	425.39	0.61	32%	Interpolated
413	414	136.15	0.20	10	423	1008.89	1007.81	0.26	430.81	0.62	32%	Interpolated
185	863	291.44	0.42	10	51	965.00	964.36	1.27	958.97	1.38	30%	
414	415	136.14	0.20	10	143	1007.71	1007.31	0.28	449.98	0.65	30%	Interpolated
1941	661	602.70	0.87	18	449	960.12	959.04	0.24	2004.78	2.89	30%	Interpolated

1549	1550	299.19	0.43	15	37	957.71	957.65	0.16	1006.59	1.45	30%	MinimumSlope
416	417	136.06	0.20	10	448	1006.37	1005.07	0.29	458.88	0.66	30%	
162	163	155.61	0.22	10	396	998.14	996.59	0.39	533.06	0.77	29%	
2015	557	24.02	0.03	10	102	980.60	980.59	0.01	84.57	0.12	28%	Interpolated
1799	1801	1127.97	1.62	27	368	953.10	952.66	0.12	4165.65	6.00	27%	Sanitary Siphon under River
1798	1799	1127.98	1.62	27	301	953.50	953.14	0.12	4166.28	6.00	27%	Sanitary Siphon under River
1797	1798	1127.98	1.62	27	451	954.08	953.54	0.12	4168.59	6.00	27%	Sanitary Siphon under River
1801	1803	1127.97	1.62	27	100	952.62	952.50	0.12	4173.22	6.01	27%	Sanitary Siphon under River
2169	2168	1127.72	1.62	27	283	957.08	956.74	0.12	4173.32	6.01	27%	
9084	2901	262.54	0.38	15	390	974.59	974.00	0.15	977.17	1.41	27%	
2765	2764	904.29	1.30	15	400	981.13	973.87	1.81	3384.67	4.87	27%	
2129	2128	255.62	0.37	15	396	1010.73	1010.14	0.15	970.03	1.40	26%	MinimumSlope
2125	49	255.43	0.37	15	148	1008.74	1008.52	0.15	970.34	1.40	26%	MinimumSlope
2128	2127	255.45	0.37	15	241	1010.14	1009.78	0.15	970.79	1.40	26%	MinimumSlope
2132	2131	255.76	0.37	15	314	1011.82	1011.35	0.15	972.04	1.40	26%	MinimumSlope
2127	2126	255.65	0.37	15	338	1009.78	1009.27	0.15	975.38	1.40	26%	MinimumSlope
2126	2125	255.51	0.37	15	352	1009.27	1008.74	0.15	975.10	1.40	26%	MinimumSlope
2131	2130	255.38	0.37	15	213	1011.35	1011.03	0.15	975.10	1.40	26%	MinimumSlope
2130	2129	255.41	0.37	15	199	1011.03	1010.73	0.15	976.57	1.41	26%	MinimumSlope
821	822	93.59	0.13	10	222	1053.31	1052.91	0.18	361.43	0.52	26%	
1810	1809	739.05	1.06	24	104	953.80	953.69	0.11	2855.31	4.11	26%	
163	164	155.60	0.22	10	374	996.59	994.73	0.50	601.20	0.87	26%	
2833	2834	564.64	0.81	24	81	955.90	955.85	0.06	2185.25	3.15	26%	
2152	2151	602.74	0.87	18	382	965.38	964.10	0.33	2364.35	3.40	25%	
665	664	268.96	0.39	8	201	993.61	983.40	5.07	1058.49	1.52	25%	Interpolated
Jun-345	1797	603.43	0.87	12	14	954.50	954.08	3.00	2400.42	3.46	25%	Sanitary Siphon under River
2171	2169	899.46	1.30	24	349	957.69	957.08	0.17	3680.34	5.30	24%	
2901	2902	271.48	0.39	15	219	974.00	973.56	0.20	1126.90	1.62	24%	
226	1193	103.07	0.15	12	52	967.33	967.28	0.10	429.25	0.62	24%	Interpolated
417	160	136.05	0.20	10	227	1004.93	1003.92	0.44	568.32	0.82	24%	
2834	2835	564.63	0.81	24	247	955.83	955.65	0.07	2375.58	3.42	24%	
2151	2150	602.73	0.87	18	315	964.10	962.84	0.40	2583.83	3.72	23%	
1812	1811	739.08	1.06	24	90	954.31	954.19	0.13	3204.70	4.61	23%	
2914	9148	77.85	0.11	8	38	978.41	978.21	0.52	339.77	0.49	23%	
529	528	564.65	0.81	24	140	957.68	957.57	0.08	2467.52	3.55	23%	
511	2849	197.93	0.29	24	10	955.65	955.65	0.00	865.81	1.25	23%	Interpolated
557	558	100.17	0.14	10	147	980.59	980.19	0.27	443.94	0.64	23%	
9135	9134	677.99	0.98	24	151	955.48	955.30	0.12	3037.83	4.37	22%	
55	2829	255.36	0.37	15	354	987.10	986.34	0.21	1164.10	1.68	22%	
1404	1405	98.28	0.14	10	199	979.40	978.85	0.28	448.36	0.65	22%	MinimumSlope
268	1504	205.40	0.30	15	302	1022.45	1022.03	0.14	937.65	1.35	22%	
1405	2333	98.28	0.14	10	218	978.85	978.24	0.28	450.72	0.65	22%	MinimumSlope
1795	1796	1127.99	1.62	27	11	956.30	956.28	0.19	5189.03	7.47	22%	Sanitary Siphon under River
1192	1363	103.07	0.15	12	341	966.79	966.39	0.12	474.77	0.68	22%	Interpolated
2333	1378	98.27	0.14	10	166	978.24	977.77	0.28	453.24	0.65	22%	MinimumSlope
822	823	93.59	0.13	10	221	1052.81	1052.24	0.26	432.78	0.62	22%	
9137	9136	678.09	0.98	24	400	956.41	955.89	0.13	3170.92	4.57	21%	
9138	9137	678.09	0.98	24	310	956.82	956.41	0.13	3200.41	4.61	21%	
9139	9138	678.13	0.98	24	323	957.25	956.82	0.13	3210.35	4.62	21%	
9136	9135	678.02	0.98	24	305	955.89	955.48	0.13	3224.80	4.64	21%	
559	2470	116.81	0.17	10	413	979.17	977.40	0.43	557.89	0.80	21%	
543	542	691.84	1.00	30	185	959.95	959.87	0.04	3320.02	4.78	21%	
1811	1810	739.07	1.06	24	224	954.17	953.80	0.16	3574.12	5.15	21%	
2395	Jun-207	138.63	0.20	10	44	969.95	969.68	0.62	671.14	0.97	21%	
50	51	255.43	0.37	15	164	990.78	990.38	0.24	1242.75	1.79	21%	
539	538	702.07	1.01	30	348	959.08	958.92	0.05	3422.86	4.93	21%	
661	9142	620.36	0.89	21	124	959.04	958.74	0.24	3034.21	4.37	20%	Interpolated
53	54	255.41	0.37	15	230	988.19	987.62	0.25	1251.05	1.80	20%	
52	53	255.41	0.37	15	108	988.46	988.19	0.25	1256.62	1.81	20%	
2174	2173	900.14	1.30	21	375	960.72	958.77	0.52	4445.46	6.40	20%	
412	413	136.23	0.20	10	215	1010.34	1008.99	0.63	674.98	0.97	20%	
2898	2899	214.67	0.31	15	380	976.32	975.63	0.18	1071.17	1.54	20%	
2896	2897	214.69	0.31	15	285	977.46	976.94	0.18	1073.91	1.55	20%	
2829	2830	255.29	0.37	15	232	986.34	985.74	0.26	1278.58	1.84	20%	
2899	9084	251.55	0.36	15	390	975.58	974.59	0.25	1265.64	1.82	20%	
1198	1194	92.79	0.13	12	332	968.18	967.80	0.11	468.87	0.68	20%	
54	55	255.42	0.37	15	196	987.62	987.10	0.27	1295.27	1.87	20%	
558	559	100.17	0.14	10	259	980.19	979.27	0.36	508.26	0.73	20%	Interpolated
540	539	693.24	1.00	30	305	959.23	959.08	0.05	3535.99	5.09	20%	
1194	226	92.79	0.13	12	396	967.80	967.33	0.12	477.73	0.69	19%	
9132	9130	739.10	1.06	24	155	954.94	954.65	0.19	3806.33	5.48	19%	
1193	1192	103.07	0.15	12	291	967.28	966.84	0.15	538.77	0.78	19%	
2895	2896	214.70	0.31	15	294	978.05	977.46	0.20	1125.85	1.62	19%	Interpolated
9131	1812	739.08	1.06	24	76	954.46	954.31	0.20	3903.52	5.62	19%	
2836	2837	564.62	0.81	24	387	955.18	954.73	0.12	3000.17	4.32	19%	
2121	2114	160.37	0.23	10	289	1003.57	1000.68	1.00	852.37	1.23	19%	
2114	1137	160.36	0.23	10	166	1000.68	999.02	1.00	852.42	1.23	19%	
9148	9149	516.67	0.74	18	381	978.21	976.46	0.46	2769.78	3.99	19%	
2897	2898	214.69	0.31	15	290	976.94	976.32	0.21	1162.43	1.67	18%	
9130	9131	739.09	1.06	24	91	954.65	954.46	0.21	4014.79	5.78	18%	
1239	1453	315.69	0.45	21	389	984.22	983.91	0.08	1739.14	2.50	18%	
1343	2443	427.45	0.62	21	463	965.52	964.84	0.15	2363.32	3.40	18%	
Jun-328	Jun-332	276.27	0.40	18	140	941.50	941.30	0.14	1544.38	2.22	18%	Sanitary Siphon under River
Jun-329	Jun-333	276.27	0.40	18	140	941.50	941.30	0.14	1544.38	2.22	18%	Sanitary Siphon under River
2894	2895	200.28	0.29	15	412	978.87	978.05	0.20	1120.92	1.61	18%	Interpolated
1794	1795	1127.99	1.62	27	18	956.41	956.36	0.28	6351.11	9.15	18%	Sanitary Siphon under River
9140	9139	620.34	0.89	24	359	957.86	957.25	0.17	3629.03	5.23	17%	
9141	9140	620.36	0.89	24	376	958.50	957.86	0.17	3629.27	5.23	17%	
528	527	564.65	0.81	24	293	957.47	956.99	0.16	3332.77	4.80	17%	
1049	1050	93.65	0.13	12	350	1050.35	1049.79	0.16	554.42	0.80	17%	
1550	2169	306.74	0.44	18	285	957.65	957.08	0.20	1825.83	2.63	17%	Interpolated
1373	1418	426.89	0.61	21	400	972.57	971.89	0.17	2542.65	3.66	17%	
1050	1052	93.61	0.13	12	346	1049.69	1049.13	0.16	557.79	0.80	17%	
1342	1343	427.48	0.62	21	381	966.32	965.65	0.18	2583.24	3.72	17%	Interpolated
9134	9132	677.99	0.98	24	146	955.26	954.94	0.22	4119.76	5.93	16%	
2452	9322	678.83	0.98	30	265	960.77	960.59	0.07	4158.36	5.99	16%	
9322	9323	678.83	0.98	30	234	960.54	960.38	0.07	4172.08	6.01	16%	
2450	2451	667.01	0.96	30	408	961.72	961.45	0.07	4104.42	5.91	16%	

9323	544	678.82	0.98	30	250	960.33	960.15	0.07	4281.38	6.17	16%	
1453	1454	315.67	0.45	21	398	983.82	983.40	0.11	2003.05	2.88	16%	
541	540	693.30	1.00	30	197	959.38	959.23	0.08	4406.10	6.34	16%	
1454	1455	315.65	0.45	21	405	983.32	982.89	0.11	2007.41	2.89	16%	
2447	2448	639.20	0.92	30	322	962.47	962.26	0.07	4072.74	5.86	16%	
2111	2112	129.68	0.19	8	122	1015.20	1011.43	3.10	827.12	1.19	16%	
2108	2107	129.68	0.19	8	144	1024.69	1020.22	3.10	827.54	1.19	16%	
2113	2121	129.68	0.19	8	142	1007.98	1003.57	3.10	827.73	1.19	16%	
2112	2113	129.68	0.19	8	111	1011.43	1007.98	3.10	827.84	1.19	16%	
2107	2110	129.68	0.19	8	65	1020.22	1018.20	3.10	827.95	1.19	16%	
2110	2111	129.68	0.19	8	97	1018.20	1015.20	3.10	827.98	1.19	16%	
2931	9148	438.87	0.63	18	276	979.51	978.21	0.47	2803.41	4.04	16%	
537	536	702.06	1.01	30	351	958.53	958.25	0.08	4504.31	6.49	16%	
2407	2108	128.41	0.18	8	59	1026.51	1024.69	3.09	826.84	1.19	16%	
1202	1201	85.19	0.12	12	357	969.56	969.00	0.16	549.07	0.79	16%	
2446	2447	639.31	0.92	30	373	962.74	962.49	0.07	4133.34	5.95	15%	
1055	9098	100.91	0.15	12	152	1002.64	1002.30	0.22	654.88	0.94	15%	Interpolated
1201	231	85.19	0.12	12	289	968.86	968.40	0.16	552.90	0.80	15%	
Jun-347	Jun-349	2.56	0.00	8	80	956.50	956.50	0.00	16.62	0.02	15%	Sanitary Siphon under River
Jun-348	Jun-350	2.56	0.00	8	80	956.50	956.50	0.00	16.62	0.02	15%	Sanitary Siphon under River
2466	2894	183.80	0.26	15	407	979.80	978.87	0.23	1201.58	1.73	15%	Interpolated
2445	2446	615.64	0.89	30	337	962.98	962.76	0.07	4074.05	5.87	15%	
1270	1269	293.56	0.42	21	261	1014.19	1013.93	0.10	1944.03	2.80	15%	
1796	Jun-340	524.56	0.76	16	14	956.29	955.90	2.79	3477.04	5.01	15%	Sanitary Siphon under River
2932	2931	438.88	0.63	18	164	980.39	979.56	0.51	2909.77	4.19	15%	
2444	2445	615.64	0.89	30	351	963.23	963.00	0.07	4082.32	5.88	15%	
544	543	678.80	0.98	30	251	960.15	959.95	0.08	4505.59	6.49	15%	
391	1270	293.57	0.42	21	398	1014.69	1014.29	0.10	1952.86	2.81	15%	
231	2802	85.21	0.12	12	53	968.34	968.25	0.17	569.06	0.82	15%	
1341	1342	427.47	0.62	21	400	967.18	966.32	0.21	2856.40	4.11	15%	Interpolated
823	1049	93.59	0.13	10	323	1052.24	1050.50	0.54	626.01	0.90	15%	
2758	2759	71.49	0.10	10	146	965.29	964.83	0.32	479.13	0.69	15%	
2746	Jun-322	1208.89	1.74	36	110	953.90	953.79	0.10	8204.47	11.81	15%	Sanitary Siphon under River
2443	2444	615.67	0.89	30	290	963.45	963.25	0.07	4188.22	6.03	15%	
1501	1502	119.47	0.17	15	365	1023.89	1023.50	0.11	820.96	1.18	15%	
9071	95	38.89	0.06	8	147	1021.72	1021.23	0.33	271.47	0.39	14%	Interpolated
2830	2934	438.51	0.63	15	117	985.74	984.00	1.48	3061.06	4.41	14%	
87	88	78.03	0.11	10	368	988.00	986.45	0.42	553.41	0.80	14%	
1831	2845	281.17	0.40	15	339	963.74	961.60	0.63	1996.11	2.87	14%	
9142	9141	620.36	0.89	24	90	958.74	958.50	0.27	4544.46	6.54	14%	
536	535	702.05	1.01	30	96	958.23	958.21	0.02	5150.30	7.42	14%	
546	555	76.92	0.11	10	344	990.26	988.74	0.44	566.46	0.82	14%	
1287	189	20.54	0.03	8	460	967.75	967.27	0.10	151.84	0.22	14%	Interpolated
28	1203	76.88	0.11	12	18	970.27	970.24	0.17	573.32	0.83	13%	
1066	1067	86.35	0.12	12	300	1005.54	1004.88	0.22	649.56	0.94	13%	
1068	1055	86.07	0.12	12	369	1003.45	1002.64	0.22	649.27	0.93	13%	Interpolated
2448	2449	639.18	0.92	30	130	962.24	962.12	0.09	4847.52	6.98	13%	
1743	9071	38.89	0.06	8	274	1022.82	1021.72	0.40	297.62	0.43	13%	
2832	2833	564.65	0.81	24	182	956.36	955.92	0.24	4321.67	6.22	13%	
1340	1341	427.47	0.62	21	396	968.42	967.29	0.29	3293.33	4.74	13%	
555	556	76.92	0.11	10	372	988.74	986.92	0.49	596.11	0.86	13%	
81	84	37.82	0.05	8	290	997.31	996.16	0.40	295.99	0.43	13%	
84	85	37.81	0.05	8	155	996.16	995.52	0.41	301.66	0.43	13%	
1502	1503	119.27	0.17	15	318	1023.48	1023.01	0.15	965.69	1.39	12%	
1267	1266	293.51	0.42	21	455	1011.84	1011.16	0.15	2383.82	3.43	12%	
1266	1265	293.46	0.42	21	398	1011.06	1010.46	0.15	2391.64	3.44	12%	
2857	2450	639.16	0.92	30	335	962.10	961.74	0.11	5227.91	7.53	12%	
1203	208	76.88	0.11	12	172	970.24	969.88	0.21	633.13	0.91	12%	Interpolated
2468	2467	131.41	0.19	12	225	973.36	971.91	0.64	1111.61	1.60	12%	
547	546	67.52	0.10	10	412	992.22	990.36	0.45	572.87	0.82	12%	
548	547	67.52	0.10	10	403	994.14	992.32	0.45	572.93	0.83	12%	
208	1202	85.19	0.12	12	79	969.78	969.56	0.28	731.26	1.05	12%	Interpolated
1809	1808	739.05	1.06	15	31	953.67	951.69	6.47	6389.75	9.20	12%	
2907	2893	138.63	0.20	15	407	967.06	966.12	0.23	1207.38	1.74	11%	SDR-35. Interpolated
1503	268	119.26	0.17	15	221	1022.92	1022.54	0.17	1042.69	1.50	11%	
2451	2452	678.86	0.98	30	431	961.43	960.80	0.15	6098.83	8.78	11%	
2166	2167	50.15	0.07	10	240	1012.75	1012.08	0.28	450.55	0.65	11%	
2167	412	50.13	0.07	10	623	1012.08	1010.34	0.28	450.41	0.65	11%	
730	1628	10.27	0.01	8	233	995.40	995.31	0.04	92.31	0.13	11%	
2165	2166	50.14	0.07	10	260	1013.48	1012.75	0.28	451.78	0.65	11%	
1374	1373	426.91	0.61	21	406	974.35	972.70	0.41	3930.20	5.66	11%	
139	228	60.30	0.09	12	296	971.38	970.90	0.16	558.41	0.80	11%	
228	28	60.31	0.09	12	293	970.85	970.37	0.16	561.42	0.81	11%	
1361	1362	18.57	0.03	8	380	967.43	966.91	0.14	173.81	0.25	11%	Interpolated
1362	1363	18.57	0.03	8	380	966.91	966.39	0.14	173.90	0.25	11%	Interpolated
189	188	22.34	0.03	8	395	967.27	966.47	0.20	211.54	0.30	11%	
95	554	48.50	0.07	10	158	1021.13	1020.67	0.29	459.82	0.66	11%	
2164	2165	46.76	0.07	10	130	1013.84	1013.48	0.28	448.96	0.65	10%	
2163	2164	46.76	0.07	10	140	1014.23	1013.84	0.28	450.42	0.65	10%	
2194	2195	67.45	0.10	12	500	986.34	985.24	0.22	649.96	0.94	10%	MinimumSlope
1036	888	44.65	0.06	10	408	992.58	991.54	0.25	430.35	0.62	10%	
2192	2193	67.19	0.10	12	341	987.72	986.97	0.22	649.68	0.94	10%	MinimumSlope
2193	2194	67.28	0.10	12	285	986.97	986.34	0.22	651.03	0.94	10%	MinimumSlope
554	553	48.50	0.07	10	306	1020.57	1019.64	0.30	470.19	0.68	10%	
1237	1238	293.35	0.42	21	435	985.22	984.28	0.22	2864.43	4.12	10%	
Jun-346	1797	524.56	0.76	16	14	954.50	954.08	3.00	5169.61	7.44	10%	Sanitary Siphon under River
1505	1506	205.20	0.30	15	313	1021.62	1019.56	0.66	2037.35	2.93	10%	
2837	2838	564.60	0.81	24	128	954.71	954.18	0.41	5657.18	8.15	10%	
2191	2192	64.54	0.09	12	243	988.25	987.72	0.22	647.82	0.93	10%	MinimumSlope
Jun-327	Jun-331	328.17	0.47	24	140	941.50	941.30	0.14	3326.02	4.79	10%	Sanitary Siphon under River
Jun-330	Jun-334	328.17	0.47	24	140	941.50	941.30	0.14	3326.02	4.79	10%	Sanitary Siphon under River
2335	1411	29.00	0.04	8	48	983.13	982.94	0.39	295.37	0.43	10%	MinimumSlope
1411	1410	29.00	0.04	8	189	982.94	982.19	0.40	296.08	0.43	10%	MinimumSlope
188	187	20.54	0.03	8	402	966.47	965.67	0.20	209.73	0.30	10%	
1409	1404	29.00	0.04	8	330	980.72	979.40	0.40	297.42	0.43	10%	MinimumSlope
1410	1409	29.01	0.04	8	367	982.19	980.72	0.40	297.69	0.43	10%	MinimumSlope
86	87	48.38	0.07	10	143	988.60	988.10	0.35	503.99	0.73	10%	
2157	2156	598.04	0.86	18	82	971.72	969.80	2.34	6248.98	9.00	10%	

2848	1375	32.29	0.05	12	303	972.47	972.29	0.06	337.83	0.49	10%	
2909	2464	69.17	0.10	10	407	982.59	979.64	0.72	725.63	1.04	10%	
51	52	255.42	0.37	15	169	990.38	988.46	1.14	2680.13	3.86	10%	
1269	1268	293.53	0.42	21	236	1013.93	1013.34	0.25	3082.15	4.44	10%	Interpolated
2440	2442	185.58	0.27	27	76	964.19	964.21	-0.03	1951.34	2.81	10%	
2156	2152	598.04	0.86	18	180	969.75	965.43	2.40	6325.69	9.11	9%	
553	552	48.50	0.07	10	74	1019.54	1019.27	0.36	514.46	0.74	9%	
2190	2191	61.28	0.09	12	350	989.02	988.25	0.22	650.04	0.94	9%	MinimumSlope
1378	1374	426.91	0.61	21	398	976.60	974.45	0.54	4528.83	6.52	9%	
1455	2941	315.64	0.45	21	246	982.81	982.06	0.30	3400.81	4.90	9%	
1067	1068	86.27	0.12	12	299	1004.83	1003.45	0.46	941.43	1.36	9%	
2195	1070	58.86	0.08	12	381	985.24	984.40	0.22	650.38	0.94	9%	MinimumSlope
552	551	48.50	0.07	10	229	1019.17	1018.26	0.40	537.22	0.77	9%	
2189	2190	58.44	0.08	12	455	990.02	989.02	0.22	649.50	0.94	9%	MinimumSlope
2243	2163	40.39	0.06	10	144	1014.63	1014.23	0.28	449.26	0.65	9%	
2241	2242	40.41	0.06	10	400	1016.87	1015.75	0.28	450.98	0.65	9%	
2242	2243	40.40	0.06	10	400	1015.75	1014.63	0.28	450.98	0.65	9%	
2238	2241	40.40	0.06	10	378	1017.93	1016.87	0.28	451.31	0.65	9%	
9149	2157	598.04	0.86	18	173	976.46	971.72	2.74	6760.74	9.74	9%	
2846	2850	197.94	0.29	30	5	956.76	956.76	0.00	2256.40	3.25	9%	
614	85	10.57	0.02	8	120	989.51	989.43	0.07	121.17	0.17	9%	
9078	623	37.23	0.05	10	410	987.52	986.47	0.26	431.17	0.62	9%	
2236	2237	39.02	0.06	10	88	1018.47	1018.22	0.28	453.28	0.65	9%	
2237	2238	39.02	0.06	10	102	1018.22	1017.93	0.28	454.51	0.65	9%	
85	86	48.38	0.07	10	143	989.24	988.60	0.45	569.57	0.82	8%	
889	9078	55.51	0.08	12	410	988.54	987.62	0.22	656.42	0.95	8%	
2467	2395	138.63	0.20	15	406	971.68	969.95	0.43	1639.88	2.36	8%	
447	406	66.51	0.10	15	403	1031.48	1031.08	0.10	791.30	1.14	8%	
1379	1380	318.61	0.46	21	453	981.51	979.79	0.38	3800.00	5.47	8%	Interpolated
1288	1287	20.54	0.03	8	218	968.35	967.75	0.28	246.61	0.36	8%	
529	534	535.23	0.77	18	16	957.67	958.08	-2.50	6462.58	9.31	8%	Interpolated
Jun-343	Jun-345	603.43	0.87	12	30	946.00	954.50	-28.33	7376.93	10.62	8%	Sanitary Siphon under River
2235	2236	36.23	0.05	10	54	1018.62	1018.47	0.28	447.78	0.64	8%	
2234	2235	36.23	0.05	10	180	1019.12	1018.62	0.28	449.52	0.65	8%	
2230	2232	36.23	0.05	10	266	1021.28	1020.54	0.28	449.62	0.65	8%	
2232	2233	36.24	0.05	10	258	1020.54	1019.82	0.28	450.12	0.65	8%	
444	2414	65.67	0.09	15	104	1033.53	1033.42	0.11	816.82	1.18	8%	
2233	2234	36.23	0.05	10	250	1019.82	1019.12	0.28	450.99	0.65	8%	
2941	1379	315.64	0.45	21	134	982.06	981.51	0.41	3952.12	5.69	8%	
2892	Jun-320	159.97	0.23	18	108	966.06	965.80	0.24	2004.37	2.89	8%	Interpolated
187	186	20.54	0.03	8	267	965.67	964.87	0.30	257.47	0.37	8%	
2838	2756	564.60	0.81	24	97	954.16	954.83	-0.69	7331.28	10.56	8%	
1380	1378	318.60	0.46	21	396	979.62	977.77	0.47	4214.36	6.07	8%	
1243	1242	293.41	0.42	21	402	990.02	988.42	0.40	3889.36	5.60	8%	
1241	1237	293.38	0.42	21	399	986.82	985.22	0.40	3901.22	5.62	8%	
1242	1241	293.40	0.42	21	397	988.42	986.82	0.40	3912.95	5.63	7%	
549	548	67.52	0.10	10	301	997.66	994.24	1.14	908.15	1.31	7%	
1375	1369	32.29	0.05	12	246	972.24	971.99	0.10	441.97	0.64	7%	
1425	2335	29.00	0.04	8	325	985.47	983.13	0.72	398.74	0.57	7%	Interpolated
1426	1425	29.00	0.04	8	350	987.99	985.47	0.72	398.74	0.57	7%	Interpolated
513	512	197.93	0.29	24	250	956.21	955.97	0.10	2725.92	3.93	7%	
19511	9106	52.35	0.08	15	409	996.20	995.86	0.08	724.79	1.04	7%	
2893	2892	138.63	0.20	18	27	966.12	966.06	0.22	1929.40	2.78	7%	SDR-35.Interpolated
1841	1831	281.19	0.40	15	394	973.32	963.74	2.43	3920.65	5.65	7%	
2470	2469	116.81	0.17	12	285	977.41	973.47	1.38	1629.92	2.35	7%	
1369	1368	32.29	0.05	12	85	971.94	971.85	0.11	451.92	0.65	7%	
Jun-336	1803	276.27	0.40	18	20	952.50	952.32	0.90	3876.37	5.58	7%	Sanitary Siphon under River
Jun-337	1803	276.27	0.40	18	20	952.50	952.32	0.90	3876.37	5.58	7%	Sanitary Siphon under River
1070	1071	61.42	0.09	12	215	984.40	983.54	0.40	877.49	1.26	7%	
556	557	76.92	0.11	10	366	986.82	980.69	1.68	1103.34	1.59	7%	
882	889	54.43	0.08	12	411	989.85	988.54	0.32	782.45	1.13	7%	
550	549	67.52	0.10	10	190	1000.24	997.76	1.30	973.34	1.40	7%	
406	407	66.48	0.10	15	406	1030.78	1030.18	0.15	966.33	1.39	7%	
512	511	197.93	0.29	24	204	955.92	955.70	0.11	2892.44	4.17	7%	
445	446	66.52	0.10	15	395	1032.88	1032.28	0.15	979.07	1.41	7%	
401	124	66.42	0.10	15	53	1028.05	1027.97	0.15	979.21	1.41	7%	
446	447	66.53	0.10	15	391	1032.18	1031.58	0.15	984.10	1.42	7%	
1354	1353	32.26	0.05	12	377	966.56	966.11	0.12	479.03	0.69	7%	Interpolated
1268	1267	293.52	0.42	21	258	1013.24	1011.94	0.50	4377.50	6.30	7%	
1355	1354	32.27	0.05	12	395	967.04	966.56	0.12	483.26	0.70	7%	Interpolated
124	1500	119.66	0.17	12	47	1027.96	1027.16	1.70	1805.03	2.60	7%	Interpolated
402	401	66.42	0.10	15	144	1028.38	1028.15	0.16	1003.37	1.44	7%	
403	402	66.43	0.10	15	62	1028.58	1028.48	0.16	1005.19	1.45	7%	
1071	1072	61.42	0.09	12	31	983.44	983.30	0.45	929.40	1.34	7%	
407	408	66.47	0.10	15	399	1029.82	1029.18	0.16	1006.63	1.45	7%	
408	403	66.43	0.10	15	309	1029.18	1028.68	0.16	1010.41	1.45	7%	
Jun-207	2907	138.63	0.20	15	369	969.68	967.06	0.71	2117.14	3.05	7%	SDR-35
527	2832	564.65	0.81	24	68	957.05	956.40	0.96	8627.65	12.42	7%	
1418	1340	427.50	0.62	21	291	971.89	968.52	1.16	6631.66	9.55	6%	Interpolated
1141	1510	75.41	0.11	15	259	1029.99	1029.42	0.22	1178.85	1.70	6%	Interpolated
138	139	60.30	0.09	12	351	973.22	971.55	0.48	956.28	1.38	6%	
1364	1358	18.57	0.03	8	288	970.75	969.60	0.40	296.81	0.43	6%	MinimumSlope
1358	1359	18.57	0.03	8	173	969.60	968.91	0.40	296.84	0.43	6%	MinimumSlope
1360	1361	18.57	0.03	8	250	968.43	967.43	0.40	297.20	0.43	6%	MinimumSlope
1359	1360	18.57	0.03	8	120	968.91	968.43	0.40	297.23	0.43	6%	MinimumSlope
1365	1364	18.57	0.03	8	301	971.96	970.75	0.40	297.85	0.43	6%	MinimumSlope
1265	1244	293.44	0.42	21	425	1010.36	1007.81	0.60	4772.27	6.87	6%	
1511	1141	75.41	0.11	15	96	1030.22	1029.99	0.24	1227.76	1.77	6%	Interpolated
Jun-339	Jun-341	603.43	0.87	12	20	956.10	946.00	50.50	9848.56	14.18	6%	Sanitary Siphon under River
1043	1036	36.39	0.05	10	241	993.88	992.68	0.50	601.57	0.87	6%	
675	9091	17.70	0.03	8	232	1067.20	1066.30	0.39	293.00	0.42	6%	
616	2911	13.85	0.02	10	372	980.47	980.20	0.07	229.67	0.33	6%	
186	185	20.53	0.03	8	25	964.87	965.00	-0.53	341.08	0.49	6%	Interpolated
1024	1025	26.65	0.04	10	400	1002.01	1000.89	0.28	450.85	0.65	6%	
1023	1024	26.66	0.04	10	399	1003.23	1002.11	0.28	451.45	0.65	6%	
1025	1026	26.64	0.04	10	300	1000.79	999.94	0.28	453.52	0.65	6%	
1022	1023	26.68	0.04	10	394	1004.45	1003.33	0.28	454.45	0.65	6%	
888	882	49.20	0.07	12	411	991.54	990.00	0.37	848.30	1.22	6%	

128	129	17.24	0.02	8	148	1011.91	1011.32	0.40	297.29	0.43	6%	
130	80	17.24	0.02	8	454	1007.13	1005.31	0.40	297.47	0.43	6%	
80	81	17.24	0.02	8	443	1005.31	1003.52	0.40	298.86	0.43	6%	
2414	445	66.54	0.10	15	206	1033.42	1032.98	0.21	1162.21	1.67	6%	
1052	2409	128.41	0.18	12	109	1049.13	1046.27	2.63	2248.51	3.24	6%	
1368	1370	32.28	0.05	12	378	971.85	971.22	0.17	565.96	0.81	6%	
131	1022	25.21	0.04	10	388	1005.63	1004.55	0.28	449.56	0.65	6%	
535	534	702.05	1.01	30	41	958.33	958.08	0.62	12521.63	18.03	6%	
297	131	25.21	0.04	10	154	1006.16	1005.73	0.28	451.08	0.65	6%	
664	663	52.79	0.08	8	294	983.40	971.44	4.07	948.27	1.37	6%	Interpolated
538	537	702.07	1.01	30	46	958.82	958.53	0.63	12665.61	18.24	6%	
2086	658	36.27	0.05	8	186	1063.36	1059.64	2.00	664.78	0.96	5%	
2083	2086	36.27	0.05	8	186	1067.08	1063.36	2.00	664.80	0.96	5%	
Jun-322	Jun-324	276.27	0.40	18	64	954.50	953.50	1.56	5107.56	7.35	5%	Sanitary Siphon under River
Jun-322	Jun-325	276.27	0.40	18	64	954.50	953.50	1.56	5107.56	7.35	5%	Sanitary Siphon under River
966	967	24.74	0.04	12	273	1070.24	1069.94	0.11	459.47	0.66	5%	
2001	2158	72.18	0.10	18	27	978.03	978.00	0.11	1363.79	1.96	5%	
574	2015	23.33	0.03	10	343	981.52	980.60	0.27	441.60	0.64	5%	
2409	2408	128.41	0.18	12	314	1046.27	1036.54	3.10	2439.79	3.51	5%	
2408	2407	128.41	0.18	12	324	1036.54	1026.51	3.10	2440.25	3.51	5%	
1289	1288	20.54	0.03	8	228	969.95	968.35	0.70	393.76	0.57	5%	
959	960	21.45	0.03	12	326	1073.14	1072.85	0.09	413.31	0.60	5%	
1506	1507	277.57	0.40	21	299	1019.47	1017.21	0.76	5356.13	7.71	5%	
2850	513	197.94	0.29	24	249	956.76	956.27	0.20	3902.56	5.62	5%	
1137	2830	183.23	0.26	12	195	999.02	985.74	6.81	3616.39	5.21	5%	
453	503	47.23	0.07	12	21	1011.30	1011.20	0.47	945.83	1.36	5%	
1500	1501	119.62	0.17	15	356	1027.16	1023.91	0.91	2401.45	3.46	5%	
1593	1585	23.38	0.03	8	415	974.16	970.01	1.00	470.00	0.68	5%	Interpolated
1594	1593	23.38	0.03	8	407	978.23	974.16	1.00	470.10	0.68	5%	Interpolated
1576	2450	23.38	0.03	8	179	965.89	964.10	1.00	470.11	0.68	5%	Interpolated
1603	1594	23.38	0.03	8	404	982.27	978.23	1.00	470.11	0.68	5%	Interpolated
1585	1576	23.38	0.03	8	412	970.01	965.89	1.00	470.17	0.68	5%	Interpolated
623	1603	23.38	0.03	8	407	986.47	982.27	1.03	477.73	0.69	5%	Interpolated
363	1511	75.41	0.11	15	328	1031.54	1030.30	0.38	1543.87	2.22	5%	
1357	1356	32.27	0.05	12	355	970.25	969.44	0.23	662.06	0.95	5%	
1132	2914	77.85	0.11	8	359	1023.00	979.41	12.13	1637.18	2.36	5%	
1507	391	277.56	0.40	21	256	1017.13	1014.78	0.92	5910.39	8.51	5%	
2442	2443	190.72	0.27	27	129	964.08	963.93	0.12	4108.48	5.92	5%	
2293	788	11.86	0.02	8	103	1040.24	1039.93	0.30	257.79	0.37	5%	Interpolated
1816	9133	60.06	0.09	10	279	971.04	964.45	2.37	1310.82	1.89	5%	
1981	2401	20.66	0.03	10	246	987.13	986.44	0.28	451.00	0.65	5%	
2439	2440	185.58	0.27	27	389	964.66	964.21	0.12	4095.70	5.90	5%	
2757	2746	160.80	0.23	24	346	954.56	953.99	0.16	3571.48	5.14	5%	Sanitary Siphon under River
542	541	693.32	1.00	30	41	959.87	959.48	0.94	15500.74	22.32	4%	
2759	2438	185.61	0.27	27	75	964.72	964.63	0.12	4172.94	6.01	4%	
2438	2439	185.61	0.27	27	82	964.78	964.68	0.12	4200.61	6.05	4%	
1370	1357	32.28	0.05	12	335	971.22	970.25	0.29	746.22	1.07	4%	Interpolated
551	550	67.52	0.10	10	465	1018.16	1002.41	3.38	1568.00	2.26	4%	
1876	1877	160.77	0.23	24	424	959.73	958.93	0.19	3824.29	5.51	4%	
1825	2757	160.96	0.23	24	273	955.08	954.56	0.19	3840.41	5.53	4%	
1877	1878	160.77	0.23	24	335	958.88	958.24	0.19	3848.47	5.54	4%	
1464	1463	29.00	0.04	8	259	1027.43	1021.73	2.20	696.91	1.00	4%	Interpolated
1463	1430	29.00	0.04	8	246	1021.73	1016.31	2.20	697.04	1.00	4%	Interpolated
1428	1427	29.00	0.04	8	348	1003.23	995.57	2.20	697.06	1.00	4%	Interpolated
1429	1428	29.00	0.04	8	342	1010.74	1003.23	2.20	697.07	1.00	4%	Interpolated
654	730	10.27	0.01	8	214	996.09	995.50	0.28	246.93	0.36	4%	
117	1426	29.00	0.04	8	221	992.86	987.99	2.20	697.34	1.00	4%	Interpolated
1246	1247	293.42	0.42	21	403	1002.33	997.05	1.31	7057.30	10.16	4%	
1430	1429	29.00	0.04	8	253	1016.31	1010.74	2.20	697.75	1.00	4%	Interpolated
1427	117	29.00	0.04	8	123	995.57	992.86	2.21	698.12	1.01	4%	Interpolated
1878	1879	160.77	0.23	24	408	958.19	957.39	0.20	3895.48	5.61	4%	
612	613	10.57	0.02	8	166	990.50	990.00	0.30	257.96	0.37	4%	
1882	1884	160.96	0.23	24	429	956.53	955.67	0.20	3939.29	5.67	4%	
1938	1939	159.97	0.23	24	321	962.12	961.48	0.20	3926.76	5.65	4%	
1939	1875	159.97	0.23	24	170	961.43	961.09	0.20	3935.98	5.67	4%	
1879	1882	160.77	0.23	24	376	957.34	956.58	0.20	3956.80	5.70	4%	
613	614	10.57	0.02	8	95	989.90	989.61	0.31	260.29	0.37	4%	
1875	1874	159.97	0.23	24	324	961.04	960.39	0.20	3939.76	5.67	4%	
1244	1246	293.43	0.42	21	383	1007.71	1002.43	1.38	7239.63	10.43	4%	
1510	1509	75.41	0.11	15	334	1029.34	1027.48	0.56	1874.23	2.70	4%	
295	296	11.86	0.02	8	270	1019.70	1018.63	0.40	296.07	0.43	4%	
1610	9078	21.20	0.03	10	15	987.58	987.52	0.39	531.46	0.77	4%	
2088	2090	39.29	0.06	8	179	1041.49	1033.62	4.40	985.68	1.42	4%	
2090	1132	39.29	0.06	8	241	1033.62	1023.00	4.40	986.05	1.42	4%	
2087	2088	39.29	0.06	8	201	1050.35	1041.49	4.40	986.16	1.42	4%	
1884	1825	160.96	0.23	24	279	955.67	955.08	0.21	4043.55	5.82	4%	
789	2293	11.86	0.02	8	82	1040.57	1040.24	0.40	298.89	0.43	4%	
Jun-335	1803	328.17	0.47	24	20	952.50	952.32	0.90	8348.24	12.02	4%	Sanitary Siphon under River
Jun-338	1803	328.17	0.47	24	20	952.50	952.32	0.90	8348.24	12.02	4%	Sanitary Siphon under River
658	2087	39.29	0.06	8	205	1059.64	1050.35	4.53	1000.06	1.44	4%	
963	966	24.75	0.04	12	353	1071.28	1070.55	0.21	630.05	0.91	4%	
2839	2840	197.92	0.29	30	139	955.01	954.87	0.10	5057.39	7.28	4%	
410	411	13.89	0.02	10	298	1012.62	1012.10	0.17	356.21	0.51	4%	
Jun-10	1021	11.86	0.02	8	12	1015.70	1015.65	0.42	305.08	0.44	4%	Interpolated
409	410	13.89	0.02	10	383	1013.40	1012.72	0.18	359.28	0.52	4%	
1247	1243	293.41	0.42	21	394	996.95	990.79	1.56	7707.03	11.10	4%	
1874	1876	160.77	0.23	24	261	960.34	959.73	0.23	4252.90	6.12	4%	
786	789	11.86	0.02	8	305	1042.00	1040.57	0.47	321.81	0.46	4%	
129	130	17.24	0.02	8	422	1011.32	1007.13	0.99	468.44	0.67	4%	
411	412	13.89	0.02	10	274	1012.00	1011.44	0.20	385.58	0.56	4%	
2756	2746	564.60	0.81	24	27	954.77	953.90	3.20	15743.76	22.67	4%	Sanitary Siphon under River
534	533	166.81	0.24	30	160	958.08	957.94	0.09	4726.69	6.81	4%	
960	963	24.76	0.04	12	352	1072.29	1071.38	0.26	704.48	1.01	4%	
621	619	13.85	0.02	10	410	982.48	981.62	0.21	394.93	0.57	4%	
3012	1629	10.37	0.01	8	217	995.09	994.23	0.40	296.22	0.43	4%	trouble line
282	126	17.24	0.02	8	198	1027.01	1024.83	1.10	492.69	0.71	3%	
1611	944	21.20	0.03	12	411	986.05	985.26	0.19	607.40	0.87	3%	
1630	3012	10.37	0.01	8	209	995.93	995.09	0.40	297.77	0.43	3%	trouble line

1629	1043	10.37	0.01	8	87	994.23	993.88	0.40	297.89	0.43	3%	
420	421	1.19	0.00	8	19	1062.61	1062.61	0.00	34.36	0.05	3%	
1628	3013	10.27	0.01	8	168	995.31	994.64	0.40	296.92	0.43	3%	
3013	1043	10.27	0.01	8	190	994.64	993.88	0.40	296.98	0.43	3%	
290	292	11.86	0.02	8	285	1028.30	1026.75	0.54	346.89	0.50	3%	
2023	2024	24.74	0.04	12	229	1068.28	1067.64	0.28	732.14	1.05	3%	
663	662	25.53	0.04	8	133	971.44	967.91	2.65	764.99	1.10	3%	
2758	2759	114.15	0.16	21	146	965.29	964.83	0.32	3465.22	4.99	3%	
944	1915	21.20	0.03	12	415	985.26	984.36	0.22	645.63	0.93	3%	
626	409	13.90	0.02	10	449	1015.36	1014.25	0.25	423.94	0.61	3%	
Jun-344	Jun-346	524.56	0.76	16	29	946.00	954.50	-29.22	16133.72	23.23	3%	Sanitary Siphon under River
1220	2848	9.40	0.01	8	472	974.36	972.57	0.38	289.59	0.42	3%	Interpolated
992	958	21.46	0.03	12	280	1074.78	1074.10	0.24	662.33	0.95	3%	
1219	2306	9.41	0.01	8	98	975.53	975.14	0.40	296.06	0.43	3%	
316	1236	9.40	0.01	8	128	981.78	981.27	0.40	296.45	0.43	3%	Interpolated
1236	1221	9.41	0.01	8	320	981.27	979.99	0.40	297.12	0.43	3%	Interpolated
1221	1222	9.41	0.01	8	428	979.99	978.28	0.40	297.25	0.43	3%	Interpolated
1222	1218	9.41	0.01	8	407	978.28	976.65	0.40	297.63	0.43	3%	Interpolated
2306	1220	9.41	0.01	8	195	975.14	974.36	0.40	297.66	0.43	3%	Interpolated
1218	1219	9.41	0.01	8	279	976.65	975.53	0.40	297.67	0.43	3%	Interpolated
2911	2466	13.85	0.02	10	45	980.20	980.08	0.27	442.03	0.64	3%	
1940	1938	159.97	0.23	24	182	962.79	962.17	0.34	5132.16	7.39	3%	
2027	1816	60.07	0.09	10	146	978.50	971.04	5.12	1927.63	2.78	3%	
2928	2929	9.25	0.01	8	393	1064.07	1062.50	0.40	297.13	0.43	3%	
798	627	13.90	0.02	10	284	1017.18	1016.39	0.28	449.70	0.65	3%	
310	309	9.40	0.01	8	24	981.62	981.52	0.42	304.82	0.44	3%	
619	616	13.85	0.02	10	411	981.62	980.47	0.28	450.90	0.65	3%	
624	620	13.85	0.02	10	411	985.07	983.92	0.28	450.95	0.65	3%	
620	2342	13.85	0.02	10	264	983.92	983.18	0.28	451.62	0.65	3%	Interpolated
623	624	13.85	0.02	10	498	986.47	985.07	0.28	452.02	0.65	3%	
2928	1051	9.09	0.01	8	154	1064.07	1063.45	0.40	297.84	0.43	3%	
967	2023	24.74	0.04	12	193	1069.84	1069.18	0.34	811.47	1.17	3%	
1308	1307	13.88	0.02	12	18	965.76	965.72	0.22	463.12	0.67	3%	
627	626	13.90	0.02	10	280	1016.29	1015.46	0.30	463.81	0.67	3%	
Jun-322	Jun-323	328.17	0.47	24	64	954.50	953.50	1.56	10999.77	15.84	3%	Sanitary Siphon under River
Jun-322	Jun-326	328.17	0.47	24	64	954.50	953.50	1.56	10999.77	15.84	3%	Sanitary Siphon under River
1917	2463	21.20	0.03	12	406	982.71	981.64	0.26	711.49	1.02	3%	
702	444	18.45	0.03	10	333	1035.35	1033.53	0.55	630.07	0.91	3%	
224	225	8.48	0.01	8	34	946.18	946.05	0.38	290.32	0.42	3%	
703	702	18.46	0.03	10	338	1037.21	1035.35	0.55	632.35	0.91	3%	
705	704	18.46	0.03	10	310	1040.62	1038.88	0.56	638.42	0.92	3%	
704	703	18.46	0.03	10	297	1038.88	1037.21	0.56	639.29	0.92	3%	
292	294	11.86	0.02	8	288	1026.75	1024.35	0.83	429.43	0.62	3%	
958	959	21.46	0.03	12	316	1074.14	1073.14	0.32	779.15	1.12	3%	
1610	1611	21.20	0.03	12	479	987.58	986.05	0.32	783.32	1.13	3%	
1026	87	26.64	0.04	10	298	992.01	988.00	1.35	989.36	1.42	3%	
1021	297	11.86	0.02	10	52	1006.40	1006.26	0.27	443.72	0.64	3%	
281	282	17.24	0.02	8	199	1030.80	1027.01	1.90	648.23	0.93	3%	
9091	674	17.70	0.03	8	83	1066.30	1064.60	2.05	672.40	0.97	3%	
2849	2839	197.93	0.29	30	272	955.65	955.03	0.23	7617.49	10.97	3%	
533	532	166.81	0.24	30	207	957.94	957.59	0.17	6559.58	9.45	3%	
Jun-320	1936	159.97	0.23	24	178	965.80	964.86	0.53	6398.76	9.21	3%	
9181	1077	6.71	0.01	8	12	988.75	988.71	0.33	270.60	0.39	2%	
Jun-340	Jun-342	524.56	0.76	16	20	956.10	946.00	50.50	21210.09	30.54	2%	Sanitary Siphon under River
1936	1937	159.97	0.23	24	305	964.86	963.18	0.55	6525.85	9.40	2%	
1937	1940	159.97	0.23	24	70	963.18	962.79	0.55	6547.81	9.43	2%	
466	456	13.54	0.02	12	374	1013.60	1012.93	0.18	555.21	0.80	2%	
672	671	17.70	0.03	8	55	1054.90	1053.59	2.39	726.11	1.05	2%	Interpolated
673	672	17.70	0.03	8	311	1062.34	1054.90	2.39	726.76	1.05	2%	Interpolated
671	670	17.70	0.03	8	54	1053.59	1052.31	2.39	726.80	1.05	2%	Interpolated
674	673	17.70	0.03	8	94	1064.60	1062.34	2.40	728.27	1.05	2%	Interpolated
1915	1917	21.20	0.03	12	414	984.36	982.71	0.40	875.20	1.26	2%	
2831	2746	484.62	0.70	33	83	954.69	953.90	0.96	20105.52	28.95	2%	
1356	1355	32.27	0.05	12	247	969.39	967.04	0.95	1350.79	1.95	2%	
2342	621	13.85	0.02	10	145	983.18	982.50	0.47	584.05	0.84	2%	
Jun-324	Jun-328	276.27	0.40	18	140	953.50	941.50	8.57	11962.73	17.23	2%	Sanitary Siphon under River
Jun-325	Jun-329	276.27	0.40	18	140	953.50	941.50	8.57	11962.73	17.23	2%	Sanitary Siphon under River
2463	2464	21.20	0.03	12	418	981.64	979.80	0.44	919.67	1.32	2%	
1803	1807	2985.69	4.30	60	181	951.00	948.00	1.66	130412.83	187.79	2%	DummyPipeforWWTF
532	2382	174.17	0.25	24	36	957.59	957.32	0.76	7672.18	11.05	2%	
455	454	13.54	0.02	12	146	1012.13	1011.86	0.19	596.96	0.86	2%	
776	775	6.29	0.01	8	202	1035.08	1034.37	0.35	278.84	0.40	2%	
824	1692	6.64	0.01	8	293	1015.02	1013.85	0.40	296.80	0.43	2%	
1658	1645	6.64	0.01	8	288	1007.51	1006.36	0.40	296.93	0.43	2%	
1692	1666	6.64	0.01	8	244	1013.85	1012.87	0.40	297.64	0.43	2%	ROOT CUT 07
1666	1667	6.63	0.01	8	373	1012.87	1011.38	0.40	297.24	0.43	2%	
1645	1636	6.63	0.01	8	383	1006.36	1004.83	0.40	297.27	0.43	2%	
706	705	18.44	0.03	10	104	1041.60	1040.62	0.94	827.32	1.19	2%	
1636	728	6.63	0.01	8	299	1004.83	1003.63	0.40	297.59	0.43	2%	
9015	9016	9.25	0.01	8	330	1059.90	1057.26	0.80	420.12	0.60	2%	
456	455	13.54	0.02	12	380	1013.00	1012.23	0.20	623.56	0.90	2%	
1313	1308	13.88	0.02	12	374	966.58	965.76	0.22	649.16	0.93	2%	
1648	776	6.29	0.01	8	177	1035.79	1035.08	0.40	297.85	0.43	2%	
9072	2936	9.64	0.01	10	38	1010.78	1010.67	0.29	461.47	0.66	2%	
467	466	13.54	0.02	12	178	1014.10	1013.70	0.23	657.47	0.95	2%	
747	746	22.79	0.03	8	374	1109.35	1088.45	5.58	1110.82	1.60	2%	
296	Jun-10	11.86	0.02	8	192	1018.63	1015.70	1.53	580.55	0.84	2%	Interpolated
2393	2909	6.07	0.01	10	413	983.10	982.59	0.12	299.33	0.43	2%	
9016	2097	9.25	0.01	10	38	1057.16	1057.05	0.29	456.21	0.66	2%	
753	747	22.79	0.03	8	356	1130.48	1109.48	5.90	1141.88	1.64	2%	
662	661	21.32	0.03	8	165	967.91	959.04	5.37	1089.46	1.57	2%	Interpolated
1168	453	13.54	0.02	12	20	1011.45	1011.40	0.25	698.02	1.01	2%	
289	290	11.86	0.02	8	337	1034.80	1028.75	1.79	629.47	0.91	2%	
666	665	17.70	0.03	8	191	1001.37	993.61	4.07	947.82	1.36	2%	Interpolated
1509	1506	75.41	0.11	15	298	1027.40	1019.56	2.63	4077.22	5.87	2%	
762	211	8.32	0.01	12	113	971.96	971.84	0.11	451.25	0.65	2%	Interpolated
1307	1303	16.06	0.02	12	523	965.74	963.59	0.41	888.43	1.28	2%	Interpolated
1303	2446	16.06	0.02	12	207	963.59	962.74	0.41	889.00	1.28	2%	Interpolated

211	212	8.32	0.01	12	397	971.84	971.40	0.11	461.65	0.66	2%	
294	295	11.86	0.02	8	205	1024.24	1020.20	1.97	659.19	0.95	2%	
994	993	12.14	0.02	12	168	1075.67	1075.27	0.24	677.21	0.98	2%	
219	220	5.11	0.01	8	247	950.28	949.34	0.38	290.09	0.42	2%	
221	223	5.11	0.01	8	362	949.20	947.78	0.39	294.40	0.42	2%	
49	50	255.43	0.37	15	52	1008.52	990.78	34.40	14737.77	21.22	2%	
2401	2469	14.59	0.02	8	403	986.44	973.47	3.22	843.18	1.21	2%	
220	221	5.11	0.01	8	35	949.34	949.20	0.40	296.11	0.43	2%	
223	224	5.11	0.01	8	402	947.78	946.18	0.40	296.69	0.43	2%	
2062	420	14.82	0.02	8	383	1075.64	1062.61	3.40	866.87	1.25	2%	
2063	2062	14.82	0.02	8	21	1076.37	1075.64	3.40	867.16	1.25	2%	
2487	2846	193.42	0.28	30	83	957.22	956.80	0.50	11326.56	16.31	2%	
995	994	12.14	0.02	12	387	1076.70	1075.67	0.27	714.82	1.03	2%	
746	2063	14.82	0.02	8	350	1088.45	1076.37	3.45	872.80	1.26	2%	
4	1	5.11	0.01	8	96	969.90	969.50	0.41	302.71	0.44	2%	
66	1515	7.21	0.01	12	305	959.91	959.61	0.10	434.31	0.63	2%	
788	289	11.86	0.02	8	216	1039.83	1034.80	2.33	718.04	1.03	2%	
126	127	17.24	0.02	8	102	1024.56	1019.51	4.96	1046.68	1.51	2%	
2916	2917	4.83	0.01	8	30	979.09	978.97	0.40	295.72	0.43	2%	
127	128	17.24	0.02	8	148	1019.51	1011.91	5.13	1064.68	1.53	2%	
746	2064	7.97	0.01	8	76	1088.45	1087.59	1.14	501.61	0.72	2%	
2025	9143	36.09	0.05	10	90	1055.08	1048.64	7.12	2274.13	3.27	2%	
9200	9162	7.16	0.01	10	29	992.90	992.82	0.28	451.23	0.65	2%	
1051	2807	9.09	0.01	8	221	1063.45	1060.14	1.50	574.75	0.83	2%	
1353	2758	185.65	0.27	27	53	966.11	965.60	0.96	11782.04	16.97	2%	
1384	1317	7.02	0.01	10	470	972.85	971.53	0.28	451.83	0.65	2%	
174	175	13.49	0.02	12	204	991.37	990.57	0.39	868.45	1.25	2%	Interpolated
454	1168	13.54	0.02	12	71	1011.78	1011.50	0.40	872.78	1.26	2%	
176	177	13.90	0.02	12	118	989.77	989.27	0.42	902.55	1.30	2%	
1817	2027	36.09	0.05	10	198	993.51	978.50	7.59	2348.12	3.38	2%	
173	174	13.50	0.02	12	155	992.02	991.37	0.42	896.11	1.29	2%	
175	176	13.49	0.02	12	189	990.57	989.77	0.42	902.42	1.30	1%	
99	67	5.22	0.01	10	170	960.92	960.62	0.18	357.68	0.52	1%	
2465	2464	13.64	0.02	15	166	979.89	979.64	0.15	974.35	1.40	1%	
2254	4	3.90	0.01	8	207	970.73	970.00	0.35	279.06	0.40	1%	Interpolated
9143	2026	36.09	0.05	10	219	1048.64	1027.72	9.53	2631.54	3.79	1%	
422	657	3.05	0.00	8	394	1061.93	1061.03	0.23	224.72	0.32	1%	
1517	1520	7.21	0.01	12	303	958.81	958.36	0.15	533.66	0.77	1%	
727	654	6.63	0.01	8	200	998.40	996.19	1.10	493.97	0.71	1%	
2026	1817	36.09	0.05	10	341	1027.72	993.51	10.03	2699.14	3.89	1%	
9061	2057	13.64	0.02	8	31	1030.25	1028.70	4.98	1049.22	1.51	1%	
2775	9062	13.64	0.02	8	107	1000.92	995.59	5.00	1050.73	1.51	1%	
2058	9061	13.64	0.02	8	225	1041.52	1030.25	5.00	1050.94	1.51	1%	
9062	2002	13.64	0.02	8	192	995.59	985.97	5.00	1050.94	1.51	1%	
2056	2775	13.64	0.02	8	263	1014.09	1000.92	5.00	1051.02	1.51	1%	
2002	2001	13.64	0.02	8	159	985.97	978.03	5.00	1051.31	1.51	1%	
2061	2058	13.64	0.02	8	289	1055.99	1041.52	5.00	1051.31	1.51	1%	This needs field verification
2057	2056	13.64	0.02	8	292	1028.70	1014.09	5.00	1051.37	1.51	1%	
993	992	12.14	0.02	12	84	1075.17	1074.78	0.46	943.98	1.36	1%	
420	2061	13.64	0.02	8	130	1062.61	1055.99	5.10	1061.23	1.53	1%	
582	577	5.87	0.01	10	466	984.98	983.64	0.29	457.05	0.66	1%	
Jun-323	Jun-327	328.17	0.47	24	140	953.50	941.50	8.57	25763.22	37.10	1%	Sanitary Siphon under River
Jun-326	Jun-330	328.17	0.47	24	140	953.50	941.50	8.57	25763.22	37.10	1%	Sanitary Siphon under River
2782	171	9.59	0.01	12	84	997.37	997.12	0.30	754.98	1.09	1%	Interpolated
171	172	9.58	0.01	12	451	997.12	995.77	0.30	758.07	1.09	1%	Interpolated
1667	1658	6.63	0.01	8	297	1011.38	1007.51	1.30	536.82	0.77	1%	
1634	654	3.64	0.01	8	444	997.86	996.09	0.40	296.87	0.43	1%	
861	862	3.51	0.01	8	331	973.01	971.76	0.38	288.76	0.42	1%	
2774	9104	5.59	0.01	10	161	993.37	992.90	0.29	461.20	0.66	1%	
2064	2073	7.97	0.01	8	379	1087.59	1080.01	2.00	664.88	0.96	1%	
2073	2072	7.97	0.01	8	80	1080.01	1078.40	2.00	665.17	0.96	1%	
1634	1633	2.66	0.00	8	426	997.86	996.91	0.22	222.11	0.32	1%	
67	66	5.22	0.01	10	270	960.62	959.91	0.26	436.71	0.63	1%	
577	576	4.78	0.01	10	313	983.64	982.95	0.22	400.23	0.58	1%	
362	363	75.41	0.11	15	76	1036.62	1031.79	6.34	6326.30	9.11	1%	
2398	2393	6.07	0.01	10	407	984.66	983.20	0.36	510.70	0.74	1%	
1633	1630	2.66	0.00	8	426	996.91	995.93	0.23	225.36	0.32	1%	
668	667	17.70	0.03	8	112	1024.38	1012.95	10.24	1503.92	2.17	1%	Interpolated
1520	1550	7.21	0.01	12	354	958.36	957.65	0.20	620.51	0.89	1%	Interpolated
576	575	4.77	0.01	10	283	982.85	982.19	0.23	411.39	0.59	1%	
1	2	5.11	0.01	10	222	969.40	968.78	0.28	450.40	0.65	1%	Sanitary Siphon under River
183	184	9.59	0.01	12	428	1002.17	1000.57	0.37	847.65	1.22	1%	
667	666	17.70	0.03	8	103	1012.95	1001.37	11.27	1578.33	2.27	1%	Interpolated
2024	2025	27.32	0.04	12	403	1067.64	1055.08	3.12	2446.12	3.52	1%	
530	529	31.28	0.05	24	117	957.90	957.78	0.10	2813.51	4.05	1%	
657	658	3.04	0.00	8	408	1061.03	1059.64	0.34	274.26	0.39	1%	
2429	183	9.59	0.01	12	402	1003.77	1002.17	0.40	874.39	1.26	1%	
1039	1038	3.66	0.01	8	240	997.65	996.41	0.52	337.90	0.49	1%	
2401	2398	6.07	0.01	10	410	986.44	984.66	0.43	561.47	0.81	1%	
575	574	4.77	0.01	10	216	982.11	981.52	0.27	445.43	0.64	1%	
996	995	7.17	0.01	12	213	1077.31	1076.80	0.24	677.64	0.98	1%	
1073	1074	7.29	0.01	12	193	987.35	986.87	0.25	690.50	0.99	1%	Interpolated
1075	1076	6.62	0.01	12	237	986.33	985.84	0.21	630.23	0.91	1%	
1074	1075	6.63	0.01	12	223	986.87	986.38	0.22	650.30	0.94	1%	
333	334	2.68	0.00	8	398	1006.23	1004.98	0.31	263.32	0.38	1%	
1069	1070	6.61	0.01	12	399	985.33	984.45	0.22	650.55	0.94	1%	
580	582	4.78	0.01	10	276	985.92	985.08	0.30	470.60	0.68	1%	
1515	1517	7.21	0.01	12	303	959.61	958.81	0.26	711.93	1.03	1%	
1037	1036	3.66	0.01	8	264	994.32	992.73	0.60	364.46	0.52	1%	
184	170	9.59	0.01	12	333	1000.57	998.97	0.48	960.19	1.38	1%	
218	219	5.11	0.01	10	304	966.49	965.38	0.37	515.22	0.74	1%	
1076	1069	6.62	0.01	12	174	985.79	985.38	0.24	672.99	0.97	1%	
1319	1313	9.89	0.01	12	291	968.11	966.56	0.53	1011.09	1.46	1%	
1565	1569	26.32	0.04	24	159	958.79	958.64	0.09	2705.05	3.90	1%	
212	208	8.31	0.01	12	425	971.40	969.78	0.38	855.31	1.23	1%	Interpolated
Jun-351	218	5.11	0.01	10	124	967.00	966.49	0.41	546.58	0.79	1%	Sanitary Siphon under River
9085	2901	8.96	0.01	15	402	975.20	974.60	0.15	970.99	1.40	1%	
2072	2080	6.12	0.01	8	132	1078.40	1075.76	2.00	664.43	0.96	1%	

2080	2081	6.12	0.01	8	374	1075.76	1068.28	2.00	664.65	0.96	1%	
2081	2083	6.12	0.01	8	60	1068.28	1067.08	2.00	664.98	0.96	1%	
1108	333	2.68	0.00	8	120	1006.70	1006.24	0.38	291.25	0.42	1%	
335	328	2.68	0.00	8	404	1000.32	998.72	0.40	295.76	0.43	1%	
Jun-332	Jun-336	276.27	0.40	18	20	941.30	952.50	-56.00	30577.20	44.03	1%	Sanitary Siphon under River
Jun-333	Jun-337	276.27	0.40	18	20	941.30	952.50	-56.00	30577.20	44.03	1%	Sanitary Siphon under River
170	2782	9.59	0.01	12	272	998.97	997.37	0.59	1063.02	1.53	1%	
334	335	2.68	0.00	8	399	1004.98	1003.38	0.40	297.51	0.43	1%	
1318	1319	9.89	0.01	12	302	970.12	968.21	0.63	1102.84	1.59	1%	
879	1631	2.66	0.00	8	404	999.19	997.57	0.40	297.50	0.43	1%	
1640	879	2.65	0.00	8	181	999.91	999.19	0.40	296.40	0.43	1%	
1038	1037	3.66	0.01	8	249	996.31	994.42	0.76	409.84	0.59	1%	
1631	1630	2.65	0.00	8	409	997.57	995.93	0.40	297.49	0.43	1%	ROOT CUT 08
1652	1639	2.65	0.00	8	387	1002.24	1000.69	0.40	297.59	0.43	1%	
1639	1640	2.65	0.00	8	194	1000.69	999.91	0.40	298.09	0.43	1%	ROOT CUT 08
2851	2487	193.42	0.28	30	5	957.32	957.22	2.00	22563.96	32.49	1%	
2158	9149	72.18	0.10	18	36	978.00	976.46	4.27	8440.55	12.15	1%	
180	181	6.17	0.01	12	234	1005.20	1004.56	0.27	724.88	1.04	1%	Interpolated
1569	1570	23.89	0.03	24	174	958.64	958.46	0.10	2833.74	4.08	1%	
181	182	6.17	0.01	12	106	1004.56	1004.26	0.28	738.12	1.06	1%	Interpolated
728	727	6.63	0.01	8	180	1003.63	998.50	2.85	793.41	1.14	1%	
1008	1005	5.34	0.01	12	169	1091.89	1091.52	0.22	648.19	0.93	1%	
1006	1007	7.17	0.01	12	204	1090.42	1089.60	0.40	878.27	1.26	1%	
177	178	13.90	0.02	12	413	989.27	983.02	1.51	1704.62	2.45	1%	
9133	9132	60.06	0.09	12	33	964.45	954.94	28.58	7408.42	10.67	1%	
2853	762	4.21	0.01	12	52	972.04	971.96	0.15	541.82	0.78	1%	
1317	1318	7.02	0.01	12	117	970.63	970.13	0.43	906.45	1.31	1%	
1005	1006	7.17	0.01	12	147	1091.19	1090.52	0.46	936.30	1.35	1%	
1570	1892	30.73	0.04	24	194	958.46	958.02	0.23	4190.39	6.03	1%	
1892	530	30.54	0.04	24	52	958.02	957.90	0.23	4246.12	6.11	1%	
2929	9015	9.25	0.01	8	31	1062.50	1059.90	8.35	1358.24	1.96	1%	
670	669	17.70	0.03	8	40	1052.31	1039.50	32.07	2662.08	3.83	1%	Interpolated
207	209	4.21	0.01	12	408	974.92	974.04	0.22	643.69	0.93	1%	
172	173	9.58	0.01	12	333	995.77	992.02	1.13	1470.62	2.12	1%	
2097	2096	7.98	0.01	8	202	1057.05	1043.31	6.80	1225.85	1.77	1%	
1273	1272	4.03	0.01	12	516	1006.71	1005.68	0.20	619.26	0.89	1%	
2095	2094	7.98	0.01	8	196	1029.60	1016.26	6.81	1226.65	1.77	1%	
2096	2095	7.98	0.01	8	201	1043.31	1029.60	6.81	1226.69	1.77	1%	
2094	1137	7.98	0.01	8	253	1016.26	999.02	6.81	1226.70	1.77	1%	
206	207	4.21	0.01	12	396	975.80	974.92	0.22	653.25	0.94	1%	
2072	2071	1.85	0.00	8	49	1078.40	1078.20	0.41	299.30	0.43	1%	Interpolated
209	210	4.21	0.01	12	318	974.04	973.16	0.28	728.52	1.05	1%	
669	668	17.70	0.03	8	35	1039.50	1024.38	42.66	3070.29	4.42	1%	Interpolated
1566	1565	24.43	0.04	24	46	958.90	958.72	0.39	4291.55	6.18	1%	
421	422	1.19	0.00	8	324	1062.61	1061.93	0.21	215.31	0.31	1%	
1081	2135	5.34	0.01	12	261	1095.89	1094.61	0.49	970.37	1.40	1%	
328	2771	4.48	0.01	8	257	998.72	990.84	3.06	822.63	1.18	1%	Interpolated
1040	1039	3.66	0.01	8	172	1001.51	997.75	2.19	695.42	1.00	1%	
1988	1042	3.66	0.01	8	303	1032.27	1025.60	2.20	697.13	1.00	1%	
Jun-218	2465	5.12	0.01	15	192	980.18	979.89	0.15	975.50	1.40	1%	
862	863	3.51	0.01	8	299	971.65	965.10	2.19	695.23	1.00	1%	
1007	998	7.17	0.01	12	95	1085.92	1085.02	0.95	1421.96	2.05	1%	
210	2853	4.21	0.01	12	307	973.16	972.04	0.36	836.43	1.20	1%	
Jun-331	Jun-335	328.17	0.47	24	20	941.30	952.50	-56.00	65851.80	94.83	0%	Sanitary Siphon under River
Jun-334	Jun-338	328.17	0.47	24	20	941.30	952.50	-56.00	65851.80	94.83	0%	Sanitary Siphon under River
775	1634	6.29	0.01	8	380	1034.27	1006.00	7.44	1281.78	1.85	0%	
179	180	3.93	0.01	12	130	1005.72	1005.20	0.40	875.00	1.26	0%	
1077	1073	6.67	0.01	12	118	988.71	987.35	1.16	1490.43	2.15	0%	Interpolated
2097	2109	1.27	0.00	8	83	1057.05	1056.72	0.40	296.97	0.43	0%	
2109	2108	1.27	0.00	8	282	1025.82	1024.69	0.40	297.64	0.43	0%	
1015	4	1.22	0.00	8	313	971.23	970.00	0.39	294.60	0.42	0%	
1014	1015	1.22	0.00	8	223	972.22	971.33	0.40	297.17	0.43	0%	
1013	1014	1.22	0.00	8	214	973.18	972.32	0.40	297.80	0.43	0%	
1272	179	3.93	0.01	12	16	1005.64	1005.70	-0.38	992.77	1.43	0%	
855	854	1.03	0.00	8	143	979.07	978.50	0.40	297.27	0.43	0%	
864	865	1.03	0.00	8	164	1010.07	1009.41	0.40	297.94	0.43	0%	
1041	1040	3.66	0.01	8	203	1012.17	1001.61	5.19	1071.20	1.54	0%	
834	539	0.97	0.00	8	174	959.75	959.08	0.38	291.60	0.42	0%	
858	857	1.03	0.00	8	329	986.70	985.14	0.47	323.47	0.47	0%	
998	997	7.17	0.01	12	101	1085.02	1082.21	2.79	2316.69	3.34	0%	
1042	1041	3.66	0.01	8	205	1025.60	1012.32	6.48	1196.65	1.72	0%	
953	864	1.03	0.00	8	77	1010.57	1010.17	0.52	339.41	0.49	0%	Interpolated
182	2429	6.17	0.01	12	15	1004.26	1003.77	3.36	2538.92	3.66	0%	
997	996	7.17	0.01	12	99	1082.11	1077.41	4.74	3016.16	4.34	0%	
143	1238	0.59	0.00	8	75	984.81	984.58	0.31	259.72	0.37	0%	
205	206	4.21	0.01	12	148	979.52	975.80	2.52	2198.38	3.17	0%	
1547	1548	0.82	0.00	10	222	959.34	958.72	0.28	450.29	0.65	0%	Interpolated
1548	1549	0.82	0.00	10	360	958.72	957.71	0.28	451.41	0.65	0%	Interpolated
2135	1008	5.34	0.01	18	500	1094.51	1091.89	0.52	2958.45	4.26	0%	
2071	422	1.85	0.00	8	327	1078.20	1061.93	4.98	1048.57	1.51	0%	Interpolated
Jun-349	Jun-351	2.86	0.00	8	80	956.50	967.00	-13.13	1702.94	2.45	0%	Sanitary Siphon under River
Jun-350	Jun-351	2.86	0.00	8	80	956.50	967.00	-13.13	1702.94	2.45	0%	Sanitary Siphon under River
951	952	1.03	0.00	8	94	1017.08	1015.37	1.81	632.51	0.91	0%	
2250	2251	3.91	0.01	24	206	971.91	971.75	0.08	2453.22	3.53	0%	
2251	2252	3.91	0.01	24	475	971.75	971.37	0.08	2488.52	3.58	0%	
2252	2253	3.91	0.01	24	400	971.37	971.05	0.08	2488.96	3.58	0%	
2253	2254	3.91	0.01	24	400	971.05	970.73	0.08	2488.96	3.58	0%	
2249	2250	3.91	0.01	24	407	972.24	971.91	0.08	2506.53	3.61	0%	
857	856	1.03	0.00	8	121	985.04	982.50	2.09	679.84	0.98	0%	
2423	2422	0.95	0.00	12	401	1062.96	1062.08	0.22	648.95	0.93	0%	MinimumSlope
952	953	1.52	0.00	8	94	1015.27	1010.57	4.99	1049.80	1.51	0%	
854	861	1.03	0.00	8	199	978.30	973.29	2.52	745.74	1.07	0%	
856	855	1.03	0.00	8	124	982.40	979.17	2.59	757.15	1.09	0%	
2	Jun-348	2.56	0.00	8	70	968.68	956.50	17.40	1960.76	2.82	0%	Sanitary Siphon under River
2	Jun-347	2.56	0.00	8	70	968.68	956.50	17.40	1960.76	2.82	0%	Sanitary Siphon under River
2424	2423	0.95	0.00	12	388	1066.15	1065.02	0.29	747.62	1.08	0%	
2422	2420	0.93	0.00	15	429	1062.08	1061.67	0.10	776.83	1.12	0%	
865	866	1.03	0.00	8	393	1009.31	995.55	3.51	880.07	1.27	0%	

9000	204	4.21	0.01	21	6	966.52	966.50	0.35	3670.32	5.29	0%	
2427	2426	0.96	0.00	12	348	1071.50	1070.12	0.40	873.13	1.26	0%	
2426	2425	0.96	0.00	12	401	1069.67	1068.07	0.40	875.05	1.26	0%	
2425	2424	0.96	0.00	12	401	1067.97	1066.25	0.43	907.63	1.31	0%	
866	858	1.03	0.00	8	190	995.45	986.90	4.50	996.62	1.44	0%	
2420	2419	0.93	0.00	15	398	1061.57	1061.01	0.14	943.08	1.36	0%	
2419	2430	0.93	0.00	15	390	1060.91	1060.30	0.16	993.92	1.43	0%	
2418	2417	0.93	0.00	15	282	1059.61	1059.16	0.16	1004.59	1.45	0%	
1790	2177	1.86	0.00	12	33	962.70	961.99	2.15	2029.75	2.92	0%	
1567	1566	1.97	0.00	24	122	958.98	958.87	0.09	2254.51	3.25	0%	
2417	2416	0.93	0.00	15	249	1059.06	1058.60	0.18	1079.03	1.55	0%	
842	543	0.45	0.00	10	19	960.62	960.47	0.81	766.39	1.10	0%	Interpolated
2430	2418	0.93	0.00	15	88	1060.30	1059.71	0.67	2054.11	2.96	0%	
2416	2415	0.92	0.00	15	402	1058.50	1054.59	0.97	2477.57	3.57	0%	
651	Jun-53	0.30	0.00	12	38	996.56	996.20	0.95	1348.39	1.94	0%	Interpolated
2415	2414	0.92	0.00	15	401	1054.55	1036.83	4.42	5283.63	7.61	0%	
6	Jun-02	0.00	0.00	8	300	1200.31	1198.95	0.45	316.61	0.46	0%	
7	6	0.00	0.00	8	129	1200.89	1200.41	0.37	286.54	0.41	0%	
9	8	0.00	0.00	8	277	1070.11	1063.52	2.38	725.35	1.04	0%	
10	9	0.00	0.00	8	281	1071.52	1070.11	0.50	332.84	0.48	0%	
11	10	0.00	0.00	8	264	1072.52	1071.52	0.38	289.11	0.42	0%	
12	11	0.00	0.00	8	248	1073.52	1072.52	0.40	298.41	0.43	0%	
15	641	0.00	0.00	8	94	1081.02	1077.97	3.23	845.14	1.22	0%	
14	15	0.00	0.00	8	242	1088.27	1081.02	3.00	813.67	1.17	0%	
13	14	0.00	0.00	8	326	1095.28	1088.27	2.15	689.07	0.99	0%	
19	13	0.00	0.00	8	298	1104.53	1095.28	3.10	828.16	1.19	0%	
18	19	0.00	0.00	8	286	1110.52	1104.79	2.00	665.39	0.96	0%	
17	18	0.00	0.00	8	298	1118.92	1110.52	2.82	789.79	1.14	0%	
16	17	0.00	0.00	8	287	1133.94	1118.92	5.24	1075.84	1.55	0%	
2920	21	0.00	0.00	8	78	1140.88	1139.34	1.97	659.22	0.95	0%	
21	22	0.00	0.00	8	191	1139.34	1138.00	0.70	393.32	0.57	0%	
22	23	0.00	0.00	8	295	1138.00	1135.38	0.89	442.87	0.64	0%	
23	16	0.00	0.00	8	267	1135.38	1133.94	0.54	345.26	0.50	0%	
69	68	0.00	0.00	10	295	961.81	961.22	0.20	380.93	0.55	0%	
92	93	0.00	0.00	10	260	1020.02	1012.52	2.88	1446.65	2.08	0%	
93	9072	0.00	0.00	10	294	1012.52	1010.78	0.59	655.48	0.94	0%	
68	99	0.00	0.00	10	126	961.22	960.92	0.24	415.86	0.60	0%	
104	119	0.00	0.00	8	319	1043.07	1041.77	0.41	300.15	0.43	0%	MinimumSlope
104	118	0.00	0.00	8	313	1043.07	1041.81	0.40	298.37	0.43	0%	
131	128	0.00	0.00	8	301	1013.11	1011.91	0.40	296.95	0.43	0%	
135	136	0.00	0.00	8	332	976.14	974.82	0.40	296.55	0.43	0%	
136	137	0.00	0.00	8	330	974.82	973.50	0.40	297.50	0.43	0%	
137	138	0.00	0.00	8	346	973.50	973.22	0.08	133.63	0.19	0%	
144	143	0.00	0.00	8	249	985.94	984.94	0.40	298.08	0.43	0%	
145	2806	0.00	0.00	8	220	987.02	985.94	0.49	329.02	0.47	0%	
146	145	0.00	0.00	8	386	990.05	987.02	0.79	416.50	0.60	0%	
147	146	0.00	0.00	8	401	992.85	990.05	0.70	392.78	0.57	0%	
148	147	0.00	0.00	8	335	995.19	992.85	0.70	392.93	0.57	0%	
149	148	0.00	0.00	8	400	1003.19	995.19	2.00	664.97	0.96	0%	
195	196	0.00	0.00	8	345	1007.92	1006.55	0.40	296.36	0.43	0%	
196	180	0.00	0.00	8	302	1006.55	1005.35	0.40	296.47	0.43	0%	
202	203	0.00	0.00	12	295	967.83	967.17	0.22	655.83	0.94	0%	
265	266	0.00	0.00	8	210	1037.37	1033.72	1.74	620.09	0.89	0%	
266	267	0.00	0.00	8	191	1033.72	1033.72	0.00	10.77	0.02	0%	Interpolated
267	268	0.00	0.00	8	207	1033.72	1032.50	0.59	360.75	0.52	0%	
269	195	0.00	0.00	8	132	1009.05	1008.52	0.40	297.35	0.43	0%	
271	269	0.00	0.00	8	374	1016.52	1009.05	2.00	664.61	0.96	0%	
272	271	0.00	0.00	8	143	1039.12	1016.52	15.84	1871.04	2.69	0%	
285	284	0.00	0.00	8	297	1048.28	1037.96	3.48	876.57	1.26	0%	
284	281	0.00	0.00	8	304	1037.96	1030.80	2.36	721.75	1.04	0%	Interpolated
308	306	0.00	0.00	8	354	1004.52	1001.52	0.85	432.61	0.62	0%	
314	313	0.00	0.00	8	133	986.52	985.52	0.75	408.19	0.59	0%	
315	314	0.00	0.00	8	373	992.52	986.52	1.61	596.23	0.86	0%	
307	315	0.00	0.00	8	202	993.71	992.52	0.59	360.78	0.52	0%	
313	311	0.00	0.00	8	168	985.52	984.95	0.34	273.71	0.39	0%	
311	310	0.00	0.00	8	318	984.95	981.62	1.05	480.71	0.69	0%	
1106	332	0.00	0.00	8	278	1009.16	1007.94	0.44	311.24	0.45	0%	Interpolated
357	2774	0.00	0.00	8	213	994.22	993.37	0.40	296.68	0.43	0%	Interpolated
358	357	0.00	0.00	8	394	995.80	994.22	0.40	297.71	0.43	0%	Interpolated
359	360	0.00	0.00	12	410	1008.85	1007.95	0.22	649.64	0.94	0%	Interpolated
364	362	0.00	0.00	15	393	1037.25	1036.62	0.16	1005.97	1.45	0%	
365	364	0.00	0.00	8	388	1045.63	1037.85	2.00	665.39	0.96	0%	
366	2317	0.00	0.00	8	200	1050.92	1046.43	2.24	704.16	1.01	0%	
367	366	0.00	0.00	8	277	1054.05	1050.92	1.13	499.64	0.72	0%	
368	364	0.00	0.00	15	316	1037.57	1037.25	0.10	799.96	1.15	0%	
370	368	0.00	0.00	15	262	1038.10	1037.57	0.20	1130.88	1.63	0%	
418	419	0.00	0.00	8	205	1065.60	1063.99	0.78	416.36	0.60	0%	
419	9060	0.00	0.00	8	428	1063.99	1062.70	0.30	258.06	0.37	0%	
9060	420	0.00	0.00	8	44	1062.70	1062.61	0.21	213.66	0.31	0%	
450	449	0.00	0.00	8	310	984.71	979.52	1.67	608.12	0.88	0%	
449	448	0.00	0.00	8	286	979.42	978.27	0.40	297.85	0.43	0%	
448	135	0.00	0.00	8	225	978.17	977.22	0.42	305.47	0.44	0%	
458	456	0.00	0.00	8	312	1018.52	1016.69	0.59	359.79	0.52	0%	
457	458	0.00	0.00	8	300	1022.52	1018.62	1.30	535.95	0.77	0%	
460	457	0.00	0.00	8	315	1023.88	1022.62	0.40	297.11	0.43	0%	
461	460	0.00	0.00	8	162	1024.63	1023.98	0.40	298.09	0.43	0%	
463	462	0.00	0.00	8	313	1043.34	1033.93	3.01	815.60	1.17	0%	
462	461	0.00	0.00	8	413	1033.83	1024.73	2.20	697.72	1.00	0%	
464	463	0.00	0.00	8	398	1056.46	1050.55	1.48	572.48	0.82	0%	
465	464	0.00	0.00	8	347	1058.06	1056.56	0.43	308.86	0.44	0%	
Jun-32	465	0.00	0.00	8	194	1058.72	1058.06	0.34	273.88	0.39	0%	
478	467	0.00	0.00	8	327	1015.53	1014.20	0.41	299.86	0.43	0%	
483	478	0.00	0.00	8	307	1017.04	1015.63	0.46	318.61	0.46	0%	
479	480	0.00	0.00	8	152	1019.68	1019.10	0.38	290.13	0.42	0%	
480	481	0.00	0.00	8	181	1019.00	1018.28	0.40	296.53	0.43	0%	
481	482	0.00	0.00	8	176	1018.18	1017.44	0.42	304.37	0.44	0%	
482	483	0.00	0.00	8	76	1017.40	1017.11	0.38	290.59	0.42	0%	
484	479	0.00	0.00	8	128	1024.31	1019.68	3.61	893.54	1.29	0%	

485	484	0.00	0.00	8	90	1027.06	1024.31	3.04	819.80	1.18	0%	
486	485	0.00	0.00	8	125	1028.26	1027.16	0.88	440.62	0.63	0%	
487	486	0.00	0.00	8	380	1051.27	1031.72	5.14	1066.16	1.54	0%	Interpolated
488	487	0.00	0.00	8	263	1058.52	1053.32	1.97	660.43	0.95	0%	
489	488	0.00	0.00	8	378	1059.63	1058.62	0.27	243.04	0.35	0%	
490	489	0.00	0.00	8	185	1060.63	1059.73	0.49	327.53	0.47	0%	
517	515	0.00	0.00	8	199	1063.55	1062.79	0.38	290.70	0.42	0%	
515	490	0.00	0.00	8	438	1062.79	1060.93	0.42	306.30	0.44	0%	
518	517	0.00	0.00	8	330	1072.90	1063.65	2.80	786.84	1.13	0%	
526	Jun-32	0.00	0.00	8	355	1060.30	1058.72	0.44	313.42	0.45	0%	
Jun-40	557	0.00	0.00	10	74	988.32	980.69	10.36	2742.80	3.95	0%	Interpolated
565	564	0.00	0.00	15	342	1039.22	1038.66	0.16	1017.24	1.46	0%	Interpolated
579	581	0.00	0.00	8	354	981.91	980.65	0.36	280.61	0.40	0%	
874	579	0.00	0.00	8	234	984.16	981.91	0.96	461.03	0.66	0%	
584	585	0.00	0.00	8	80	990.36	990.01	0.44	311.73	0.45	0%	
585	586	0.00	0.00	8	42	989.91	989.61	0.71	396.09	0.57	0%	
586	580	0.00	0.00	8	318	989.51	987.52	0.63	371.83	0.54	0%	
581	587	0.00	0.00	8	105	980.45	980.02	0.41	300.24	0.43	0%	
587	2916	0.00	0.00	8	195	979.92	979.10	0.42	305.00	0.44	0%	
589	2916	0.00	0.00	8	25	980.42	979.10	5.29	1081.62	1.56	0%	
610	609	0.00	0.00	8	150	993.32	992.71	0.41	300.11	0.43	0%	
609	611	0.00	0.00	8	288	992.61	991.49	0.39	293.33	0.42	0%	
611	612	0.00	0.00	8	265	991.39	990.60	0.30	256.77	0.37	0%	
622	623	0.00	0.00	8	39	986.73	986.57	0.41	300.23	0.43	0%	
628	272	0.00	0.00	8	216	1040.15	1039.12	0.48	324.27	0.47	0%	
Jun-49	628	0.00	0.00	8	170	1040.93	1040.25	0.40	297.69	0.43	0%	
641	12	0.00	0.00	8	150	1077.87	1073.52	2.91	801.41	1.15	0%	
Jun-51	651	0.00	0.00	12	285	999.28	996.56	0.95	1352.86	1.95	0%	
652	653	0.00	0.00	8	299	1011.10	996.71	4.82	1031.55	1.49	0%	
653	654	0.00	0.00	8	175	996.61	995.92	0.39	256.36	0.37	0%	
676	675	0.00	0.00	8	334	1072.35	1067.20	1.54	583.45	0.84	0%	
677	676	0.00	0.00	8	297	1080.12	1072.35	2.62	760.46	1.10	0%	Interpolated
678	677	0.00	0.00	8	251	1094.52	1080.12	5.74	1126.02	1.62	0%	Interpolated
679	678	0.00	0.00	8	239	1107.10	1094.62	5.21	1073.33	1.55	0%	
680	679	0.00	0.00	8	300	1119.93	1107.20	4.24	968.37	1.39	0%	
681	680	0.00	0.00	8	300	1133.78	1120.03	4.59	1007.10	1.45	0%	
696	691	0.00	0.00	8	170	1015.34	1015.01	0.19	206.84	0.30	0%	
691	692	0.00	0.00	8	140	1014.91	1014.34	0.41	299.57	0.43	0%	
692	693	0.00	0.00	8	475	1014.24	1012.32	0.40	298.81	0.43	0%	
693	453	0.00	0.00	8	103	1012.22	1011.82	0.39	293.26	0.42	0%	
694	695	0.00	0.00	8	262	1018.13	1017.18	0.36	283.11	0.41	0%	
695	696	0.00	0.00	8	142	1017.08	1015.34	1.23	520.50	0.75	0%	
707	706	0.00	0.00	8	144	1046.28	1044.95	0.92	451.90	0.65	0%	
708	707	0.00	0.00	8	129	1047.63	1046.38	0.97	462.60	0.67	0%	
709	708	0.00	0.00	8	426	1053.35	1051.63	0.40	298.81	0.43	0%	
710	709	0.00	0.00	8	177	1056.09	1053.45	1.49	573.76	0.83	0%	
711	710	0.00	0.00	8	250	1057.69	1056.19	0.60	364.20	0.52	0%	
724	711	0.00	0.00	8	304	1060.04	1057.69	0.77	413.53	0.60	0%	
748	749	0.00	0.00	8	393	1197.08	1187.70	2.39	726.12	1.05	0%	
749	750	0.00	0.00	8	400	1187.57	1179.49	2.02	667.79	0.96	0%	
750	751	0.00	0.00	8	394	1179.36	1158.83	5.21	1072.62	1.54	0%	
751	752	0.00	0.00	8	390	1158.69	1145.77	3.31	855.51	1.23	0%	
752	753	0.00	0.00	8	395	1145.64	1130.61	3.80	916.65	1.32	0%	
764	763	0.00	0.00	8	135	989.46	988.92	0.40	297.58	0.43	0%	
765	764	0.00	0.00	8	167	990.13	989.46	0.40	297.63	0.43	0%	Interpolated
766	765	0.00	0.00	8	94	990.51	990.13	0.40	298.68	0.43	0%	Interpolated
650	Jun-51	0.00	0.00	12	112	999.51	999.28	0.21	627.84	0.90	0%	
985	787	0.00	0.00	8	132	1043.95	1043.44	0.39	204.66	0.29	0%	
787	783	0.00	0.00	8	146	1043.70	1043.10	0.41	301.12	0.43	0%	
783	786	0.00	0.00	8	207	1043.00	1042.10	0.43	309.92	0.45	0%	
808	807	0.00	0.00	8	282	1138.07	1137.80	0.10	145.41	0.21	0%	
807	736	0.00	0.00	8	349	1137.70	1135.88	0.52	339.40	0.49	0%	
736	806	0.00	0.00	8	103	1135.78	1135.34	0.43	306.88	0.44	0%	
806	681	0.00	0.00	8	206	1135.24	1133.88	0.66	382.19	0.55	0%	
809	810	0.00	0.00	8	215	1143.37	1141.42	0.91	447.81	0.64	0%	
810	811	0.00	0.00	8	179	1141.32	1140.83	0.27	246.10	0.35	0%	
811	812	0.00	0.00	8	157	1140.73	1140.07	0.42	305.18	0.44	0%	
812	808	0.00	0.00	8	382	1139.97	1138.17	0.47	322.51	0.46	0%	
830	831	0.00	0.00	8	297	994.04	989.25	1.61	597.16	0.86	0%	
831	832	0.00	0.00	8	223	989.15	982.64	2.92	803.68	1.16	0%	
832	833	0.00	0.00	8	224	982.54	977.06	2.45	735.28	1.06	0%	
833	835	0.00	0.00	8	394	976.96	966.09	2.76	781.12	1.12	0%	
835	834	0.00	0.00	8	390	965.99	959.75	1.60	594.95	0.86	0%	
2374	837	0.00	0.00	8	367	991.93	990.31	0.44	312.48	0.45	0%	
838	842	0.00	0.00	10	395	961.85	960.62	0.31	475.64	0.68	0%	
843	9084	0.00	0.00	8	417	983.16	977.02	1.47	570.13	0.82	0%	
844	9084	0.00	0.00	8	401	979.19	976.59	0.65	378.72	0.55	0%	
845	848	0.00	0.00	8	225	1062.23	1060.88	0.60	364.02	0.52	0%	
848	526	0.00	0.00	8	299	1060.78	1060.30	0.16	188.20	0.27	0%	
869	868	0.00	0.00	8	205	1062.54	1061.49	0.51	336.41	0.48	0%	
868	724	0.00	0.00	8	178	1061.39	1060.14	0.70	394.09	0.57	0%	
872	871	0.00	0.00	8	262	986.79	985.96	0.32	264.50	0.38	0%	
871	874	0.00	0.00	8	247	985.76	984.36	0.57	353.83	0.51	0%	
880	881	0.00	0.00	8	411	995.00	991.84	0.77	412.16	0.59	0%	
881	882	0.00	0.00	8	409	991.74	990.10	0.40	297.49	0.43	0%	
883	882	0.00	0.00	8	254	991.01	990.10	0.36	281.41	0.41	0%	
884	883	0.00	0.00	8	255	992.02	991.11	0.36	280.95	0.40	0%	
885	884	0.00	0.00	8	410	994.42	992.12	0.56	352.03	0.51	0%	
893	881	0.00	0.00	8	351	993.62	991.94	0.48	325.16	0.47	0%	
899	900	0.00	0.00	8	133	1052.11	1051.56	0.41	302.03	0.43	0%	
900	285	0.00	0.00	8	314	1051.56	1050.30	0.40	297.60	0.43	0%	
901	902	0.00	0.00	8	186	1055.31	1054.66	0.35	277.80	0.40	0%	
902	903	0.00	0.00	8	180	1054.46	1053.62	0.47	320.74	0.46	0%	
903	899	0.00	0.00	8	346	1053.52	1052.31	0.35	278.08	0.40	0%	
Jun-87	901	0.00	0.00	8	20	1055.41	1055.31	0.49	330.40	0.48	0%	
918	Jun-87	0.00	0.00	8	117	1055.83	1055.41	0.36	281.55	0.41	0%	
919	918	0.00	0.00	8	116	1056.54	1055.93	0.52	340.34	0.49	0%	
920	919	0.00	0.00	8	332	1075.89	1056.54	5.82	1134.29	1.63	0%	

921	920	0.00	0.00	8	154	1078.24	1075.99	1.46	568.71	0.82	0%	
948	949	0.00	0.00	8	85	1021.07	1019.09	2.34	719.41	1.04	0%	
949	950	0.00	0.00	8	87	1018.99	1018.64	0.40	298.07	0.43	0%	
950	951	0.00	0.00	8	338	1018.54	1017.18	0.40	298.04	0.43	0%	
986	985	0.00	0.00	8	234	1048.47	1044.02	1.90	648.52	0.93	0%	
987	986	0.00	0.00	8	118	1050.54	1048.47	1.76	622.95	0.90	0%	
988	987	0.00	0.00	8	316	1056.39	1050.54	1.85	639.21	0.92	0%	
989	988	0.00	0.00	8	97	1057.37	1056.44	0.96	460.69	0.66	0%	
990	989	0.00	0.00	8	122	1073.48	1057.42	13.12	1702.47	2.45	0%	
1011	1012	0.00	0.00	8	107	1023.93	1013.16	10.05	1490.05	2.15	0%	
1012	1013	0.00	0.00	8	358	1013.06	983.28	8.31	1354.87	1.95	0%	
631	1028	0.00	0.00	8	143	1042.30	1041.73	0.40	297.12	0.43	0%	
1028	Jun-49	0.00	0.00	8	230	1041.63	1040.93	0.30	259.15	0.37	0%	
1029	1030	0.00	0.00	8	184	1038.00	1030.60	4.02	942.59	1.36	0%	
1032	7	0.00	0.00	8	130	1201.30	1200.79	0.39	264.31	0.38	0%	
1031	1032	0.00	0.00	8	403	1203.00	1201.40	0.40	296.35	0.43	0%	
1054	1055	0.00	0.00	8	229	1004.43	1002.64	0.78	415.71	0.60	0%	Interpolated
1053	1054	0.00	0.00	8	228	1005.34	1004.43	0.40	296.92	0.43	0%	
1078	1083	0.00	0.00	8	230	1106.00	1098.26	3.37	862.35	1.24	0%	Interpolated
1079	1078	0.00	0.00	8	236	1119.96	1106.10	5.87	1138.56	1.64	0%	
1080	1079	0.00	0.00	8	246	1138.95	1120.06	7.68	1302.30	1.88	0%	
1082	1081	0.00	0.00	8	250	1097.30	1096.30	0.40	297.27	0.43	0%	
1083	1082	0.00	0.00	8	214	1098.26	1097.40	0.40	298.09	0.43	0%	
336	1106	0.00	0.00	8	100	1009.60	1009.16	0.44	311.30	0.45	0%	Interpolated
1112	891	0.00	0.00	8	414	995.01	993.22	0.43	309.01	0.44	0%	
1114	1115	0.00	0.00	10	404	1077.14	1076.02	0.28	448.88	0.65	0%	
1116	1117	0.00	0.00	10	282	1076.26	1075.48	0.28	448.53	0.65	0%	
1117	992	0.00	0.00	10	105	1075.38	1075.10	0.27	440.03	0.63	0%	
1133	1134	0.00	0.00	8	118	1023.30	1016.85	5.49	1100.99	1.59	0%	
1134	1135	0.00	0.00	8	75	1016.75	1012.87	5.15	1067.01	1.54	0%	
1135	2932	0.00	0.00	8	255	1012.77	985.05	10.89	1550.99	2.23	0%	
1146	1145	0.00	0.00	15	178	1040.17	1039.89	0.16	997.25	1.44	0%	
1147	1146	0.00	0.00	15	365	1040.75	1040.17	0.16	1001.74	1.44	0%	
1148	1147	0.00	0.00	15	179	1041.03	1040.75	0.16	994.85	1.43	0%	
1191	202	0.00	0.00	12	274	968.26	967.83	0.16	549.27	0.79	0%	
1216	1366	0.00	0.00	8	388	974.80	973.25	0.40	296.96	0.43	0%	MinimumSlope
1215	1216	0.00	0.00	8	379	976.32	974.80	0.40	297.67	0.43	0%	MinimumSlope
1214	1215	0.00	0.00	8	273	977.41	976.32	0.40	297.03	0.43	0%	MinimumSlope
1213	1214	0.00	0.00	8	468	979.28	977.41	0.40	297.26	0.43	0%	MinimumSlope
1212	1213	0.00	0.00	8	68	979.55	979.28	0.40	295.50	0.43	0%	MinimumSlope
1232	1212	0.00	0.00	8	273	980.64	979.55	0.40	296.91	0.43	0%	MinimumSlope
1060	1232	0.00	0.00	8	182	981.37	980.64	0.40	297.62	0.43	0%	MinimumSlope
1231	1060	0.00	0.00	8	154	981.99	981.37	0.40	298.23	0.43	0%	MinimumSlope
65	1231	0.00	0.00	8	69	982.27	981.99	0.41	299.85	0.43	0%	MinimumSlope
1230	65	0.00	0.00	8	52	982.48	982.27	0.41	299.15	0.43	0%	MinimumSlope
1229	1230	0.00	0.00	8	200	983.28	982.48	0.40	297.02	0.43	0%	MinimumSlope
1228	1229	0.00	0.00	8	223	984.17	983.28	0.40	297.20	0.43	0%	MinimumSlope
1245	149	0.00	0.00	8	430	1004.91	1003.19	0.40	297.43	0.43	0%	Interpolated
1248	1243	0.00	0.00	15	109	992.27	990.42	1.70	3272.25	4.71	0%	
1249	1248	0.00	0.00	15	253	1013.52	992.27	8.41	7287.56	10.49	0%	
1250	1249	0.00	0.00	15	185	1028.92	1013.52	8.33	7250.82	10.44	0%	
1251	1250	0.00	0.00	15	134	1030.02	1028.92	0.82	2278.44	3.28	0%	
1252	1251	0.00	0.00	15	249	1034.52	1030.02	1.81	3376.31	4.86	0%	
1253	1252	0.00	0.00	15	199	1053.52	1034.52	9.53	7758.68	11.17	0%	
1255	1254	0.00	0.00	15	181	1065.02	1057.52	4.14	5110.62	7.36	0%	
1256	1255	0.00	0.00	15	146	1066.52	1065.02	1.02	2543.22	3.66	0%	
1254	1253	0.00	0.00	15	134	1056.52	1053.52	2.24	3763.57	5.42	0%	
360	1274	0.00	0.00	12	340	1007.95	1007.20	0.22	650.49	0.94	0%	Interpolated
1274	1273	0.00	0.00	12	223	1007.20	1006.71	0.22	649.12	0.93	0%	Interpolated
1298	1299	0.00	0.00	8	53	960.36	960.16	0.38	288.35	0.42	0%	
2404	1298	0.00	0.00	8	20	961.68	960.36	6.69	1215.83	1.75	0%	
1309	1310	0.00	0.00	8	15	970.26	970.20	0.40	296.60	0.43	0%	Interpolated
1310	1311	0.00	0.00	8	135	970.20	969.66	0.40	297.40	0.43	0%	Interpolated
1311	1312	0.00	0.00	8	396	969.66	968.08	0.40	296.84	0.43	0%	Interpolated
1312	1313	0.00	0.00	8	382	968.08	966.38	0.45	297.51	0.43	0%	Interpolated
1331	2439	0.00	0.00	8	420	969.42	964.66	1.13	500.20	0.72	0%	Interpolated
1331	1332	0.00	0.00	8	336	969.42	968.08	0.40	296.72	0.43	0%	Interpolated
1332	1308	0.00	0.00	8	304	968.08	966.86	0.40	297.61	0.43	0%	Interpolated
1366	1365	0.00	0.00	8	322	973.25	971.96	0.40	297.61	0.43	0%	MinimumSlope
1416	1417	0.00	0.00	8	150	999.35	998.75	0.40	297.72	0.43	0%	Interpolated
1415	1416	0.00	0.00	8	300	1000.55	999.35	0.40	297.06	0.43	0%	Interpolated
1414	1415	0.00	0.00	8	199	1001.35	1000.55	0.40	298.19	0.43	0%	Interpolated
1413	1414	0.00	0.00	8	181	1002.07	1001.35	0.40	296.08	0.43	0%	Interpolated
1419	1413	0.00	0.00	8	384	1003.61	1002.07	0.40	297.63	0.43	0%	Interpolated
1420	1419	0.00	0.00	8	225	1004.51	1003.61	0.40	297.07	0.43	0%	Interpolated
1421	1420	0.00	0.00	8	224	1005.40	1004.51	0.40	296.15	0.43	0%	Interpolated
1421	1422	0.00	0.00	8	267	1005.40	1004.33	0.40	297.80	0.43	0%	Interpolated
1422	2331	0.00	0.00	8	101	1004.33	1003.93	0.40	296.02	0.43	0%	Interpolated
1423	1424	0.00	0.00	8	140	1003.28	1002.72	0.40	297.24	0.43	0%	Interpolated
1424	1411	0.00	0.00	8	313	1002.72	1001.48	0.40	296.05	0.43	0%	Interpolated
1465	1464	0.00	0.00	8	280	1033.59	1027.43	2.20	697.44	1.00	0%	Interpolated
1466	1465	0.00	0.00	8	282	1039.84	1033.59	2.22	700.33	1.01	0%	Interpolated
119	1466	0.00	0.00	8	484	1041.77	1039.84	0.40	296.95	0.43	0%	MinimumSlope
118	1494	0.00	0.00	8	303	1041.81	1040.60	0.40	296.84	0.43	0%	Interpolated
1495	265	0.00	0.00	8	157	1038.81	1037.37	0.92	450.40	0.65	0%	Interpolated
1535	69	0.00	0.00	10	310	963.58	961.81	0.57	643.60	0.93	0%	Interpolated
Jun-138	1536	0.00	0.00	8	400	972.99	971.39	0.40	297.11	0.43	0%	Interpolated
1536	1537	0.00	0.00	8	243	971.39	970.42	0.40	297.12	0.43	0%	Interpolated
1537	1538	0.00	0.00	8	109	970.42	969.98	0.40	298.77	0.43	0%	Interpolated
1538	1539	0.00	0.00	8	321	969.98	968.70	0.40	296.77	0.43	0%	Interpolated
1539	1540	0.00	0.00	8	404	968.70	967.08	0.40	297.53	0.43	0%	Interpolated
1540	1541	0.00	0.00	8	400	967.08	965.48	0.40	297.38	0.43	0%	ROOT CUT.interpolated
1541	2847	0.00	0.00	8	176	965.48	964.78	0.40	296.66	0.43	0%	ROOT CUT.interpolated
1542	1544	0.00	0.00	8	223	963.92	963.03	0.40	296.81	0.43	0%	Interpolated
1544	1545	0.00	0.00	8	308	963.03	961.80	0.40	297.18	0.43	0%	Interpolated
1545	1546	0.00	0.00	8	306	961.80	960.57	0.40	297.78	0.43	0%	Interpolated
1546	1547	0.00	0.00	8	308	960.57	959.34	0.40	297.10	0.43	0%	Interpolated
1552	2451	0.00	0.00	8	286	964.30	963.16	0.40	296.93	0.43	0%	Interpolated

1555	1556	0.00	0.00	24	134	960.58	960.28	0.22	4162.02	5.99	0%	
1556	1557	0.00	0.00	24	162	960.11	959.97	0.09	2590.02	3.73	0%	
1557	1558	0.00	0.00	24	200	959.97	959.87	0.05	1967.55	2.83	0%	
2380	841	0.00	0.00	10	216	978.13	970.30	3.63	1624.06	2.34	0%	Interpolated
1568	1567	0.00	0.00	24	288	959.30	959.04	0.09	2644.29	3.81	0%	
1558	1568	0.00	0.00	24	368	959.80	959.40	0.11	2902.52	4.18	0%	
1578	1552	0.00	0.00	8	400	965.90	964.30	0.40	297.14	0.43	0%	Interpolated
1579	1578	0.00	0.00	8	489	967.86	965.90	0.40	297.53	0.43	0%	
1587	1552	0.00	0.00	8	404	965.92	964.30	0.40	297.68	0.43	0%	
2373	1587	0.00	0.00	8	412	966.92	965.92	0.24	231.58	0.33	0%	
Jun-140	1587	0.00	0.00	8	377	967.43	965.92	0.40	297.38	0.43	0%	line dead ends before 7th st. intersection
1597	1596	0.00	0.00	8	494	990.21	988.23	0.40	297.66	0.43	0%	
1598	2343	0.00	0.00	8	200	991.82	991.02	0.40	297.57	0.43	0%	
1598	2874	0.00	0.00	8	421	991.82	988.50	0.79	417.62	0.60	0%	
1596	622	0.00	0.00	8	375	988.23	986.73	0.40	297.20	0.43	0%	
1600	1309	0.00	0.00	8	136	970.81	970.26	0.40	298.44	0.43	0%	
1602	1601	0.00	0.00	8	174	984.66	982.55	1.21	517.81	0.75	0%	
1602	1603	0.00	0.00	8	240	984.66	982.27	1.00	469.46	0.68	0%	
1608	1609	0.00	0.00	8	413	990.82	989.21	0.39	293.60	0.42	0%	
1615	1616	0.00	0.00	8	248	992.80	991.80	0.40	298.33	0.43	0%	removed from Greasline (4th st carwash)
1616	2318	0.00	0.00	8	205	991.80	990.98	0.40	297.50	0.43	0%	
1617	2319	0.00	0.00	8	203	990.17	989.35	0.40	298.66	0.43	0%	
1618	889	0.00	0.00	8	178	991.41	988.54	1.62	597.61	0.86	0%	
2872	886	0.00	0.00	8	166	990.77	990.10	0.40	298.61	0.43	0%	
886	2320	0.00	0.00	8	202	990.10	989.30	0.40	296.06	0.43	0%	
1619	2321	0.00	0.00	8	204	988.46	987.65	0.40	296.37	0.43	0%	
893	1617	0.00	0.00	8	58	993.62	990.17	5.96	1147.22	1.65	0%	
1580	1579	0.00	0.00	8	201	968.66	967.86	0.40	296.42	0.43	0%	
1951	885	0.00	0.00	8	407	996.05	994.42	0.40	297.48	0.43	0%	trouble line
2387	885	0.00	0.00	8	412	995.52	994.42	0.27	242.81	0.35	0%	8' - 8" DIP CONNECTS TO EXIST 8" VCP @ MH 203
1417	2322	0.00	0.00	8	196	998.75	997.96	0.40	298.06	0.43	0%	ROOT CUT 08
1627	2883	0.00	0.00	8	231	997.17	996.24	0.40	298.05	0.43	0%	
777	1633	0.00	0.00	8	374	1000.39	996.91	0.93	453.53	0.65	0%	
1650	777	0.00	0.00	8	379	1003.89	1000.39	0.92	451.47	0.65	0%	
729	728	0.00	0.00	8	224	1004.53	1003.63	0.40	297.69	0.43	0%	
1635	1636	0.00	0.00	8	280	1005.95	1004.83	0.40	297.27	0.43	0%	
1413	1635	0.00	0.00	8	286	1007.10	1005.95	0.40	297.91	0.43	0%	
1419	1644	0.00	0.00	8	313	1008.63	1007.39	0.40	295.68	0.43	0%	
1644	1645	0.00	0.00	8	256	1007.39	1006.36	0.40	297.94	0.43	0%	
1646	729	0.00	0.00	8	155	1005.15	1004.53	0.40	297.14	0.43	0%	
1650	1652	0.00	0.00	8	412	1003.89	1002.24	0.40	297.57	0.43	0%	
1656	1648	0.00	0.00	8	382	1037.32	1035.79	0.40	297.48	0.43	0%	
1659	1419	0.00	0.00	8	296	1004.79	1003.61	0.40	296.83	0.43	0%	
1660	1659	0.00	0.00	8	221	1005.68	1004.79	0.40	297.97	0.43	0%	
1661	1660	0.00	0.00	8	222	1006.57	1005.68	0.40	297.40	0.43	0%	
1657	1656	0.00	0.00	8	98	1037.71	1037.32	0.40	296.76	0.43	0%	
1676	9035	0.00	0.00	8	331	1039.22	1037.90	0.40	296.75	0.43	0%	
1688	1689	0.00	0.00	8	199	1041.62	1040.83	0.40	296.49	0.43	0%	
1687	1688	0.00	0.00	8	254	1042.64	1041.62	0.40	297.83	0.43	0%	
1662	2879	0.00	0.00	8	283	1018.88	1017.75	0.40	297.22	0.43	0%	
1437	824	0.00	0.00	8	354	1016.43	1015.02	0.40	296.81	0.43	0%	
1711	1701	0.00	0.00	8	668	1023.98	1021.31	0.40	297.18	0.43	0%	
1698	1687	0.00	0.00	8	217	1043.51	1042.64	0.40	297.75	0.43	0%	
1696	1437	0.00	0.00	8	329	1017.75	1016.43	0.40	297.58	0.43	0%	
1704	1696	0.00	0.00	8	325	1019.05	1017.75	0.40	297.38	0.43	0%	
1707	1708	0.00	0.00	8	199	1026.54	1025.74	0.40	298.10	0.43	0%	ROOT CUT
1708	2877	0.00	0.00	8	353	1025.74	1024.33	0.40	297.19	0.43	0%	
1714	1704	0.00	0.00	8	234	1019.99	1019.05	0.40	297.63	0.43	0%	
1715	1714	0.00	0.00	8	435	1021.73	1019.99	0.40	297.19	0.43	0%	
1716	1715	0.00	0.00	8	190	1022.49	1021.73	0.40	296.92	0.43	0%	
1717	1716	0.00	0.00	8	188	1023.24	1022.49	0.40	297.01	0.43	0%	ROOT CUT 08
1718	1717	0.00	0.00	8	202	1024.05	1023.24	0.40	297.80	0.43	0%	ROOT CUT 08
1719	1718	0.00	0.00	8	200	1024.85	1024.05	0.40	297.02	0.43	0%	
1744	1743	0.00	0.00	8	358	1024.25	1022.82	0.40	297.15	0.43	0%	
1752	1751	0.00	0.00	8	76	1046.46	1046.16	0.39	295.29	0.43	0%	
1751	1750	0.00	0.00	8	175	1046.16	1045.46	0.40	297.57	0.43	0%	
1750	1749	0.00	0.00	8	227	1045.46	1044.55	0.40	297.60	0.43	0%	
1749	1748	0.00	0.00	8	230	1044.55	1043.63	0.40	297.42	0.43	0%	
1748	1747	0.00	0.00	8	352	1043.63	1027.78	4.50	996.93	1.44	0%	
1747	1746	0.00	0.00	8	352	1027.78	1026.37	0.40	297.54	0.43	0%	
1746	1745	0.00	0.00	8	351	1026.37	1024.97	0.40	296.96	0.43	0%	
1745	1744	0.00	0.00	8	179	1024.97	1024.25	0.40	298.12	0.43	0%	ROOT CUT 08
1767	1768	0.00	0.00	8	257	1038.73	1037.70	0.40	297.39	0.43	0%	
1768	1769	0.00	0.00	8	337	1037.70	1036.35	0.40	297.50	0.43	0%	
1769	1770	0.00	0.00	8	155	1036.35	1035.73	0.40	297.27	0.43	0%	
1770	1771	0.00	0.00	8	154	1035.73	1035.11	0.40	298.21	0.43	0%	
1771	1772	0.00	0.00	8	280	1035.11	1033.99	0.40	297.44	0.43	0%	
1772	1773	0.00	0.00	8	332	1033.99	1032.66	0.40	297.63	0.43	0%	
1773	1774	0.00	0.00	8	124	1032.66	1032.16	0.40	298.11	0.43	0%	
1774	1775	0.00	0.00	8	277	1032.16	1031.05	0.40	297.69	0.43	0%	
1775	1776	0.00	0.00	8	367	1031.05	1029.58	0.40	297.31	0.43	0%	
1776	124	0.00	0.00	8	404	1029.58	1027.96	0.40	297.64	0.43	0%	
1787	2180	0.00	0.00	8	146	971.35	970.31	0.71	396.71	0.57	0%	
1788	2179	0.00	0.00	12	66	969.75	968.15	2.43	2160.60	3.11	0%	
2178	1790	0.00	0.00	12	334	963.68	962.80	0.26	711.01	1.02	0%	
1791	1535	0.00	0.00	8	245	964.56	963.58	0.40	297.44	0.43	0%	
1838	2381	0.00	0.00	8	276	969.60	963.22	2.31	714.90	1.03	0%	
1839	1838	0.00	0.00	8	130	972.65	969.60	2.35	720.16	1.04	0%	
1845	2381	0.00	0.00	8	244	965.52	963.12	0.98	465.80	0.67	0%	
1847	1839	0.00	0.00	8	487	984.10	972.65	2.35	720.97	1.04	0%	
1846	1845	0.00	0.00	8	242	967.88	965.52	0.98	464.42	0.67	0%	
1853	1846	0.00	0.00	8	183	969.67	967.88	0.98	465.44	0.67	0%	
1855	1853	0.00	0.00	8	206	971.69	969.67	0.98	465.64	0.67	0%	
1847	843	0.00	0.00	8	393	984.10	982.53	0.40	297.29	0.43	0%	
844	9085	0.00	0.00	8	390	979.19	975.20	1.02	475.39	0.68	0%	
1894	1855	0.00	0.00	8	196	973.61	971.69	0.98	465.14	0.67	0%	
1859	843	0.00	0.00	8	388	984.67	982.53	0.55	348.92	0.50	0%	
1859	Jun-165	0.00	0.00	8	362	984.67	982.89	0.49	329.78	0.47	0%	

1861	1860	0.00	0.00	8	194	977.44	975.53	0.98	466.08	0.67	0%	
1862	1861	0.00	0.00	8	195	979.35	977.44	0.98	465.40	0.67	0%	
1863	1859	0.00	0.00	8	388	985.61	984.72	0.23	225.19	0.32	0%	
1868	1862	0.00	0.00	8	216	981.47	979.35	0.98	465.27	0.67	0%	
1870	1868	0.00	0.00	8	239	983.81	981.47	0.98	465.44	0.67	0%	
1871	1863	0.00	0.00	8	457	989.99	985.71	0.94	455.13	0.66	0%	
1895	1870	0.00	0.00	8	404	987.75	983.81	0.98	464.34	0.67	0%	
1896	1871	0.00	0.00	8	399	991.58	989.99	0.40	296.89	0.43	0%	
1871	1870	0.00	0.00	8	409	989.99	983.81	1.51	577.99	0.83	0%	
1860	1894	0.00	0.00	8	196	975.53	973.61	0.98	465.14	0.67	0%	
1895	1896	0.00	0.00	8	407	987.75	984.42	0.82	425.25	0.61	0%	
1896	1904	0.00	0.00	8	413	984.42	982.13	0.56	350.20	0.50	0%	
1904	2894	0.00	0.00	8	418	982.13	978.87	0.78	414.97	0.60	0%	
1907	1904	0.00	0.00	8	407	985.31	982.13	0.78	415.42	0.60	0%	
1908	1907	0.00	0.00	8	237	987.15	985.31	0.78	414.43	0.60	0%	
2463	1931	0.00	0.00	8	409	986.45	984.14	0.56	353.30	0.51	0%	
1953	1931	0.00	0.00	8	413	985.24	983.44	0.44	310.17	0.45	0%	
1930	1931	0.00	0.00	8	191	984.30	983.54	0.40	296.85	0.43	0%	
1929	1930	0.00	0.00	8	197	985.09	984.30	0.40	297.63	0.43	0%	
1928	1929	0.00	0.00	8	217	985.96	985.09	0.40	297.98	0.43	0%	
1927	1928	0.00	0.00	8	211	986.80	985.96	0.40	296.45	0.43	0%	
21702	1951	0.00	0.00	8	224	996.94	996.05	0.40	296.28	0.43	0%	
1963	1953	0.00	0.00	8	201	990.90	985.24	2.82	788.67	1.14	0%	
1962	1963	0.00	0.00	8	19	991.43	990.90	2.81	788.19	1.13	0%	
2396	1962	0.00	0.00	8	179	996.46	991.43	2.82	788.72	1.14	0%	
2798	2397	0.00	0.00	8	408	1016.77	999.53	4.23	966.26	1.39	0%	
9075	9109	0.00	0.00	8	290	1023.35	1021.00	0.81	423.01	0.61	0%	
1982	1981	0.00	0.00	8	67	987.40	987.13	0.40	299.13	0.43	0%	
1985	9080	0.00	0.00	8	262	1039.69	1038.64	0.40	297.81	0.43	0%	
763	2003	0.00	0.00	8	190	988.92	988.16	0.40	297.18	0.43	0%	
2003	1982	0.00	0.00	8	189	988.16	987.40	0.40	298.17	0.43	0%	
9064	1988	0.00	0.00	8	258	1037.94	1032.27	2.20	697.27	1.00	0%	
1997	Jun-40	0.00	0.00	8	131	999.34	988.32	8.40	1362.25	1.96	0%	
1996	1997	0.00	0.00	8	149	1011.85	999.34	8.40	1362.62	1.96	0%	
Jun-179	1996	0.00	0.00	8	310	1037.90	1011.85	8.40	1362.33	1.96	0%	
767	766	0.00	0.00	8	224	1032.70	990.51	18.80	2038.18	2.93	0%	
768	767	0.00	0.00	8	157	1044.73	1032.70	7.64	1299.43	1.87	0%	
1989	9067	0.00	0.00	8	77	1043.83	1042.13	2.21	698.26	1.01	0%	
2370	2371	0.00	0.00	8	383	1057.03	1049.21	2.04	672.01	0.97	0%	
72	2073	0.00	0.00	8	369	1089.73	1080.01	2.63	762.89	1.10	0%	
1132	1133	0.00	0.00	8	200	1024.10	1023.30	0.40	297.02	0.43	0%	
2134	821	0.00	0.00	8	229	1054.23	1053.31	0.40	298.04	0.43	0%	
8	2134	0.00	0.00	8	229	1059.52	1054.23	2.31	714.15	1.03	0%	
2149	1787	0.00	0.00	8	370	972.82	971.35	0.40	296.14	0.43	0%	
2184	2185	0.00	0.00	12	365	993.84	993.04	0.22	649.04	0.93	0%	MinimumSlope
2186	2187	0.00	0.00	12	146	991.84	991.52	0.22	648.07	0.93	0%	MinimumSlope
2187	2188	0.00	0.00	12	409	991.52	990.60	0.23	657.42	0.95	0%	MinimumSlope
2188	2189	0.00	0.00	12	273	990.60	990.02	0.21	638.48	0.92	0%	MinimumSlope
2331	1423	0.00	0.00	8	162	1003.93	1003.28	0.40	297.96	0.43	0%	
2185	2186	0.00	0.00	12	543	993.04	991.84	0.22	651.37	0.94	0%	MinimumSlope
Jun-192	2230	0.00	0.00	10	162	1021.73	1021.28	0.28	449.14	0.65	0%	
2275	2276	0.00	0.00	8	52	1004.95	1004.90	0.10	145.69	0.21	0%	
2276	2277	0.00	0.00	8	207	1004.90	996.28	4.16	958.57	1.38	0%	
2277	610	0.00	0.00	8	153	996.18	993.78	1.57	589.22	0.85	0%	
2284	2283	0.00	0.00	8	376	1021.21	1019.80	0.37	287.72	0.41	0%	
2283	2282	0.00	0.00	8	299	1019.70	1018.60	0.37	285.00	0.41	0%	
2282	694	0.00	0.00	8	93	1018.50	1018.13	0.40	296.71	0.43	0%	
2179	2178	0.00	0.00	12	400	964.61	963.73	0.22	650.05	0.94	0%	
2180	1788	0.00	0.00	12	254	970.31	969.75	0.22	650.33	0.94	0%	
2317	365	0.00	0.00	8	200	1046.43	1045.63	0.40	297.22	0.43	0%	
2318	1617	0.00	0.00	8	205	990.98	990.17	0.40	295.68	0.43	0%	
2319	889	0.00	0.00	8	203	989.35	988.54	0.40	296.83	0.43	0%	
2320	1619	0.00	0.00	8	209	989.30	988.46	0.40	297.99	0.43	0%	
2321	1927	0.00	0.00	8	211	987.65	986.80	0.40	298.26	0.43	0%	
2322	1627	0.00	0.00	8	196	997.96	997.17	0.40	298.07	0.43	0%	trouble line
2343	1597	0.00	0.00	8	204	991.02	990.21	0.40	296.53	0.43	0%	
2362	2361	0.00	0.00	10	199	973.34	972.63	0.36	509.23	0.73	0%	
2361	2358	0.00	0.00	10	535	972.53	971.02	0.28	452.94	0.65	0%	
2358	2357	0.00	0.00	21	377	970.10	969.72	0.10	1955.80	2.82	0%	
2357	2356	0.00	0.00	21	381	969.62	969.24	0.10	1946.72	2.80	0%	
2356	1191	0.00	0.00	21	141	969.14	969.00	0.10	1939.06	2.79	0%	
Jun-209	2364	0.00	0.00	8	173	1021.14	1018.86	1.32	539.27	0.78	0%	
2019	Jun-209	0.00	0.00	8	160	1027.12	1021.24	3.67	901.11	1.30	0%	
2366	2019	0.00	0.00	8	330	1052.57	1027.22	7.68	1302.81	1.88	0%	
Jun-210	2366	0.00	0.00	8	300	1070.07	1052.67	5.80	1146.73	1.65	0%	
Jun-210	2368	0.00	0.00	8	331	1070.52	1067.40	0.94	456.35	0.66	0%	ROOT CUT 08
2368	2369	0.00	0.00	8	354	1067.30	1062.49	1.36	547.89	0.79	0%	ROOT CUT
2369	9068	0.00	0.00	8	295	1062.39	1057.11	1.79	628.68	0.91	0%	ROOT CUT
2371	1989	0.00	0.00	8	245	1049.21	1043.83	2.20	696.99	1.00	0%	
2372	2379	0.00	0.00	8	230	987.96	987.50	0.20	210.25	0.30	0%	
2379	2380	0.00	0.00	8	182	986.38	978.22	4.49	996.38	1.43	0%	
2375	2372	0.00	0.00	8	410	989.38	987.74	0.40	297.26	0.43	0%	
2376	2373	0.00	0.00	8	411	991.45	967.22	5.90	1141.61	1.64	0%	
2377	2375	0.00	0.00	8	195	991.09	990.00	0.56	358.27	0.52	0%	
2381	2345	0.00	0.00	8	192	963.12	962.11	0.53	341.12	0.49	0%	
2345	2382	0.00	0.00	8	206	962.01	960.10	0.93	453.00	0.65	0%	
2384	888	0.00	0.00	8	337	992.98	991.63	0.40	297.43	0.43	0%	
2383	2384	0.00	0.00	8	172	994.78	992.98	1.05	480.88	0.69	0%	
2387	2383	0.00	0.00	8	410	995.52	994.88	0.16	185.73	0.27	0%	
1953	2393	0.00	0.00	8	417	985.24	983.25	0.48	324.84	0.47	0%	
2393	2394	0.00	0.00	8	143	984.14	981.85	1.60	594.78	0.86	0%	
2394	2395	0.00	0.00	8	250	981.75	970.25	4.60	1007.94	1.45	0%	
2396	2402	0.00	0.00	8	198	996.46	988.10	4.21	964.75	1.39	0%	
2402	2398	0.00	0.00	8	218	988.00	984.86	1.44	564.50	0.81	0%	
2398	2399	0.00	0.00	8	200	985.66	977.02	4.32	977.19	1.41	0%	
2400	2401	0.00	0.00	8	208	1000.30	986.44	6.66	1213.33	1.75	0%	
2397	2396	0.00	0.00	8	19	996.96	996.66	1.56	586.81	0.85	0%	
2403	2405	0.00	0.00	10	304	961.68	961.68	0.00	15.46	0.02	0%	

2405	2404	0.00	0.00	10	313	961.68	961.68	0.00	15.22	0.02	0%	
2410	2413	0.00	0.00	10	239	1078.35	1077.68	0.28	450.89	0.65	0%	
2411	2410	0.00	0.00	10	402	1079.47	1078.35	0.28	450.00	0.65	0%	
9145	2411	0.00	0.00	10	103	1079.76	1079.47	0.28	452.60	0.65	0%	
2413	1114	0.00	0.00	10	192	1077.68	1077.14	0.28	451.61	0.65	0%	
2462	2427	0.00	0.00	10	98	1071.81	1071.52	0.30	463.03	0.67	0%	
9080	2797	0.00	0.00	8	330	1038.64	1016.77	6.63	1208.37	1.74	0%	
2797	2798	0.00	0.00	8	65	1016.85	1016.77	0.12	164.89	0.24	0%	
2801	1608	0.00	0.00	8	312	992.09	990.82	0.41	299.93	0.43	0%	
2802	2803	0.00	0.00	10	294	971.12	970.30	0.28	450.45	0.65	0%	
2803	2804	0.00	0.00	10	294	970.30	970.21	0.03	149.12	0.21	0%	
2804	2805	0.00	0.00	8	294	970.21	969.03	0.40	297.87	0.43	0%	
2805	1361	0.00	0.00	8	400	969.03	967.43	0.40	297.27	0.43	0%	
2806	144	0.00	0.00	8	41	985.94	985.94	0.00	23.11	0.03	0%	
2843	2844	0.00	0.00	12	338	957.60	956.57	0.30	764.89	1.10	0%	
2844	2845	0.00	0.00	12	416	956.61	955.62	0.24	675.96	0.97	0%	
1618	2872	0.00	0.00	8	160	991.41	990.77	0.40	297.30	0.43	0%	
2847	1542	0.00	0.00	8	215	964.78	963.92	0.40	297.22	0.43	0%	ROOT CUT
2874	1908	0.00	0.00	8	173	988.50	987.15	0.78	415.07	0.60	0%	
2877	1711	0.00	0.00	8	87	1024.33	1023.98	0.40	298.06	0.43	0%	
2883	1628	0.00	0.00	8	233	996.24	995.31	0.40	297.06	0.43	0%	
Jun-165	2899	0.00	0.00	15	58	982.89	976.16	11.61	8561.69	12.33	0%	
2076	9003	0.00	0.00	10	400	1091.56	1090.44	0.28	450.98	0.65	0%	
9003	72	0.00	0.00	10	143	1090.34	1089.83	0.36	509.26	0.73	0%	
9010	9011	0.00	0.00	8	146	1045.00	1036.24	6.02	1153.30	1.66	0%	
9012	9013	0.00	0.00	8	169	1023.50	1006.57	10.03	1492.08	2.15	0%	
9011	9012	0.00	0.00	8	115	1036.04	1030.06	5.18	1070.03	1.54	0%	
9013	9014	0.00	0.00	10	310	1006.27	1005.03	0.40	539.04	0.78	0%	
9014	2121	0.00	0.00	10	111	1004.93	1003.57	1.23	943.33	1.36	0%	
9035	1657	0.00	0.00	8	48	1037.90	1037.71	0.39	294.60	0.42	0%	
9066	9064	0.00	0.00	8	130	1040.80	1037.94	2.20	696.80	1.00	0%	
9067	9066	0.00	0.00	8	60	1042.13	1040.80	2.20	697.23	1.00	0%	
9068	2370	0.00	0.00	8	63	1057.11	1057.03	0.13	167.58	0.24	0%	ROOT CUT
9109	2400	0.00	0.00	8	204	1021.00	1000.30	10.17	1498.92	2.16	0%	
332	1108	0.00	0.00	8	282	1007.94	1006.70	0.44	311.92	0.45	0%	
9120	9121	0.00	0.00	8	258	1003.95	1002.19	0.68	388.54	0.56	0%	
9121	9122	0.00	0.00	8	257	1002.19	1000.48	0.66	383.13	0.55	0%	
9122	650	0.00	0.00	8	181	1000.48	999.45	0.57	354.12	0.51	0%	
9179	9180	0.00	0.00	8	235	997.00	995.82	0.50	333.26	0.48	0%	
9180	9181	0.00	0.00	8	177	995.72	988.75	3.95	933.86	1.34	0%	
9204	9203	0.00	0.00	10	143	1003.91	1003.05	0.60	660.89	0.95	0%	
9203	9202	0.00	0.00	10	400	1003.05	998.15	1.22	943.29	1.36	0%	
9202	9201	0.00	0.00	10	400	998.15	993.25	1.22	943.29	1.36	0%	
9201	9200	0.00	0.00	10	50	993.25	992.90	0.70	711.21	1.02	0%	
1030	948	0.00	0.00	8	399	1030.50	1021.07	2.36	722.59	1.04	0%	
564	370	0.00	0.00	15	149	1038.66	1038.10	0.38	1541.77	2.22	0%	
1145	565	0.00	0.00	15	234	1039.89	1039.22	0.29	1344.05	1.94	0%	
1494	1495	0.00	0.00	8	445	1040.60	1038.81	0.40	297.96	0.43	0%	
306	307	0.00	0.00	8	269	1001.52	993.71	2.90	800.61	1.15	0%	
1415	652	0.00	0.00	8	388	1012.65	1011.10	0.40	297.21	0.43	0%	
2879	1437	0.00	0.00	8	329	1017.75	1016.43	0.40	297.95	0.43	0%	
2364	551	0.00	0.00	8	89	1018.66	1018.26	0.45	315.93	0.45	0%	
1701	2364	0.00	0.00	8	662	1021.31	1018.66	0.40	297.46	0.43	0%	
1689	1676	0.00	0.00	18	401	1040.83	1039.22	0.40	2589.07	3.73	0%	
768	Jun-179	0.00	0.00	8	99	1044.73	1037.90	6.91	1235.90	1.78	0%	
1630	1038	0.00	0.00	8	271	997.39	996.31	0.40	296.64	0.43	0%	
2399	2467	0.00	0.00	8	199	976.92	971.68	2.64	763.43	1.10	0%	
1931	2909	0.00	0.00	8	418	983.37	982.59	0.19	203.05	0.29	0%	
891	888	0.00	0.00	8	411	993.17	991.54	0.40	296.19	0.43	0%	
1609	9078	0.00	0.00	8	407	989.21	987.62	0.39	293.78	0.42	0%	
2463	616	0.00	0.00	8	409	988.55	986.28	0.56	350.24	0.50	0%	
1601	1600	0.00	0.00	8	280	982.55	970.81	4.20	962.99	1.39	0%	
841	838	0.00	0.00	10	233	970.30	961.85	3.63	1623.47	2.34	0%	
837	1895	0.00	0.00	8	412	990.21	987.75	0.60	363.09	0.52	0%	
1896	2895	0.00	0.00	8	421	984.42	981.01	0.81	422.95	0.61	0%	
1115	992	0.00	0.00	10	330	1075.92	1074.95	0.29	461.79	0.66	0%	
43984	748	0.00	0.00	8	329	1198.95	1197.08	0.57	354.53	0.51	0%	
203	9000	0.00	0.00	12	180	967.17	966.52	0.36	833.09	1.20	0%	

Table 2: Existing Conditions - Wet Weather Pipe Capacity												
Node ID #		Peak Flow		Size	Length	US Invert	DS Invert	Slope	Capacity		Sanitary Sewer % Full	Notes
From	To	(gpm)	(MGD)	(in)	(ft)	(ft)	(ft)	(%)	(gpm)	(MGD)	(%)	
Jun-341	Jun-343	964.72	1.39	12	100	946.00	946.00	0.00	43.83	0.06	2201%	Sanitary Siphon under River
Jun-342	Jun-344	883.38	1.27	16	100	946.00	946.00	0.00	94.38	0.14	936%	Sanitary Siphon under River
2464	2466	198.91	0.29	10	414	979.83	979.80	0.01	72.54	0.10	274%	
1027	89	491.41	0.71	10	188	985.63	985.43	0.11	278.33	0.40	177%	
2840	2831	385.34	0.55	24	143	954.84	954.84	0.00	232.65	0.34	166%	
1796	Jun-339	964.72	1.39	12	14	956.13	956.10	0.21	641.54	0.92	150%	Sanitary Siphon under River
9102	9101	598.38	0.86	10	324	1005.39	1004.63	0.23	413.09	0.59	145%	
2835	2836	865.81	1.25	24	208	955.63	955.62	0.00	609.78	0.88	142%	
2769	2768	1331.21	1.92	15	400	987.83	987.25	0.14	956.81	1.38	139%	
1530	1529	526.12	0.76	10	337	960.84	960.10	0.22	399.34	0.58	132%	MinimumSlope
161	162	337.01	0.49	8	390	999.31	998.14	0.30	257.62	0.37	131%	
1532	1531	520.64	0.75	10	288	962.22	961.59	0.22	398.49	0.57	131%	MinimumSlope
1531	1530	520.64	0.75	10	341	961.59	960.84	0.22	399.57	0.58	130%	MinimumSlope
1533	1532	520.64	0.75	10	286	962.85	962.22	0.22	400.34	0.58	130%	MinimumSlope
863	1534	520.64	0.75	10	394	964.36	963.49	0.22	400.56	0.58	130%	MinimumSlope
1534	1533	520.64	0.75	10	290	963.49	962.85	0.22	400.57	0.58	130%	MinimumSlope
2772	2771	1320.22	1.90	15	158	991.14	990.84	0.19	1095.03	1.58	121%	
2764	2763	1329.00	1.91	18	452	964.58	964.25	0.07	1104.19	1.59	120%	Interpolated
649	9107	1121.52	1.61	15	398	998.27	997.68	0.15	966.92	1.39	116%	
2763	2762	1328.67	1.91	18	401	964.25	963.93	0.08	1154.79	1.66	115%	Interpolated
2762	2761	1327.94	1.91	18	400	963.93	963.61	0.08	1155.15	1.66	115%	Interpolated
2761	2760	1327.57	1.91	18	287	963.61	963.38	0.08	1155.91	1.66	115%	Interpolated
2760	2312	1327.37	1.91	18	185	963.38	963.23	0.08	1163.49	1.68	114%	Interpolated
9118	9102	598.38	0.86	10	238	1006.39	1005.39	0.42	552.48	0.80	108%	
1281	1280	540.24	0.78	10	274	976.72	975.70	0.37	520.35	0.75	104%	
9096	9095	1121.82	1.62	15	381	1000.28	999.55	0.19	1100.29	1.58	102%	
1278	1279	540.12	0.78	10	298	974.12	972.89	0.41	547.73	0.79	99%	
2312	2314	1327.24	1.91	18	287	963.23	962.91	0.11	1364.82	1.97	97%	
1280	1278	540.17	0.78	10	318	975.56	974.19	0.43	559.50	0.81	97%	
2768	2767	1330.84	1.92	15	400	987.19	985.90	0.32	1427.02	2.05	93%	
1279	185	540.08	0.78	10	238	972.78	971.65	0.47	587.36	0.85	92%	
90	91	491.18	0.71	10	441	984.29	982.52	0.40	539.69	0.78	91%	
89	90	491.34	0.71	10	279	985.43	984.29	0.41	545.24	0.79	90%	
160	161	337.01	0.49	8	190	1000.52	999.31	0.64	374.86	0.54	90%	
9098	9097	1121.94	1.62	15	400	1002.30	1001.29	0.25	1262.65	1.82	89%	
9097	9096	1121.85	1.62	15	400	1001.29	1000.28	0.25	1262.65	1.82	89%	
2770	2769	1331.21	1.92	15	400	989.38	987.89	0.37	1533.62	2.21	87%	
2766	2765	1330.44	1.92	15	404	982.86	981.28	0.39	1571.90	2.26	85%	220 L.F. 24" STEEL CASING
254	165	382.67	0.55	10	231	994.33	993.68	0.28	452.18	0.65	85%	MinimumSlope
178	1281	540.27	0.78	10	232	978.18	976.88	0.56	638.58	0.92	85%	
2934	2933	672.27	0.97	15	97	984.10	984.00	0.10	807.43	1.16	83%	
9106	9105	1225.57	1.76	15	368	995.86	994.58	0.35	1481.39	2.13	83%	
1283	1282	495.95	0.71	10	460	981.86	979.51	0.51	609.13	0.88	81%	Interpolated
1282	178	495.87	0.71	10	260	979.51	978.18	0.51	609.08	0.88	81%	Interpolated
91	1283	495.98	0.71	10	129	982.52	981.86	0.51	609.40	0.88	81%	Interpolated
1519	1549	527.23	0.76	12	352	958.48	957.71	0.22	648.52	0.93	81%	MinimumSlope
1528	1519	527.54	0.76	12	365	959.28	958.48	0.22	649.12	0.93	81%	MinimumSlope
1529	1528	527.66	0.76	12	371	960.10	959.28	0.22	651.21	0.94	81%	MinimumSlope
2933	2932	672.27	0.97	15	91	982.27	982.17	0.11	832.47	1.20	81%	
9108	649	1121.55	1.62	15	35	998.16	998.27	-0.31	1407.08	2.03	80%	
1791	2177	1327.05	1.91	18	404	962.67	961.99	0.17	1677.09	2.42	79%	
88	1027	491.41	0.71	10	121	986.35	985.68	0.55	634.51	0.91	77%	
1238	1239	588.57	0.85	21	390	984.28	984.22	0.02	764.66	1.10	77%	
2150	1946	924.18	1.33	18	265	962.79	962.56	0.09	1203.48	1.73	77%	
164	254	340.26	0.49	10	144	994.73	994.33	0.28	448.78	0.65	76%	MinimumSlope
9095	9108	1121.55	1.62	15	395	999.55	998.16	0.35	1489.68	2.15	75%	
9099	9098	598.38	0.86	12	374	1003.54	1002.30	0.33	798.48	1.15	75%	
9105	9104	1225.50	1.76	15	395	994.58	992.90	0.42	1638.08	2.36	75%	
9104	2772	1320.36	1.90	15	356	992.90	991.14	0.49	1766.69	2.54	75%	
165	166	382.60	0.55	10	375	993.68	992.29	0.37	519.17	0.75	74%	
2314	1791	1327.17	1.91	18	69	962.81	962.67	0.20	1834.82	2.64	72%	
415	416	304.02	0.44	10	337	1007.31	1006.47	0.25	425.39	0.61	71%	Interpolated
167	168	382.56	0.55	10	304	991.23	990.03	0.40	535.82	0.77	71%	
168	169	382.22	0.55	10	405	990.03	988.43	0.40	535.88	0.77	71%	
166	167	382.49	0.55	10	265	992.29	991.23	0.40	539.44	0.78	71%	
169	88	380.92	0.55	10	401	988.43	986.83	0.40	538.66	0.78	71%	
413	414	303.38	0.44	10	423	1008.89	1007.81	0.26	430.81	0.62	70%	Interpolated
2449	2857	1101.23	1.59	30	201	962.12	962.10	0.01	1591.54	2.29	69%	Interpolated
414	415	303.19	0.44	10	143	1007.71	1007.31	0.28	449.98	0.65	67%	Interpolated
9107	9106	1121.47	1.61	15	399	997.68	995.86	0.46	1696.95	2.44	66%	
2175	2174	1332.03	1.92	21	430	961.18	960.72	0.11	2015.71	2.90	66%	
416	417	302.45	0.44	10	448	1006.37	1005.07	0.29	458.88	0.66	66%	
2382	2851	381.36	0.55	24	23	957.32	957.32	0.00	585.23	0.84	65%	
2173	2172	1331.71	1.92	21	410	958.77	958.31	0.11	2064.50	2.97	65%	
2176	2175	1332.19	1.92	21	400	961.63	961.18	0.11	2067.28	2.98	64%	
162	163	341.15	0.49	10	396	998.14	996.59	0.39	533.06	0.77	64%	
2177	2176	1331.07	1.92	21	311	961.99	961.63	0.12	2097.04	3.02	63%	
9101	9099	598.38	0.86	12	232	1004.63	1003.54	0.47	948.98	1.37	63%	
1808	1803	1175.43	1.69	15	101	951.59	951.00	0.59	1925.00	2.77	61%	Interpolated
2902	1841	398.78	0.57	15	270	973.51	973.32	0.07	665.98	0.96	60%	
2802	1198	154.67	0.22	12	345	968.25	968.13	0.03	258.34	0.37	60%	Interpolated
1504	1505	365.69	0.53	15	201	1021.94	1021.82	0.06	614.63	0.89	59%	
9117	9118	598.38	0.86	12	263	1007.83	1006.39	0.55	1026.35	1.48	58%	
163	164	340.79	0.49	10	374	996.59	994.73	0.50	601.20	0.87	57%	
2172	2171	1331.58	1.92	21	421	958.31	957.69	0.15	2366.10	3.41	56%	
1363	1353	243.29	0.35	12	269	966.39	966.12	0.10</				

2807	1052	13.95	0.02	8	30	1060.14	1060.14	0.00	27.16	0.04	51%	
2469	2468	169.46	0.24	12	192	973.47	973.36	0.06	331.59	0.48	51%	
1945	1944	924.17	1.33	18	264	961.92	961.40	0.20	1815.09	2.61	51%	
1944	1942	924.17	1.33	18	435	961.40	960.54	0.20	1816.64	2.62	51%	
1942	1941	924.16	1.33	18	212	960.54	960.12	0.20	1820.37	2.62	51%	
1946	1945	924.18	1.33	18	309	962.56	961.92	0.21	1858.26	2.68	50%	
1941	661	924.16	1.33	18	449	960.12	959.04	0.24	2004.78	2.89	46%	Interpolated
412	413	303.15	0.44	10	215	1010.34	1008.99	0.63	674.98	0.97	45%	
511	2849	385.71	0.56	24	10	955.65	955.65	0.00	865.81	1.25	45%	Interpolated
1799	1801	1847.87	2.66	27	368	953.10	952.66	0.12	4165.65	6.00	44%	Sanitary Siphon under River
1798	1799	1847.93	2.66	27	301	953.50	953.14	0.12	4166.28	6.00	44%	Sanitary Siphon under River
1797	1798	1848.05	2.66	27	451	954.08	953.54	0.12	4168.59	6.00	44%	Sanitary Siphon under River
1801	1803	1847.86	2.66	27	100	952.62	952.50	0.12	4173.22	6.01	44%	Sanitary Siphon under River
2169	2168	1847.36	2.66	27	283	957.08	956.74	0.12	4173.32	6.01	44%	
188	187	88.76	0.13	8	402	966.47	965.67	0.20	209.73	0.30	42%	
1810	1809	1175.68	1.69	24	104	953.80	953.69	0.11	2855.31	4.11	41%	
2129	2128	391.40	0.56	15	396	1010.73	1010.14	0.15	970.03	1.40	40%	MinimumSlope
2125	49	391.32	0.56	15	148	1008.74	1008.52	0.15	970.34	1.40	40%	MinimumSlope
2128	2127	391.32	0.56	15	241	1010.14	1009.78	0.15	970.79	1.40	40%	MinimumSlope
2132	2131	391.55	0.56	15	314	1011.82	1011.35	0.15	972.04	1.40	40%	MinimumSlope
Jun-345	1797	964.71	1.39	12	14	954.50	954.08	3.00	2400.42	3.46	40%	Sanitary Siphon under River
2126	2125	391.34	0.56	15	352	1009.27	1008.74	0.15	975.10	1.40	40%	MinimumSlope
2131	2130	391.29	0.56	15	213	1011.35	1011.03	0.15	975.10	1.40	40%	MinimumSlope
2127	2126	391.37	0.56	15	338	1009.78	1009.27	0.15	975.38	1.40	40%	MinimumSlope
2130	2129	391.28	0.56	15	199	1011.03	1010.73	0.15	976.57	1.41	40%	MinimumSlope
226	1193	171.76	0.25	12	52	967.33	967.28	0.10	429.25	0.62	40%	Interpolated
821	822	143.68	0.21	10	222	1053.31	1052.91	0.18	361.43	0.52	40%	
2833	2834	866.10	1.25	24	81	955.90	955.85	0.06	2185.25	3.15	40%	
9084	2901	386.79	0.56	15	390	974.59	974.00	0.15	977.17	1.41	40%	
2765	2764	1330.40	1.92	15	400	981.13	973.87	1.81	3384.67	4.87	39%	
2152	2151	924.19	1.33	18	382	965.38	964.10	0.33	2364.35	3.40	39%	
268	1504	365.93	0.53	15	302	1022.45	1022.03	0.14	937.65	1.35	39%	
1404	1405	165.94	0.24	10	199	979.40	978.85	0.28	448.36	0.65	37%	MinimumSlope
1405	2333	165.92	0.24	10	218	978.85	978.24	0.28	450.72	0.65	37%	MinimumSlope
1812	1811	1175.68	1.69	24	90	954.31	954.19	0.13	3204.70	4.61	37%	
2333	1378	165.90	0.24	10	166	978.24	977.77	0.28	453.24	0.65	37%	MinimumSlope
2834	2835	866.00	1.25	24	247	955.83	955.65	0.07	2375.58	3.42	36%	
2171	2169	1331.56	1.92	24	349	957.69	957.08	0.17	3680.34	5.30	36%	
1192	1363	171.46	0.25	12	341	966.79	966.39	0.12	474.77	0.68	36%	Interpolated
2151	2150	924.18	1.33	18	315	964.10	962.84	0.40	2583.83	3.72	36%	
543	542	1183.09	1.70	30	185	959.95	959.87	0.04	3320.02	4.78	36%	
1795	1796	1848.09	2.66	27	11	956.30	956.28	0.19	5189.03	7.47	36%	Sanitary Siphon under River
2901	2902	399.05	0.57	15	219	974.00	973.56	0.20	1126.90	1.62	35%	
2914	9148	119.51	0.17	8	38	978.41	978.21	0.52	339.77	0.49	35%	
529	528	866.35	1.25	24	140	957.68	957.57	0.08	2467.52	3.55	35%	
9135	9134	1064.41	1.53	24	151	955.48	955.30	0.12	3037.83	4.37	35%	
539	538	1192.58	1.72	30	348	959.08	958.92	0.05	3422.86	4.93	35%	
187	186	88.87	0.13	8	267	965.67	964.87	0.30	257.47	0.37	35%	
1239	1453	587.32	0.85	21	389	984.22	983.91	0.08	1739.14	2.50	34%	
55	2829	391.36	0.56	15	354	987.10	986.34	0.21	1164.10	1.68	34%	
9137	9136	1064.48	1.53	24	400	956.41	955.89	0.13	3170.92	4.57	34%	
540	539	1183.78	1.70	30	305	959.23	959.08	0.05	3535.99	5.09	33%	
189	188	70.74	0.10	8	395	967.27	966.47	0.20	211.54	0.30	33%	
9138	9137	1064.51	1.53	24	310	956.82	956.41	0.13	3200.41	4.61	33%	
822	823	143.71	0.21	10	221	1052.81	1052.24	0.26	432.78	0.62	33%	
9139	9138	1064.54	1.53	24	323	957.25	956.82	0.13	3210.35	4.62	33%	
9136	9135	1064.43	1.53	24	305	955.89	955.48	0.13	3224.80	4.64	33%	
1198	1194	154.50	0.22	12	332	968.18	967.80	0.11	468.87	0.68	33%	
1811	1810	1175.68	1.69	24	224	954.17	953.80	0.16	3574.12	5.15	33%	
1194	226	154.28	0.22	12	396	967.80	967.33	0.12	477.73	0.69	32%	
1193	1192	171.63	0.25	12	291	967.28	966.84	0.15	538.77	0.78	32%	
1343	2443	751.51	1.08	21	463	965.52	964.84	0.15	2363.32	3.40	32%	
661	9142	957.06	1.38	21	124	959.04	958.74	0.24	3034.21	4.37	32%	Interpolated
50	51	391.32	0.56	15	164	990.78	990.38	0.24	1242.75	1.79	31%	
53	54	391.33	0.56	15	230	988.19	987.62	0.25	1251.05	1.80	31%	
52	53	391.32	0.56	15	108	988.46	988.19	0.25	1256.62	1.81	31%	
9132	9130	1175.69	1.69	24	155	954.94	954.65	0.19	3806.33	5.48	31%	
2829	2830	391.33	0.56	15	232	986.34	985.74	0.26	1278.58	1.84	31%	
1501	1502	249.88	0.36	15	365	1023.89	1023.50	0.11	820.96	1.18	30%	
54	55	391.30	0.56	15	196	987.62	987.10	0.27	1295.27	1.87	30%	
557	558	133.95	0.19	10	147	980.59	980.19	0.27	443.94	0.64	30%	
9131	1812	1175.68	1.69	24	76	954.46	954.31	0.20	3903.52	5.62	30%	
2174	2173	1331.95	1.92	21	375	960.72	958.77	0.52	4445.46	6.40	30%	
1550	2169	545.82	0.79	18	285	957.65	957.08	0.20	1825.83	2.63	30%	Interpolated
2896	2897	320.03	0.46	15	285	977.46	976.94	0.18	1073.91	1.55	30%	
2898	2899	319.18	0.46	15	380	976.32	975.63	0.18	1071.17	1.54	30%	
1373	1418	755.03	1.09	21	400	972.57	971.89	0.17	2542.65	3.66	30%	
730	1628	27.38	0.04	8	233	995.40	995.31	0.04	92.31	0.13	30%	
2899	9084	371.60	0.54	15	390	975.58	974.59	0.25	1265.64	1.82	29%	
1453	1454	586.75	0.84	21	398	983.82	983.40	0.11	2003.05	2.88	29%	
9130	9131	1175.69	1.69	24	91	954.65	954.46	0.21	4014.79	5.78	29%	
1342	1343	754.37	1.09	21	381	966.32	965.65	0.18	2583.24	3.72	29%	Interpolated
1454	1455	586.12	0.84	21	405	983.32	982.89	0.11	2007.41	2.89	29%	
1794	1795	1848.09	2.66	27	18	956.41	956.36	0.28	6351.11	9.15	29%	Sanitary Siphon under River
2121	2114	246.10	0.35	10	289	1003.57	1000.68	1.00	852.37	1.23	29%	
2114	1137	246.09	0.35	10	166	1000.68	999.02	1.00	852.42	1.23	29%	
2836	2837	865.77	1.25	24	387	955.18	954.73	0.12	3000.17	4.32	29%	
9148	9149	792.32	1.14	18	381	978.21	976.46	0.46	2769.78	3.99	29%	
Jun-347	Jun-349	4.74	0.01	8	80	956.50	956.50	0.00	16.62	0.02	29%	Sanitary Siphon under River
Jun-348	Jun-350	4.74	0.01	8	80	956.50	956.50	0.00	16.62	0.02	29%	Sanitary Siphon under River
1270	1269	553.10	0.80	21	261	1014.19	1013.93	0.10	1944.03	2.80	28%	
2895	2896	320.31	0.46	15	294	978.05	977.46	0.20	1125.85	1.62	28%	Interpolated
391	1270	553.21	0.80	21	398	1014.69	1014.29	0.10	1952.86	2.81	28%	
2450	2451	1160.08	1.67	30	408	961.72	961.45	0.07	4104.42	5.91	28%	
2452	9332	1171.00	1.69	30	265	960.77	960.59	0.07	4158.36	5.99	28%	
9332	9323	1170.83	1.69	30	234	960.54	960.38	0.07	4172.08	6.01	28%	

2015	557	23.53	0.03	10	102	980.60	980.59	0.01	84.57	0.12	28%	Interpolated
1036	888	118.86	0.17	10	408	992.58	991.54	0.25	430.35	0.62	28%	
2897	2898	319.86	0.46	15	290	976.94	976.32	0.21	1162.43	1.67	28%	
9071	95	74.33	0.11	8	147	1021.72	1021.23	0.33	271.47	0.39	27%	Interpolated
9323	544	1170.63	1.69	30	250	960.33	960.15	0.07	4281.38	6.17	27%	
2447	2448	1102.36	1.59	30	322	962.47	962.26	0.07	4072.74	5.86	27%	
559	2470	150.58	0.22	10	413	979.17	977.40	0.43	557.89	0.80	27%	
541	540	1184.16	1.71	30	197	959.38	959.23	0.08	4406.10	6.34	27%	
1287	189	40.71	0.06	8	460	967.75	967.27	0.10	151.84	0.22	27%	Interpolated
2894	2895	300.01	0.43	15	412	978.87	978.05	0.20	1120.92	1.61	27%	Interpolated
2446	2447	1103.75	1.59	30	373	962.74	962.49	0.07	4133.34	5.95	27%	
537	536	1192.08	1.72	30	351	958.53	958.25	0.08	4504.31	6.49	26%	
1341	1342	754.52	1.09	21	400	967.18	966.32	0.21	2856.40	4.11	26%	Interpolated
9140	9139	957.03	1.38	24	359	957.86	957.25	0.17	3629.03	5.23	26%	
9141	9140	957.06	1.38	24	376	958.50	957.86	0.17	3629.27	5.23	26%	
558	559	133.94	0.19	10	259	980.19	979.27	0.36	508.26	0.73	26%	Interpolated
2395	Jun-207	176.45	0.25	10	44	969.95	969.68	0.62	671.14	0.97	26%	
186	185	88.89	0.13	8	25	964.87	965.00	-0.53	341.08	0.49	26%	Interpolated
528	527	866.32	1.25	24	293	957.47	956.99	0.16	3332.77	4.80	26%	
544	543	1170.26	1.69	30	251	960.15	959.95	0.08	4505.59	6.49	26%	
1049	1050	143.67	0.21	12	350	1050.35	1049.79	0.16	554.42	0.80	26%	
1202	1201	142.23	0.20	12	357	969.56	969.00	0.16	549.07	0.79	26%	
1502	1503	249.86	0.36	15	318	1023.48	1023.01	0.15	965.69	1.39	26%	
9134	9132	1064.37	1.53	24	146	955.26	954.94	0.22	4119.76	5.93	26%	
2445	2446	1051.01	1.51	30	337	962.98	962.76	0.07	4074.05	5.87	26%	
2444	2445	1052.60	1.52	30	351	963.23	963.00	0.07	4082.32	5.88	26%	
1050	1052	143.59	0.21	12	346	1049.69	1049.13	0.16	557.79	0.80	26%	
Jun-328	Jun-332	397.55	0.57	18	140	941.50	941.30	0.14	1544.38	2.22	26%	Sanitary Siphon under River
Jun-329	Jun-333	397.55	0.57	18	140	941.50	941.30	0.14	1544.38	2.22	26%	Sanitary Siphon under River
1201	231	142.18	0.20	12	289	968.86	968.40	0.16	552.90	0.80	26%	
2166	2167	114.67	0.17	10	240	1012.75	1012.08	0.28	450.55	0.65	25%	
1796	Jun-340	883.38	1.27	16	14	956.29	955.90	2.79	3477.04	5.01	25%	Sanitary Siphon under River
231	2802	143.39	0.21	12	53	968.34	968.25	0.17	569.06	0.82	25%	
2443	2444	1054.02	1.52	30	290	963.45	963.25	0.07	4188.22	6.03	25%	
2165	2166	113.68	0.16	10	260	1013.48	1012.75	0.28	451.78	0.65	25%	
2167	412	113.17	0.16	10	623	1012.08	1010.34	0.28	450.41	0.65	25%	
1743	9071	74.33	0.11	8	274	1022.82	1021.72	0.40	297.62	0.43	25%	
87	88	137.71	0.20	10	368	988.00	986.45	0.42	553.41	0.80	25%	
2111	2112	199.05	0.29	8	122	1015.20	1011.43	3.10	827.12	1.19	24%	
2108	2107	199.05	0.29	8	144	1024.69	1020.22	3.10	827.54	1.19	24%	
2113	2121	199.05	0.29	8	142	1007.98	1003.57	3.10	827.73	1.19	24%	
2112	2113	199.05	0.29	8	111	1011.43	1007.98	3.10	827.84	1.19	24%	
2107	2110	199.05	0.29	8	65	1020.22	1018.20	3.10	827.95	1.19	24%	
2110	2111	199.05	0.29	8	97	1018.20	1015.20	3.10	827.98	1.19	24%	
2931	9148	672.84	0.97	18	276	979.51	978.21	0.47	2803.41	4.04	24%	
1503	268	250.04	0.36	15	221	1022.92	1022.54	0.17	1042.69	1.50	24%	
2758	2759	114.49	0.16	10	146	965.29	964.83	0.32	479.13	0.69	24%	
2407	2108	196.96	0.28	8	59	1026.51	1024.69	3.09	826.84	1.19	24%	
2164	2165	106.33	0.15	10	130	1013.84	1013.48	0.28	448.96	0.65	24%	
2163	2164	106.45	0.15	10	140	1014.23	1013.84	0.28	450.42	0.65	24%	
1055	9098	152.52	0.22	12	152	1002.64	1002.30	0.22	654.88	0.94	23%	Interpolated
1267	1266	552.85	0.80	21	455	1011.84	1011.16	0.15	2383.82	3.43	23%	
536	535	1191.96	1.72	30	96	958.23	958.21	0.02	5150.30	7.42	23%	
2932	2931	672.85	0.97	18	164	980.39	979.56	0.51	2909.77	4.19	23%	
1266	1265	552.74	0.80	21	398	1011.06	1010.46	0.15	2391.64	3.44	23%	
2466	2894	276.87	0.40	15	407	979.80	978.87	0.23	1201.58	1.73	23%	Interpolated
1340	1341	755.28	1.09	21	396	968.42	967.29	0.29	3293.33	4.74	23%	
823	1049	143.52	0.21	10	323	1052.24	1050.50	0.54	626.01	0.90	23%	
2448	2449	1101.57	1.59	30	130	962.24	962.12	0.09	4847.52	6.98	23%	
28	1203	129.76	0.19	12	18	970.27	970.24	0.17	573.32	0.83	23%	
81	84	66.71	0.10	8	290	997.31	996.16	0.40	295.99	0.43	23%	
889	9078	146.84	0.21	12	410	988.54	987.62	0.22	656.42	0.95	22%	
84	85	66.71	0.10	8	155	996.16	995.52	0.41	301.66	0.43	22%	
2830	2934	672.27	0.97	15	117	985.74	984.00	1.48	3061.06	4.41	22%	
2746	Jun-322	1743.48	2.51	36	110	953.90	953.79	0.10	8204.47	11.81	21%	Sanitary Siphon under River
9142	9141	957.06	1.38	24	90	958.74	958.50	0.27	4544.46	6.54	21%	
2857	2450	1100.82	1.59	30	335	962.10	961.74	0.11	5227.91	7.53	21%	
2238	2241	94.10	0.14	10	378	1017.93	1016.87	0.28	451.31	0.65	21%	
2241	2242	93.94	0.14	10	400	1016.87	1015.75	0.28	450.98	0.65	21%	
9078	623	89.49	0.13	10	410	987.52	986.47	0.26	431.17	0.62	21%	
2242	2243	93.15	0.13	10	400	1015.75	1014.63	0.28	450.98	0.65	21%	
1831	2845	411.48	0.59	15	339	963.74	961.60	0.63	1996.11	2.87	21%	
2243	2163	92.21	0.13	10	144	1014.63	1014.23	0.28	449.26	0.65	21%	
1203	208	129.76	0.19	12	172	970.24	969.88	0.21	633.13	0.91	20%	Interpolated
2832	2833	866.26	1.25	24	182	956.36	955.92	0.24	4321.67	6.22	20%	
2237	2238	89.70	0.13	10	102	1018.22	1017.93	0.28	454.51	0.65	20%	
2236	2237	89.27	0.13	10	88	1018.47	1018.22	0.28	453.28	0.65	20%	
546	555	111.36	0.16	10	344	990.26	988.74	0.44	566.46	0.82	20%	
208	1202	142.42	0.21	12	79	969.78	969.56	0.28	731.26	1.05	19%	Interpolated
1237	1238	552.52	0.80	21	435	985.22	984.28	0.22	2864.43	4.12	19%	
1374	1373	756.45	1.09	21	406	974.35	972.70	0.41	3930.20	5.66	19%	
2451	2452	1171.71	1.69	30	431	961.43	960.80	0.15	6098.83	8.78	19%	
555	556	111.35	0.16	10	372	988.74	986.92	0.49	596.11	0.86	19%	
2234	2235	83.95	0.12	10	180	1019.12	1018.62	0.28	449.52	0.65	19%	
2232	2233	83.99	0.12	10	258	1020.54	1019.82	0.28	450.12	0.65	19%	
2235	2236	83.24	0.12	10	54	1018.62	1018.47	0.28	447.78	0.64	19%	
2233	2234	83.82	0.12	10	250	1019.82	1019.12	0.28	450.99	0.65	19%	
2230	2232	83.43	0.12	10	266	1021.28	1020.54	0.28	449.62	0.65	19%	
882	889	144.49	0.21	12	411	989.85	988.54	0.32	782.45	1.13	18%	
1809	1808	1175.68	1.69	15	31	953.67	951.69	6.47	6389.75	9.20	18%	
139	228	101.78	0.15	12	296	971.38	970.90	0.16	558.41	0.80	18%	
1361	1362	31.66	0.05	8	380	967.43	966.91	0.14	173.81	0.25	18%	Interpolated
228	28	101.91	0.15	12	293	970.85	970.37	0.16	561.42	0.81	18%	
1362	1363	31.54	0.05	8	380	966.91	966.39	0.14	173.90	0.25	18%	Interpolated
95	554	82.94	0.12	10	158	1021.13	1020.67	0.29	459.82	0.66	18%	
1505	1506	365.60	0.53	15	313	1021.62	1019.56	0.66	2037.35	2.93	18%	

1269	1268	552.97	0.80	21	236	1013.93	1013.34	0.25	3082.15	4.44	18%	Interpolated
547	546	101.96	0.15	10	412	992.22	990.36	0.45	572.87	0.82	18%	
548	547	101.96	0.15	10	403	994.14	992.32	0.45	572.93	0.83	18%	
1068	1055	115.04	0.17	12	369	1003.45	1002.64	0.22	649.27	0.93	18%	Interpolated
1066	1067	115.05	0.17	12	300	1005.54	1004.88	0.22	649.56	0.94	18%	
554	553	82.94	0.12	10	306	1020.57	1019.64	0.30	470.19	0.68	18%	
1141	1510	206.85	0.30	15	259	1029.99	1029.42	0.22	1178.85	1.70	18%	Interpolated
1455	2941	585.95	0.84	21	246	982.81	982.06	0.30	3400.81	4.90	17%	
2846	2850	385.86	0.56	30	5	956.76	956.76	0.00	2256.40	3.25	17%	
Jun-346	1797	883.37	1.27	16	14	954.50	954.08	3.00	5169.61	7.44	17%	Sanitary Siphon under River
86	87	85.35	0.12	10	143	988.60	988.10	0.35	503.99	0.73	17%	
1511	1141	207.51	0.30	15	96	1030.22	1029.99	0.24	1227.76	1.77	17%	Interpolated
1378	1374	756.66	1.09	21	398	976.60	974.45	0.54	4528.83	6.52	17%	
2335	1411	48.98	0.07	8	48	983.13	982.94	0.39	295.37	0.43	17%	MinimumSlope
1411	1410	48.95	0.07	8	189	982.94	982.19	0.40	296.08	0.43	17%	MinimumSlope
1410	1409	49.16	0.07	8	367	982.19	980.72	0.40	297.69	0.43	17%	MinimumSlope
1409	1404	49.01	0.07	8	330	980.72	979.40	0.40	297.42	0.43	16%	MinimumSlope
553	552	82.94	0.12	10	74	1019.54	1019.27	0.36	514.46	0.74	16%	
1043	1036	96.93	0.14	10	241	993.88	992.68	0.50	601.57	0.87	16%	
1379	1380	589.35	0.85	21	453	981.51	979.79	0.38	3800.00	5.47	16%	Interpolated
2848	1375	52.39	0.08	12	303	972.47	972.29	0.06	337.83	0.49	16%	
552	551	82.94	0.12	10	229	1019.17	1018.26	0.40	537.22	0.77	15%	
888	882	130.65	0.19	12	411	991.54	990.00	0.37	848.30	1.22	15%	
2440	2442	300.51	0.43	27	76	964.19	964.21	-0.03	1951.34	2.81	15%	
614	85	18.65	0.03	8	120	989.51	989.43	0.07	121.17	0.17	15%	
2837	2838	865.54	1.25	24	128	954.71	954.18	0.41	5657.18	8.15	15%	
2468	2467	169.39	0.24	12	225	973.36	971.91	0.64	1111.61	1.60	15%	
85	86	85.36	0.12	10	143	989.24	988.60	0.45	569.57	0.82	15%	
2941	1379	585.98	0.84	21	134	982.06	981.51	0.41	3952.12	5.69	15%	
2157	2156	916.99	1.32	18	82	971.72	969.80	2.34	6248.98	9.00	15%	
51	52	391.32	0.56	15	169	990.38	988.46	1.14	2680.13	3.86	15%	
2907	2893	176.26	0.25	15	407	967.06	966.12	0.23	1207.38	1.74	15%	SDR-35.Interpolated
2156	2152	916.99	1.32	18	180	969.75	965.43	2.40	6325.69	9.11	14%	
616	2911	33.26	0.05	10	372	980.47	980.20	0.07	229.67	0.33	14%	
Jun-327	Jun-331	474.18	0.68	24	140	941.50	941.30	0.14	3326.02	4.79	14%	Sanitary Siphon under River
Jun-330	Jun-334	474.18	0.68	24	140	941.50	941.30	0.14	3326.02	4.79	14%	Sanitary Siphon under River
1243	1242	552.63	0.80	21	402	990.02	988.42	0.40	3889.36	5.60	14%	
1241	1237	552.57	0.80	21	399	986.82	985.22	0.40	3901.22	5.62	14%	
513	512	385.74	0.56	24	250	956.21	955.97	0.10	2725.92	3.93	14%	
1242	1241	552.60	0.80	21	397	988.42	986.82	0.40	3912.95	5.63	14%	
1380	1378	589.15	0.85	21	396	979.62	977.77	0.47	4214.36	6.07	14%	
124	1500	249.91	0.36	12	47	1027.96	1027.16	1.70	1805.03	2.60	14%	Interpolated
2909	2464	99.24	0.14	10	407	982.59	979.64	0.72	725.63	1.04	14%	
9149	2157	916.99	1.32	18	173	976.46	971.72	2.74	6760.74	9.74	14%	
363	1511	207.92	0.30	15	328	1031.54	1030.30	0.38	1543.87	2.22	13%	
512	511	385.72	0.56	24	204	955.92	955.70	0.11	2892.44	4.17	13%	
Jun-343	Jun-345	964.72	1.39	12	30	946.00	954.50	-28.33	7376.93	10.62	13%	Sanitary Siphon under River
447	406	103.25	0.15	15	403	1031.48	1031.08	0.10	791.30	1.14	13%	
19511	9106	94.57	0.14	15	409	996.20	995.86	0.08	724.79	1.04	13%	
2194	2195	84.79	0.12	12	500	986.34	985.24	0.22	649.96	0.94	13%	MinimumSlope
2192	2193	84.22	0.12	12	341	987.72	986.97	0.22	649.68	0.94	13%	MinimumSlope
529	534	837.14	1.21	18	16	957.67	958.08	-2.50	6462.58	9.31	13%	Interpolated
2193	2194	84.31	0.12	12	285	986.97	986.34	0.22	651.03	0.94	13%	MinimumSlope
1268	1267	552.95	0.80	21	258	1013.24	1011.94	0.50	4377.50	6.30	13%	
2191	2192	81.02	0.12	12	243	988.25	987.72	0.22	647.82	0.93	13%	MinimumSlope
444	2414	101.08	0.15	15	104	1033.53	1033.42	0.11	816.82	1.18	12%	
1426	1425	49.05	0.07	8	350	987.99	985.47	0.72	398.74	0.57	12%	Interpolated
1425	2335	48.97	0.07	8	325	985.47	983.13	0.72	398.74	0.57	12%	Interpolated
1610	9078	64.97	0.09	10	15	987.58	987.52	0.39	531.46	0.77	12%	
1067	1068	115.05	0.17	12	299	1004.83	1003.45	0.46	941.43	1.36	12%	
2190	2191	77.42	0.11	12	350	989.02	988.25	0.22	650.04	0.94	12%	MinimumSlope
1603	1594	55.87	0.08	8	404	982.27	978.23	1.00	470.11	0.68	12%	Interpolated
1594	1593	55.84	0.08	8	407	978.23	974.16	1.00	470.10	0.68	12%	Interpolated
1593	1585	55.82	0.08	8	415	974.16	970.01	1.00	470.00	0.68	12%	Interpolated
1585	1576	55.80	0.08	8	412	970.01	965.89	1.00	470.17	0.68	12%	Interpolated
1576	2450	55.78	0.08	8	179	965.89	964.10	1.00	470.11	0.68	12%	Interpolated
1375	1369	52.37	0.08	12	246	972.24	971.99	0.10	441.97	0.64	12%	
2838	2756	865.50	1.25	24	97	954.16	954.83	-0.69	7331.28	10.56	12%	
623	1603	55.92	0.08	8	407	986.47	982.27	1.03	477.73	0.69	12%	Interpolated
1369	1368	52.35	0.08	12	85	971.94	971.85	0.11	451.92	0.65	12%	
1265	1244	552.70	0.80	21	425	1010.36	1007.81	0.60	4772.27	6.87	12%	
2195	1070	74.90	0.11	12	381	985.24	984.40	0.22	650.38	0.94	12%	MinimumSlope
2189	2190	74.46	0.11	12	455	990.02	989.02	0.22	649.50	0.94	11%	MinimumSlope
1418	1340	755.50	1.09	21	291	971.89	968.52	1.16	6631.66	9.55	11%	Interpolated
675	9091	32.91	0.05	8	232	1067.20	1066.30	0.39	293.00	0.42	11%	
549	548	101.96	0.15	10	301	997.66	994.24	1.14	908.15	1.31	11%	
654	730	27.40	0.04	8	214	996.09	995.50	0.28	246.93	0.36	11%	
1510	1509	206.85	0.30	15	334	1029.34	1027.48	0.56	1874.23	2.70	11%	
2467	2395	176.54	0.25	15	406	971.68	969.95	0.43	1639.88	2.36	11%	
1354	1353	51.39	0.07	12	377	966.56	966.11	0.12	479.03	0.69	11%	Interpolated
1355	1354	51.65	0.07	12	395	967.04	966.56	0.12	483.26	0.70	11%	Interpolated
406	407	103.23	0.15	15	406	1030.78	1030.18	0.15	966.33	1.39	11%	
1364	1358	31.64	0.05	8	288	970.75	969.60	0.40	296.81	0.43	11%	MinimumSlope
1359	1360	31.68	0.05	8	120	968.91	968.43	0.40	297.23	0.43	11%	MinimumSlope
1611	944	64.71	0.09	12	411	986.05	985.26	0.19	607.40	0.87	11%	
1358	1359	31.60	0.05	8	173	969.60	968.91	0.40	296.84	0.43	11%	MinimumSlope
138	139	101.77	0.15	12	351	973.22	971.55	0.48	956.28	1.38	11%	
1365	1364	31.67	0.05	8	301	971.96	970.75	0.40	297.85	0.43	11%	MinimumSlope
1360	1361	31.56	0.05	8	250	968.43	967.43	0.40	297.20	0.43	11%	MinimumSlope
445	446	103.30	0.15	15	395	1032.88	1032.28	0.15	979.07	1.41	11%	
401	124	103.21	0.15	15	53	1028.05	1027.97	0.15	979.21	1.41	11%	
1841	1831	411.84	0.59	15	394	973.32	963.74	2.43	3920.65	5.65	11%	
446	447	103.29	0.15	15	391	1032.18	1031.58	0.15	984.10	1.42	10%	
550	549	101.96	0.15	10	190	1000.24	997.76	1.30	973.34	1.40	10%	
1024	1025	47.04	0.07	10	400	1002.01	1000.89	0.28	450.85	0.65	10%	
1023	1024	47.06	0.07	10	399	1003.23	1002.11	0.28	451.45	0.65	10%	

1500	1501	249.90	0.36	15	356	1027.16	1023.91	0.91	2401.45	3.46	10%	
1025	1026	47.03	0.07	10	300	1000.79	999.94	0.28	453.52	0.65	10%	
1022	1023	47.07	0.07	10	394	1004.45	1003.33	0.28	454.45	0.65	10%	
402	401	103.21	0.15	15	144	1028.38	1028.15	0.16	1003.37	1.44	10%	
403	402	103.21	0.15	15	62	1028.58	1028.48	0.16	1005.19	1.45	10%	
Jun-336	1803	397.55	0.57	18	20	952.50	952.32	0.90	3876.37	5.58	10%	Sanitary Siphon under River
Jun-337	1803	397.55	0.57	18	20	952.50	952.32	0.90	3876.37	5.58	10%	Sanitary Siphon under River
407	408	103.22	0.15	15	399	1029.82	1029.18	0.16	1006.63	1.45	10%	
128	129	30.41	0.04	8	148	1011.91	1011.32	0.40	297.29	0.43	10%	
130	80	30.41	0.04	8	454	1007.13	1005.31	0.40	297.47	0.43	10%	
408	403	103.22	0.15	15	309	1029.18	1028.68	0.16	1010.41	1.45	10%	
80	81	30.41	0.04	8	443	1005.31	1003.52	0.40	298.86	0.43	10%	
556	557	111.35	0.16	10	366	986.82	980.69	1.68	1103.34	1.59	10%	
527	2832	866.36	1.25	24	68	957.05	956.40	0.96	8627.65	12.42	10%	
966	967	46.00	0.07	12	273	1070.24	1069.94	0.11	459.47	0.66	10%	
944	1915	64.62	0.09	12	415	985.26	984.36	0.22	645.63	0.93	10%	
131	1022	44.47	0.06	10	388	1005.63	1004.55	0.28	449.56	0.65	10%	
2850	513	385.84	0.56	24	249	956.76	956.27	0.20	3902.56	5.62	10%	
297	131	44.47	0.06	10	154	1006.16	1005.73	0.28	451.08	0.65	10%	
2892	Jun-320	197.52	0.28	18	108	966.06	965.80	0.24	2004.37	2.89	10%	Interpolated
1506	1507	525.96	0.76	21	299	1019.47	1017.21	0.76	5356.13	7.71	10%	
Jun-339	Jun-341	964.72	1.39	12	20	956.10	946.00	50.50	9848.56	14.18	10%	Sanitary Siphon under River
959	960	39.89	0.06	12	326	1073.14	1072.85	0.09	413.31	0.60	10%	
535	534	1191.95	1.72	30	41	958.33	958.08	0.62	12521.63	18.03	10%	
538	537	1192.27	1.72	30	46	958.82	958.53	0.63	12665.61	18.24	9%	
1070	1071	81.92	0.12	12	215	984.40	983.54	0.40	877.49	1.26	9%	
3012	1629	27.64	0.04	8	217	995.09	994.23	0.40	296.22	0.43	9%	trouble line
1630	3012	27.64	0.04	8	209	995.93	995.09	0.40	297.77	0.43	9%	trouble line
1629	1043	27.63	0.04	8	87	994.23	993.88	0.40	297.89	0.43	9%	
1368	1370	52.33	0.08	12	378	971.85	971.22	0.17	565.96	0.81	9%	
2470	2469	150.58	0.22	12	285	977.41	973.47	1.38	1629.92	2.35	9%	
1628	3013	27.37	0.04	8	168	995.31	994.64	0.40	296.92	0.43	9%	
3013	1043	27.36	0.04	8	190	994.64	993.88	0.40	296.98	0.43	9%	
2893	2892	176.19	0.25	18	27	966.12	966.06	0.22	1929.40	2.78	9%	
1917	2463	64.52	0.09	12	406	982.71	981.64	0.26	711.49	1.02	9%	SDR-35.Interpolated
1507	391	525.94	0.76	21	256	1017.13	1014.78	0.92	5910.39	8.51	9%	
2414	445	103.33	0.15	15	206	1033.42	1032.98	0.21	1162.21	1.67	9%	
1071	1072	81.92	0.12	12	31	983.44	983.30	0.45	929.40	1.34	9%	
1052	2409	196.97	0.28	12	109	1049.13	1046.27	2.63	2248.51	3.24	9%	
410	411	30.79	0.04	10	298	1012.62	1012.10	0.17	356.21	0.51	9%	
409	410	30.93	0.04	10	383	1013.40	1012.72	0.18	359.28	0.52	9%	
1816	9133	111.51	0.16	10	279	971.04	964.45	2.37	1310.82	1.89	9%	
621	619	33.37	0.05	10	410	982.48	981.62	0.21	394.93	0.57	8%	
1288	1287	20.58	0.03	8	218	968.35	967.75	0.28	246.61	0.36	8%	
2086	658	55.42	0.08	8	186	1063.36	1059.64	2.00	664.78	0.96	8%	
2083	2086	55.42	0.08	8	186	1067.08	1063.36	2.00	664.80	0.96	8%	
Jun-207	2907	176.43	0.25	15	369	969.68	967.06	0.71	2117.14	3.05	8%	SDR-35
1610	1611	64.88	0.09	12	479	987.58	986.05	0.32	783.32	1.13	8%	
2293	788	20.92	0.03	8	103	1040.24	1039.93	0.30	257.79	0.37	8%	Interpolated
2001	2158	110.58	0.16	18	27	978.03	978.00	0.11	1363.79	1.96	8%	
2409	2408	196.97	0.28	12	314	1046.27	1036.54	3.10	2439.79	3.51	8%	
2408	2407	196.96	0.28	12	324	1036.54	1026.51	3.10	2440.25	3.51	8%	
703	702	50.87	0.07	10	338	1037.21	1035.35	0.55	632.35	0.91	8%	
702	444	50.66	0.07	10	333	1035.35	1033.53	0.55	630.07	0.91	8%	
1308	1307	37.07	0.05	12	18	965.76	965.72	0.22	463.12	0.67	8%	
411	412	30.74	0.04	10	274	1012.00	1011.44	0.20	385.58	0.56	8%	
705	704	50.82	0.07	10	310	1040.62	1038.88	0.56	638.42	0.92	8%	
704	703	50.87	0.07	10	297	1038.88	1037.21	0.56	639.29	0.92	8%	
1246	1247	552.66	0.80	21	403	1002.33	997.05	1.31	7057.30	10.16	8%	
1357	1356	51.76	0.07	12	355	970.25	969.44	0.23	662.06	0.95	8%	
Jun-322	Jun-324	397.55	0.57	18	64	954.50	953.50	1.56	5107.56	7.35	8%	Sanitary Siphon under River
Jun-322	Jun-325	397.55	0.57	18	64	954.50	953.50	1.56	5107.56	7.35	8%	Sanitary Siphon under River
1137	2830	280.99	0.40	12	195	999.02	985.74	6.81	3616.39	5.21	8%	
542	541	1184.42	1.71	30	41	959.87	959.48	0.94	15500.74	22.32	8%	
1244	1246	552.68	0.80	21	383	1007.71	1002.43	1.38	7239.63	10.43	8%	
2839	2840	385.44	0.56	30	139	955.01	954.87	0.10	5057.39	7.28	8%	
2911	2466	33.24	0.05	10	45	980.20	980.08	0.27	442.03	0.64	8%	
534	533	354.79	0.51	30	160	958.08	957.94	0.09	4726.69	6.81	8%	
2442	2443	307.06	0.44	27	129	964.08	963.93	0.12	4108.48	5.92	7%	
624	620	33.41	0.05	10	411	985.07	983.92	0.28	450.95	0.65	7%	
623	624	33.47	0.05	10	498	986.47	985.07	0.28	452.02	0.65	7%	
619	616	33.33	0.05	10	411	981.62	980.47	0.28	450.90	0.65	7%	
620	2342	33.38	0.05	10	264	983.92	983.18	0.28	451.62	0.65	7%	
1915	1917	64.56	0.09	12	414	984.36	982.71	0.40	875.20	1.26	7%	Interpolated
2439	2440	301.16	0.43	27	389	964.66	964.21	0.12	4095.70	5.90	7%	
963	966	46.01	0.07	12	353	1071.28	1070.55	0.21	630.05	0.91	7%	
1132	2914	119.51	0.17	8	359	1023.00	979.41	12.13	1637.18	2.36	7%	
626	409	30.92	0.04	10	449	1015.36	1014.25	0.25	423.94	0.61	7%	
2759	2438	302.39	0.44	27	75	964.72	964.63	0.12	4172.94	6.01	7%	
612	613	18.65	0.03	8	166	990.50	990.00	0.30	257.96	0.37	7%	
2438	2439	302.13	0.44	27	82	964.78	964.68	0.12	4200.61	6.05	7%	
1247	1243	552.64	0.80	21	394	996.95	990.79	1.56	7707.03	11.10	7%	
613	614	18.65	0.03	8	95	989.90	989.61	0.31	260.29	0.37	7%	
295	296	20.92	0.03	8	270	1019.70	1018.63	0.40	296.07	0.43	7%	
1429	1428	49.03	0.07	8	342	1010.74	1003.23	2.20	697.07	1.00	7%	Interpolated
1464	1463	49.01	0.07	8	259	1027.43	1021.73	2.20	696.91	1.00	7%	Interpolated
1463	1430	49.01	0.07	8	246	1021.73	1016.31	2.20	697.04	1.00	7%	Interpolated
1430	1429	49.03	0.07	8	253	1016.31	1010.74	2.20	697.75	1.00	7%	Interpolated
1428	1427	48.98	0.07	8	348	1003.23	995.57	2.20	697.06	1.00	7%	Interpolated
117	1426	48.96	0.07	8	221	992.86	987.99	2.20	697.34	1.00	7%	Interpolated
1427	117	48.98	0.07	8	123	995.57	992.86	2.21	698.12	1.01	7%	Interpolated
2463	2464	64.46	0.09	12	418	981.64	979.80	0.44	919.67	1.32	7%	
789	2293	20.92	0.03	8	82	1040.57	1040.24	0.40	298.89	0.43	7%	
1370	1357	52.17	0.08	12	335	971.22	970.25	0.29	746.22	1.07	7%	Interpolated
798	627	30.93	0.04	10	284	1017.18	1016.39	0.28	449.70	0.65	7%	
Jun-10	1021	20.92	0.03	8	12	1015.70	1015.65	0.42	305.08	0.44	7%	Interpolated

627	626	30.93	0.04	10	280	1016.29	1015.46	0.30	463.81	0.67	7%	
1981	2401	29.64	0.04	10	246	987.13	986.44	0.28	451.00	0.65	7%	
960	963	46.03	0.07	12	352	1072.29	1071.38	0.26	704.48	1.01	7%	
551	550	101.96	0.15	10	465	1018.16	1002.41	3.38	1568.00	2.26	7%	
786	789	20.92	0.03	8	305	1042.00	1040.57	0.47	321.81	0.46	7%	
129	130	30.41	0.04	8	422	1011.32	1007.13	0.99	468.44	0.67	6%	
2023	2024	46.00	0.07	12	229	1068.28	1067.64	0.28	732.14	1.05	6%	
282	126	30.41	0.04	8	198	1027.01	1024.83	1.10	492.69	0.71	6%	
2088	2090	60.37	0.09	8	179	1041.49	1033.62	4.40	985.68	1.42	6%	
2090	1132	60.37	0.09	8	241	1033.62	1023.00	4.40	986.05	1.42	6%	
2087	2088	60.37	0.09	8	201	1050.35	1041.49	4.40	986.16	1.42	6%	
706	705	50.57	0.07	10	104	1041.60	1040.62	0.94	827.32	1.19	6%	
658	2087	60.37	0.09	8	205	1059.64	1050.35	4.53	1000.06	1.44	6%	
290	292	20.92	0.03	8	285	1028.30	1026.75	0.54	346.89	0.50	6%	
776	775	16.81	0.02	8	202	1035.08	1034.37	0.35	278.84	0.40	6%	
992	958	39.92	0.06	12	280	1074.78	1074.10	0.24	662.33	0.95	6%	
824	1692	17.76	0.03	8	293	1015.02	1013.85	0.40	296.80	0.43	6%	
1658	1645	17.75	0.03	8	288	1007.51	1006.36	0.40	296.93	0.43	6%	
1666	1667	17.73	0.03	8	373	1012.87	1011.38	0.40	297.24	0.43	6%	
1645	1636	17.73	0.03	8	383	1006.36	1004.83	0.40	297.27	0.43	6%	
1692	1666	17.74	0.03	8	244	1013.85	1012.87	0.40	297.64	0.43	6%	ROOT CUT 07
1636	728	17.71	0.03	8	299	1004.83	1003.63	0.40	297.59	0.43	6%	
2027	1816	111.54	0.16	10	146	978.50	971.04	5.12	1927.63	2.78	6%	
2342	621	33.37	0.05	10	145	983.18	982.50	0.47	584.05	0.84	6%	
1313	1308	37.08	0.05	12	374	966.58	965.76	0.22	649.16	0.93	6%	
Jun-335	1803	474.18	0.68	24	20	952.50	952.32	0.90	8348.24	12.02	6%	Sanitary Siphon under River
Jun-338	1803	474.18	0.68	24	20	952.50	952.32	0.90	8348.24	12.02	6%	Sanitary Siphon under River
967	2023	46.00	0.07	12	193	1069.84	1069.18	0.34	811.47	1.17	6%	
420	421	1.94	0.00	8	19	1062.61	1062.61	0.00	34.36	0.05	6%	
1648	776	16.81	0.02	8	177	1035.79	1035.08	0.40	297.85	0.43	6%	
2757	2746	198.36	0.29	24	346	954.56	953.99	0.16	3571.48	5.14	6%	Sanitary Siphon under River
2756	2746	865.50	1.25	24	27	954.77	953.90	3.20	15743.76	22.67	5%	Sanitary Siphon under River
Jun-344	Jun-346	883.38	1.27	16	29	946.00	954.50	-29.22	16133.72	23.23	5%	Sanitary Siphon under River
2758	2759	188.75	0.27	21	146	965.29	964.83	0.32	3465.22	4.99	5%	
533	532	354.77	0.51	30	207	957.94	957.59	0.17	6559.58	9.45	5%	
453	503	50.51	0.07	12	21	1011.30	1011.20	0.47	945.83	1.36	5%	
574	2015	23.38	0.03	10	343	981.52	980.60	0.27	441.60	0.64	5%	
1289	1288	20.58	0.03	8	228	969.95	968.35	0.70	393.76	0.57	5%	
1876	1877	198.14	0.29	24	424	959.73	958.93	0.19	3824.29	5.51	5%	
1825	2757	198.21	0.29	24	273	955.08	954.56	0.19	3840.41	5.53	5%	
1877	1878	198.14	0.29	24	335	958.88	958.24	0.19	3848.47	5.54	5%	
958	959	39.92	0.06	12	316	1074.14	1073.14	0.32	779.15	1.12	5%	
224	225	14.78	0.02	8	34	946.18	946.05	0.38	290.32	0.42	5%	
1878	1879	198.11	0.29	24	408	958.19	957.39	0.20	3895.48	5.61	5%	
1509	1506	206.85	0.30	15	298	1027.40	1019.56	2.63	4077.22	5.87	5%	
2849	2839	385.69	0.56	30	272	955.65	955.03	0.23	7617.49	10.97	5%	
1882	1884	198.29	0.29	24	429	956.53	955.67	0.20	3939.29	5.67	5%	
1938	1939	197.47	0.28	24	321	962.12	961.48	0.20	3926.76	5.65	5%	
1939	1875	197.46	0.28	24	170	961.43	961.09	0.20	3935.98	5.67	5%	
1875	1874	197.46	0.28	24	324	961.04	960.39	0.20	3939.76	5.67	5%	
1879	1882	198.11	0.29	24	376	957.34	956.58	0.20	3956.80	5.70	5%	
1884	1825	198.28	0.29	24	279	955.67	955.08	0.21	4043.55	5.82	5%	
9091	674	32.91	0.05	8	83	1066.30	1064.60	2.05	672.40	0.97	5%	
292	294	20.92	0.03	8	288	1026.75	1024.35	0.83	429.43	0.62	5%	
1307	1303	42.92	0.06	12	523	965.74	963.59	0.41	888.43	1.28	5%	Interpolated
1303	2446	42.91	0.06	12	207	963.59	962.74	0.41	889.00	1.28	5%	Interpolated
1220	2848	13.82	0.02	8	472	974.36	972.57	0.38	289.59	0.42	5%	Interpolated
2928	2929	14.16	0.02	8	393	1064.07	1062.50	0.40	297.13	0.43	5%	
1026	87	47.03	0.07	10	298	992.01	988.00	1.35	989.36	1.42	5%	
532	2382	362.11	0.52	24	36	957.59	957.32	0.76	7672.18	11.05	5%	
1021	297	20.92	0.03	10	52	1006.40	1006.26	0.27	443.72	0.64	5%	
1221	1222	14.01	0.02	8	428	979.99	978.28	0.40	297.25	0.43	5%	Interpolated
1236	1221	13.99	0.02	8	320	981.27	979.99	0.40	297.12	0.43	5%	Interpolated
2774	9104	21.64	0.03	10	161	993.37	992.90	0.29	461.20	0.66	5%	
281	282	30.41	0.04	8	199	1030.80	1027.01	1.90	648.23	0.93	5%	
1222	1218	13.96	0.02	8	407	978.28	976.65	0.40	297.63	0.43	5%	Interpolated
2928	1051	13.95	0.02	8	154	1064.07	1063.45	0.40	297.84	0.43	5%	
2306	1220	13.93	0.02	8	195	975.14	974.36	0.40	297.66	0.43	5%	Interpolated
1219	2306	13.85	0.02	8	98	975.53	975.14	0.40	296.06	0.43	5%	
1218	1219	13.90	0.02	8	279	976.65	975.53	0.40	297.67	0.43	5%	Interpolated
316	1236	13.82	0.02	8	128	981.78	981.27	0.40	296.45	0.43	5%	Interpolated
1874	1876	198.20	0.29	24	261	960.34	959.73	0.23	4252.90	6.12	5%	
672	671	32.91	0.05	8	55	1054.90	1053.59	2.39	726.11	1.05	5%	Interpolated
673	672	32.91	0.05	8	311	1062.34	1054.90	2.39	726.76	1.05	5%	Interpolated
671	670	32.91	0.05	8	54	1053.59	1052.31	2.39	726.80	1.05	5%	Interpolated
674	673	32.91	0.05	8	94	1064.60	1062.34	2.40	728.27	1.05	5%	Interpolated
310	309	13.73	0.02	8	24	981.62	981.52	0.42	304.82	0.44	5%	
66	1515	19.40	0.03	12	305	959.91	959.61	0.10	434.31	0.63	4%	
Jun-322	Jun-323	474.18	0.68	24	64	954.50	953.50	1.56	10999.77	15.84	4%	Sanitary Siphon under River
Jun-322	Jun-326	474.18	0.68	24	64	954.50	953.50	1.56	10999.77	15.84	4%	Sanitary Siphon under River
663	662	32.91	0.05	8	133	971.44	967.91	2.65	764.99	1.10	4%	
174	175	36.38	0.05	12	204	991.37	990.57	0.39	868.45	1.25	4%	
Jun-340	Jun-342	883.38	1.27	16	20	956.10	946.00	50.50	21210.09	30.54	4%	Sanitary Siphon under River
176	177	37.51	0.05	12	118	989.77	989.27	0.42	902.55	1.30	4%	
1384	1317	18.76	0.03	10	470	972.85	971.53	0.28	451.83	0.65	4%	Interpolated
173	174	36.38	0.05	12	155	992.02	991.37	0.42	896.11	1.29	4%	
175	176	36.38	0.05	12	189	990.57	989.77	0.42	902.42	1.30	4%	
99	67	14.05	0.02	10	170	960.92	960.62	0.18	357.68	0.52	4%	
1940	1938	197.50	0.28	24	182	962.79	962.17	0.34	5132.16	7.39	4%	
1356	1355	51.74	0.07	12	247	969.39	967.04	0.95	1350.79	1.95	4%	
1517	1520	19.41	0.03	12	303	958.81	958.36	0.15	533.66	0.77	4%	
296	Jun-10	20.92	0.03	8	192	1018.63	1015.70	1.53	580.55	0.84	4%	Interpolated
727	654	17.71	0.03	8	200	998.40	996.19	1.10	493.97	0.71	4%	
2831	2746	720.10	1.04	33	83	954.69	953.90	0.96	20105.52	28.95	4%	
2465	2464	34.47	0.05	15	166	979.89	979.64	0.15	974.35	1.40	4%	
666	665	32.91	0.05	8	191	1001.37	993.61	4.07	947.82	1.36	3%	Interpolated

664	663	32.91	0.05	8	294	983.40	971.44	4.07	948.27	1.37	3%	Interpolated
9181	1077	9.33	0.01	8	12	988.75	988.71	0.33	270.60	0.39	3%	
2782	171	25.81	0.04	12	84	997.37	997.12	0.30	754.98	1.09	3%	Interpolated
171	172	25.81	0.04	12	451	997.12	995.77	0.30	758.07	1.09	3%	Interpolated
9015	9016	14.16	0.02	8	330	1059.90	1057.26	0.80	420.12	0.60	3%	
2487	2846	381.36	0.55	30	83	957.22	956.80	0.50	11326.56	16.31	3%	
994	993	22.58	0.03	12	168	1075.67	1075.27	0.24	677.21	0.98	3%	
289	290	20.92	0.03	8	337	1034.80	1028.75	1.79	629.47	0.91	3%	
Jun-324	Jun-328	397.55	0.57	18	140	953.50	941.50	8.57	11962.73	17.23	3%	Sanitary Siphon under River
Jun-325	Jun-329	397.55	0.57	18	140	953.50	941.50	8.57	11962.73	17.23	3%	Sanitary Siphon under River
1667	1658	17.72	0.03	8	297	1011.38	1007.51	1.30	536.82	0.77	3%	
1634	654	9.78	0.01	8	444	997.86	996.09	0.40	296.87	0.43	3%	
861	862	9.46	0.01	8	331	973.01	971.76	0.38	288.76	0.42	3%	
362	363	206.85	0.30	15	76	1036.62	1031.79	6.34	6326.30	9.11	3%	
219	220	9.45	0.01	8	247	950.28	949.34	0.38	290.09	0.42	3%	
67	66	14.04	0.02	10	270	960.62	959.91	0.26	436.71	0.63	3%	
221	223	9.45	0.01	8	362	949.20	947.78	0.39	294.40	0.42	3%	
1634	1633	7.10	0.01	8	426	997.86	996.91	0.22	222.11	0.32	3%	
220	221	9.44	0.01	8	35	949.34	949.20	0.40	296.11	0.43	3%	
223	224	9.43	0.01	8	402	947.78	946.18	0.40	296.69	0.43	3%	
294	295	20.92	0.03	8	205	1024.24	1020.20	1.97	659.19	0.95	3%	
995	994	22.58	0.03	12	387	1076.70	1075.67	0.27	714.82	1.03	3%	
747	746	34.94	0.05	8	374	1109.35	1088.45	5.58	1110.82	1.60	3%	
1633	1630	7.08	0.01	8	426	996.91	995.93	0.23	225.36	0.32	3%	
4	1	9.50	0.01	8	96	969.90	969.50	0.41	302.71	0.44	3%	
1520	1550	19.40	0.03	12	354	958.36	957.65	0.20	620.51	0.89	3%	Interpolated
665	664	32.91	0.05	8	201	993.61	983.40	5.07	1058.49	1.52	3%	Interpolated
9016	2097	14.16	0.02	10	38	1057.16	1057.05	0.29	456.21	0.66	3%	
Jun-320	1936	197.52	0.28	24	178	965.80	964.86	0.53	6398.76	9.21	3%	
753	747	34.94	0.05	8	356	1130.48	1109.48	5.90	1141.88	1.64	3%	
183	184	25.81	0.04	12	428	1002.17	1000.57	0.37	847.65	1.22	3%	
1936	1937	197.51	0.28	24	305	964.86	963.18	0.55	6525.85	9.40	3%	
662	661	32.91	0.05	8	165	967.91	959.04	5.37	1089.46	1.57	3%	Interpolated
1937	1940	197.49	0.28	24	70	963.18	962.79	0.55	6547.81	9.43	3%	
2429	183	25.81	0.04	12	402	1003.77	1002.17	0.40	874.39	1.26	3%	
762	211	13.30	0.02	12	113	971.96	971.84	0.11	451.25	0.65	3%	Interpolated
2025	9143	67.00	0.10	10	90	1055.08	1048.64	7.12	2274.13	3.27	3%	
788	289	20.92	0.03	8	216	1039.83	1034.80	2.33	718.04	1.03	3%	
2393	2909	8.70	0.01	10	413	983.10	982.59	0.12	299.33	0.43	3%	
126	127	30.41	0.04	8	102	1024.56	1019.51	4.96	1046.68	1.51	3%	
1039	1038	9.79	0.01	8	240	997.65	996.41	0.52	337.90	0.49	3%	
127	128	30.41	0.04	8	148	1019.51	1011.91	5.13	1064.68	1.53	3%	
1817	2027	67.00	0.10	10	198	993.51	978.50	7.59	2348.12	3.38	3%	
211	212	13.09	0.02	12	397	971.84	971.40	0.11	461.65	0.66	3%	
333	334	7.21	0.01	8	398	1006.23	1004.98	0.31	263.32	0.38	3%	
1515	1517	19.40	0.03	12	303	959.61	958.81	0.26	711.93	1.03	3%	
2254	4	7.54	0.01	8	207	970.73	970.00	0.35	279.06	0.40	3%	Interpolated
184	170	25.81	0.04	12	333	1000.57	998.97	0.48	960.19	1.38	3%	
1037	1036	9.79	0.01	8	264	994.32	992.73	0.60	364.46	0.52	3%	
49	50	391.32	0.56	15	52	1008.52	990.78	34.40	14737.77	21.22	3%	
2062	420	22.75	0.03	8	383	1075.64	1062.61	3.40	866.87	1.25	3%	
2063	2062	22.75	0.03	8	21	1076.37	1075.64	3.40	867.16	1.25	3%	
1319	1313	26.43	0.04	12	291	968.11	966.56	0.53	1011.09	1.46	3%	
466	456	14.48	0.02	12	374	1013.60	1012.93	0.18	555.21	0.80	3%	
746	2063	22.75	0.03	8	350	1088.45	1076.37	3.45	872.80	1.26	3%	
1353	2758	303.61	0.44	27	53	966.11	965.60	0.96	11782.04	16.97	3%	
9143	2026	67.00	0.10	10	219	1048.64	1027.72	9.53	2631.54	3.79	3%	
2026	1817	67.00	0.10	10	341	1027.72	993.51	10.03	2699.14	3.89	2%	
2401	2469	20.93	0.03	8	403	986.44	973.47	3.22	843.18	1.21	2%	
1108	333	7.22	0.01	8	120	1006.70	1006.24	0.38	291.25	0.42	2%	
335	328	7.21	0.01	8	404	1000.32	998.72	0.40	295.76	0.43	2%	
746	2064	12.19	0.02	8	76	1088.45	1087.59	1.14	501.61	0.72	2%	
170	2782	25.81	0.04	12	272	998.97	997.37	0.59	1063.02	1.53	2%	
1051	2807	13.95	0.02	8	221	1063.45	1060.14	1.50	574.75	0.83	2%	
455	454	14.48	0.02	12	146	1012.13	1011.86	0.19	596.96	0.86	2%	
334	335	7.21	0.01	8	399	1004.98	1003.38	0.40	297.51	0.43	2%	
1318	1319	26.43	0.04	12	302	970.12	968.21	0.63	1102.84	1.59	2%	
1640	879	7.10	0.01	8	181	999.91	999.19	0.40	296.40	0.43	2%	
993	992	22.58	0.03	12	84	1075.17	1074.78	0.46	943.98	1.36	2%	
1038	1037	9.79	0.01	8	249	996.31	994.42	0.76	409.84	0.59	2%	
879	1631	7.10	0.01	8	404	999.19	997.57	0.40	297.50	0.43	2%	
1652	1639	7.09	0.01	8	387	1002.24	1000.69	0.40	297.59	0.43	2%	
1631	1630	7.08	0.01	8	409	997.57	995.93	0.40	297.49	0.43	2%	ROOT CUT 08
1639	1640	7.09	0.01	8	194	1000.69	999.91	0.40	298.09	0.43	2%	ROOT CUT 08
456	455	14.48	0.02	12	380	1013.00	1012.23	0.20	623.56	0.90	2%	
180	181	16.60	0.02	12	234	1005.20	1004.56	0.27	724.88	1.04	2%	Interpolated
181	182	16.60	0.02	12	106	1004.56	1004.26	0.28	738.12	1.06	2%	Interpolated
728	727	17.71	0.03	8	180	1003.63	998.50	2.85	793.41	1.14	2%	
422	657	4.97	0.01	8	394	1061.93	1061.03	0.23	224.72	0.32	2%	
467	466	14.48	0.02	12	178	1014.10	1013.70	0.23	657.47	0.95	2%	
177	178	37.51	0.05	12	413	989.27	983.02	1.51	1704.62	2.45	2%	
668	667	32.91	0.05	8	112	1024.38	1012.95	10.24	1503.92	2.17	2%	Interpolated
1	2	9.48	0.01	10	222	969.40	968.78	0.28	450.40	0.65	2%	Sanitary Siphon under River
667	666	32.91	0.05	8	103	1012.95	1001.37	11.27	1578.33	2.27	2%	Interpolated
2024	2025	50.79	0.07	12	403	1067.64	1055.08	3.12	2446.12	3.52	2%	
1168	453	14.48	0.02	12	20	1011.45	1011.40	0.25	698.02	1.01	2%	
1317	1318	18.76	0.03	12	117	970.63	970.13	0.43	906.45	1.31	2%	
9200	9162	9.33	0.01	10	29	992.90	992.82	0.28	451.23	0.65	2%	
9061	2057	20.81	0.03	8	31	1030.25	1028.70	4.98	1049.22	1.51	2%	
2775	9062	20.81	0.03	8	107	1000.92	995.59	5.00	1050.73	1.51	2%	
2058	9061	20.81	0.03	8	225	1041.52	1030.25	5.00	1050.94	1.51	2%	
9062	2002	20.81	0.03	8	192	995.59	985.97	5.00	1050.94	1.51	2%	
2056	2775	20.81	0.03	8	263	1014.09	1000.92	5.00	1051.02	1.51	2%	
2002	2001	20.81	0.03	8	159	985.97	978.03	5.00	1051.31	1.51	2%	
2061	2058	20.81	0.03	8	289	1055.99	1041.52	5.00	1051.31	1.51	2%	This needs field verification
2057	2056	20.81	0.03	8	292	1028.70	1014.09	5.00	1051.37	1.51	2%	

996	995	13.34	0.02	12	213	1077.31	1076.80	0.24	677.64	0.98	2%	
420	2061	20.81	0.03	8	130	1062.61	1055.99	5.10	1061.23	1.53	2%	
9072	2936	8.61	0.01	10	38	1010.78	1010.67	0.29	461.47	0.66	2%	
Jun-323	Jun-327	474.18	0.68	24	140	953.50	941.50	8.57	25763.22	37.10	2%	Sanitary Siphon under River
Jun-326	Jun-330	474.18	0.68	24	140	953.50	941.50	8.57	25763.22	37.10	2%	Sanitary Siphon under River
218	219	9.45	0.01	10	304	966.49	965.38	0.37	515.22	0.74	2%	
2064	2073	12.19	0.02	8	379	1087.59	1080.01	2.00	664.88	0.96	2%	
2073	2072	12.19	0.02	8	80	1080.01	1078.40	2.00	665.17	0.96	2%	
657	658	4.96	0.01	8	408	1061.03	1059.64	0.34	274.26	0.39	2%	
172	173	25.81	0.04	12	333	995.77	992.02	1.13	1470.62	2.12	2%	
Jun-351	218	9.48	0.01	10	124	967.00	966.49	0.41	546.58	0.79	2%	Sanitary Siphon under River
2398	2393	8.71	0.01	10	407	984.66	983.20	0.36	510.70	0.74	2%	
1273	1272	10.56	0.02	12	516	1006.71	1005.68	0.20	619.26	0.89	2%	
2851	2487	381.36	0.55	30	5	957.32	957.22	2.00	22563.96	32.49	2%	
454	1168	14.48	0.02	12	71	1011.78	1011.50	0.40	872.78	1.26	2%	
2401	2398	8.71	0.01	10	410	986.44	984.66	0.43	561.47	0.81	2%	
1008	1005	9.93	0.01	12	169	1091.89	1091.52	0.22	648.19	0.93	2%	
1006	1007	13.34	0.02	12	204	1090.42	1089.60	0.40	878.27	1.26	2%	
212	208	12.89	0.02	12	425	971.40	969.78	0.38	855.31	1.23	2%	Interpolated
9133	9132	111.51	0.16	12	33	964.45	954.94	28.58	7408.42	10.67	2%	
1075	1076	9.33	0.01	12	237	986.33	985.84	0.21	630.23	0.91	1%	
328	2771	12.07	0.02	8	257	998.72	990.84	3.06	822.63	1.18	1%	Interpolated
1074	1075	9.34	0.01	12	223	986.87	986.38	0.22	650.30	0.94	1%	
1069	1070	9.33	0.01	12	399	985.33	984.45	0.22	650.55	0.94	1%	
1005	1006	13.34	0.02	12	147	1091.19	1090.52	0.46	936.30	1.35	1%	
1073	1074	9.77	0.01	12	193	987.35	986.87	0.25	690.50	0.99	1%	Interpolated
1040	1039	9.79	0.01	8	172	1001.51	997.75	2.19	695.42	1.00	1%	
1988	1042	9.79	0.01	8	303	1032.27	1025.60	2.20	697.13	1.00	1%	
2916	2917	4.11	0.01	8	30	979.09	978.97	0.40	295.72	0.43	1%	
1076	1069	9.33	0.01	12	174	985.79	985.38	0.24	672.99	0.97	1%	
2072	2080	9.18	0.01	8	132	1078.40	1075.76	2.00	664.43	0.96	1%	
2080	2081	9.18	0.01	8	374	1075.76	1068.28	2.00	664.65	0.96	1%	
2081	2083	9.18	0.01	8	60	1068.28	1067.08	2.00	664.98	0.96	1%	
862	863	9.46	0.01	8	299	971.65	965.10	2.19	695.23	1.00	1%	
9085	2901	12.80	0.02	15	402	975.20	974.60	0.15	970.99	1.40	1%	
775	1634	16.81	0.02	8	380	1034.27	1006.00	7.44	1281.78	1.85	1%	
2158	9149	110.58	0.16	18	36	978.00	976.46	4.27	8440.55	12.15	1%	
Jun-332	Jun-336	397.55	0.57	18	20	941.30	952.50	-56.00	30577.20	44.03	1%	Sanitary Siphon under River
Jun-333	Jun-337	397.55	0.57	18	20	941.30	952.50	-56.00	30577.20	44.03	1%	Sanitary Siphon under River
670	669	32.91	0.05	8	40	1052.31	1039.50	32.07	2662.08	3.83	1%	Interpolated
834	539	3.52	0.01	8	174	959.75	959.08	0.38	291.60	0.42	1%	
179	180	10.56	0.02	12	130	1005.72	1005.20	0.40	875.00	1.26	1%	
2853	762	6.40	0.01	12	52	972.04	971.96	0.15	541.82	0.78	1%	
582	577	5.13	0.01	10	466	984.98	983.64	0.29	457.05	0.66	1%	
530	529	31.24	0.04	24	117	957.90	957.78	0.10	2813.51	4.05	1%	
669	668	32.91	0.05	8	35	1039.50	1024.38	42.66	3070.29	4.42	1%	Interpolated
1272	179	10.56	0.02	12	16	1005.64	1005.70	-0.38	992.77	1.43	1%	
2929	9015	14.16	0.02	8	31	1062.50	1059.90	8.35	1358.24	1.96	1%	
577	576	4.11	0.01	10	313	983.64	982.95	0.22	400.23	0.58	1%	
1081	2135	9.93	0.01	12	261	1095.89	1094.61	0.49	970.37	1.40	1%	
2072	2071	3.01	0.00	8	49	1078.40	1078.20	0.41	299.30	0.43	1%	Interpolated
207	209	6.47	0.01	12	408	974.92	974.04	0.22	643.69	0.93	1%	
576	575	4.11	0.01	10	283	982.85	982.19	0.23	411.39	0.59	1%	
206	207	6.47	0.01	12	396	975.80	974.92	0.22	653.25	0.94	1%	
2097	2096	12.06	0.02	8	202	1057.05	1043.31	6.80	1225.85	1.77	1%	
2095	2094	12.06	0.02	8	196	1029.60	1016.26	6.81	1226.65	1.77	1%	
2096	2095	12.06	0.02	8	201	1043.31	1029.60	6.81	1226.69	1.77	1%	
2094	1137	12.06	0.02	8	253	1016.26	999.02	6.81	1226.70	1.77	1%	
1565	1569	26.18	0.04	24	159	958.79	958.64	0.09	2705.05	3.90	1%	
Jun-218	2465	9.33	0.01	15	192	980.18	979.89	0.15	975.50	1.40	1%	
1007	998	13.34	0.02	12	95	1085.92	1085.02	0.95	1421.96	2.05	1%	
855	854	2.77	0.00	8	143	979.07	978.50	0.40	297.27	0.43	1%	
864	865	2.77	0.00	8	164	1010.07	1009.41	0.40	297.94	0.43	1%	
575	574	4.11	0.01	10	216	982.11	981.52	0.27	445.43	0.64	1%	
1041	1040	9.79	0.01	8	203	1012.17	1001.61	5.19	1071.20	1.54	1%	
421	422	1.94	0.00	8	324	1062.61	1061.93	0.21	215.31	0.31	1%	
209	210	6.46	0.01	12	318	974.04	973.16	0.28	728.52	1.05	1%	
580	582	4.11	0.01	10	276	985.92	985.08	0.30	470.60	0.68	1%	
143	1238	2.24	0.00	8	75	984.81	984.58	0.31	259.72	0.37	1%	
858	857	2.77	0.00	8	329	986.70	985.14	0.47	323.47	0.47	1%	
1569	1570	23.89	0.03	24	174	958.64	958.46	0.10	2833.74	4.08	1%	
1015	4	2.43	0.00	8	313	971.23	970.00	0.39	294.60	0.42	1%	
1042	1041	9.79	0.01	8	205	1025.60	1012.32	6.48	1196.65	1.72	1%	
1014	1015	2.43	0.00	8	223	972.22	971.33	0.40	297.17	0.43	1%	
953	864	2.77	0.00	8	77	1010.57	1010.17	0.52	339.41	0.49	1%	Interpolated
1013	1014	2.43	0.00	8	214	973.18	972.32	0.40	297.80	0.43	1%	
210	2853	6.56	0.01	12	307	973.16	972.04	0.36	836.43	1.20	1%	
1570	1892	30.78	0.04	24	194	958.46	958.02	0.23	4190.39	6.03	1%	
Jun-331	Jun-335	474.18	0.68	24	20	941.30	952.50	-56.00	65851.80	94.83	1%	Sanitary Siphon under River
Jun-334	Jun-338	474.18	0.68	24	20	941.30	952.50	-56.00	65851.80	94.83	1%	Sanitary Siphon under River
1892	530	30.57	0.04	24	52	958.02	957.90	0.23	4246.12	6.11	1%	
2097	2109	2.10	0.00	8	83	1057.05	1056.72	0.40	296.97	0.43	1%	
2109	2108	2.10	0.00	8	282	1025.82	1024.69	0.40	297.64	0.43	1%	
182	2429	16.60	0.02	12	15	1004.26	1003.77	3.36	2538.92	3.66	1%	
1077	1073	9.33	0.01	12	118	988.71	987.35	1.16	1490.43	2.15	1%	Interpolated
1790	2177	12.06	0.02	12	33	962.70	961.99	2.15	2029.75	2.92	1%	
998	997	13.34	0.02	12	101	1085.02	1082.21	2.79	2316.69	3.34	1%	
651	Jun-53	7.76	0.01	12	38	996.56	996.20	0.95	1348.39	1.94	1%	Interpolated
1566	1565	24.55	0.04	24	46	958.90	958.72	0.39	4291.55	6.18	1%	
1547	1548	2.20	0.00	10	222	959.34	958.72	0.28	450.29	0.65	0%	Interpolated
1548	1549	2.20	0.00	10	360	958.72	957.71	0.28	451.41	0.65	0%	Interpolated
997	996	13.34	0.02	12	99	1082.11	1077.41	4.74	3016.16	4.34	0%	
951	952	2.77	0.00	8	94	1017.08	1015.37	1.81	632.51	0.91	0%	
857	856	2.77	0.00	8	121	985.04	982.50	2.09	679.84	0.98	0%	
2423	2422	2.63	0.00	12	401	1062.96	1062.08	0.22	648.95	0.93	0%	MinimumSlope
854	861	2.77	0.00	8	199	978.30	973.29	2.52	745.74	1.07	0%	

856	855	2.77	0.00	8	124	982.40	979.17	2.59	757.15	1.09	0%	
2424	2423	2.63	0.00	12	388	1066.15	1065.02	0.29	747.62	1.08	0%	
2135	1008	9.93	0.01	18	500	1094.51	1091.89	0.52	2958.45	4.26	0%	
2422	2420	2.60	0.00	15	429	1062.08	1061.67	0.10	776.83	1.12	0%	
2251	2252	8.13	0.01	24	475	971.75	971.37	0.08	2488.52	3.58	0%	
2250	2251	8.01	0.01	24	206	971.91	971.75	0.08	2453.22	3.53	0%	
2249	2250	8.00	0.01	24	407	972.24	971.91	0.08	2506.53	3.61	0%	
2252	2253	7.90	0.01	24	400	971.37	971.05	0.08	2488.96	3.58	0%	
865	866	2.77	0.00	8	393	1009.31	995.55	3.51	880.07	1.27	0%	
2253	2254	7.69	0.01	24	400	971.05	970.73	0.08	2488.96	3.58	0%	
2427	2426	2.63	0.00	12	348	1071.50	1070.12	0.40	873.13	1.26	0%	
2426	2425	2.63	0.00	12	401	1069.67	1068.07	0.40	875.05	1.26	0%	
2425	2424	2.63	0.00	12	401	1067.97	1066.25	0.43	907.63	1.31	0%	
2071	422	3.01	0.00	8	327	1078.20	1061.93	4.98	1048.57	1.51	0%	Interpolated
205	206	6.29	0.01	12	148	979.52	975.80	2.52	2198.38	3.17	0%	
Jun-349	Jun-351	4.74	0.01	8	80	956.50	967.00	-13.13	1702.94	2.45	0%	Sanitary Siphon under River
Jun-350	Jun-351	4.74	0.01	8	80	956.50	967.00	-13.13	1702.94	2.45	0%	Sanitary Siphon under River
866	858	2.77	0.00	8	190	995.45	986.90	4.50	996.62	1.44	0%	
2420	2419	2.58	0.00	15	398	1061.57	1061.01	0.14	943.08	1.36	0%	
952	953	2.77	0.00	8	94	1015.27	1010.57	4.99	1049.80	1.51	0%	
2419	2430	2.58	0.00	15	390	1060.91	1060.30	0.16	993.92	1.43	0%	
2418	2417	2.57	0.00	15	282	1059.61	1059.16	0.16	1004.59	1.45	0%	
2	Jun-348	4.74	0.01	8	70	968.68	956.50	17.40	1960.76	2.82	0%	Sanitary Siphon under River
2	Jun-347	4.74	0.01	8	70	968.68	956.50	17.40	1960.76	2.82	0%	Sanitary Siphon under River
2417	2416	2.56	0.00	15	249	1059.06	1058.60	0.18	1079.03	1.55	0%	
9000	204	6.29	0.01	21	6	966.52	966.50	0.35	3670.32	5.29	0%	
842	543	1.20	0.00	10	19	960.62	960.47	0.81	766.39	1.10	0%	Interpolated
2430	2418	2.58	0.00	15	88	1060.30	1059.71	0.67	2054.11	2.96	0%	
2416	2415	2.56	0.00	15	402	1058.50	1054.59	0.97	2477.57	3.57	0%	
1567	1566	1.99	0.00	24	122	958.98	958.87	0.09	2254.51	3.25	0%	
2415	2414	2.56	0.00	15	401	1054.55	1036.83	4.42	5283.63	7.61	0%	
6	Jun-02	0.00	0.00	8	300	1200.31	1198.95	0.45	316.61	0.46	0%	
7	6	0.00	0.00	8	129	1200.89	1200.41	0.37	286.54	0.41	0%	
9	8	0.00	0.00	8	277	1070.11	1063.52	2.38	725.35	1.04	0%	
10	9	0.00	0.00	8	281	1071.52	1070.11	0.50	332.84	0.48	0%	
11	10	0.00	0.00	8	264	1072.52	1071.52	0.38	289.11	0.42	0%	
12	11	0.00	0.00	8	248	1073.52	1072.52	0.40	298.41	0.43	0%	
15	641	0.00	0.00	8	94	1081.02	1077.97	3.23	845.14	1.22	0%	
14	15	0.00	0.00	8	242	1088.27	1081.02	3.00	813.67	1.17	0%	
13	14	0.00	0.00	8	326	1095.28	1088.27	2.15	689.07	0.99	0%	
19	13	0.00	0.00	8	298	1104.53	1095.28	3.10	828.16	1.19	0%	
18	19	0.00	0.00	8	286	1110.52	1104.79	2.00	665.39	0.96	0%	
17	18	0.00	0.00	8	298	1118.92	1110.52	2.82	789.79	1.14	0%	
16	17	0.00	0.00	8	287	1133.94	1118.92	5.24	1075.84	1.55	0%	
2920	21	0.00	0.00	8	78	1140.88	1139.34	1.97	659.22	0.95	0%	
21	22	0.00	0.00	8	191	1139.34	1138.00	0.70	393.32	0.57	0%	
22	23	0.00	0.00	8	295	1138.00	1135.38	0.89	442.87	0.64	0%	
23	16	0.00	0.00	8	267	1135.38	1133.94	0.54	345.26	0.50	0%	
69	68	0.00	0.00	10	295	961.81	961.22	0.20	380.93	0.55	0%	
92	93	0.00	0.00	10	260	1020.02	1012.52	2.88	1446.65	2.08	0%	
93	9072	0.00	0.00	10	294	1012.52	1010.78	0.59	655.48	0.94	0%	
68	99	0.00	0.00	10	126	961.22	960.92	0.24	415.86	0.60	0%	
104	119	0.00	0.00	8	319	1043.07	1041.77	0.41	300.15	0.43	0%	Minimum Slope
104	118	0.00	0.00	8	313	1043.07	1041.81	0.40	298.37	0.43	0%	
131	128	0.00	0.00	8	301	1013.11	1011.91	0.40	296.95	0.43	0%	
135	136	0.00	0.00	8	332	976.14	974.82	0.40	296.55	0.43	0%	
136	137	0.00	0.00	8	330	974.82	973.50	0.40	297.50	0.43	0%	
137	138	0.00	0.00	8	346	973.50	973.22	0.08	133.63	0.19	0%	
144	143	0.00	0.00	8	249	985.94	984.94	0.40	298.08	0.43	0%	
145	2806	0.00	0.00	8	220	987.02	985.94	0.49	329.02	0.47	0%	
146	145	0.00	0.00	8	386	990.05	987.02	0.79	416.50	0.60	0%	
147	146	0.00	0.00	8	401	992.85	990.05	0.70	392.78	0.57	0%	
148	147	0.00	0.00	8	335	995.19	992.85	0.70	392.93	0.57	0%	
149	148	0.00	0.00	8	400	1003.19	995.19	2.00	664.97	0.96	0%	
195	196	0.00	0.00	8	345	1007.92	1006.55	0.40	296.36	0.43	0%	
196	180	0.00	0.00	8	302	1006.55	1005.35	0.40	296.47	0.43	0%	
202	203	0.00	0.00	12	295	967.83	967.17	0.22	655.83	0.94	0%	
265	266	0.00	0.00	8	210	1037.37	1033.72	1.74	620.09	0.89	0%	
266	267	0.00	0.00	8	191	1033.72	1033.72	0.00	10.77	0.02	0%	Interpolated
267	268	0.00	0.00	8	207	1033.72	1032.50	0.59	360.75	0.52	0%	
269	195	0.00	0.00	8	132	1009.05	1008.52	0.40	297.35	0.43	0%	
271	269	0.00	0.00	8	374	1016.52	1009.05	2.00	664.61	0.96	0%	
272	271	0.00	0.00	8	143	1039.12	1016.52	15.84	1871.04	2.69	0%	
285	284	0.00	0.00	8	297	1048.28	1037.96	3.48	876.57	1.26	0%	
284	281	0.00	0.00	8	304	1037.96	1030.80	2.36	721.75	1.04	0%	Interpolated
308	306	0.00	0.00	8	354	1004.52	1001.52	0.85	432.61	0.62	0%	
314	313	0.00	0.00	8	133	986.52	985.52	0.75	408.19	0.59	0%	
315	314	0.00	0.00	8	373	992.52	986.52	1.61	596.23	0.86	0%	
307	315	0.00	0.00	8	202	993.71	992.52	0.59	360.78	0.52	0%	
313	311	0.00	0.00	8	168	985.52	984.95	0.34	273.71	0.39	0%	
311	310	0.00	0.00	8	318	984.95	981.62	1.05	480.71	0.69	0%	
1106	332	0.00	0.00	8	278	1009.16	1007.94	0.44	311.24	0.45	0%	Interpolated
357	2774	0.00	0.00	8	213	994.22	993.37	0.40	296.68	0.43	0%	Interpolated
358	357	0.00	0.00	8	394	995.80	994.22	0.40	297.71	0.43	0%	Interpolated
359	360	0.00	0.00	12	410	1008.85	1007.95	0.22	649.64	0.94	0%	Interpolated
364	362	0.00	0.00	15	393	1037.25	1036.62	0.16	1005.97	1.45	0%	
365	364	0.00	0.00	8	388	1045.63	1037.85	2.00	665.39	0.96	0%	
366	2317	0.00	0.00	8	200	1050.92	1046.43	2.24	704.16	1.01	0%	
367	366	0.00	0.00	8	277	1054.05	1050.92	1.13	499.64	0.72	0%	
368	364	0.00	0.00	15	316	1037.57	1037.25	0.10	799.96	1.15	0%	
370	368	0.00	0.00	15	262	1038.10	1037.57	0.20	1130.88	1.63	0%	
418	419	0.00	0.00	8	205	1065.60	1063.99	0.78	416.36	0.60	0%	
419	9060	0.00	0.00	8	428	1063.99	1062.70	0.30	258.06	0.37	0%	
9060	420	0.00	0.00	8	44	1062.70	1062.61	0.21	213.66	0.31	0%	
450	449	0.00	0.00	8	310	984.71	979.52	1.67	608.12	0.88	0%	
449	448	0.00	0.00	8	286	979.42	978.27	0.40	297.85	0.43	0%	

448	135	0.00	0.00	8	225	978.17	977.22	0.42	305.47	0.44	0%	
458	456	0.00	0.00	8	312	1018.52	1016.69	0.59	359.79	0.52	0%	
457	458	0.00	0.00	8	300	1022.52	1018.62	1.30	535.95	0.77	0%	
460	457	0.00	0.00	8	315	1023.88	1022.62	0.40	297.11	0.43	0%	
461	460	0.00	0.00	8	162	1024.63	1023.98	0.40	298.09	0.43	0%	
463	462	0.00	0.00	8	313	1043.34	1033.93	3.01	815.60	1.17	0%	
462	461	0.00	0.00	8	413	1033.83	1024.73	2.20	697.72	1.00	0%	
464	463	0.00	0.00	8	398	1056.46	1050.55	1.48	572.48	0.82	0%	
465	464	0.00	0.00	8	347	1058.06	1056.56	0.43	308.86	0.44	0%	
Jun-32	465	0.00	0.00	8	194	1058.72	1058.06	0.34	273.88	0.39	0%	
478	467	0.00	0.00	8	327	1015.53	1014.20	0.41	299.86	0.43	0%	
483	478	0.00	0.00	8	307	1017.04	1015.63	0.46	318.61	0.46	0%	
479	480	0.00	0.00	8	152	1019.68	1019.10	0.38	290.13	0.42	0%	
480	481	0.00	0.00	8	181	1019.00	1018.28	0.40	296.53	0.43	0%	
481	482	0.00	0.00	8	176	1018.18	1017.44	0.42	304.37	0.44	0%	
482	483	0.00	0.00	8	76	1017.40	1017.11	0.38	290.59	0.42	0%	
484	479	0.00	0.00	8	128	1024.31	1019.68	3.61	893.54	1.29	0%	
485	484	0.00	0.00	8	90	1027.06	1024.31	3.04	819.80	1.18	0%	
486	485	0.00	0.00	8	125	1028.26	1027.16	0.88	440.62	0.63	0%	Interpolated
487	486	0.00	0.00	8	380	1051.27	1031.72	5.14	1066.16	1.54	0%	
488	487	0.00	0.00	8	263	1058.52	1053.32	1.97	660.43	0.95	0%	
489	488	0.00	0.00	8	378	1059.63	1058.62	0.27	243.04	0.35	0%	
490	489	0.00	0.00	8	185	1060.63	1059.73	0.49	327.53	0.47	0%	
517	515	0.00	0.00	8	199	1063.55	1062.79	0.38	290.70	0.42	0%	
515	490	0.00	0.00	8	438	1062.79	1060.93	0.42	306.30	0.44	0%	
518	517	0.00	0.00	8	330	1072.90	1063.65	2.80	786.84	1.13	0%	
526	Jun-32	0.00	0.00	8	355	1060.30	1058.72	0.44	313.42	0.45	0%	Interpolated
Jun-40	557	0.00	0.00	10	74	988.32	980.69	10.36	2742.80	3.95	0%	Interpolated
565	564	0.00	0.00	15	342	1039.22	1038.66	0.16	1017.24	1.46	0%	
579	581	0.00	0.00	8	354	981.91	980.65	0.36	280.61	0.40	0%	
874	579	0.00	0.00	8	234	984.16	981.91	0.96	461.03	0.66	0%	
584	585	0.00	0.00	8	80	990.36	990.01	0.44	311.73	0.45	0%	
585	586	0.00	0.00	8	42	989.91	989.61	0.71	396.09	0.57	0%	
586	580	0.00	0.00	8	318	989.51	987.52	0.63	371.83	0.54	0%	
581	587	0.00	0.00	8	105	980.45	980.02	0.41	300.24	0.43	0%	
587	2916	0.00	0.00	8	195	979.92	979.10	0.42	305.00	0.44	0%	
589	2916	0.00	0.00	8	25	980.42	979.10	5.29	1081.62	1.56	0%	
610	609	0.00	0.00	8	150	993.32	992.71	0.41	300.11	0.43	0%	
609	611	0.00	0.00	8	288	992.61	991.49	0.39	293.33	0.42	0%	
611	612	0.00	0.00	8	265	991.39	990.60	0.30	256.77	0.37	0%	
622	623	0.00	0.00	8	39	986.73	986.57	0.41	300.23	0.43	0%	
628	272	0.00	0.00	8	216	1040.15	1039.12	0.48	324.27	0.47	0%	
Jun-49	628	0.00	0.00	8	170	1040.93	1040.25	0.40	297.69	0.43	0%	
641	12	0.00	0.00	8	150	1077.87	1073.52	2.91	801.41	1.15	0%	
Jun-51	651	0.00	0.00	12	285	999.28	996.56	0.95	1352.86	1.95	0%	
652	653	0.00	0.00	8	299	1011.10	996.71	4.82	1031.55	1.49	0%	
653	654	0.00	0.00	8	175	996.61	995.92	0.39	256.36	0.37	0%	
676	675	0.00	0.00	8	334	1072.35	1067.20	1.54	583.45	0.84	0%	Interpolated
677	676	0.00	0.00	8	297	1080.12	1072.35	2.62	760.46	1.10	0%	Interpolated
678	677	0.00	0.00	8	251	1094.52	1080.12	5.74	1126.02	1.62	0%	
679	678	0.00	0.00	8	239	1107.10	1094.62	5.21	1073.33	1.55	0%	
680	679	0.00	0.00	8	300	1119.93	1107.20	4.24	968.37	1.39	0%	
681	680	0.00	0.00	8	300	1133.78	1120.03	4.59	1007.10	1.45	0%	
696	691	0.00	0.00	8	170	1015.34	1015.01	0.19	206.84	0.30	0%	
691	692	0.00	0.00	8	140	1014.91	1014.34	0.41	299.57	0.43	0%	
692	693	0.00	0.00	8	475	1014.24	1012.32	0.40	298.81	0.43	0%	
693	453	0.00	0.00	8	103	1012.22	1011.82	0.39	293.26	0.42	0%	
694	695	0.00	0.00	8	262	1018.13	1017.18	0.36	283.11	0.41	0%	
695	696	0.00	0.00	8	142	1017.08	1015.34	1.23	520.50	0.75	0%	
707	706	0.00	0.00	8	144	1046.28	1044.95	0.92	451.90	0.65	0%	
708	707	0.00	0.00	8	129	1047.63	1046.38	0.97	462.60	0.67	0%	
709	708	0.00	0.00	8	426	1053.35	1051.63	0.40	298.81	0.43	0%	
710	709	0.00	0.00	8	177	1056.09	1053.45	1.49	573.76	0.83	0%	
711	710	0.00	0.00	8	250	1057.69	1056.19	0.60	364.20	0.52	0%	
724	711	0.00	0.00	8	304	1060.04	1057.69	0.77	413.53	0.60	0%	
748	749	0.00	0.00	8	393	1197.08	1187.70	2.39	726.12	1.05	0%	
749	750	0.00	0.00	8	400	1187.57	1179.49	2.02	667.79	0.96	0%	
750	751	0.00	0.00	8	394	1179.36	1158.83	5.21	1072.62	1.54	0%	
751	752	0.00	0.00	8	390	1158.69	1145.77	3.31	855.51	1.23	0%	
752	753	0.00	0.00	8	395	1145.64	1130.61	3.80	916.65	1.32	0%	
764	763	0.00	0.00	8	135	989.46	988.92	0.40	297.58	0.43	0%	Interpolated
765	764	0.00	0.00	8	167	990.13	989.46	0.40	297.63	0.43	0%	
766	765	0.00	0.00	8	94	990.51	990.13	0.40	298.68	0.43	0%	Interpolated
650	Jun-51	0.00	0.00	12	112	999.51	999.28	0.21	627.84	0.90	0%	
985	787	0.00	0.00	8	132	1043.95	1043.44	0.39	204.66	0.29	0%	
787	783	0.00	0.00	8	146	1043.70	1043.10	0.41	301.12	0.43	0%	
783	786	0.00	0.00	8	207	1043.00	1042.10	0.43	309.92	0.45	0%	
808	807	0.00	0.00	8	282	1138.07	1137.80	0.10	145.41	0.21	0%	
807	736	0.00	0.00	8	349	1137.70	1135.88	0.52	339.40	0.49	0%	
736	806	0.00	0.00	8	103	1135.78	1135.34	0.43	306.88	0.44	0%	
806	681	0.00	0.00	8	206	1135.24	1133.88	0.66	382.19	0.55	0%	
809	810	0.00	0.00	8	215	1143.37	1141.42	0.91	447.81	0.64	0%	
810	811	0.00	0.00	8	179	1141.32	1140.83	0.27	246.10	0.35	0%	
811	812	0.00	0.00	8	157	1140.73	1140.07	0.42	305.18	0.44	0%	
812	808	0.00	0.00	8	382	1139.97	1138.17	0.47	322.51	0.46	0%	
830	831	0.00	0.00	8	297	994.04	989.25	1.61	597.16	0.86	0%	
831	832	0.00	0.00	8	223	989.15	982.64	2.92	803.68	1.16	0%	
832	833	0.00	0.00	8	224	982.54	977.06	2.45	735.28	1.06	0%	
833	835	0.00	0.00	8	394	976.96	966.09	2.76	781.12	1.12	0%	
835	834	0.00	0.00	8	390	965.99	959.75	1.60	594.95	0.86	0%	
2374	837	0.00	0.00	8	367	991.93	990.31	0.44	312.48	0.45	0%	
838	842	0.00	0.00	10	395	961.85	960.62	0.31	475.64	0.68	0%	
843	9084	0.00	0.00	8	417	983.16	977.02	1.47	570.13	0.82	0%	
844	9084	0.00	0.00	8	401	979.19	976.59	0.65	378.72	0.55	0%	
845	848	0.00	0.00	8	225	1062.23	1060.88	0.60	364.02	0.52	0%	
848	526	0.00	0.00	8	299	1060.78	1060.30	0.16	188.20	0.27	0%	

869	868	0.00	0.00	8	205	1062.54	1061.49	0.51	336.41	0.48	0%	
868	724	0.00	0.00	8	178	1061.39	1060.14	0.70	394.09	0.57	0%	
872	871	0.00	0.00	8	262	986.79	985.96	0.32	264.50	0.38	0%	
871	874	0.00	0.00	8	247	985.76	984.36	0.57	353.83	0.51	0%	
880	881	0.00	0.00	8	411	995.00	991.84	0.77	412.16	0.59	0%	
881	882	0.00	0.00	8	409	991.74	990.10	0.40	297.49	0.43	0%	
883	882	0.00	0.00	8	254	991.01	990.10	0.36	281.41	0.41	0%	
884	883	0.00	0.00	8	255	992.02	991.11	0.36	280.95	0.40	0%	
885	884	0.00	0.00	8	410	994.42	992.12	0.56	352.03	0.51	0%	
893	881	0.00	0.00	8	351	993.62	991.94	0.48	325.16	0.47	0%	
899	900	0.00	0.00	8	133	1052.11	1051.56	0.41	302.03	0.43	0%	
900	285	0.00	0.00	8	314	1051.56	1050.30	0.40	297.60	0.43	0%	
901	902	0.00	0.00	8	186	1055.31	1054.66	0.35	277.80	0.40	0%	
902	903	0.00	0.00	8	180	1054.46	1053.62	0.47	320.74	0.46	0%	
903	899	0.00	0.00	8	346	1053.52	1052.31	0.35	278.08	0.40	0%	
Jun-87	901	0.00	0.00	8	20	1055.41	1055.31	0.49	330.40	0.48	0%	
918	Jun-87	0.00	0.00	8	117	1055.83	1055.41	0.36	281.55	0.41	0%	
919	918	0.00	0.00	8	116	1056.54	1055.93	0.52	340.34	0.49	0%	
920	919	0.00	0.00	8	332	1075.89	1056.54	5.82	1134.29	1.63	0%	
921	920	0.00	0.00	8	154	1078.24	1075.99	1.46	568.71	0.82	0%	
948	949	0.00	0.00	8	85	1021.07	1019.09	2.34	719.41	1.04	0%	
949	950	0.00	0.00	8	87	1018.99	1018.64	0.40	298.07	0.43	0%	
950	951	0.00	0.00	8	338	1018.54	1017.18	0.40	298.04	0.43	0%	
986	985	0.00	0.00	8	234	1048.47	1044.02	1.90	648.52	0.93	0%	
987	986	0.00	0.00	8	118	1050.54	1048.47	1.76	622.95	0.90	0%	
988	987	0.00	0.00	8	316	1056.39	1050.54	1.85	639.21	0.92	0%	
989	988	0.00	0.00	8	97	1057.37	1056.44	0.96	460.69	0.66	0%	
990	989	0.00	0.00	8	122	1073.48	1057.42	13.12	1702.47	2.45	0%	
1011	1012	0.00	0.00	8	107	1023.93	1013.16	10.05	1490.05	2.15	0%	
1012	1013	0.00	0.00	8	358	1013.06	983.28	8.31	1354.87	1.95	0%	
631	1028	0.00	0.00	8	143	1042.30	1041.73	0.40	297.12	0.43	0%	
1028	Jun-49	0.00	0.00	8	230	1041.63	1040.93	0.30	259.15	0.37	0%	
1029	1030	0.00	0.00	8	184	1038.00	1030.60	4.02	942.59	1.36	0%	
1032	7	0.00	0.00	8	130	1201.30	1200.79	0.39	264.31	0.38	0%	
1031	1032	0.00	0.00	8	403	1203.00	1201.40	0.40	296.35	0.43	0%	
1054	1055	0.00	0.00	8	229	1004.43	1002.64	0.78	415.71	0.60	0%	Interpolated
1053	1054	0.00	0.00	8	228	1005.34	1004.43	0.40	296.92	0.43	0%	
1078	1083	0.00	0.00	8	230	1106.00	1098.26	3.37	862.35	1.24	0%	Interpolated
1079	1078	0.00	0.00	8	236	1119.96	1106.10	5.87	1138.56	1.64	0%	
1080	1079	0.00	0.00	8	246	1138.95	1120.06	7.68	1302.30	1.88	0%	
1082	1081	0.00	0.00	8	250	1097.30	1096.30	0.40	297.27	0.43	0%	
1083	1082	0.00	0.00	8	214	1098.26	1097.40	0.40	298.09	0.43	0%	
336	1106	0.00	0.00	8	100	1009.60	1009.16	0.44	311.30	0.45	0%	Interpolated
1112	891	0.00	0.00	8	414	995.01	993.22	0.43	309.01	0.44	0%	
1114	1115	0.00	0.00	10	404	1077.14	1076.02	0.28	448.88	0.65	0%	
1116	1117	0.00	0.00	10	282	1076.26	1075.48	0.28	448.53	0.65	0%	
1117	992	0.00	0.00	10	105	1075.38	1075.10	0.27	440.03	0.63	0%	
1133	1134	0.00	0.00	8	118	1023.30	1016.85	5.49	1100.99	1.59	0%	
1134	1135	0.00	0.00	8	75	1016.75	1012.87	5.15	1067.01	1.54	0%	
1135	2932	0.00	0.00	8	255	1012.77	985.05	10.89	1550.99	2.23	0%	
1146	1145	0.00	0.00	15	178	1040.17	1039.89	0.16	997.25	1.44	0%	
1147	1146	0.00	0.00	15	365	1040.75	1040.17	0.16	1001.74	1.44	0%	
1148	1147	0.00	0.00	15	179	1041.03	1040.75	0.16	994.85	1.43	0%	
1191	202	0.00	0.00	12	274	968.26	967.83	0.16	549.27	0.79	0%	
1216	1366	0.00	0.00	8	388	974.80	973.25	0.40	296.96	0.43	0%	MinimumSlope
1215	1216	0.00	0.00	8	379	976.32	974.80	0.40	297.67	0.43	0%	MinimumSlope
1214	1215	0.00	0.00	8	273	977.41	976.32	0.40	297.03	0.43	0%	MinimumSlope
1213	1214	0.00	0.00	8	468	979.28	977.41	0.40	297.26	0.43	0%	MinimumSlope
1212	1213	0.00	0.00	8	68	979.55	979.28	0.40	295.50	0.43	0%	MinimumSlope
1232	1212	0.00	0.00	8	273	980.64	979.55	0.40	296.91	0.43	0%	MinimumSlope
1060	1232	0.00	0.00	8	182	981.37	980.64	0.40	297.62	0.43	0%	MinimumSlope
1231	1060	0.00	0.00	8	154	981.99	981.37	0.40	298.23	0.43	0%	MinimumSlope
65	1231	0.00	0.00	8	69	982.27	981.99	0.41	299.85	0.43	0%	MinimumSlope
1230	65	0.00	0.00	8	52	982.48	982.27	0.41	299.15	0.43	0%	MinimumSlope
1229	1230	0.00	0.00	8	200	983.28	982.48	0.40	297.02	0.43	0%	MinimumSlope
1228	1229	0.00	0.00	8	223	984.17	983.28	0.40	297.20	0.43	0%	MinimumSlope
1245	149	0.00	0.00	8	430	1004.91	1003.19	0.40	297.43	0.43	0%	Interpolated
1248	1243	0.00	0.00	15	109	992.27	990.42	1.70	3272.25	4.71	0%	
1249	1248	0.00	0.00	15	253	1013.52	992.27	8.41	7287.56	10.49	0%	
1250	1249	0.00	0.00	15	185	1028.92	1013.52	8.33	7250.82	10.44	0%	
1251	1250	0.00	0.00	15	134	1030.02	1028.92	0.82	2278.44	3.28	0%	
1252	1251	0.00	0.00	15	249	1034.52	1030.02	1.81	3376.31	4.86	0%	
1253	1252	0.00	0.00	15	199	1053.52	1034.52	9.53	7758.68	11.17	0%	
1255	1254	0.00	0.00	15	181	1065.02	1057.52	4.14	5110.62	7.36	0%	
1256	1255	0.00	0.00	15	146	1066.52	1065.02	1.02	2543.22	3.66	0%	
1254	1253	0.00	0.00	15	134	1056.52	1053.52	2.24	3763.57	5.42	0%	
360	1274	0.00	0.00	12	340	1007.95	1007.20	0.22	650.49	0.94	0%	Interpolated
1274	1273	0.00	0.00	12	223	1007.20	1006.71	0.22	649.12	0.93	0%	Interpolated
1298	1299	0.00	0.00	8	53	960.36	960.16	0.38	288.35	0.42	0%	
2404	1298	0.00	0.00	8	20	961.68	960.36	6.69	1215.83	1.75	0%	
1309	1310	0.00	0.00	8	15	970.26	970.20	0.40	296.60	0.43	0%	Interpolated
1310	1311	0.00	0.00	8	135	970.20	969.66	0.40	297.40	0.43	0%	Interpolated
1311	1312	0.00	0.00	8	396	969.66	968.08	0.40	296.84	0.43	0%	Interpolated
1312	1313	0.00	0.00	8	382	968.08	966.38	0.45	297.51	0.43	0%	Interpolated
1331	2439	0.00	0.00	8	420	969.42	964.66	1.13	500.20	0.72	0%	Interpolated
1331	1332	0.00	0.00	8	336	969.42	968.08	0.40	296.72	0.43	0%	Interpolated
1332	1308	0.00	0.00	8	304	968.08	966.86	0.40	297.61	0.43	0%	Interpolated
1366	1365	0.00	0.00	8	322	973.25	971.96	0.40	297.61	0.43	0%	MinimumSlope
1416	1417	0.00	0.00	8	150	999.35	998.75	0.40	297.72	0.43	0%	Interpolated
1415	1416	0.00	0.00	8	300	1000.55	999.35	0.40	297.06	0.43	0%	Interpolated
1414	1415	0.00	0.00	8	199	1001.35	1000.55	0.40	298.19	0.43	0%	Interpolated
1413	1414	0.00	0.00	8	181	1002.07	1001.35	0.40	296.08	0.43	0%	Interpolated
1419	1413	0.00	0.00	8	384	1003.61	1002.07	0.40	297.63	0.43	0%	Interpolated
1420	1419	0.00	0.00	8	225	1004.51	1003.61	0.40	297.07	0.43	0%	Interpolated
1421	1420	0.00	0.00	8	224	1005.40	1004.51	0.40	296.15	0.43	0%	Interpolated
1421	1422	0.00	0.00	8	267	1005.40	1004.33	0.40	297.80	0.43	0%	Interpolated

1422	2331	0.00	0.00	8	101	1004.33	1003.93	0.40	296.02	0.43	0%	Interpolated
1423	1424	0.00	0.00	8	140	1003.28	1002.72	0.40	297.24	0.43	0%	Interpolated
1424	1411	0.00	0.00	8	313	1002.72	1001.48	0.40	296.05	0.43	0%	Interpolated
1465	1464	0.00	0.00	8	280	1033.59	1027.43	2.20	697.44	1.00	0%	Interpolated
1466	1465	0.00	0.00	8	282	1039.84	1033.59	2.22	700.33	1.01	0%	Interpolated
119	1466	0.00	0.00	8	484	1041.77	1039.84	0.40	296.95	0.43	0%	Minimum Slope
118	1494	0.00	0.00	8	303	1041.81	1040.60	0.40	296.84	0.43	0%	Interpolated
1495	265	0.00	0.00	8	157	1038.81	1037.37	0.92	450.40	0.65	0%	Interpolated
1535	69	0.00	0.00	10	310	963.58	961.81	0.57	643.60	0.93	0%	Interpolated
Jun-138	1536	0.00	0.00	8	400	972.99	971.39	0.40	297.11	0.43	0%	Interpolated
1536	1537	0.00	0.00	8	243	971.39	970.42	0.40	297.12	0.43	0%	Interpolated
1537	1538	0.00	0.00	8	109	970.42	969.98	0.40	298.77	0.43	0%	Interpolated
1538	1539	0.00	0.00	8	321	969.98	968.70	0.40	296.77	0.43	0%	Interpolated
1539	1540	0.00	0.00	8	404	968.70	967.08	0.40	297.53	0.43	0%	Interpolated
1540	1541	0.00	0.00	8	400	967.08	965.48	0.40	297.38	0.43	0%	ROOT CUT.Interpolated
1541	2847	0.00	0.00	8	176	965.48	964.78	0.40	296.66	0.43	0%	ROOT CUT.Interpolated
1542	1544	0.00	0.00	8	223	963.92	963.03	0.40	296.81	0.43	0%	Interpolated
1544	1545	0.00	0.00	8	308	963.03	961.80	0.40	297.18	0.43	0%	Interpolated
1545	1546	0.00	0.00	8	306	961.80	960.57	0.40	297.78	0.43	0%	Interpolated
1546	1547	0.00	0.00	8	308	960.57	959.34	0.40	297.10	0.43	0%	Interpolated
1552	2451	0.00	0.00	8	286	964.30	963.16	0.40	296.93	0.43	0%	Interpolated
1555	1556	0.00	0.00	24	134	960.58	960.28	0.22	4162.02	5.99	0%	
1556	1557	0.00	0.00	24	162	960.11	959.97	0.09	2590.02	3.73	0%	
1557	1558	0.00	0.00	24	200	959.97	959.87	0.05	1967.55	2.83	0%	
2380	841	0.00	0.00	10	216	978.13	970.30	3.63	1624.06	2.34	0%	Interpolated
1568	1567	0.00	0.00	24	288	959.30	959.04	0.09	2644.29	3.81	0%	
1558	1568	0.00	0.00	24	368	959.80	959.40	0.11	2902.52	4.18	0%	
1578	1552	0.00	0.00	8	400	965.90	964.30	0.40	297.14	0.43	0%	Interpolated
1579	1578	0.00	0.00	8	489	967.86	965.90	0.40	297.53	0.43	0%	
1587	1552	0.00	0.00	8	404	965.92	964.30	0.40	297.68	0.43	0%	
2373	1587	0.00	0.00	8	412	966.92	965.92	0.24	231.58	0.33	0%	
Jun-140	1587	0.00	0.00	8	377	967.43	965.92	0.40	297.38	0.43	0%	line dead ends before 7th st. intersection
1597	1596	0.00	0.00	8	494	990.21	988.23	0.40	297.66	0.43	0%	
1598	2343	0.00	0.00	8	200	991.82	991.02	0.40	297.57	0.43	0%	
1598	2874	0.00	0.00	8	421	991.82	988.50	0.79	417.62	0.60	0%	
1596	622	0.00	0.00	8	375	988.23	986.73	0.40	297.20	0.43	0%	
1600	1309	0.00	0.00	8	136	970.81	970.26	0.40	298.44	0.43	0%	
1602	1601	0.00	0.00	8	174	984.66	982.55	1.21	517.81	0.75	0%	
1602	1603	0.00	0.00	8	240	984.66	982.27	1.00	469.46	0.68	0%	
1608	1609	0.00	0.00	8	413	990.82	989.21	0.39	293.60	0.42	0%	
1615	1616	0.00	0.00	8	248	992.80	991.80	0.40	298.33	0.43	0%	removed from Greasline (4th st carwash)
1616	2318	0.00	0.00	8	205	991.80	990.98	0.40	297.50	0.43	0%	
1617	2319	0.00	0.00	8	203	990.17	989.35	0.40	298.66	0.43	0%	
1618	889	0.00	0.00	8	178	991.41	988.54	1.62	597.61	0.86	0%	
2872	886	0.00	0.00	8	166	990.77	990.10	0.40	298.61	0.43	0%	
886	2320	0.00	0.00	8	202	990.10	989.30	0.40	296.06	0.43	0%	
1619	2321	0.00	0.00	8	204	988.46	987.65	0.40	296.37	0.43	0%	
893	1617	0.00	0.00	8	58	993.62	990.17	5.96	1147.22	1.65	0%	
1580	1579	0.00	0.00	8	201	968.66	967.86	0.40	296.42	0.43	0%	
1951	885	0.00	0.00	8	407	996.05	994.42	0.40	297.48	0.43	0%	trouble line
2387	885	0.00	0.00	8	412	995.52	994.42	0.27	242.81	0.35	0%	8' - 8" DIP CONNECTS TO EXIST 8" VCP @ MH 203
1417	2322	0.00	0.00	8	196	998.75	997.96	0.40	298.06	0.43	0%	ROOT CUT 08
1627	2883	0.00	0.00	8	231	997.17	996.24	0.40	298.05	0.43	0%	
777	1633	0.00	0.00	8	374	1000.39	996.91	0.93	453.53	0.65	0%	
1650	777	0.00	0.00	8	379	1003.89	1000.39	0.92	451.47	0.65	0%	
729	728	0.00	0.00	8	224	1004.53	1003.63	0.40	297.69	0.43	0%	
1635	1636	0.00	0.00	8	280	1005.95	1004.83	0.40	297.27	0.43	0%	
1413	1635	0.00	0.00	8	286	1007.10	1005.95	0.40	297.91	0.43	0%	
1419	1644	0.00	0.00	8	313	1008.63	1007.39	0.40	295.68	0.43	0%	
1644	1645	0.00	0.00	8	256	1007.39	1006.36	0.40	297.94	0.43	0%	
1646	729	0.00	0.00	8	155	1005.15	1004.53	0.40	297.14	0.43	0%	
1650	1652	0.00	0.00	8	412	1003.89	1002.24	0.40	297.57	0.43	0%	
1656	1648	0.00	0.00	8	382	1037.32	1035.79	0.40	297.48	0.43	0%	
1659	1419	0.00	0.00	8	296	1004.79	1003.61	0.40	296.83	0.43	0%	
1660	1659	0.00	0.00	8	221	1005.68	1004.79	0.40	297.97	0.43	0%	
1661	1660	0.00	0.00	8	222	1006.57	1005.68	0.40	297.40	0.43	0%	
1657	1656	0.00	0.00	8	98	1037.71	1037.32	0.40	296.76	0.43	0%	
1676	9035	0.00	0.00	8	331	1039.22	1037.90	0.40	296.75	0.43	0%	
1688	1689	0.00	0.00	8	199	1041.62	1040.83	0.40	296.49	0.43	0%	
1687	1688	0.00	0.00	8	254	1042.64	1041.62	0.40	297.83	0.43	0%	
1662	2879	0.00	0.00	8	283	1018.88	1017.75	0.40	297.22	0.43	0%	
1437	824	0.00	0.00	8	354	1016.43	1015.02	0.40	296.81	0.43	0%	
1711	1701	0.00	0.00	8	668	1023.98	1021.31	0.40	297.18	0.43	0%	
1698	1687	0.00	0.00	8	217	1043.51	1042.64	0.40	297.75	0.43	0%	
1696	1437	0.00	0.00	8	329	1017.75	1016.43	0.40	297.58	0.43	0%	
1704	1696	0.00	0.00	8	325	1019.05	1017.75	0.40	297.38	0.43	0%	
1707	1708	0.00	0.00	8	199	1026.54	1025.74	0.40	298.10	0.43	0%	ROOT CUT
1708	2877	0.00	0.00	8	353	1025.74	1024.33	0.40	297.19	0.43	0%	
1714	1704	0.00	0.00	8	234	1019.99	1019.05	0.40	297.63	0.43	0%	
1715	1714	0.00	0.00	8	435	1021.73	1019.99	0.40	297.19	0.43	0%	
1716	1715	0.00	0.00	8	190	1022.49	1021.73	0.40	296.92	0.43	0%	
1717	1716	0.00	0.00	8	188	1023.24	1022.49	0.40	297.01	0.43	0%	ROOT CUT 08
1718	1717	0.00	0.00	8	202	1024.05	1023.24	0.40	297.80	0.43	0%	ROOT CUT 08
1719	1718	0.00	0.00	8	200	1024.85	1024.05	0.40	297.02	0.43	0%	
1744	1743	0.00	0.00	8	358	1024.25	1022.82	0.40	297.15	0.43	0%	
1752	1751	0.00	0.00	8	76	1046.46	1046.16	0.39	295.29	0.43	0%	
1751	1750	0.00	0.00	8	175	1046.16	1045.46	0.40	297.57	0.43	0%	
1750	1749	0.00	0.00	8	227	1045.46	1044.55	0.40	297.60	0.43	0%	
1749	1748	0.00	0.00	8	230	1044.55	1043.63	0.40	297.42	0.43	0%	
1748	1747	0.00	0.00	8	352	1043.63	1027.78	4.50	996.93	1.44	0%	
1747	1746	0.00	0.00	8	352	1027.78	1026.37	0.40	297.54	0.43	0%	
1746	1745	0.00	0.00	8	351	1026.37	1024.97	0.40	296.96	0.43	0%	
1745	1744	0.00	0.00	8	179	1024.97	1024.25	0.40	298.12	0.43	0%	ROOT CUT 08
1767	1768	0.00	0.00	8	257	1038.73	1037.70	0.40	297.39	0.43	0%	
1768	1769	0.00	0.00	8	337	1037.70	1036.35	0.40	297.50	0.43	0%	
1769	1770	0.00	0.00	8	155	1036.35	1035.73	0.40	297.27	0.43	0%	

1770	1771	0.00	0.00	8	154	1035.73	1035.11	0.40	298.21	0.43	0%	
1771	1772	0.00	0.00	8	280	1035.11	1033.99	0.40	297.44	0.43	0%	
1772	1773	0.00	0.00	8	332	1033.99	1032.66	0.40	297.63	0.43	0%	
1773	1774	0.00	0.00	8	124	1032.66	1032.16	0.40	298.11	0.43	0%	
1774	1775	0.00	0.00	8	277	1032.16	1031.05	0.40	297.69	0.43	0%	
1775	1776	0.00	0.00	8	367	1031.05	1029.58	0.40	297.31	0.43	0%	
1776	124	0.00	0.00	8	404	1029.58	1027.96	0.40	297.64	0.43	0%	
1787	2180	0.00	0.00	8	146	971.35	970.31	0.71	396.71	0.57	0%	
1788	2179	0.00	0.00	12	66	969.75	968.15	2.43	2160.60	3.11	0%	
2178	1790	0.00	0.00	12	334	963.68	962.80	0.26	711.01	1.02	0%	
1791	1535	0.00	0.00	8	245	964.56	963.58	0.40	297.44	0.43	0%	
1838	2381	0.00	0.00	8	276	969.60	963.22	2.31	714.90	1.03	0%	
1839	1838	0.00	0.00	8	130	972.65	969.60	2.35	720.16	1.04	0%	
1845	2381	0.00	0.00	8	244	965.52	963.12	0.98	465.80	0.67	0%	
1847	1839	0.00	0.00	8	487	984.10	972.65	2.35	720.97	1.04	0%	
1846	1845	0.00	0.00	8	242	967.88	965.52	0.98	464.42	0.67	0%	
1853	1846	0.00	0.00	8	183	969.67	967.88	0.98	465.44	0.67	0%	
1855	1853	0.00	0.00	8	206	971.69	969.67	0.98	465.64	0.67	0%	
1847	843	0.00	0.00	8	393	984.10	982.53	0.40	297.29	0.43	0%	
844	9085	0.00	0.00	8	390	979.19	975.20	1.02	475.39	0.68	0%	
1894	1855	0.00	0.00	8	196	973.61	971.69	0.98	465.14	0.67	0%	
1859	843	0.00	0.00	8	388	984.67	982.53	0.55	348.92	0.50	0%	
1859	Jun-165	0.00	0.00	8	362	984.67	982.89	0.49	329.78	0.47	0%	
1861	1860	0.00	0.00	8	194	977.44	975.53	0.98	466.08	0.67	0%	
1862	1861	0.00	0.00	8	195	979.35	977.44	0.98	465.40	0.67	0%	
1863	1859	0.00	0.00	8	388	985.61	984.72	0.23	225.19	0.32	0%	
1868	1862	0.00	0.00	8	216	981.47	979.35	0.98	465.27	0.67	0%	
1870	1868	0.00	0.00	8	239	983.81	981.47	0.98	465.44	0.67	0%	
1871	1863	0.00	0.00	8	457	989.99	985.71	0.94	455.13	0.66	0%	
1895	1870	0.00	0.00	8	404	987.75	983.81	0.98	464.34	0.67	0%	
1896	1871	0.00	0.00	8	399	991.58	989.99	0.40	296.89	0.43	0%	
1871	1870	0.00	0.00	8	409	989.99	983.81	1.51	577.99	0.83	0%	
1860	1894	0.00	0.00	8	196	975.53	973.61	0.98	465.14	0.67	0%	
1895	1896	0.00	0.00	8	407	987.75	984.42	0.82	425.25	0.61	0%	
1896	1904	0.00	0.00	8	413	984.42	982.13	0.56	350.20	0.50	0%	
1904	2894	0.00	0.00	8	418	982.13	978.87	0.78	414.97	0.60	0%	
1907	1904	0.00	0.00	8	407	985.31	982.13	0.78	415.42	0.60	0%	
1908	1907	0.00	0.00	8	237	987.15	985.31	0.78	414.43	0.60	0%	
2463	1931	0.00	0.00	8	409	986.45	984.14	0.56	353.30	0.51	0%	
1953	1931	0.00	0.00	8	413	985.24	983.44	0.44	310.17	0.45	0%	
1930	1931	0.00	0.00	8	191	984.30	983.54	0.40	296.85	0.43	0%	
1929	1930	0.00	0.00	8	197	985.09	984.30	0.40	297.63	0.43	0%	
1928	1929	0.00	0.00	8	217	985.96	985.09	0.40	297.98	0.43	0%	
1927	1928	0.00	0.00	8	211	986.80	985.96	0.40	296.45	0.43	0%	
21702	1951	0.00	0.00	8	224	996.94	996.05	0.40	296.28	0.43	0%	
1963	1953	0.00	0.00	8	201	990.90	985.24	2.82	788.67	1.14	0%	
1962	1963	0.00	0.00	8	19	991.43	990.90	2.81	788.19	1.13	0%	
2396	1962	0.00	0.00	8	179	996.46	991.43	2.82	788.72	1.14	0%	
2798	2397	0.00	0.00	8	408	1016.77	999.53	4.23	966.26	1.39	0%	
9075	9109	0.00	0.00	8	290	1023.35	1021.00	0.81	423.01	0.61	0%	
1982	1981	0.00	0.00	8	67	987.40	987.13	0.40	299.13	0.43	0%	
1985	9080	0.00	0.00	8	262	1039.69	1038.64	0.40	297.81	0.43	0%	
763	2003	0.00	0.00	8	190	988.92	988.16	0.40	297.18	0.43	0%	
2003	1982	0.00	0.00	8	189	988.16	987.40	0.40	298.17	0.43	0%	
9064	1988	0.00	0.00	8	258	1037.94	1032.27	2.20	697.27	1.00	0%	
1997	14763	0.00	0.00	8	131	999.34	988.32	8.40	1362.25	1.96	0%	
1996	1997	0.00	0.00	8	149	1011.85	999.34	8.40	1362.62	1.96	0%	
Jun-179	1996	0.00	0.00	8	310	1037.90	1011.85	8.40	1362.33	1.96	0%	
767	766	0.00	0.00	8	224	1032.70	990.51	18.80	2038.18	2.93	0%	
768	767	0.00	0.00	8	157	1044.73	1032.70	7.64	1299.43	1.87	0%	
1989	9067	0.00	0.00	8	77	1043.83	1042.13	2.21	698.26	1.01	0%	
2370	2371	0.00	0.00	8	383	1057.03	1049.21	2.04	672.01	0.97	0%	
72	2073	0.00	0.00	8	369	1089.73	1080.01	2.63	762.89	1.10	0%	
1132	1133	0.00	0.00	8	200	1024.10	1023.30	0.40	297.02	0.43	0%	
2134	821	0.00	0.00	8	229	1054.23	1053.31	0.40	298.04	0.43	0%	
8	2134	0.00	0.00	8	229	1059.52	1054.23	2.31	714.15	1.03	0%	
2149	1787	0.00	0.00	8	370	972.82	971.35	0.40	296.14	0.43	0%	
2184	2185	0.00	0.00	12	365	993.84	993.04	0.22	649.04	0.93	0%	MinimumSlope
2186	2187	0.00	0.00	12	146	991.84	991.52	0.22	648.07	0.93	0%	MinimumSlope
2187	2188	0.00	0.00	12	409	991.52	990.60	0.23	657.42	0.95	0%	MinimumSlope
2188	2189	0.00	0.00	12	273	990.60	990.02	0.21	638.48	0.92	0%	MinimumSlope
2331	1423	0.00	0.00	8	162	1003.93	1003.28	0.40	297.96	0.43	0%	
2185	2186	0.00	0.00	12	543	993.04	991.84	0.22	651.37	0.94	0%	MinimumSlope
Jun-192	2230	0.00	0.00	10	162	1021.73	1021.28	0.28	449.14	0.65	0%	
2275	2276	0.00	0.00	8	52	1004.95	1004.90	0.10	145.69	0.21	0%	
2276	2277	0.00	0.00	8	207	1004.90	996.28	4.16	958.57	1.38	0%	
2277	610	0.00	0.00	8	153	996.18	993.78	1.57	589.22	0.85	0%	
2284	2283	0.00	0.00	8	376	1021.21	1019.80	0.37	287.72	0.41	0%	
2283	2282	0.00	0.00	8	299	1019.70	1018.60	0.37	285.00	0.41	0%	
2282	694	0.00	0.00	8	93	1018.50	1018.13	0.40	296.71	0.43	0%	
2179	2178	0.00	0.00	12	400	964.61	963.73	0.22	650.05	0.94	0%	
2180	1788	0.00	0.00	12	254	970.31	969.75	0.22	650.33	0.94	0%	
2317	365	0.00	0.00	8	200	1046.43	1045.63	0.40	297.22	0.43	0%	
2318	1617	0.00	0.00	8	205	990.98	990.17	0.40	295.68	0.43	0%	
2319	889	0.00	0.00	8	203	989.35	988.54	0.40	296.83	0.43	0%	
2320	1619	0.00	0.00	8	209	989.30	988.46	0.40	297.99	0.43	0%	
2321	1927	0.00	0.00	8	211	987.65	986.80	0.40	298.26	0.43	0%	
2322	1627	0.00	0.00	8	196	997.96	997.17	0.40	298.07	0.43	0%	
2343	1597	0.00	0.00	8	204	991.02	990.21	0.40	296.53	0.43	0%	trouble line
2362	2361	0.00	0.00	10	199	973.34	972.63	0.36	509.23	0.73	0%	
2361	2358	0.00	0.00	10	535	972.53	971.02	0.28	452.94	0.65	0%	
2358	2357	0.00	0.00	21	377	970.10	969.72	0.10	1955.80	2.82	0%	
2357	2356	0.00	0.00	21	381	969.62	969.24	0.10	1946.72	2.80	0%	
2356	1191	0.00	0.00	21	141	969.14	969.00	0.10	1939.06	2.79	0%	
Jun-209	2364	0.00	0.00	8	173	1021.14	1018.86	1.32	539.27	0.78	0%	
2019	Jun-209	0.00	0.00	8	160	1027.12	1021.24	3.67	901.11	1.30	0%	

2366	2019	0.00	0.00	8	330	1052.57	1027.22	7.68	1302.81	1.88	0%	
Jun-210	2366	0.00	0.00	8	300	1070.07	1052.67	5.80	1146.73	1.65	0%	
Jun-210	2368	0.00	0.00	8	331	1070.52	1067.40	0.94	456.35	0.66	0%	ROOT CUT 08
2368	2369	0.00	0.00	8	354	1067.30	1062.49	1.36	547.89	0.79	0%	ROOT CUT
2369	9068	0.00	0.00	8	295	1062.39	1057.11	1.79	628.68	0.91	0%	ROOT CUT
2371	1989	0.00	0.00	8	245	1049.21	1043.83	2.20	696.99	1.00	0%	
2372	2379	0.00	0.00	8	230	987.96	987.50	0.20	210.25	0.30	0%	
2379	2380	0.00	0.00	8	182	986.38	978.22	4.49	996.38	1.43	0%	
2375	2372	0.00	0.00	8	410	989.38	987.74	0.40	297.26	0.43	0%	
2376	2373	0.00	0.00	8	411	991.45	967.22	5.90	1141.61	1.64	0%	
2377	2375	0.00	0.00	8	195	991.09	990.00	0.56	358.27	0.52	0%	
2381	2345	0.00	0.00	8	192	963.12	962.11	0.53	341.12	0.49	0%	
2345	2382	0.00	0.00	8	206	962.01	960.10	0.93	453.00	0.65	0%	
2384	888	0.00	0.00	8	337	992.98	991.63	0.40	297.43	0.43	0%	
2383	2384	0.00	0.00	8	172	994.78	992.98	1.05	480.88	0.69	0%	
2387	2383	0.00	0.00	8	410	995.52	994.88	0.16	185.73	0.27	0%	
1953	2393	0.00	0.00	8	417	985.24	983.25	0.48	324.84	0.47	0%	
2393	2394	0.00	0.00	8	143	984.14	981.85	1.60	594.78	0.86	0%	
2394	2395	0.00	0.00	8	250	981.75	970.25	4.60	1007.94	1.45	0%	
2396	2402	0.00	0.00	8	198	996.46	988.10	4.21	964.75	1.39	0%	
2402	2398	0.00	0.00	8	218	988.00	984.86	1.44	564.50	0.81	0%	
2398	2399	0.00	0.00	8	200	985.66	977.02	4.32	977.19	1.41	0%	
2400	2401	0.00	0.00	8	208	1000.30	986.44	6.66	1213.33	1.75	0%	
2397	2396	0.00	0.00	8	19	996.96	996.66	1.56	586.81	0.85	0%	
2403	2405	0.00	0.00	10	304	961.68	961.68	0.00	15.46	0.02	0%	
2405	2404	0.00	0.00	10	313	961.68	961.68	0.00	15.22	0.02	0%	
2410	2413	0.00	0.00	10	239	1078.35	1077.68	0.28	450.89	0.65	0%	
2411	2410	0.00	0.00	10	402	1079.47	1078.35	0.28	450.00	0.65	0%	
9145	2411	0.00	0.00	10	103	1079.76	1079.47	0.28	452.60	0.65	0%	
2413	1114	0.00	0.00	10	192	1077.68	1077.14	0.28	451.61	0.65	0%	
2462	2427	0.00	0.00	10	98	1071.81	1071.52	0.30	463.03	0.67	0%	
9080	2797	0.00	0.00	8	330	1038.64	1016.77	6.63	1208.37	1.74	0%	
2797	2798	0.00	0.00	8	65	1016.85	1016.77	0.12	164.89	0.24	0%	
2801	1608	0.00	0.00	8	312	992.09	990.82	0.41	299.93	0.43	0%	
2802	2803	0.00	0.00	10	294	971.12	970.30	0.28	450.45	0.65	0%	
2803	2804	0.00	0.00	10	294	970.30	970.21	0.03	149.12	0.21	0%	
2804	2805	0.00	0.00	8	294	970.21	969.03	0.40	297.87	0.43	0%	
2805	1361	0.00	0.00	8	400	969.03	967.43	0.40	297.27	0.43	0%	
2806	144	0.00	0.00	8	41	985.94	985.94	0.00	23.11	0.03	0%	
2843	2844	0.00	0.00	12	338	957.60	956.57	0.30	764.89	1.10	0%	
2844	2845	0.00	0.00	12	416	956.61	955.62	0.24	675.96	0.97	0%	
1618	2872	0.00	0.00	8	160	991.41	990.77	0.40	297.30	0.43	0%	
2847	1542	0.00	0.00	8	215	964.78	963.92	0.40	297.22	0.43	0%	ROOT CUT
2874	1908	0.00	0.00	8	173	988.50	987.15	0.78	415.07	0.60	0%	
2877	1711	0.00	0.00	8	87	1024.33	1023.98	0.40	298.06	0.43	0%	
2883	1628	0.00	0.00	8	233	996.24	995.31	0.40	297.06	0.43	0%	
Jun-165	2899	0.00	0.00	15	58	982.89	976.16	11.61	8561.69	12.33	0%	
2076	9003	0.00	0.00	10	400	1091.56	1090.44	0.28	450.98	0.65	0%	
9003	72	0.00	0.00	10	143	1090.34	1089.83	0.36	509.26	0.73	0%	
9010	9011	0.00	0.00	8	146	1045.00	1036.24	6.02	1153.30	1.66	0%	
9012	9013	0.00	0.00	8	169	1023.50	1006.57	10.03	1492.08	2.15	0%	
9011	9012	0.00	0.00	8	115	1036.04	1030.06	5.18	1070.03	1.54	0%	
9013	9014	0.00	0.00	10	310	1006.27	1005.03	0.40	539.04	0.78	0%	
9014	2121	0.00	0.00	10	111	1004.93	1003.57	1.23	943.33	1.36	0%	
9035	1657	0.00	0.00	8	48	1037.90	1037.71	0.39	294.60	0.42	0%	
9066	9064	0.00	0.00	8	130	1040.80	1037.94	2.20	696.80	1.00	0%	
9067	9066	0.00	0.00	8	60	1042.13	1040.80	2.20	697.23	1.00	0%	
9068	2370	0.00	0.00	8	63	1057.11	1057.03	0.13	167.58	0.24	0%	ROOT CUT
9109	2400	0.00	0.00	8	204	1021.00	1000.30	10.17	1498.92	2.16	0%	
332	1108	0.00	0.00	8	282	1007.94	1006.70	0.44	311.92	0.45	0%	
9120	9121	0.00	0.00	8	258	1003.95	1002.19	0.68	388.54	0.56	0%	
9121	9122	0.00	0.00	8	257	1002.19	1000.48	0.66	383.13	0.55	0%	
9122	650	0.00	0.00	8	181	1000.48	999.45	0.57	354.12	0.51	0%	
9179	9180	0.00	0.00	8	235	997.00	995.82	0.50	333.26	0.48	0%	
9180	9181	0.00	0.00	8	177	995.72	988.75	3.95	933.86	1.34	0%	
9204	9203	0.00	0.00	10	143	1003.91	1003.05	0.60	660.89	0.95	0%	
9203	9202	0.00	0.00	10	400	1003.05	998.15	1.22	943.29	1.36	0%	
9202	9201	0.00	0.00	10	400	998.15	993.25	1.22	943.29	1.36	0%	
9201	9200	0.00	0.00	10	50	993.25	992.90	0.70	711.21	1.02	0%	
1030	948	0.00	0.00	8	399	1030.50	1021.07	2.36	722.59	1.04	0%	
564	370	0.00	0.00	15	149	1038.66	1038.10	0.38	1541.77	2.22	0%	
1145	565	0.00	0.00	15	234	1039.89	1039.22	0.29	1344.05	1.94	0%	
1494	1495	0.00	0.00	8	445	1040.60	1038.81	0.40	297.96	0.43	0%	
306	307	0.00	0.00	8	269	1001.52	993.71	2.90	800.61	1.15	0%	
1415	652	0.00	0.00	8	388	1012.65	1011.10	0.40	297.21	0.43	0%	
2879	1437	0.00	0.00	8	329	1017.75	1016.43	0.40	297.95	0.43	0%	
2364	551	0.00	0.00	8	89	1018.66	1018.26	0.45	315.93	0.45	0%	
1701	2364	0.00	0.00	8	662	1021.31	1018.66	0.40	297.46	0.43	0%	
1689	1676	0.00	0.00	18	401	1040.83	1039.22	0.40	2589.07	3.73	0%	
768	Jun-179	0.00	0.00	8	99	1044.73	1037.90	6.91	1235.90	1.78	0%	
1630	1038	0.00	0.00	8	271	997.39	996.31	0.40	296.64	0.43	0%	
2399	2467	0.00	0.00	8	199	976.92	971.68	2.64	763.43	1.10	0%	
1931	2909	0.00	0.00	8	418	983.37	982.59	0.19	203.05	0.29	0%	
891	888	0.00	0.00	8	411	993.17	991.54	0.40	296.19	0.43	0%	
1609	9078	0.00	0.00	8	407	989.21	987.62	0.39	293.78	0.42	0%	
2463	616	0.00	0.00	8	409	988.55	986.28	0.56	350.24	0.50	0%	
1601	1600	0.00	0.00	8	280	982.55	970.81	4.20	962.99	1.39	0%	
841	838	0.00	0.00	10	233	970.30	961.85	3.63	1623.47	2.34	0%	
837	1895	0.00	0.00	8	412	990.21	987.75	0.60	363.09	0.52	0%	
1896	2895	0.00	0.00	8	421	984.42	981.01	0.81	422.95	0.61	0%	
1115	992	0.00	0.00	10	330	1075.92	1074.95	0.29	461.79	0.66	0%	
43984	748	0.00	0.00	8	329	1198.95	1197.08	0.57	354.53	0.51	0%	
203	9000	0.00	0.00	12	180	967.17	966.52	0.36	833.09	1.20	0%	

Table 3: Existing Conditions - Wet Weather with Medford Flows Pipe Capacity												
Node ID #		Peak Flow		Size	Length	US Invert	DS Invert	Slope	Capacity		Sanitary Sewer % Full	Notes
From	To	(gpm)	(MGD)	(in)	(ft)	(ft)	(ft)	(%)	(gpm)	(MGD)	(%)	
Jun-341	Jun-343	964.72	1.39	12	100	946.00	946.00	0.00	43.83	0.06	2201%	Sanitary Siphon under River
Jun-342	Jun-344	883.39	1.27	16	100	946.00	946.00	0.00	94.38	0.14	936%	Sanitary Siphon under River
2464	2466	198.91	0.29	10	414	979.83	979.80	0.01	72.54	0.10	274%	
2840	2831	462.84	0.67	24	143	954.84	954.84	0.00	232.65	0.34	199%	
1027	89	491.42	0.71	10	188	985.63	985.43	0.11	278.33	0.40	177%	
2835	2836	968.20	1.39	24	208	955.63	955.62	0.00	609.78	0.88	159%	
1796	Jun-339	964.72	1.39	12	14	956.13	956.10	0.21	641.54	0.92	150%	Sanitary Siphon under River
9102	9101	598.38	0.86	10	324	1005.39	1004.63	0.23	413.09	0.59	145%	
2769	2768	1331.22	1.92	15	400	987.83	987.25	0.14	956.81	1.38	139%	
1530	1529	524.98	0.76	10	337	960.84	960.10	0.22	399.34	0.58	131%	MinimumSlope
161	162	337.01	0.49	8	390	999.31	998.14	0.30	257.62	0.37	131%	
1532	1531	519.49	0.75	10	288	962.22	961.59	0.22	398.49	0.57	130%	MinimumSlope
1531	1530	519.49	0.75	10	341	961.59	960.84	0.22	399.57	0.58	130%	MinimumSlope
1533	1532	519.49	0.75	10	286	962.85	962.22	0.22	400.34	0.58	130%	MinimumSlope
863	1534	519.49	0.75	10	394	964.36	963.49	0.22	400.56	0.58	130%	MinimumSlope
1534	1533	519.49	0.75	10	290	963.49	962.85	0.22	400.57	0.58	130%	MinimumSlope
2772	2771	1320.22	1.90	15	158	991.14	990.84	0.19	1095.03	1.58	121%	
2764	2763	1329.00	1.91	18	452	964.58	964.25	0.07	1104.19	1.59	120%	Interpolated
649	9107	1121.52	1.61	15	398	998.27	997.68	0.15	966.92	1.39	116%	
2763	2762	1328.67	1.91	18	401	964.25	963.93	0.08	1154.79	1.66	115%	Interpolated
2762	2761	1327.94	1.91	18	400	963.93	963.61	0.08	1155.15	1.66	115%	Interpolated
2761	2760	1327.57	1.91	18	287	963.61	963.38	0.08	1155.91	1.66	115%	Interpolated
2760	2312	1327.37	1.91	18	185	963.38	963.23	0.08	1163.49	1.68	114%	Interpolated
9118	9102	598.38	0.86	10	238	1006.39	1005.39	0.42	552.48	0.80	108%	
1281	1280	540.25	0.78	10	274	976.72	975.70	0.37	520.35	0.75	104%	
9096	9095	1121.82	1.62	15	381	1000.28	999.55	0.19	1100.29	1.58	102%	
1238	1239	763.62	1.10	21	390	984.28	984.22	0.02	764.66	1.10	100%	
1278	1279	540.14	0.78	10	298	974.12	972.89	0.41	547.73	0.79	99%	
2312	2314	1327.24	1.91	18	287	963.23	962.91	0.11	1364.82	1.97	97%	
1280	1278	540.18	0.78	10	318	975.56	974.19	0.43	559.50	0.81	97%	
2768	2767	1330.84	1.92	15	400	987.19	985.90	0.32	1427.02	2.05	93%	
1279	185	540.09	0.78	10	238	972.78	971.65	0.47	587.36	0.85	92%	
90	91	491.20	0.71	10	441	984.29	982.52	0.40	539.69	0.78	91%	
89	90	491.36	0.71	10	279	985.43	984.29	0.41	545.24	0.79	90%	
160	161	337.01	0.49	8	190	1000.52	999.31	0.64	374.86	0.54	90%	
9098	9097	1121.94	1.62	15	400	1002.30	1001.29	0.25	1262.65	1.82	89%	
9097	9096	1121.85	1.62	15	400	1001.29	1000.28	0.25	1262.65	1.82	89%	
1504	1505	540.39	0.78	15	201	1021.94	1021.82	0.06	614.63	0.89	88%	
2770	2769	1331.21	1.92	15	400	989.38	987.89	0.37	1533.62	2.21	87%	
2766	2765	1330.44	1.92	15	404	982.86	981.28	0.39	1571.90	2.26	85%	220 L.F. 24" STEEL CASING
254	165	382.67	0.55	10	231	994.33	993.68	0.28	452.18	0.65	85%	MinimumSlope
178	1281	540.28	0.78	10	232	978.18	976.88	0.56	638.58	0.92	85%	
2934	2933	672.27	0.97	15	97	984.10	984.00	0.10	807.43	1.16	83%	
9106	9105	1225.58	1.76	15	368	995.86	994.58	0.35	1481.39	2.13	83%	
1283	1282	495.96	0.71	10	460	981.86	979.51	0.51	609.13	0.88	81%	Interpolated
1282	178	495.89	0.71	10	260	979.51	978.18	0.51	609.08	0.88	81%	Interpolated
91	1283	495.99	0.71	10	129	982.52	981.86	0.51	609.40	0.88	81%	Interpolated
1519	1549	525.76	0.76	12	352	958.48	957.71	0.22	648.52	0.93	81%	MinimumSlope
1528	1519	526.23	0.76	12	365	959.28	958.48	0.22	649.12	0.93	81%	MinimumSlope
1529	1528	526.36	0.76	12	371	960.10	959.28	0.22	651.21	0.94	81%	MinimumSlope
2933	2932	672.27	0.97	15	91	982.27	982.17	0.11	832.47	1.20	81%	
2449	2857	1281.92	1.85	30	201	962.12	962.10	0.01	1591.54	2.29	81%	Interpolated
9108	649	1121.55	1.62	15	35	998.16	998.27	-0.31	1407.08	2.03	80%	
1791	2177	1327.05	1.91	18	404	962.67	961.99	0.17	1677.09	2.42	79%	
2382	2851	458.90	0.66	24	23	957.32	957.32	0.00	585.23	0.84	78%	
88	1027	491.42	0.71	10	121	986.35	985.68	0.55	634.51	0.91	77%	
2150	1946	924.18	1.33	18	265	962.79	962.56	0.09	1203.48	1.73	77%	
164	254	340.27	0.49	10	144	994.73	994.33	0.28	448.78	0.65	76%	MinimumSlope
9095	9108	1121.55	1.62	15	395	999.55	998.16	0.35	1489.68	2.15	75%	
9099	9098	598.38	0.86	12	374	1003.54	1002.30	0.33	798.48	1.15	75%	
9105	9104	1225.50	1.76	15	395	994.58	992.90	0.42	1638.08	2.36	75%	
9104	2772	1320.36	1.90	15	356	992.90	991.14	0.49	1766.69	2.54	75%	
165	166	382.61	0.55	10	375	993.68	992.29	0.37	519.17	0.75	74%	
2314	1791	1327.17	1.91	18	69	962.81	962.67	0.20	1834.82	2.64	72%	
415	416	304.01	0.44	10	337	1007.31	1006.47	0.25	425.39	0.61	71%	Interpolated
167	168	382.57	0.55	10	304	991.23	990.03	0.40	535.82	0.77	71%	
168	169	382.22	0.55	10	405	990.03	988.43	0.40	535.88	0.77	71%	
166	167	382.49	0.55	10	265	992.29	991.23	0.40	539.44	0.78	71%	
169	88	380.93	0.55	10	401	988.43	986.83	0.40	538.66	0.78	71%	
413	414	303.38	0.44	10	423	1008.89	1007.81	0.26	430.81	0.62	70%	Interpolated
414	415	303.19	0.44	10	143	1007.71	1007.31	0.28	449.98	0.65	67%	Interpolated
9107	9106	1121.47	1.61	15	399	997.68	995.86	0.46	1696.95	2.44	66%	
2175	2174	1332.03	1.92	21	430	961.18	960.72	0.11	2015.71	2.90	66%	
416	417	302.45	0.44	10	448	1006.37	1005.07	0.29	458.88	0.66	66%	
2173	2172	1331.71	1.92	21	410	958.77	958.31	0.11	2064.50	2.97	65%	
2176	2175	1332.19	1.92	21	400	961.63	961.18	0.11	2067.28	2.98	64%	
162	163	341.16	0.49	10	396	998.14	996.59	0.39	533.06	0.77	64%	
2177	2176	1331.07	1.92	21	311	961.99	961.63	0.12	2097.04	3.02	63%	
9101	9099	598.38	0.86	12	232	1004.63	1003.54	0.47	948.98	1.37	63%	
1808	1803	1175.47	1.69	15	101	951.59	951.00	0.59	1925.00	2.77	61%	Interpolated
2902	1841	398.78	0.57	15	270	973.51	973.32	0.07	665.98	0.96	60%	
2802	1198	154.67	0.22	12	345	968.25	968.13	0.03	258.34	0.37	60%	Interpolated
9117	9118	598.38	0.86	12	263	1007.83	1006.39	0.55	1026.35	1.48	58%	
268	1504	540.50	0.78	15	302	1022.45	1022.03	0.14	937.65	1.35	58%	
163	164	340.79	0.49	10	374	996.59	994.73	0.50	601.20	0.87	57%	
2172	2171</											

2767	2766	1330.83	1.92	15	280	985.80	982.90	1.04	2557.07	3.68	52%	
1501	1502	424.07	0.61	15	365	1023.89	1023.50	0.11	820.96	1.18	52%	
2771	2770	1332.26	1.92	15	138	990.84	989.38	1.06	2584.21	3.72	52%	
2807	1052	13.95	0.02	8	30	1060.14	1060.14	0.00	27.16	0.04	51%	
2469	2468	169.46	0.24	12	192	973.47	973.36	0.06	331.59	0.48	51%	
1945	1944	924.17	1.33	18	264	961.92	961.40	0.20	1815.09	2.61	51%	
1944	1942	924.17	1.33	18	435	961.40	960.54	0.20	1816.64	2.62	51%	
1942	1941	924.16	1.33	18	212	960.54	960.12	0.20	1820.37	2.62	51%	
1946	1945	924.18	1.33	18	309	962.56	961.92	0.21	1858.26	2.68	50%	
1941	661	924.16	1.33	18	449	960.12	959.04	0.24	2004.78	2.89	46%	
412	413	303.15	0.44	10	215	1010.34	1008.99	0.63	674.98	0.97	45%	Interpolated
1799	1801	1847.89	2.66	27	368	953.10	952.66	0.12	4165.65	6.00	44%	Sanitary Siphon under River
1798	1799	1847.96	2.66	27	301	953.50	953.14	0.12	4166.28	6.00	44%	Sanitary Siphon under River
1797	1798	1848.07	2.66	27	451	954.08	953.54	0.12	4168.59	6.00	44%	Sanitary Siphon under River
2833	2834	968.49	1.39	24	81	955.90	955.85	0.06	2185.25	3.15	44%	
1801	1803	1847.88	2.66	27	100	952.62	952.50	0.12	4173.22	6.01	44%	Sanitary Siphon under River
2169	2168	1847.39	2.66	27	283	957.08	956.74	0.12	4173.32	6.01	44%	
1502	1503	424.07	0.61	15	318	1023.48	1023.01	0.15	965.69	1.39	44%	
1239	1453	762.80	1.10	21	389	984.22	983.91	0.08	1739.14	2.50	44%	
188	187	88.35	0.13	8	402	966.47	965.67	0.20	209.73	0.30	42%	
1810	1809	1175.68	1.69	24	104	953.80	953.69	0.11	2855.31	4.11	41%	
543	542	1363.32	1.96	30	185	959.95	959.87	0.04	3320.02	4.78	41%	
2834	2835	968.39	1.39	24	247	955.83	955.65	0.07	2375.58	3.42	41%	
1503	268	424.16	0.61	15	221	1022.92	1022.54	0.17	1042.69	1.50	41%	
2129	2128	391.40	0.56	15	396	1010.73	1010.14	0.15	970.03	1.40	40%	MinimumSlope
2125	49	391.32	0.56	15	148	1008.74	1008.52	0.15	970.34	1.40	40%	MinimumSlope
2128	2127	391.32	0.56	15	241	1010.14	1009.78	0.15	970.79	1.40	40%	MinimumSlope
2132	2131	391.55	0.56	15	314	1011.82	1011.35	0.15	972.04	1.40	40%	MinimumSlope
Jun-345	1797	964.72	1.39	12	14	954.50	954.08	3.00	2400.42	3.46	40%	Sanitary Siphon under River
2126	2125	391.34	0.56	15	352	1009.27	1008.74	0.15	975.10	1.40	40%	MinimumSlope
2131	2130	391.29	0.56	15	213	1011.35	1011.03	0.15	975.10	1.40	40%	MinimumSlope
2127	2126	391.37	0.56	15	338	1009.78	1009.27	0.15	975.38	1.40	40%	MinimumSlope
539	538	1372.56	1.98	30	348	959.08	958.92	0.05	3422.86	4.93	40%	
2130	2129	391.28	0.56	15	199	1011.03	1010.73	0.15	976.57	1.41	40%	MinimumSlope
226	1193	171.76	0.25	12	52	967.33	967.28	0.10	429.25	0.62	40%	Interpolated
821	822	143.68	0.21	10	222	1053.31	1052.91	0.18	361.43	0.52	40%	
9084	2901	386.79	0.56	15	390	974.59	974.00	0.15	977.17	1.41	40%	
1343	2443	934.91	1.35	21	463	965.52	964.84	0.15	2363.32	3.40	40%	
2765	2764	1330.40	1.92	15	400	981.13	973.87	1.81	3384.67	4.87	39%	
529	528	968.75	1.40	24	140	957.68	957.57	0.08	2467.52	3.55	39%	
2152	2151	924.19	1.33	18	382	965.38	964.10	0.33	2364.35	3.40	39%	
540	539	1363.85	1.96	30	305	959.23	959.08	0.05	3535.99	5.09	39%	
1453	1454	762.35	1.10	21	398	983.82	983.40	0.11	2003.05	2.88	38%	
1454	1455	761.83	1.10	21	405	983.32	982.89	0.11	2007.41	2.89	38%	
2462	2427	174.26	0.25	10	98	1071.81	1071.52	0.30	463.03	0.67	38%	
1270	1269	728.01	1.05	21	261	1014.19	1013.93	0.10	1944.03	2.80	37%	
391	1270	728.09	1.05	21	398	1014.69	1014.29	0.10	1952.86	2.81	37%	
1404	1405	165.94	0.24	10	199	979.40	978.85	0.28	448.36	0.65	37%	MinimumSlope
1373	1418	938.33	1.35	21	400	972.57	971.89	0.17	2542.65	3.66	37%	
1405	2333	165.92	0.24	10	218	978.85	978.24	0.28	450.72	0.65	37%	MinimumSlope
1812	1811	1175.68	1.69	24	90	954.31	954.19	0.13	3204.70	4.61	37%	
2333	1378	165.90	0.24	10	166	978.24	977.77	0.28	453.24	0.65	37%	MinimumSlope
1342	1343	938.10	1.35	21	381	966.32	965.65	0.18	2583.24	3.72	36%	Interpolated
2171	2169	1331.57	1.92	24	349	957.69	957.08	0.17	3680.34	5.30	36%	
1192	1363	171.46	0.25	12	341	966.79	966.39	0.12	474.77	0.68	36%	Interpolated
2151	2150	924.18	1.33	18	315	964.10	962.84	0.40	2583.83	3.72	36%	
1795	1796	1848.12	2.66	27	11	956.30	956.28	0.19	5189.03	7.47	36%	Sanitary Siphon under River
2901	2902	399.05	0.57	15	219	974.00	973.56	0.20	1126.90	1.62	35%	
2914	9148	119.51	0.17	8	38	978.41	978.21	0.52	339.77	0.49	35%	
447	406	277.31	0.40	15	403	1031.48	1031.08	0.10	791.30	1.14	35%	
9135	9134	1064.41	1.53	24	151	955.48	955.30	0.12	3037.83	4.37	35%	
187	186	88.54	0.13	8	267	965.67	964.87	0.30	257.47	0.37	34%	
189	188	71.75	0.10	8	395	967.27	966.47	0.20	211.54	0.30	34%	
55	2829	391.36	0.56	15	354	987.10	986.34	0.21	1164.10	1.68	34%	
9137	9136	1064.48	1.53	24	400	956.41	955.89	0.13	3170.92	4.57	34%	
9138	9137	1064.51	1.53	24	310	956.82	956.41	0.13	3200.41	4.61	33%	
822	823	143.71	0.21	10	221	1052.81	1052.24	0.26	432.78	0.62	33%	
9139	9138	1064.54	1.53	24	323	957.25	956.82	0.13	3210.35	4.62	33%	
9136	9135	1064.43	1.53	24	305	955.89	955.48	0.13	3224.80	4.64	33%	
1198	1194	154.50	0.22	12	332	968.18	967.80	0.11	468.87	0.68	33%	
1811	1810	1175.68	1.69	24	224	954.17	953.80	0.16	3574.12	5.15	33%	
1341	1342	938.49	1.35	21	400	967.18	966.32	0.21	2856.40	4.11	33%	Interpolated
2450	2451	1340.64	1.93	30	408	961.72	961.45	0.07	4104.42	5.91	33%	
2452	9332	1351.40	1.95	30	265	960.77	960.59	0.07	4158.36	5.99	32%	
9332	9323	1351.20	1.95	30	234	960.54	960.38	0.07	4172.08	6.01	32%	
1194	226	154.28	0.22	12	396	967.80	967.33	0.12	477.73	0.69	32%	
2836	2837	968.15	1.39	24	387	955.18	954.73	0.12	3000.17	4.32	32%	
1193	1192	171.63	0.25	12	291	967.28	966.84	0.15	538.77	0.78	32%	
9323	544	1350.97	1.95	30	250	960.33	960.15	0.07	4281.38	6.17	32%	
661	9142	957.06	1.38	21	124	959.04	958.74	0.24	3034.21	4.37	32%	Interpolated
2447	2448	1283.25	1.85	30	322	962.47	962.26	0.07	4072.74	5.86	32%	
50	51	391.32	0.56	15	164	990.78	990.38	0.24	1242.75	1.79	31%	
53	54	391.33	0.56	15	230	988.19	987.62	0.25	1251.05	1.80	31%	
52	53	391.32	0.56	15	108	988.46	988.19	0.25	1256.62	1.81	31%	
2446	2447	1284.92	1.85	30	373	962.74	962.49	0.07	4133.34	5.95	31%	
541	540	1364.29	1.96	30	197	959.38	959.23	0.08	4406.10	6.34	31%	
9132	9130	1175.69	1.69	24	155	954.94	954.65	0.19	3806.33	5.48	31%	
2829	2830	391.33	0.56	15	232	986.34	985.74	0.26	1278.58	1.84	31%	
1267	1266	727.76	1.05	21	455	1011.84	1011.16	0.15	2383.82	3.43	31%	
537	536	1372.06	1.98	30	351	958.53	958.25	0.08	4504.31	6.49	30%	
1266	1265	727.51	1.05	21	398	1011.06	1010.46	0.15	2391.64	3.44	30%	
2445	2446	1233.64	1.78	30	337	962.98	962.76	0.07	4074.05	5.87	30%	
2444	2445	1235.75	1.78	30	351	963.23	963.00	0.07	4082.32	5.88	30%	
54	55	391.30	0.56	15	196	987.62	987.10	0.27	1295.27	1.87	30%	
557	558	133.95	0.19	10	147	980.59	980.19	0.27	443.94	0.64	30%	
9131	1812	1175.68	1.69	24	76	954.46	954.31	0.20	3903.52	5.62	30%	

544	543	1350.54	1.94	30	251	960.15	959.95	0.08	4505.59	6.49	30%	
2174	2173	1331.95	1.92	21	375	960.72	958.77	0.52	4445.46	6.40	30%	
2896	2897	320.03	0.46	15	285	977.46	976.94	0.18	1073.91	1.55	30%	
1550	2169	544.06	0.78	18	285	957.65	957.08	0.20	1825.83	2.63	30%	Interpolated
2898	2899	319.18	0.46	15	380	976.32	975.63	0.18	1071.17	1.54	30%	
730	1628	27.38	0.04	8	233	995.40	995.31	0.04	92.31	0.13	30%	
2443	2444	1237.58	1.78	30	290	963.45	963.25	0.07	4188.22	6.03	30%	
2899	9084	371.60	0.54	15	390	975.58	974.59	0.25	1265.64	1.82	29%	
9130	9131	1175.69	1.69	24	91	954.65	954.46	0.21	4014.79	5.78	29%	
1794	1795	1848.12	2.66	27	18	956.41	956.36	0.28	6351.11	9.15	29%	Sanitary Siphon under River
528	527	968.73	1.39	24	293	957.47	956.99	0.16	3332.77	4.80	29%	
2121	2114	246.10	0.35	10	289	1003.57	1000.68	1.00	852.37	1.23	29%	
2114	1137	246.09	0.35	10	166	1000.68	999.02	1.00	852.42	1.23	29%	
406	407	277.31	0.40	15	406	1030.78	1030.18	0.15	966.33	1.39	29%	
9148	9149	792.32	1.14	18	381	978.21	976.46	0.46	2769.78	3.99	29%	
Jun-347	Jun-349	4.74	0.01	8	80	956.50	956.50	0.00	16.62	0.02	29%	Sanitary Siphon under River
Jun-348	Jun-350	4.74	0.01	8	80	956.50	956.50	0.00	16.62	0.02	29%	Sanitary Siphon under River
1340	1341	938.54	1.35	21	396	968.42	967.29	0.29	3293.33	4.74	28%	
2895	2896	320.31	0.46	15	294	978.05	977.46	0.20	1125.85	1.62	28%	Interpolated
2423	2422	184.59	0.27	12	401	1062.96	1062.08	0.22	648.95	0.93	28%	MinimumSlope
401	124	277.84	0.40	15	53	1028.05	1027.97	0.15	979.21	1.41	28%	
Jun-328	Jun-332	438.06	0.63	18	140	941.50	941.30	0.14	1544.38	2.22	28%	Sanitary Siphon under River
Jun-329	Jun-333	438.06	0.63	18	140	941.50	941.30	0.14	1544.38	2.22	28%	Sanitary Siphon under River
445	446	277.31	0.40	15	395	1032.88	1032.28	0.15	979.07	1.41	28%	
446	447	277.31	0.40	15	391	1032.18	1031.58	0.15	984.10	1.42	28%	
2015	557	23.53	0.03	10	102	980.60	980.59	0.01	84.57	0.12	28%	Interpolated
402	401	277.34	0.40	15	144	1028.38	1028.15	0.16	1003.37	1.44	28%	
1036	888	118.86	0.17	10	408	992.58	991.54	0.25	430.35	0.62	28%	
403	402	277.32	0.40	15	62	1028.58	1028.48	0.16	1005.19	1.45	28%	
407	408	277.31	0.40	15	399	1029.82	1029.18	0.16	1006.63	1.45	28%	
2897	2898	319.86	0.46	15	290	976.94	976.32	0.21	1162.43	1.67	28%	
408	403	277.32	0.40	15	309	1029.18	1028.68	0.16	1010.41	1.45	27%	
9071	95	74.33	0.11	8	147	1021.72	1021.23	0.33	271.47	0.39	27%	Interpolated
559	2470	150.58	0.22	10	413	979.17	977.40	0.43	557.89	0.80	27%	
2894	2895	300.01	0.43	15	412	978.87	978.05	0.20	1120.92	1.61	27%	Interpolated
536	535	1371.93	1.98	30	96	958.23	958.21	0.02	5150.30	7.42	27%	
1505	1506	540.34	0.78	15	313	1021.62	1019.56	0.66	2037.35	2.93	27%	
2448	2449	1282.33	1.85	30	130	962.24	962.12	0.09	4847.52	6.98	26%	
9140	9139	957.03	1.38	24	359	957.86	957.25	0.17	3629.03	5.23	26%	
9141	9140	957.06	1.38	24	376	958.50	957.86	0.17	3629.27	5.23	26%	
558	559	133.94	0.19	10	259	980.19	979.27	0.36	508.26	0.73	26%	Interpolated
2395	Jun-207	176.45	0.25	10	44	969.95	969.68	0.62	671.14	0.97	26%	
186	185	88.45	0.13	8	25	964.87	965.00	-0.53	341.08	0.49	26%	Interpolated
1049	1050	143.67	0.21	12	350	1050.35	1049.79	0.16	554.42	0.80	26%	
1202	1201	142.23	0.20	12	357	969.56	969.00	0.16	549.07	0.79	26%	
9134	9132	1064.37	1.53	24	146	955.26	954.94	0.22	4119.76	5.93	26%	
1050	1052	143.59	0.21	12	346	1049.69	1049.13	0.16	557.79	0.80	26%	
1201	231	142.18	0.20	12	289	968.86	968.40	0.16	552.90	0.80	26%	
2166	2167	114.67	0.17	10	240	1012.75	1012.08	0.28	450.55	0.65	25%	
1796	Jun-340	883.39	1.27	16	14	956.29	955.90	2.79	3477.04	5.01	25%	Sanitary Siphon under River
1237	1238	727.22	1.05	21	435	985.22	984.28	0.22	2864.43	4.12	25%	
231	2802	143.39	0.21	12	53	968.34	968.25	0.17	569.06	0.82	25%	
2165	2166	113.68	0.16	10	260	1013.48	1012.75	0.28	451.78	0.65	25%	
2167	412	113.17	0.16	10	623	1012.08	1010.34	0.28	450.41	0.65	25%	
1743	9071	74.33	0.11	8	274	1022.82	1021.72	0.40	297.62	0.43	25%	
87	88	137.71	0.20	10	368	988.00	986.45	0.42	553.41	0.80	25%	
1287	189	37.77	0.05	8	460	967.75	967.27	0.10	151.84	0.22	25%	Interpolated
2857	2450	1281.41	1.85	30	335	962.10	961.74	0.11	5227.91	7.53	25%	
2111	2112	199.05	0.29	8	122	1015.20	1011.43	3.10	827.12	1.19	24%	
2108	2107	199.05	0.29	8	144	1024.69	1020.22	3.10	827.54	1.19	24%	
2113	2121	199.05	0.29	8	142	1007.98	1003.57	3.10	827.73	1.19	24%	
2112	2113	199.05	0.29	8	111	1011.43	1007.98	3.10	827.84	1.19	24%	
2107	2110	199.05	0.29	8	65	1020.22	1018.20	3.10	827.95	1.19	24%	
2110	2111	199.05	0.29	8	97	1018.20	1015.20	3.10	827.98	1.19	24%	
2931	9148	672.84	0.97	18	276	979.51	978.21	0.47	2803.41	4.04	24%	
1374	1373	939.63	1.35	21	406	974.35	972.70	0.41	3930.20	5.66	24%	
2758	2759	114.48	0.16	10	146	965.29	964.83	0.32	479.13	0.69	24%	
2414	445	277.31	0.40	15	206	1033.42	1032.98	0.21	1162.21	1.67	24%	
2407	2108	196.96	0.28	8	59	1026.51	1024.69	3.09	826.84	1.19	24%	
2164	2165	106.33	0.15	10	130	1013.84	1013.48	0.28	448.96	0.65	24%	
2163	2164	106.45	0.15	10	140	1014.23	1013.84	0.28	450.42	0.65	24%	
1269	1268	727.88	1.05	21	236	1013.93	1013.34	0.25	3082.15	4.44	24%	Interpolated
2424	2423	176.24	0.25	12	388	1066.15	1065.02	0.29	747.62	1.08	24%	
124	1500	424.07	0.61	12	47	1027.96	1027.16	1.70	1805.03	2.60	23%	Interpolated
2746	Jun-322	1923.13	2.77	36	110	953.90	953.79	0.10	8204.47	11.81	23%	Sanitary Siphon under River
1055	9098	152.52	0.22	12	152	1002.64	1002.30	0.22	654.88	0.94	23%	Interpolated
2932	2931	672.85	0.97	18	164	980.39	979.56	0.51	2909.77	4.19	23%	
2466	2894	276.87	0.40	15	407	979.80	978.87	0.23	1201.58	1.73	23%	Interpolated
2422	2420	178.99	0.26	15	429	1062.08	1061.67	0.10	776.83	1.12	23%	
823	1049	143.52	0.21	10	323	1052.24	1050.50	0.54	626.01	0.90	23%	
28	1203	129.76	0.19	12	18	970.27	970.24	0.17	573.32	0.83	23%	
81	84	66.71	0.10	8	290	997.31	996.16	0.40	295.99	0.43	23%	
2832	2833	968.66	1.39	24	182	956.36	955.92	0.24	4321.67	6.22	22%	
1455	2941	761.70	1.10	21	246	982.81	982.06	0.30	3400.81	4.90	22%	
889	9078	146.84	0.21	12	410	988.54	987.62	0.22	656.42	0.95	22%	
2451	2452	1352.24	1.95	30	431	961.43	960.80	0.15	6098.83	8.78	22%	
84	85	66.71	0.10	8	155	996.16	995.52	0.41	301.66	0.43	22%	
2830	2934	672.27	0.97	15	117	985.74	984.00	1.48	3061.06	4.41	22%	
9142	9141	957.06	1.38	24	90	958.74	958.50	0.27	4544.46	6.54	21%	
2238	2241	94.10	0.14	10	378	1017.93	1016.87	0.28	451.31	0.65	21%	
2241	2242	93.94	0.14	10	400	1016.87	1015.75	0.28	450.98	0.65	21%	
1378	1374	940.34	1.35	21	398	976.60	974.45	0.54	4528.83	6.52	21%	
9078	623	89.49	0.13	10	410	987.52	986.47	0.26	431.17	0.62	21%	
2242	2243	93.15	0.13	10	400	1015.75	1014.63	0.28	450.98	0.65	21%	
1831	2845	411.48	0.59	15	339	963.74	961.60	0.63	1996.11	2.87	21%	
2846	2850	463.40	0.67	30	5	956.76	956.76	0.00	2256.40	3.25	21%	

2243	2163	92.21	0.13	10	144	1014.63	1014.23	0.28	449.26	0.65	21%	
1203	208	129.76	0.19	12	172	970.24	969.88	0.21	633.13	0.91	20%	Interpolated
2427	2426	176.24	0.25	12	348	1071.50	1070.12	0.40	873.13	1.26	20%	
2426	2425	176.24	0.25	12	401	1069.67	1068.07	0.40	875.05	1.26	20%	
1379	1380	765.14	1.10	21	453	981.51	979.79	0.38	3800.00	5.47	20%	Interpolated
2237	2238	89.70	0.13	10	102	1018.22	1017.93	0.28	454.51	0.65	20%	
2236	2237	89.27	0.13	10	88	1018.47	1018.22	0.28	453.28	0.65	20%	
546	555	111.36	0.16	10	344	990.26	988.74	0.44	566.46	0.82	20%	
2420	2419	185.02	0.27	15	398	1061.57	1061.01	0.14	943.08	1.36	20%	
208	1202	142.42	0.21	12	79	969.78	969.56	0.28	731.26	1.05	19%	Interpolated
2425	2424	176.24	0.25	12	401	1067.97	1066.25	0.43	907.63	1.31	19%	
2941	1379	761.69	1.10	21	134	982.06	981.51	0.41	3952.12	5.69	19%	
1243	1242	727.38	1.05	21	402	990.02	988.42	0.40	3889.36	5.60	19%	
555	556	111.35	0.16	10	372	988.74	986.92	0.49	596.11	0.86	19%	
2234	2235	83.95	0.12	10	180	1019.12	1018.62	0.28	449.52	0.65	19%	
2232	2233	83.99	0.12	10	258	1020.54	1019.82	0.28	450.12	0.65	19%	
1241	1237	727.29	1.05	21	399	986.82	985.22	0.40	3901.22	5.62	19%	
2235	2236	83.24	0.12	10	54	1018.62	1018.47	0.28	447.78	0.64	19%	
1242	1241	727.34	1.05	21	397	988.42	986.82	0.40	3912.95	5.63	19%	
2233	2234	83.82	0.12	10	250	1019.82	1019.12	0.28	450.99	0.65	19%	
2230	2232	83.43	0.12	10	266	1021.28	1020.54	0.28	449.62	0.65	19%	
882	889	144.49	0.21	12	411	989.85	988.54	0.32	782.45	1.13	18%	
1809	1808	1175.68	1.69	15	31	953.67	951.69	6.47	6389.75	9.20	18%	
2418	2417	184.18	0.27	15	282	1059.61	1059.16	0.16	1004.59	1.45	18%	
2419	2430	181.18	0.26	15	390	1060.91	1060.30	0.16	993.92	1.43	18%	
139	228	101.78	0.15	12	296	971.38	970.90	0.16	558.41	0.80	18%	
1361	1362	31.66	0.05	8	380	967.43	966.91	0.14	173.81	0.25	18%	Interpolated
228	28	101.91	0.15	12	293	970.85	970.37	0.16	561.42	0.81	18%	
1380	1378	764.97	1.10	21	396	979.62	977.77	0.47	4214.36	6.07	18%	
1362	1363	31.54	0.05	8	380	966.91	966.39	0.14	173.90	0.25	18%	Interpolated
95	554	82.94	0.12	10	158	1021.13	1020.67	0.29	459.82	0.66	18%	
547	546	101.96	0.15	10	412	992.22	990.36	0.45	572.87	0.82	18%	
548	547	101.96	0.15	10	403	994.14	992.32	0.45	572.93	0.83	18%	
1068	1055	115.04	0.17	12	369	1003.45	1002.64	0.22	649.27	0.93	18%	Interpolated
1066	1067	115.05	0.17	12	300	1005.54	1004.88	0.22	649.56	0.94	18%	
1500	1501	424.07	0.61	15	356	1027.16	1023.91	0.91	2401.45	3.46	18%	
554	553	82.94	0.12	10	306	1020.57	1019.64	0.30	470.19	0.68	18%	
1141	1510	206.85	0.30	15	259	1029.99	1029.42	0.22	1178.85	1.70	18%	Interpolated
2837	2838	967.93	1.39	24	128	954.71	954.18	0.41	5657.18	8.15	17%	
Jun-346	1797	883.39	1.27	16	14	954.50	954.08	3.00	5169.61	7.44	17%	Sanitary Siphon under River
513	512	463.27	0.67	24	250	956.21	955.97	0.10	2725.92	3.93	17%	
86	87	85.35	0.12	10	143	988.60	988.10	0.35	503.99	0.73	17%	
1511	1141	207.51	0.30	15	96	1030.22	1029.99	0.24	1227.76	1.77	17%	Interpolated
1268	1267	727.86	1.05	21	258	1013.24	1011.94	0.50	4377.50	6.30	17%	
2335	1411	48.98	0.07	8	48	983.13	982.94	0.39	295.37	0.43	17%	MinimumSlope
1411	1410	48.95	0.07	8	189	982.94	982.19	0.40	296.08	0.43	17%	MinimumSlope
1410	1409	49.16	0.07	8	367	982.19	980.72	0.40	297.69	0.43	17%	MinimumSlope
1409	1404	49.01	0.07	8	330	980.72	979.40	0.40	297.42	0.43	16%	MinimumSlope
2417	2416	177.23	0.26	15	249	1059.06	1058.60	0.18	1079.03	1.55	16%	
553	552	82.94	0.12	10	74	1019.54	1019.27	0.36	514.46	0.74	16%	
1043	1036	96.93	0.14	10	241	993.88	992.68	0.50	601.57	0.87	16%	
512	511	463.25	0.67	24	204	955.92	955.70	0.11	2892.44	4.17	16%	
Jun-327	Jun-331	523.50	0.75	24	140	941.50	941.30	0.14	3326.02	4.79	16%	Sanitary Siphon under River
Jun-330	Jun-334	523.50	0.75	24	140	941.50	941.30	0.14	3326.02	4.79	16%	Sanitary Siphon under River
2848	1375	52.39	0.08	12	303	972.47	972.29	0.06	337.83	0.49	16%	
552	551	82.94	0.12	10	229	1019.17	1018.26	0.40	537.22	0.77	15%	
888	882	130.65	0.19	12	411	991.54	990.00	0.37	848.30	1.22	15%	
2440	2442	300.52	0.43	27	76	964.19	964.21	-0.03	1951.34	2.81	15%	
614	85	18.65	0.03	8	120	989.51	989.43	0.07	121.17	0.17	15%	
1265	1244	727.46	1.05	21	425	1010.36	1007.81	0.60	4772.27	6.87	15%	
2468	2467	169.38	0.24	12	225	973.36	971.91	0.64	1111.61	1.60	15%	
85	86	85.36	0.12	10	143	989.24	988.60	0.45	569.57	0.82	15%	
2157	2156	916.99	1.32	18	82	971.72	969.80	2.34	6248.98	9.00	15%	
51	52	391.32	0.56	15	169	990.38	988.46	1.14	2680.13	3.86	15%	
2907	2893	176.26	0.25	15	407	967.06	966.12	0.23	1207.38	1.74	15%	SDR-35.Interpolated
529	534	939.55	1.35	18	16	957.67	958.08	-2.50	6462.58	9.31	15%	Interpolated
2156	2152	916.99	1.32	18	180	969.75	965.43	2.40	6325.69	9.11	14%	
616	2911	33.26	0.05	10	372	980.47	980.20	0.07	229.67	0.33	14%	
1418	1340	938.84	1.35	21	291	971.89	968.52	1.16	6631.66	9.55	14%	Interpolated
2909	2464	99.24	0.14	10	407	982.59	979.64	0.72	725.63	1.04	14%	
9149	2157	916.99	1.32	18	173	976.46	971.72	2.74	6760.74	9.74	14%	
363	1511	207.92	0.30	15	328	1031.54	1030.30	0.38	1543.87	2.22	13%	
2838	2756	967.90	1.39	24	97	954.16	954.83	-0.69	7331.28	10.56	13%	
1506	1507	700.74	1.01	21	299	1019.47	1017.21	0.76	5356.13	7.71	13%	
Jun-343	Jun-345	964.72	1.39	12	30	946.00	954.50	-28.33	7376.93	10.62	13%	Sanitary Siphon under River
2194	2195	84.67	0.12	12	500	986.34	985.24	0.22	649.96	0.94	13%	MinimumSlope
19511	9106	93.94	0.14	15	409	996.20	995.86	0.08	724.79	1.04	13%	
2192	2193	84.00	0.12	12	341	987.72	986.97	0.22	649.68	0.94	13%	MinimumSlope
2193	2194	84.14	0.12	12	285	986.97	986.34	0.22	651.03	0.94	13%	MinimumSlope
2191	2192	80.68	0.12	12	243	988.25	987.72	0.22	647.82	0.93	12%	MinimumSlope
444	2414	101.07	0.15	15	104	1033.53	1033.42	0.11	816.82	1.18	12%	
1426	1425	49.05	0.07	8	350	987.99	985.47	0.72	398.74	0.57	12%	Interpolated
1425	2335	48.97	0.07	8	325	985.47	983.13	0.72	398.74	0.57	12%	Interpolated
1610	9078	64.97	0.09	10	15	987.58	987.52	0.39	531.46	0.77	12%	
1067	1068	115.05	0.17	12	299	1004.83	1003.45	0.46	941.43	1.36	12%	
1603	1594	55.87	0.08	8	404	982.27	978.23	1.00	470.11	0.68	12%	Interpolated
1594	1593	55.84	0.08	8	407	978.23	974.16	1.00	470.10	0.68	12%	Interpolated
1593	1585	55.82	0.08	8	415	974.16	970.01	1.00	470.00	0.68	12%	Interpolated
2850	513	463.38	0.67	24	249	956.76	956.27	0.20	3902.56	5.62	12%	
1585	1576	55.80	0.08	8	412	970.01	965.89	1.00	470.17	0.68	12%	Interpolated
1576	2450	55.78	0.08	8	179	965.89	964.10	1.00	470.11	0.68	12%	Interpolated
1507	391	700.73	1.01	21	256	1017.13	1014.78	0.92	5910.39	8.51	12%	
2190	2191	77.06	0.11	12	350	989.02	988.25	0.22	650.04	0.94	12%	MinimumSlope
1375	1369	52.37	0.08	12	246	972.24	971.99	0.10	441.97	0.64	12%	
623	1603	55.92	0.08	8	407	986.47	982.27	1.03	477.73	0.69	12%	Interpolated
1369	1368	52.35	0.08	12	85	971.94	971.85	0.11	451.92	0.65	12%	

2195	1070	74.81	0.11	12	381	985.24	984.40	0.22	650.38	0.94	12%	MinimumSlope
2189	2190	73.96	0.11	12	455	990.02	989.02	0.22	649.50	0.94	11%	MinimumSlope
Jun-336	1803	438.06	0.63	18	20	952.50	952.32	0.90	3876.37	5.58	11%	Sanitary Siphon under River
Jun-337	1803	438.06	0.63	18	20	952.50	952.32	0.90	3876.37	5.58	11%	Sanitary Siphon under River
675	9091	32.91	0.05	8	232	1067.20	1066.30	0.39	293.00	0.42	11%	
527	2832	968.77	1.40	24	68	957.05	956.40	0.96	8627.65	12.42	11%	
549	548	101.96	0.15	10	301	997.66	994.24	1.14	908.15	1.31	11%	
654	730	27.40	0.04	8	214	996.09	995.50	0.28	246.93	0.36	11%	
1510	1509	206.85	0.30	15	334	1029.34	1027.48	0.56	1874.23	2.70	11%	
535	534	1371.91	1.98	30	41	958.33	958.08	0.62	12521.63	18.03	11%	
538	537	1372.25	1.98	30	46	958.82	958.53	0.63	12665.61	18.24	11%	
2467	2395	176.54	0.25	15	406	971.68	969.95	0.43	1639.88	2.36	11%	
1354	1353	51.39	0.07	12	377	966.56	966.11	0.12	479.03	0.69	11%	Interpolated
1355	1354	51.65	0.07	12	395	967.04	966.56	0.12	483.26	0.70	11%	Interpolated
1364	1358	31.64	0.05	8	288	970.75	969.60	0.40	296.81	0.43	11%	MinimumSlope
1359	1360	31.68	0.05	8	120	968.91	968.43	0.40	297.23	0.43	11%	MinimumSlope
1611	944	64.71	0.09	12	411	986.05	985.26	0.19	607.40	0.87	11%	
1358	1359	31.60	0.05	8	173	969.60	968.91	0.40	296.84	0.43	11%	MinimumSlope
138	139	101.77	0.15	12	351	973.22	971.55	0.48	956.28	1.38	11%	
1365	1364	31.67	0.05	8	301	971.96	970.75	0.40	297.85	0.43	11%	MinimumSlope
1360	1361	31.56	0.05	8	250	968.43	967.43	0.40	297.20	0.43	11%	MinimumSlope
1841	1831	411.84	0.59	15	394	973.32	963.74	2.43	3920.65	5.65	11%	
550	549	101.96	0.15	10	190	1000.24	997.76	1.30	973.34	1.40	10%	
1024	1025	47.04	0.07	10	400	1002.01	1000.89	0.28	450.85	0.65	10%	
1023	1024	47.06	0.07	10	399	1003.23	1002.11	0.28	451.45	0.65	10%	
1025	1026	47.03	0.07	10	300	1000.79	999.94	0.28	453.52	0.65	10%	
1022	1023	47.07	0.07	10	394	1004.45	1003.33	0.28	454.45	0.65	10%	
1246	1247	727.41	1.05	21	403	1002.33	997.05	1.31	7057.30	10.16	10%	
128	129	30.41	0.04	8	148	1011.91	1011.32	0.40	297.29	0.43	10%	
130	80	30.41	0.04	8	454	1007.13	1005.31	0.40	297.47	0.43	10%	
80	81	30.41	0.04	8	443	1005.31	1003.52	0.40	298.86	0.43	10%	
556	557	111.35	0.16	10	366	986.82	980.69	1.68	1103.34	1.59	10%	
1244	1246	727.44	1.05	21	383	1007.71	1002.43	1.38	7239.63	10.43	10%	
966	967	46.00	0.07	12	273	1070.24	1069.94	0.11	459.47	0.66	10%	
944	1915	64.62	0.09	12	415	985.26	984.36	0.22	645.63	0.93	10%	
131	1022	44.47	0.06	10	388	1005.63	1004.55	0.28	449.56	0.65	10%	
297	131	44.47	0.06	10	154	1006.16	1005.73	0.28	451.08	0.65	10%	
2892	Jun-320	197.52	0.28	18	108	966.06	965.80	0.24	2004.37	2.89	10%	Interpolated
Jun-339	Jun-341	964.72	1.39	12	20	956.10	946.00	50.50	9848.56	14.18	10%	Sanitary Siphon under River
959	960	39.89	0.06	12	326	1073.14	1072.85	0.09	413.31	0.60	10%	
1247	1243	727.39	1.05	21	394	996.95	990.79	1.56	7707.03	11.10	9%	
1070	1071	81.92	0.12	12	215	984.40	983.54	0.40	877.49	1.26	9%	
3012	1629	27.64	0.04	8	217	995.09	994.23	0.40	296.22	0.43	9%	trouble line
1630	3012	27.64	0.04	8	209	995.93	995.09	0.40	297.77	0.43	9%	trouble line
1629	1043	27.63	0.04	8	87	994.23	993.88	0.40	297.89	0.43	9%	
1368	1370	52.33	0.08	12	378	971.85	971.22	0.17	565.96	0.81	9%	
2470	2469	150.58	0.22	12	285	977.41	973.47	1.38	1629.92	2.35	9%	
1628	3013	27.37	0.04	8	168	995.31	994.64	0.40	296.92	0.43	9%	
3013	1043	27.36	0.04	8	190	994.64	993.88	0.40	296.98	0.43	9%	
2839	2840	462.94	0.67	30	139	955.01	954.87	0.10	5057.39	7.28	9%	
534	533	432.34	0.62	30	160	958.08	957.94	0.09	4726.69	6.81	9%	
2893	2892	176.19	0.25	18	27	966.12	966.06	0.22	1929.40	2.78	9%	SDR-35.Interpolated
1917	2463	64.52	0.09	12	406	982.71	981.64	0.26	711.49	1.02	9%	
2430	2418	183.73	0.26	15	88	1060.30	1059.71	0.67	2054.11	2.96	9%	
1071	1072	81.92	0.12	12	31	983.44	983.30	0.45	929.40	1.34	9%	
542	541	1364.58	1.96	30	41	959.87	959.48	0.94	15500.74	22.32	9%	
1052	2409	196.97	0.28	12	109	1049.13	1046.27	2.63	2248.51	3.24	9%	
410	411	30.79	0.04	10	298	1012.62	1012.10	0.17	356.21	0.51	9%	
409	410	30.93	0.04	10	383	1013.40	1012.72	0.18	359.28	0.52	9%	
Jun-322	Jun-324	438.06	0.63	18	64	954.50	953.50	1.56	5107.56	7.35	9%	Sanitary Siphon under River
Jun-322	Jun-325	438.06	0.63	18	64	954.50	953.50	1.56	5107.56	7.35	9%	Sanitary Siphon under River
1816	9133	111.51	0.16	10	279	971.04	964.45	2.37	1310.82	1.89	9%	
621	619	33.37	0.05	10	410	982.48	981.62	0.21	394.93	0.57	8%	
1288	1287	20.58	0.03	8	218	968.35	967.75	0.28	246.61	0.36	8%	
2086	658	55.42	0.08	8	186	1063.36	1059.64	2.00	664.78	0.96	8%	
2083	2086	55.42	0.08	8	186	1067.08	1063.36	2.00	664.80	0.96	8%	
Jun-207	2907	176.43	0.25	15	369	969.68	967.06	0.71	2117.14	3.05	8%	SDR-35
1610	1611	64.88	0.09	12	479	987.58	986.05	0.32	783.32	1.13	8%	
2293	788	20.92	0.03	8	103	1040.24	1039.93	0.30	257.79	0.37	8%	Interpolated
2001	2158	110.58	0.16	18	27	978.03	978.00	0.11	1363.79	1.96	8%	
2409	2408	196.97	0.28	12	314	1046.27	1036.54	3.10	2439.79	3.51	8%	
2408	2407	196.96	0.28	12	324	1036.54	1026.51	3.10	2440.25	3.51	8%	
703	702	50.87	0.07	10	338	1037.21	1035.35	0.55	632.35	0.91	8%	
702	444	50.66	0.07	10	333	1035.35	1033.53	0.55	630.07	0.91	8%	
1308	1307	37.07	0.05	12	18	965.76	965.72	0.22	463.12	0.67	8%	
411	412	30.74	0.04	10	274	1012.00	1011.44	0.20	385.58	0.56	8%	
705	704	50.82	0.07	10	310	1040.62	1038.88	0.56	638.42	0.92	8%	
704	703	50.87	0.07	10	297	1038.88	1037.21	0.56	639.29	0.92	8%	
1357	1356	51.76	0.07	12	355	970.25	969.44	0.23	662.06	0.95	8%	
1137	2830	280.99	0.40	12	195	999.02	985.74	6.81	3616.39	5.21	8%	
2911	2466	33.24	0.05	10	45	980.20	980.08	0.27	442.03	0.64	8%	
2442	2443	306.47	0.44	27	129	964.08	963.93	0.12	4108.48	5.92	7%	
624	620	33.41	0.05	10	411	985.07	983.92	0.28	450.95	0.65	7%	
623	624	33.47	0.05	10	498	986.47	985.07	0.28	452.02	0.65	7%	
619	616	33.33	0.05	10	411	981.62	980.47	0.28	450.90	0.65	7%	
620	2342	33.38	0.05	10	264	983.92	983.18	0.28	451.62	0.65	7%	Interpolated
1915	1917	64.56	0.09	12	414	984.36	982.71	0.40	875.20	1.26	7%	
2439	2440	301.15	0.43	27	389	964.66	964.21	0.12	4095.70	5.90	7%	
963	966	46.01	0.07	12	353	1071.28	1070.55	0.21	630.05	0.91	7%	
1132	2914	119.51	0.17	8	359	1023.00	979.41	12.13	1637.18	2.36	7%	
626	409	30.92	0.04	10	449	1015.36	1014.25	0.25	423.94	0.61	7%	
2759	2438	302.38	0.44	27	75	964.72	964.63	0.12	4172.94	6.01	7%	
612	613	18.65	0.03	8	166	990.50	990.00	0.30	257.96	0.37	7%	
2438	2439	302.12	0.44	27	82	964.78	964.68	0.12	4200.61	6.05	7%	
613	614	18.65	0.03	8	95	989.90	989.61	0.31	260.29	0.37	7%	
2416	2415	176.24	0.25	15	402	1058.50	1054.59	0.97	2477.57	3.57	7%	

295	296	20.92	0.03	8	270	1019.70	1018.63	0.40	296.07	0.43	7%	
1429	1428	49.03	0.07	8	342	1010.74	1003.23	2.20	697.07	1.00	7%	Interpolated
1464	1463	49.01	0.07	8	259	1027.43	1021.73	2.20	696.91	1.00	7%	Interpolated
1463	1430	49.01	0.07	8	246	1021.73	1016.31	2.20	697.04	1.00	7%	Interpolated
1428	1427	48.98	0.07	8	348	1003.23	995.57	2.20	697.06	1.00	7%	Interpolated
1430	1429	49.02	0.07	8	253	1016.31	1010.74	2.20	697.75	1.00	7%	Interpolated
117	1426	48.96	0.07	8	221	992.86	987.99	2.20	697.34	1.00	7%	Interpolated
1427	117	48.98	0.07	8	123	995.57	992.86	2.21	698.12	1.01	7%	Interpolated
2463	2464	64.46	0.09	12	418	981.64	979.80	0.44	919.67	1.32	7%	
789	2293	20.92	0.03	8	82	1040.57	1040.24	0.40	298.89	0.43	7%	
1370	1357	52.17	0.08	12	335	971.22	970.25	0.29	746.22	1.07	7%	Interpolated
798	627	30.93	0.04	10	284	1017.18	1016.39	0.28	449.70	0.65	7%	
Jun-10	1021	20.92	0.03	8	12	1015.70	1015.65	0.42	305.08	0.44	7%	Interpolated
627	626	30.93	0.04	10	280	1016.29	1015.46	0.30	463.81	0.67	7%	
533	532	432.32	0.62	30	207	957.94	957.59	0.17	6559.58	9.45	7%	
1981	2401	29.64	0.04	10	246	987.13	986.44	0.28	451.00	0.65	7%	
960	963	46.03	0.07	12	352	1072.29	1071.38	0.26	704.48	1.01	7%	
551	550	101.96	0.15	10	465	1018.16	1002.41	3.38	1568.00	2.26	7%	
786	789	20.92	0.03	8	305	1042.00	1040.57	0.47	321.81	0.46	7%	
129	130	30.41	0.04	8	422	1011.32	1007.13	0.99	468.44	0.67	6%	
2023	2024	46.00	0.07	12	229	1068.28	1067.64	0.28	732.14	1.05	6%	
Jun-335	1803	523.50	0.75	24	20	952.50	952.32	0.90	8348.24	12.02	6%	Sanitary Siphon under River
Jun-338	1803	523.50	0.75	24	20	952.50	952.32	0.90	8348.24	12.02	6%	Sanitary Siphon under River
282	126	30.41	0.04	8	198	1027.01	1024.83	1.10	492.69	0.71	6%	
2756	2746	967.90	1.39	24	27	954.77	953.90	3.20	15743.76	22.67	6%	Sanitary Siphon under River
2088	2090	60.37	0.09	8	179	1041.49	1033.62	4.40	985.68	1.42	6%	
2090	1132	60.37	0.09	8	241	1033.62	1023.00	4.40	986.05	1.42	6%	
2087	2088	60.37	0.09	8	201	1050.35	1041.49	4.40	986.16	1.42	6%	
706	705	50.57	0.07	10	104	1041.60	1040.62	0.94	827.32	1.19	6%	
2849	2839	463.21	0.67	30	272	955.65	955.03	0.23	7617.49	10.97	6%	
658	2087	60.37	0.09	8	205	1059.64	1050.35	4.53	1000.06	1.44	6%	
290	292	20.92	0.03	8	285	1028.30	1026.75	0.54	346.89	0.50	6%	
776	775	16.81	0.02	8	202	1035.08	1034.37	0.35	278.84	0.40	6%	
992	958	39.92	0.06	12	280	1074.78	1074.10	0.24	662.33	0.95	6%	
824	1692	17.76	0.03	8	293	1015.02	1013.85	0.40	296.80	0.43	6%	
1658	1645	17.75	0.03	8	288	1007.51	1006.36	0.40	296.93	0.43	6%	
1666	1667	17.73	0.03	8	373	1012.87	1011.38	0.40	297.24	0.43	6%	
1645	1636	17.73	0.03	8	383	1006.36	1004.83	0.40	297.27	0.43	6%	
1692	1666	17.74	0.03	8	244	1013.85	1012.87	0.40	297.64	0.43	6%	ROOT CUT 07
1636	728	17.71	0.03	8	299	1004.83	1003.63	0.40	297.59	0.43	6%	
2027	1816	111.54	0.16	10	146	978.50	971.04	5.12	1927.63	2.78	6%	
532	2382	439.65	0.63	24	36	957.59	957.32	0.76	7672.18	11.05	6%	
2342	621	33.37	0.05	10	145	983.18	982.50	0.47	584.05	0.84	6%	
1313	1308	37.08	0.05	12	374	966.58	965.76	0.22	649.16	0.93	6%	
967	2023	46.00	0.07	12	193	1069.84	1069.18	0.34	811.47	1.17	6%	
420	421	1.94	0.00	8	19	1062.61	1062.61	0.00	34.36	0.05	6%	
1648	776	16.81	0.02	8	177	1035.79	1035.08	0.40	297.85	0.43	6%	
2757	2746	198.47	0.29	24	346	954.56	953.99	0.16	3571.48	5.14	6%	Sanitary Siphon under River
Jun-344	Jun-346	883.39	1.27	16	29	946.00	954.50	-29.22	16133.72	23.23	5%	Sanitary Siphon under River
2758	2759	188.74	0.27	21	146	965.29	964.83	0.32	3465.22	4.99	5%	
453	503	50.51	0.07	12	21	1011.30	1011.20	0.47	945.83	1.36	5%	
574	2015	23.09	0.03	10	343	981.52	980.60	0.27	441.60	0.64	5%	
1289	1288	20.58	0.03	8	228	969.95	968.35	0.70	393.76	0.57	5%	
1876	1877	198.14	0.29	24	424	959.73	958.93	0.19	3824.29	5.51	5%	
1825	2757	198.20	0.29	24	273	955.08	954.56	0.19	3840.41	5.53	5%	
1877	1878	198.14	0.29	24	335	958.88	958.24	0.19	3848.47	5.54	5%	
958	959	39.92	0.06	12	316	1074.14	1073.14	0.32	779.15	1.12	5%	
224	225	14.78	0.02	8	34	946.18	946.05	0.38	290.32	0.42	5%	
1878	1879	198.11	0.29	24	408	958.19	957.39	0.20	3895.48	5.61	5%	
1509	1506	206.85	0.30	15	298	1027.40	1019.56	2.63	4077.22	5.87	5%	
1882	1884	198.29	0.29	24	429	956.53	955.67	0.20	3939.29	5.67	5%	
1938	1939	197.47	0.28	24	321	962.12	961.48	0.20	3926.76	5.65	5%	
1939	1875	197.45	0.28	24	170	961.43	961.09	0.20	3935.98	5.67	5%	
1875	1874	197.46	0.28	24	324	961.04	960.39	0.20	3939.76	5.67	5%	
1879	1882	198.10	0.29	24	376	957.34	956.58	0.20	3956.80	5.70	5%	
1884	1825	198.28	0.29	24	279	955.67	955.08	0.21	4043.55	5.82	5%	
9091	674	32.91	0.05	8	83	1066.30	1064.60	2.05	672.40	0.97	5%	
292	294	20.92	0.03	8	288	1026.75	1024.35	0.83	429.43	0.62	5%	
1307	1303	42.92	0.06	12	523	965.74	963.59	0.41	888.43	1.28	5%	Interpolated
1303	2446	42.91	0.06	12	207	963.59	962.74	0.41	889.00	1.28	5%	Interpolated
1220	2848	13.82	0.02	8	472	974.36	972.57	0.38	289.59	0.42	5%	Interpolated
2928	2929	14.16	0.02	8	393	1064.07	1062.50	0.40	297.13	0.43	5%	
Jun-322	Jun-323	523.50	0.75	24	64	954.50	953.50	1.56	10999.77	15.84	5%	Sanitary Siphon under River
Jun-322	Jun-326	523.50	0.75	24	64	954.50	953.50	1.56	10999.77	15.84	5%	Sanitary Siphon under River
1026	87	47.03	0.07	10	298	992.01	988.00	1.35	989.36	1.42	5%	
1021	297	20.92	0.03	10	52	1006.40	1006.26	0.27	443.72	0.64	5%	
1221	1222	14.01	0.02	8	428	979.99	978.28	0.40	297.25	0.43	5%	Interpolated
1236	1221	13.99	0.02	8	320	981.27	979.99	0.40	297.12	0.43	5%	Interpolated
281	282	30.41	0.04	8	199	1030.80	1027.01	1.90	648.23	0.93	5%	
1222	1218	13.96	0.02	8	407	978.28	976.65	0.40	297.63	0.43	5%	Interpolated
2928	1051	13.95	0.02	8	154	1064.07	1063.45	0.40	297.84	0.43	5%	
2306	1220	13.93	0.02	8	195	975.14	974.36	0.40	297.66	0.43	5%	Interpolated
1219	2306	13.85	0.02	8	98	975.53	975.14	0.40	296.06	0.43	5%	
2774	9104	21.54	0.03	10	161	993.37	992.90	0.29	461.20	0.66	5%	
1218	1219	13.90	0.02	8	279	976.65	975.53	0.40	297.67	0.43	5%	Interpolated
316	1236	13.82	0.02	8	128	981.78	981.27	0.40	296.45	0.43	5%	Interpolated
1874	1876	198.20	0.29	24	261	960.34	959.73	0.23	4252.90	6.12	5%	
672	671	32.91	0.05	8	55	1054.90	1053.59	2.39	726.11	1.05	5%	Interpolated
673	672	32.91	0.05	8	311	1062.34	1054.90	2.39	726.76	1.05	5%	Interpolated
671	670	32.91	0.05	8	54	1053.59	1052.31	2.39	726.80	1.05	5%	Interpolated
674	673	32.91	0.05	8	94	1064.60	1062.34	2.40	728.27	1.05	5%	Interpolated
310	309	13.73	0.02	8	24	981.62	981.52	0.42	304.82	0.44	5%	
66	1515	19.40	0.03	12	305	959.91	959.61	0.10	434.31	0.63	4%	
663	662	32.91	0.05	8	133	971.44	967.91	2.65	764.99	1.10	4%	
174	175	36.38	0.05	12	204	991.37	990.57	0.39	868.45	1.25	4%	
Jun-340	Jun-342	883.39	1.27	16	20	956.10	946.00	50.50	21210.09	30.54	4%	Sanitary Siphon under River

176	177	37.51	0.05	12	118	989.77	989.27	0.42	902.55	1.30	4%	
1384	1317	18.76	0.03	10	470	972.85	971.53	0.28	451.83	0.65	4%	Interpolated
173	174	36.38	0.05	12	155	992.02	991.37	0.42	896.11	1.29	4%	
2487	2846	458.90	0.66	30	83	957.22	956.80	0.50	11326.56	16.31	4%	
175	176	36.38	0.05	12	189	990.57	989.77	0.42	902.42	1.30	4%	
2831	2746	794.16	1.14	33	83	954.69	953.90	0.96	20105.52	28.95	4%	
99	67	14.05	0.02	10	170	960.92	960.62	0.18	357.68	0.52	4%	
1940	1938	197.49	0.28	24	182	962.79	962.17	0.34	5132.16	7.39	4%	
1356	1355	51.74	0.07	12	247	969.39	967.04	0.95	1350.79	1.95	4%	
Jun-324	Jun-328	438.06	0.63	18	140	953.50	941.50	8.57	11962.73	17.23	4%	Sanitary Siphon under River
Jun-325	Jun-329	438.06	0.63	18	140	953.50	941.50	8.57	11962.73	17.23	4%	Sanitary Siphon under River
1517	1520	19.41	0.03	12	303	958.81	958.36	0.15	533.66	0.77	4%	
296	Jun-10	20.92	0.03	8	192	1018.63	1015.70	1.53	580.55	0.84	4%	Interpolated
727	654	17.71	0.03	8	200	998.40	996.19	1.10	493.97	0.71	4%	
2465	2464	34.12	0.05	15	166	979.89	979.64	0.15	974.35	1.40	4%	
666	665	32.91	0.05	8	191	1001.37	993.61	4.07	947.82	1.36	3%	Interpolated
664	663	32.91	0.05	8	294	983.40	971.44	4.07	948.27	1.37	3%	Interpolated
9181	1077	9.33	0.01	8	12	988.75	988.71	0.33	270.60	0.39	3%	
2782	171	25.81	0.04	12	84	997.37	997.12	0.30	754.98	1.09	3%	Interpolated
171	172	25.81	0.04	12	451	997.12	995.77	0.30	758.07	1.09	3%	Interpolated
9015	9016	14.16	0.02	8	330	1059.90	1057.26	0.80	420.12	0.60	3%	
2415	2414	176.24	0.25	15	401	1054.55	1036.83	4.42	5283.63	7.61	3%	
994	993	22.58	0.03	12	168	1075.67	1075.27	0.24	677.21	0.98	3%	
289	290	20.92	0.03	8	337	1034.80	1028.75	1.79	629.47	0.91	3%	
1667	1658	17.72	0.03	8	297	1011.38	1007.51	1.30	536.82	0.77	3%	
1634	654	9.78	0.01	8	444	997.86	996.09	0.40	296.87	0.43	3%	
861	862	9.46	0.01	8	331	973.01	971.76	0.38	288.76	0.42	3%	
362	363	206.85	0.30	15	76	1036.62	1031.79	6.34	6326.30	9.11	3%	
219	220	9.45	0.01	8	247	950.28	949.34	0.38	290.09	0.42	3%	
67	66	14.04	0.02	10	270	960.62	959.91	0.26	436.71	0.63	3%	
221	223	9.45	0.01	8	362	949.20	947.78	0.39	294.40	0.42	3%	
1634	1633	7.10	0.01	8	426	997.86	996.91	0.22	222.11	0.32	3%	
220	221	9.44	0.01	8	35	949.34	949.20	0.40	296.11	0.43	3%	
223	224	9.43	0.01	8	402	947.78	946.18	0.40	296.69	0.43	3%	
294	295	20.92	0.03	8	205	1024.24	1020.20	1.97	659.19	0.95	3%	
995	994	22.58	0.03	12	387	1076.70	1075.67	0.27	714.82	1.03	3%	
747	746	34.94	0.05	8	374	1109.35	1088.45	5.58	1110.82	1.60	3%	
1633	1630	7.08	0.01	8	426	996.91	995.93	0.23	225.36	0.32	3%	
4	1	9.50	0.01	8	96	969.90	969.50	0.41	302.71	0.44	3%	
1520	1550	19.40	0.03	12	354	958.36	957.65	0.20	620.51	0.89	3%	Interpolated
665	664	32.91	0.05	8	201	993.61	983.40	5.07	1058.49	1.52	3%	Interpolated
9016	2097	14.16	0.02	10	38	1057.16	1057.05	0.29	456.21	0.66	3%	
Jun-320	1936	197.52	0.28	24	178	965.80	964.86	0.53	6398.76	9.21	3%	
753	747	34.94	0.05	8	356	1130.48	1109.48	5.90	1141.88	1.64	3%	
183	184	25.81	0.04	12	428	1002.17	1000.57	0.37	847.65	1.22	3%	
1936	1937	197.50	0.28	24	305	964.86	963.18	0.55	6525.85	9.40	3%	
662	661	32.91	0.05	8	165	967.91	959.04	5.37	1089.46	1.57	3%	Interpolated
1937	1940	197.49	0.28	24	70	963.18	962.79	0.55	6547.81	9.43	3%	
2429	183	25.81	0.04	12	402	1003.77	1002.17	0.40	874.39	1.26	3%	
762	211	13.30	0.02	12	113	971.96	971.84	0.11	451.25	0.65	3%	Interpolated
2025	9143	67.00	0.10	10	90	1055.08	1048.64	7.12	2274.13	3.27	3%	
788	289	20.92	0.03	8	216	1039.83	1034.80	2.33	718.04	1.03	3%	
2393	2909	8.70	0.01	10	413	983.10	982.59	0.12	299.33	0.43	3%	
126	127	30.41	0.04	8	102	1024.56	1019.51	4.96	1046.68	1.51	3%	
1039	1038	9.79	0.01	8	240	997.65	996.41	0.52	337.90	0.49	3%	
127	128	30.41	0.04	8	148	1019.51	1011.91	5.13	1064.68	1.53	3%	
1817	2027	67.00	0.10	10	198	993.51	978.50	7.59	2348.12	3.38	3%	
211	212	13.09	0.02	12	397	971.84	971.40	0.11	461.65	0.66	3%	
333	334	7.21	0.01	8	398	1006.23	1004.98	0.31	263.32	0.38	3%	
1515	1517	19.40	0.03	12	303	959.61	958.81	0.26	711.93	1.03	3%	
2254	4	7.54	0.01	8	207	970.73	970.00	0.35	279.06	0.40	3%	Interpolated
184	170	25.81	0.04	12	333	1000.57	998.97	0.48	960.19	1.38	3%	
1037	1036	9.79	0.01	8	264	994.32	992.73	0.60	364.46	0.52	3%	
49	50	391.32	0.56	15	52	1008.52	990.78	34.40	14737.77	21.22	3%	
2062	420	22.75	0.03	8	383	1075.64	1062.61	3.40	866.87	1.25	3%	
2063	2062	22.75	0.03	8	21	1076.37	1075.64	3.40	867.16	1.25	3%	
1319	1313	26.43	0.04	12	291	968.11	966.56	0.53	1011.09	1.46	3%	
466	456	14.48	0.02	12	374	1013.60	1012.93	0.18	555.21	0.80	3%	
746	2063	22.75	0.03	8	350	1088.45	1076.37	3.45	872.80	1.26	3%	
1353	2758	303.60	0.44	27	53	966.11	965.60	0.96	11782.04	16.97	3%	
9143	2026	67.00	0.10	10	219	1048.64	1027.72	9.53	2631.54	3.79	3%	
2026	1817	67.00	0.10	10	341	1027.72	993.51	10.03	2699.14	3.89	2%	
2401	2469	20.93	0.03	8	403	986.44	973.47	3.22	843.18	1.21	2%	
1108	333	7.22	0.01	8	120	1006.70	1006.24	0.38	291.25	0.42	2%	
335	328	7.21	0.01	8	404	1000.32	998.72	0.40	295.76	0.43	2%	
746	2064	12.19	0.02	8	76	1088.45	1087.59	1.14	501.61	0.72	2%	
170	2782	25.81	0.04	12	272	998.97	997.37	0.59	1063.02	1.53	2%	
1051	2807	13.95	0.02	8	221	1063.45	1060.14	1.50	574.75	0.83	2%	
455	454	14.48	0.02	12	146	1012.13	1011.86	0.19	596.96	0.86	2%	
334	335	7.21	0.01	8	399	1004.98	1003.38	0.40	297.51	0.43	2%	
1318	1319	26.43	0.04	12	302	970.12	968.21	0.63	1102.84	1.59	2%	
1640	879	7.10	0.01	8	181	999.91	999.19	0.40	296.40	0.43	2%	
993	992	22.58	0.03	12	84	1075.17	1074.78	0.46	943.98	1.36	2%	
1038	1037	9.79	0.01	8	249	996.31	994.42	0.76	409.84	0.59	2%	
879	1631	7.10	0.01	8	404	999.19	997.57	0.40	297.50	0.43	2%	
1652	1639	7.09	0.01	8	387	1002.24	1000.69	0.40	297.59	0.43	2%	
1631	1630	7.08	0.01	8	409	997.57	995.93	0.40	297.49	0.43	2%	ROOT CUT 08
1639	1640	7.09	0.01	8	194	1000.69	999.91	0.40	298.09	0.43	2%	ROOT CUT 08
456	455	14.48	0.02	12	380	1013.00	1012.23	0.20	623.56	0.90	2%	
180	181	16.60	0.02	12	234	1005.20	1004.56	0.27	724.88	1.04	2%	Interpolated
181	182	16.60	0.02	12	106	1004.56	1004.26	0.28	738.12	1.06	2%	Interpolated
728	727	17.71	0.03	8	180	1003.63	998.50	2.85	793.41	1.14	2%	
422	657	4.97	0.01	8	394	1061.93	1061.03	0.23	224.72	0.32	2%	
467	466	14.48	0.02	12	178	1014.10	1013.70	0.23	657.47	0.95	2%	
177	178	37.51	0.05	12	413	989.27	983.02	1.51	1704.62	2.45	2%	
668	667	32.91	0.05	8	112	1024.38	1012.95	10.24	1503.92	2.17	2%	Interpolated

1	2	9.48	0.01	10	222	969.40	968.78	0.28	450.40	0.65	2%	Sanitary Siphon under River
667	666	32.91	0.05	8	103	1012.95	1001.37	11.27	1578.33	2.27	2%	Interpolated
2024	2025	50.79	0.07	12	403	1067.64	1055.08	3.12	2446.12	3.52	2%	
1168	453	14.48	0.02	12	20	1011.45	1011.40	0.25	698.02	1.01	2%	
1317	1318	18.76	0.03	12	117	970.63	970.13	0.43	906.45	1.31	2%	
9200	9162	9.33	0.01	10	29	992.90	992.82	0.28	451.23	0.65	2%	
2851	2487	458.90	0.66	30	5	957.32	957.22	2.00	22563.96	32.49	2%	
Jun-323	Jun-327	523.50	0.75	24	140	953.50	941.50	8.57	25763.22	37.10	2%	Sanitary Siphon under River
Jun-326	Jun-330	523.50	0.75	24	140	953.50	941.50	8.57	25763.22	37.10	2%	Sanitary Siphon under River
9061	2057	20.81	0.03	8	31	1030.25	1028.70	4.98	1049.22	1.51	2%	
2775	9062	20.81	0.03	8	107	1000.92	995.59	5.00	1050.73	1.51	2%	
2058	9061	20.81	0.03	8	225	1041.52	1030.25	5.00	1050.94	1.51	2%	
9062	2002	20.81	0.03	8	192	995.59	985.97	5.00	1050.94	1.51	2%	
2056	2775	20.81	0.03	8	263	1014.09	1000.92	5.00	1051.02	1.51	2%	
2002	2001	20.81	0.03	8	159	985.97	978.03	5.00	1051.31	1.51	2%	
2061	2058	20.81	0.03	8	289	1055.99	1041.52	5.00	1051.31	1.51	2%	This needs field verification
2057	2056	20.81	0.03	8	292	1028.70	1014.09	5.00	1051.37	1.51	2%	
996	995	13.34	0.02	12	213	1077.31	1076.80	0.24	677.64	0.98	2%	
420	2061	20.81	0.03	8	130	1062.61	1055.99	5.10	1061.23	1.53	2%	
9072	2936	8.61	0.01	10	38	1010.78	1010.67	0.29	461.47	0.66	2%	
218	219	9.45	0.01	10	304	966.49	965.38	0.37	515.22	0.74	2%	
2064	2073	12.19	0.02	8	379	1087.59	1080.01	2.00	664.88	0.96	2%	
2073	2072	12.19	0.02	8	80	1080.01	1078.40	2.00	665.17	0.96	2%	
657	658	4.96	0.01	8	408	1061.03	1059.64	0.34	274.26	0.39	2%	
172	173	25.81	0.04	12	333	995.77	992.02	1.13	1470.62	2.12	2%	
Jun-351	218	9.48	0.01	10	124	967.00	966.49	0.41	546.58	0.79	2%	Sanitary Siphon under River
2398	2393	8.71	0.01	10	407	984.66	983.20	0.36	510.70	0.74	2%	
1273	1272	10.56	0.02	12	516	1006.71	1005.68	0.20	619.26	0.89	2%	
454	1168	14.48	0.02	12	71	1011.78	1011.50	0.40	872.78	1.26	2%	
143	1238	4.17	0.01	8	75	984.81	984.58	0.31	259.72	0.37	2%	
2401	2398	8.71	0.01	10	410	986.44	984.66	0.43	561.47	0.81	2%	
1008	1005	9.93	0.01	12	169	1091.89	1091.52	0.22	648.19	0.93	2%	
1006	1007	13.34	0.02	12	204	1090.42	1089.60	0.40	878.27	1.26	2%	
212	208	12.89	0.02	12	425	971.40	969.78	0.38	855.31	1.23	2%	Interpolated
9133	9132	111.51	0.16	12	33	964.45	954.94	28.58	7408.42	10.67	2%	
1075	1076	9.33	0.01	12	237	986.33	985.84	0.21	630.23	0.91	1%	
328	2771	12.07	0.02	8	257	998.72	990.84	3.06	822.63	1.18	1%	Interpolated
1074	1075	9.34	0.01	12	223	986.87	986.38	0.22	650.30	0.94	1%	
1069	1070	9.33	0.01	12	399	985.33	984.45	0.22	650.55	0.94	1%	
Jun-332	Jun-336	438.06	0.63	18	20	941.30	952.50	-56.00	30577.20	44.03	1%	Sanitary Siphon under River
Jun-333	Jun-337	438.06	0.63	18	20	941.30	952.50	-56.00	30577.20	44.03	1%	Sanitary Siphon under River
1005	1006	13.34	0.02	12	147	1091.19	1090.52	0.46	936.30	1.35	1%	
1073	1074	9.77	0.01	12	193	987.35	986.87	0.25	690.50	0.99	1%	Interpolated
1040	1039	9.79	0.01	8	172	1001.51	997.75	2.19	695.42	1.00	1%	
1988	1042	9.79	0.01	8	303	1032.27	1025.60	2.20	697.13	1.00	1%	
2916	2917	4.11	0.01	8	30	979.09	978.97	0.40	295.72	0.43	1%	
1076	1069	9.33	0.01	12	174	985.79	985.38	0.24	672.99	0.97	1%	
2072	2080	9.18	0.01	8	132	1078.40	1075.76	2.00	664.43	0.96	1%	
2080	2081	9.18	0.01	8	374	1075.76	1068.28	2.00	664.65	0.96	1%	
2081	2083	9.18	0.01	8	60	1068.28	1067.08	2.00	664.98	0.96	1%	
862	863	9.46	0.01	8	299	971.65	965.10	2.19	695.23	1.00	1%	
9085	2901	12.80	0.02	15	402	975.20	974.60	0.15	970.99	1.40	1%	
775	1634	16.81	0.02	8	380	1034.27	1006.00	7.44	1281.78	1.85	1%	
2158	9149	110.58	0.16	18	36	978.00	976.46	4.27	8440.55	12.15	1%	
670	669	32.91	0.05	8	40	1052.31	1039.50	32.07	2662.08	3.83	1%	Interpolated
834	539	3.52	0.01	8	174	959.75	959.08	0.38	291.60	0.42	1%	
179	180	10.56	0.02	12	130	1005.72	1005.20	0.40	875.00	1.26	1%	
2853	762	6.40	0.01	12	52	972.04	971.96	0.15	541.82	0.78	1%	
582	577	5.13	0.01	10	466	984.98	983.64	0.29	457.05	0.66	1%	
530	529	31.23	0.04	24	117	957.90	957.78	0.10	2813.51	4.05	1%	
669	668	32.91	0.05	8	35	1039.50	1024.38	42.66	3070.29	4.42	1%	Interpolated
1272	179	10.56	0.02	12	16	1005.64	1005.70	-0.38	992.77	1.43	1%	
2929	9015	14.16	0.02	8	31	1062.50	1059.90	8.35	1358.24	1.96	1%	
577	576	4.11	0.01	10	313	983.64	982.95	0.22	400.23	0.58	1%	
1081	2135	9.93	0.01	12	261	1095.89	1094.61	0.49	970.37	1.40	1%	
2072	2071	3.01	0.00	8	49	1078.40	1078.20	0.41	299.30	0.43	1%	Interpolated
207	209	6.47	0.01	12	408	974.92	974.04	0.22	643.69	0.93	1%	
576	575	4.11	0.01	10	283	982.85	982.19	0.23	411.39	0.59	1%	
206	207	6.47	0.01	12	396	975.80	974.92	0.22	653.25	0.94	1%	
2097	2096	12.06	0.02	8	202	1057.05	1043.31	6.80	1225.85	1.77	1%	
2095	2094	12.06	0.02	8	196	1029.60	1016.26	6.81	1226.65	1.77	1%	
2096	2095	12.06	0.02	8	201	1043.31	1029.60	6.81	1226.69	1.77	1%	
2094	1137	12.06	0.02	8	253	1016.26	999.02	6.81	1226.70	1.77	1%	
1565	1569	26.13	0.04	24	159	958.79	958.64	0.09	2705.05	3.90	1%	
Jun-218	2465	9.31	0.01	15	192	980.18	979.89	0.15	975.50	1.40	1%	
1007	998	13.34	0.02	12	95	1085.92	1085.02	0.95	1421.96	2.05	1%	
855	854	2.77	0.00	8	143	979.07	978.50	0.40	297.27	0.43	1%	
864	865	2.77	0.00	8	164	1010.07	1009.41	0.40	297.94	0.43	1%	
575	574	4.11	0.01	10	216	982.11	981.52	0.27	445.43	0.64	1%	
1041	1040	9.79	0.01	8	203	1012.17	1001.61	5.19	1071.20	1.54	1%	
421	422	1.94	0.00	8	324	1062.61	1061.93	0.21	215.31	0.31	1%	
209	210	6.46	0.01	12	318	974.04	973.16	0.28	728.52	1.05	1%	
580	582	4.11	0.01	10	276	985.92	985.08	0.30	470.60	0.68	1%	
858	857	2.77	0.00	8	329	986.70	985.14	0.47	323.47	0.47	1%	
1569	1570	23.87	0.03	24	174	958.64	958.46	0.10	2833.74	4.08	1%	
1015	4	2.43	0.00	8	313	971.23	970.00	0.39	294.60	0.42	1%	
1042	1041	9.79	0.01	8	205	1025.60	1012.32	6.48	1196.65	1.72	1%	
1014	1015	2.43	0.00	8	223	972.22	971.33	0.40	297.17	0.43	1%	
953	864	2.77	0.00	8	77	1010.57	1010.17	0.52	339.41	0.49	1%	Interpolated
1013	1014	2.43	0.00	8	214	973.18	972.32	0.40	297.80	0.43	1%	
Jun-331	Jun-335	523.50	0.75	24	20	941.30	952.50	-56.00	65851.80	94.83	1%	Sanitary Siphon under River
Jun-334	Jun-338	523.50	0.75	24	20	941.30	952.50	-56.00	65851.80	94.83	1%	Sanitary Siphon under River
210	2853	6.56	0.01	12	307	973.16	972.04	0.36	836.43	1.20	1%	
1570	1892	30.75	0.04	24	194	958.46	958.02	0.23	4190.39	6.03	1%	
1892	530	30.55	0.04	24	52	958.02	957.90	0.23	4246.12	6.11	1%	
2097	2109	2.10	0.00	8	83	1057.05	1056.72	0.40	296.97	0.43	1%	

2109	2108	2.10	0.00	8	282	1025.82	1024.69	0.40	297.64	0.43	1%	
182	2429	16.60	0.02	12	15	1004.26	1003.77	3.36	2538.92	3.66	1%	
1077	1073	9.33	0.01	12	118	988.71	987.35	1.16	1490.43	2.15	1%	Interpolated
1790	2177	11.95	0.02	12	33	962.70	961.99	2.15	2029.75	2.92	1%	
998	997	13.34	0.02	12	101	1085.02	1082.21	2.79	2316.69	3.34	1%	
651	Jun-53	7.76	0.01	12	38	996.56	996.20	0.95	1348.39	1.94	1%	Interpolated
1566	1565	24.33	0.04	24	46	958.90	958.72	0.39	4291.55	6.18	1%	
1547	1548	2.20	0.00	10	222	959.34	958.72	0.28	450.29	0.65	0%	Interpolated
1548	1549	2.20	0.00	10	360	958.72	957.71	0.28	451.41	0.65	0%	Interpolated
997	996	13.34	0.02	12	99	1082.11	1077.41	4.74	3016.16	4.34	0%	
951	952	2.77	0.00	8	94	1017.08	1015.37	1.81	632.51	0.91	0%	
857	856	2.77	0.00	8	121	985.04	982.50	2.09	679.84	0.98	0%	
854	861	2.77	0.00	8	199	978.30	973.29	2.52	745.74	1.07	0%	
856	855	2.77	0.00	8	124	982.40	979.17	2.59	757.15	1.09	0%	
2135	1008	9.93	0.01	18	500	1094.51	1091.89	0.52	2958.45	4.26	0%	
2251	2252	8.13	0.01	24	475	971.75	971.37	0.08	2488.52	3.58	0%	
2250	2251	8.01	0.01	24	206	971.91	971.75	0.08	2453.22	3.53	0%	
2249	2250	8.00	0.01	24	407	972.24	971.91	0.08	2506.53	3.61	0%	
2252	2253	7.90	0.01	24	400	971.37	971.05	0.08	2488.96	3.58	0%	
865	866	2.77	0.00	8	393	1009.31	995.55	3.51	880.07	1.27	0%	
2253	2254	7.69	0.01	24	400	971.05	970.73	0.08	2488.96	3.58	0%	
2071	422	3.01	0.00	8	327	1078.20	1061.93	4.98	1048.57	1.51	0%	Interpolated
205	206	6.29	0.01	12	148	979.52	975.80	2.52	2198.38	3.17	0%	
Jun-349	Jun-351	4.74	0.01	8	80	956.50	967.00	-13.13	1702.94	2.45	0%	Sanitary Siphon under River
Jun-350	Jun-351	4.74	0.01	8	80	956.50	967.00	-13.13	1702.94	2.45	0%	Sanitary Siphon under River
866	858	2.77	0.00	8	190	995.45	986.90	4.50	996.62	1.44	0%	
952	953	2.77	0.00	8	94	1015.27	1010.57	4.99	1049.80	1.51	0%	
2	Jun-348	4.74	0.01	8	70	968.68	956.50	17.40	1960.76	2.82	0%	Sanitary Siphon under River
2	Jun-347	4.74	0.01	8	70	968.68	956.50	17.40	1960.76	2.82	0%	Sanitary Siphon under River
842	543	1.64	0.00	10	19	960.62	960.47	0.81	766.39	1.10	0%	Interpolated
9000	204	6.29	0.01	21	6	966.52	966.50	0.35	3670.32	5.29	0%	
1567	1566	1.90	0.00	24	122	958.98	958.87	0.09	2254.51	3.25	0%	
6	Jun-02	0.00	0.00	8	300	1200.31	1198.95	0.45	316.61	0.46	0%	
7	6	0.00	0.00	8	129	1200.89	1200.41	0.37	286.54	0.41	0%	
9	8	0.00	0.00	8	277	1070.11	1063.52	2.38	725.35	1.04	0%	
10	9	0.00	0.00	8	281	1071.52	1070.11	0.50	332.84	0.48	0%	
11	10	0.00	0.00	8	264	1072.52	1071.52	0.38	289.11	0.42	0%	
12	11	0.00	0.00	8	248	1073.52	1072.52	0.40	298.41	0.43	0%	
15	641	0.00	0.00	8	94	1081.02	1077.97	3.23	845.14	1.22	0%	
14	15	0.00	0.00	8	242	1088.27	1081.02	3.00	813.67	1.17	0%	
13	14	0.00	0.00	8	326	1095.28	1088.27	2.15	689.07	0.99	0%	
19	13	0.00	0.00	8	298	1104.53	1095.28	3.10	828.16	1.19	0%	
18	19	0.00	0.00	8	286	1110.52	1104.79	2.00	665.39	0.96	0%	
17	18	0.00	0.00	8	298	1118.92	1110.52	2.82	789.79	1.14	0%	
16	17	0.00	0.00	8	287	1133.94	1118.92	5.24	1075.84	1.55	0%	
2920	21	0.00	0.00	8	78	1140.88	1139.34	1.97	659.22	0.95	0%	
21	22	0.00	0.00	8	191	1139.34	1138.00	0.70	393.32	0.57	0%	
22	23	0.00	0.00	8	295	1138.00	1135.38	0.89	442.87	0.64	0%	
23	16	0.00	0.00	8	267	1135.38	1133.94	0.54	345.26	0.50	0%	
69	68	0.00	0.00	10	295	961.81	961.22	0.20	380.93	0.55	0%	
92	93	0.00	0.00	10	260	1020.02	1012.52	2.88	1446.65	2.08	0%	
93	9072	0.00	0.00	10	294	1012.52	1010.78	0.59	655.48	0.94	0%	
68	99	0.00	0.00	10	126	961.22	960.92	0.24	415.86	0.60	0%	
104	119	0.00	0.00	8	319	1043.07	1041.77	0.41	300.15	0.43	0%	MinimumSlope
104	118	0.00	0.00	8	313	1043.07	1041.81	0.40	298.37	0.43	0%	
131	128	0.00	0.00	8	301	1013.11	1011.91	0.40	296.95	0.43	0%	
135	136	0.00	0.00	8	332	976.14	974.82	0.40	296.55	0.43	0%	
136	137	0.00	0.00	8	330	974.82	973.50	0.40	297.50	0.43	0%	
137	138	0.00	0.00	8	346	973.50	973.22	0.08	133.63	0.19	0%	
144	143	0.00	0.00	8	249	985.94	984.94	0.40	298.08	0.43	0%	
145	2806	0.00	0.00	8	220	987.02	985.94	0.49	329.02	0.47	0%	
146	145	0.00	0.00	8	386	990.05	987.02	0.79	416.50	0.60	0%	
147	146	0.00	0.00	8	401	992.85	990.05	0.70	392.78	0.57	0%	
148	147	0.00	0.00	8	335	995.19	992.85	0.70	392.93	0.57	0%	
149	148	0.00	0.00	8	400	1003.19	995.19	2.00	664.97	0.96	0%	
195	196	0.00	0.00	8	345	1007.92	1006.55	0.40	296.36	0.43	0%	
196	180	0.00	0.00	8	302	1006.55	1005.35	0.40	296.47	0.43	0%	
202	203	0.00	0.00	12	295	967.83	967.17	0.22	655.83	0.94	0%	
265	266	0.00	0.00	8	210	1037.37	1033.72	1.74	620.09	0.89	0%	
266	267	0.00	0.00	8	191	1033.72	1033.72	0.00	10.77	0.02	0%	Interpolated
267	268	0.00	0.00	8	207	1033.72	1032.50	0.59	360.75	0.52	0%	
269	195	0.00	0.00	8	132	1009.05	1008.52	0.40	297.35	0.43	0%	
271	269	0.00	0.00	8	374	1016.52	1009.05	2.00	664.61	0.96	0%	
272	271	0.00	0.00	8	143	1039.12	1016.52	15.84	1871.04	2.69	0%	
285	284	0.00	0.00	8	297	1048.28	1037.96	3.48	876.57	1.26	0%	
284	281	0.00	0.00	8	304	1037.96	1030.80	2.36	721.75	1.04	0%	Interpolated
308	306	0.00	0.00	8	354	1004.52	1001.52	0.85	432.61	0.62	0%	
314	313	0.00	0.00	8	133	986.52	985.52	0.75	408.19	0.59	0%	
315	314	0.00	0.00	8	373	992.52	986.52	1.61	596.23	0.86	0%	
307	315	0.00	0.00	8	202	993.71	992.52	0.59	360.78	0.52	0%	
313	311	0.00	0.00	8	168	985.52	984.95	0.34	273.71	0.39	0%	
311	310	0.00	0.00	8	318	984.95	981.62	1.05	480.71	0.69	0%	
1106	332	0.00	0.00	8	278	1009.16	1007.94	0.44	311.24	0.45	0%	Interpolated
357	2774	0.00	0.00	8	213	994.22	993.37	0.40	296.68	0.43	0%	Interpolated
358	357	0.00	0.00	8	394	995.80	994.22	0.40	297.71	0.43	0%	Interpolated
359	360	0.00	0.00	12	410	1008.85	1007.95	0.22	649.64	0.94	0%	Interpolated
364	362	0.00	0.00	15	393	1037.25	1036.62	0.16	1005.97	1.45	0%	
365	364	0.00	0.00	8	388	1045.63	1037.85	2.00	665.39	0.96	0%	
366	2317	0.00	0.00	8	200	1050.92	1046.43	2.24	704.16	1.01	0%	
367	366	0.00	0.00	8	277	1054.05	1050.92	1.13	499.64	0.72	0%	
368	364	0.00	0.00	15	316	1037.57	1037.25	0.10	799.96	1.15	0%	
370	368	0.00	0.00	15	262	1038.10	1037.57	0.20	1130.88	1.63	0%	
418	419	0.00	0.00	8	205	1065.60	1063.99	0.78	416.36	0.60	0%	
419	9060	0.00	0.00	8	428	1063.99	1062.70	0.30	258.06	0.37	0%	
9060	420	0.00	0.00	8	44	1062.70	1062.61	0.21	213.66	0.31	0%	
450	449	0.00	0.00	8	310	984.71	979.52	1.67	608.12	0.88	0%	

449	448	0.00	0.00	8	286	979.42	978.27	0.40	297.85	0.43	0%	
448	135	0.00	0.00	8	225	978.17	977.22	0.42	305.47	0.44	0%	
458	456	0.00	0.00	8	312	1018.52	1016.69	0.59	359.79	0.52	0%	
457	458	0.00	0.00	8	300	1022.52	1018.62	1.30	535.95	0.77	0%	
460	457	0.00	0.00	8	315	1023.88	1022.62	0.40	297.11	0.43	0%	
461	460	0.00	0.00	8	162	1024.63	1023.98	0.40	298.09	0.43	0%	
463	462	0.00	0.00	8	313	1043.34	1033.93	3.01	815.60	1.17	0%	
462	461	0.00	0.00	8	413	1033.83	1024.73	2.20	697.72	1.00	0%	
464	463	0.00	0.00	8	398	1056.46	1050.55	1.48	572.48	0.82	0%	
465	464	0.00	0.00	8	347	1058.06	1056.56	0.43	308.86	0.44	0%	
Jun-32	465	0.00	0.00	8	194	1058.72	1058.06	0.34	273.88	0.39	0%	
478	467	0.00	0.00	8	327	1015.53	1014.20	0.41	299.86	0.43	0%	
483	478	0.00	0.00	8	307	1017.04	1015.63	0.46	318.61	0.46	0%	
479	480	0.00	0.00	8	152	1019.68	1019.10	0.38	290.13	0.42	0%	
480	481	0.00	0.00	8	181	1019.00	1018.28	0.40	296.53	0.43	0%	
481	482	0.00	0.00	8	176	1018.18	1017.44	0.42	304.37	0.44	0%	
482	483	0.00	0.00	8	76	1017.40	1017.11	0.38	290.59	0.42	0%	
484	479	0.00	0.00	8	128	1024.31	1019.68	3.61	893.54	1.29	0%	
485	484	0.00	0.00	8	90	1027.06	1024.31	3.04	819.80	1.18	0%	
486	485	0.00	0.00	8	125	1028.26	1027.16	0.88	440.62	0.63	0%	Interpolated
487	486	0.00	0.00	8	380	1051.27	1031.72	5.14	1066.16	1.54	0%	
488	487	0.00	0.00	8	263	1058.52	1053.32	1.97	660.43	0.95	0%	
489	488	0.00	0.00	8	378	1059.63	1058.62	0.27	243.04	0.35	0%	
490	489	0.00	0.00	8	185	1060.63	1059.73	0.49	327.53	0.47	0%	
517	515	0.00	0.00	8	199	1063.55	1062.79	0.38	290.70	0.42	0%	
515	490	0.00	0.00	8	438	1062.79	1060.93	0.42	306.30	0.44	0%	
518	517	0.00	0.00	8	330	1072.90	1063.65	2.80	786.84	1.13	0%	
526	Jun-32	0.00	0.00	8	355	1060.30	1058.72	0.44	313.42	0.45	0%	Interpolated
Jun-40	557	0.00	0.00	10	74	988.32	980.69	10.36	2742.80	3.95	0%	Interpolated
565	564	0.00	0.00	15	342	1039.22	1038.66	0.16	1017.24	1.46	0%	
579	581	0.00	0.00	8	354	981.91	980.65	0.36	280.61	0.40	0%	
874	579	0.00	0.00	8	234	984.16	981.91	0.96	461.03	0.66	0%	
584	585	0.00	0.00	8	80	990.36	990.01	0.44	311.73	0.45	0%	
585	586	0.00	0.00	8	42	989.91	989.61	0.71	396.09	0.57	0%	
586	580	0.00	0.00	8	318	989.51	987.52	0.63	371.83	0.54	0%	
581	587	0.00	0.00	8	105	980.45	980.02	0.41	300.24	0.43	0%	
587	2916	0.00	0.00	8	195	979.92	979.10	0.42	305.00	0.44	0%	
589	2916	0.00	0.00	8	25	980.42	979.10	5.29	1081.62	1.56	0%	
610	609	0.00	0.00	8	150	993.32	992.71	0.41	300.11	0.43	0%	
609	611	0.00	0.00	8	288	992.61	991.49	0.39	293.33	0.42	0%	
611	612	0.00	0.00	8	265	991.39	990.60	0.30	256.77	0.37	0%	
622	623	0.00	0.00	8	39	986.73	986.57	0.41	300.23	0.43	0%	
628	272	0.00	0.00	8	216	1040.15	1039.12	0.48	324.27	0.47	0%	
Jun-49	628	0.00	0.00	8	170	1040.93	1040.25	0.40	297.69	0.43	0%	
641	12	0.00	0.00	8	150	1077.87	1073.52	2.91	801.41	1.15	0%	
Jun-51	651	0.00	0.00	12	285	999.28	996.56	0.95	1352.86	1.95	0%	
652	653	0.00	0.00	8	299	1011.10	996.71	4.82	1031.55	1.49	0%	
653	654	0.00	0.00	8	175	996.61	995.92	0.39	256.36	0.37	0%	
676	675	0.00	0.00	8	334	1072.35	1067.20	1.54	583.45	0.84	0%	Interpolated
677	676	0.00	0.00	8	297	1080.12	1072.35	2.62	760.46	1.10	0%	Interpolated
678	677	0.00	0.00	8	251	1094.52	1080.12	5.74	1126.02	1.62	0%	
679	678	0.00	0.00	8	239	1107.10	1094.62	5.21	1073.33	1.55	0%	
680	679	0.00	0.00	8	300	1119.93	1107.20	4.24	968.37	1.39	0%	
681	680	0.00	0.00	8	300	1133.78	1120.03	4.59	1007.10	1.45	0%	
696	691	0.00	0.00	8	170	1015.34	1015.01	0.19	206.84	0.30	0%	
691	692	0.00	0.00	8	140	1014.91	1014.34	0.41	299.57	0.43	0%	
692	693	0.00	0.00	8	475	1014.24	1012.32	0.40	298.81	0.43	0%	
693	453	0.00	0.00	8	103	1012.22	1011.82	0.39	293.26	0.42	0%	
694	695	0.00	0.00	8	262	1018.13	1017.18	0.36	283.11	0.41	0%	
695	696	0.00	0.00	8	142	1017.08	1015.34	1.23	520.50	0.75	0%	
707	706	0.00	0.00	8	144	1046.28	1044.95	0.92	451.90	0.65	0%	
708	707	0.00	0.00	8	129	1047.63	1046.38	0.97	462.60	0.67	0%	
709	708	0.00	0.00	8	426	1053.35	1051.63	0.40	298.81	0.43	0%	
710	709	0.00	0.00	8	177	1056.09	1053.45	1.49	573.76	0.83	0%	
711	710	0.00	0.00	8	250	1057.69	1056.19	0.60	364.20	0.52	0%	
724	711	0.00	0.00	8	304	1060.04	1057.69	0.77	413.53	0.60	0%	
748	749	0.00	0.00	8	393	1197.08	1187.70	2.39	726.12	1.05	0%	
749	750	0.00	0.00	8	400	1187.57	1179.49	2.02	667.79	0.96	0%	
750	751	0.00	0.00	8	394	1179.36	1158.83	5.21	1072.62	1.54	0%	
751	752	0.00	0.00	8	390	1158.69	1145.77	3.31	855.51	1.23	0%	
752	753	0.00	0.00	8	395	1145.64	1130.61	3.80	916.65	1.32	0%	
764	763	0.00	0.00	8	135	989.46	988.92	0.40	297.58	0.43	0%	Interpolated
765	764	0.00	0.00	8	167	990.13	989.46	0.40	297.63	0.43	0%	
766	765	0.00	0.00	8	94	990.51	990.13	0.40	298.68	0.43	0%	Interpolated
650	Jun-51	0.00	0.00	12	112	999.51	999.28	0.21	627.84	0.90	0%	
985	787	0.00	0.00	8	132	1043.95	1043.44	0.39	204.66	0.29	0%	
787	783	0.00	0.00	8	146	1043.70	1043.10	0.41	301.12	0.43	0%	
783	786	0.00	0.00	8	207	1043.00	1042.10	0.43	309.92	0.45	0%	
808	807	0.00	0.00	8	282	1138.07	1137.80	0.10	145.41	0.21	0%	
807	736	0.00	0.00	8	349	1137.70	1135.88	0.52	339.40	0.49	0%	
736	806	0.00	0.00	8	103	1135.78	1135.34	0.43	306.88	0.44	0%	
806	681	0.00	0.00	8	206	1135.24	1133.88	0.66	382.19	0.55	0%	
809	810	0.00	0.00	8	215	1143.37	1141.42	0.91	447.81	0.64	0%	
810	811	0.00	0.00	8	179	1141.32	1140.83	0.27	246.10	0.35	0%	
811	812	0.00	0.00	8	157	1140.73	1140.07	0.42	305.18	0.44	0%	
812	808	0.00	0.00	8	382	1139.97	1138.17	0.47	322.51	0.46	0%	
830	831	0.00	0.00	8	297	994.04	989.25	1.61	597.16	0.86	0%	
831	832	0.00	0.00	8	223	989.15	982.64	2.92	803.68	1.16	0%	
832	833	0.00	0.00	8	224	982.54	977.06	2.45	735.28	1.06	0%	
833	835	0.00	0.00	8	394	976.96	966.09	2.76	781.12	1.12	0%	
835	834	0.00	0.00	8	390	965.99	959.75	1.60	594.95	0.86	0%	
2374	837	0.00	0.00	8	367	991.93	990.31	0.44	312.48	0.45	0%	
838	842	0.00	0.00	10	395	961.85	960.62	0.31	475.64	0.68	0%	
843	9084	0.00	0.00	8	417	983.16	977.02	1.47	570.13	0.82	0%	
844	9084	0.00	0.00	8	401	979.19	976.59	0.65	378.72	0.55	0%	
845	848	0.00	0.00	8	225	1062.23	1060.88	0.60	364.02	0.52	0%	

848	526	0.00	0.00	8	299	1060.78	1060.30	0.16	188.20	0.27	0%	
869	868	0.00	0.00	8	205	1062.54	1061.49	0.51	336.41	0.48	0%	
868	724	0.00	0.00	8	178	1061.39	1060.14	0.70	394.09	0.57	0%	
872	871	0.00	0.00	8	262	986.79	985.96	0.32	264.50	0.38	0%	
871	874	0.00	0.00	8	247	985.76	984.36	0.57	353.83	0.51	0%	
880	881	0.00	0.00	8	411	995.00	991.84	0.77	412.16	0.59	0%	
881	882	0.00	0.00	8	409	991.74	990.10	0.40	297.49	0.43	0%	
883	882	0.00	0.00	8	254	991.01	990.10	0.36	281.41	0.41	0%	
884	883	0.00	0.00	8	255	992.02	991.11	0.36	280.95	0.40	0%	
885	884	0.00	0.00	8	410	994.42	992.12	0.56	352.03	0.51	0%	
893	881	0.00	0.00	8	351	993.62	991.94	0.48	325.16	0.47	0%	
899	900	0.00	0.00	8	133	1052.11	1051.56	0.41	302.03	0.43	0%	
900	285	0.00	0.00	8	314	1051.56	1050.30	0.40	297.60	0.43	0%	
901	902	0.00	0.00	8	186	1055.31	1054.66	0.35	277.80	0.40	0%	
902	903	0.00	0.00	8	180	1054.46	1053.62	0.47	320.74	0.46	0%	
903	899	0.00	0.00	8	346	1053.52	1052.31	0.35	278.08	0.40	0%	
Jun-87	901	0.00	0.00	8	20	1055.41	1055.31	0.49	330.40	0.48	0%	
918	Jun-87	0.00	0.00	8	117	1055.83	1055.41	0.36	281.55	0.41	0%	
919	918	0.00	0.00	8	116	1056.54	1055.93	0.52	340.34	0.49	0%	
920	919	0.00	0.00	8	332	1075.89	1056.54	5.82	1134.29	1.63	0%	
921	920	0.00	0.00	8	154	1078.24	1075.99	1.46	568.71	0.82	0%	
948	949	0.00	0.00	8	85	1021.07	1019.09	2.34	719.41	1.04	0%	
949	950	0.00	0.00	8	87	1018.99	1018.64	0.40	298.07	0.43	0%	
950	951	0.00	0.00	8	338	1018.54	1017.18	0.40	298.04	0.43	0%	
986	985	0.00	0.00	8	234	1048.47	1044.02	1.90	648.52	0.93	0%	
987	986	0.00	0.00	8	118	1050.54	1048.47	1.76	622.95	0.90	0%	
988	987	0.00	0.00	8	316	1056.39	1050.54	1.85	639.21	0.92	0%	
989	988	0.00	0.00	8	97	1057.37	1056.44	0.96	460.69	0.66	0%	
990	989	0.00	0.00	8	122	1073.48	1057.42	13.12	1702.47	2.45	0%	
1011	1012	0.00	0.00	8	107	1023.93	1013.16	10.05	1490.05	2.15	0%	
1012	1013	0.00	0.00	8	358	1013.06	983.28	8.31	1354.87	1.95	0%	
631	1028	0.00	0.00	8	143	1042.30	1041.73	0.40	297.12	0.43	0%	
1028	Jun-49	0.00	0.00	8	230	1041.63	1040.93	0.30	259.15	0.37	0%	
1029	1030	0.00	0.00	8	184	1038.00	1030.60	4.02	942.59	1.36	0%	
1032	7	0.00	0.00	8	130	1201.30	1200.79	0.39	264.31	0.38	0%	
1031	1032	0.00	0.00	8	403	1203.00	1201.40	0.40	296.35	0.43	0%	
1054	1055	0.00	0.00	8	229	1004.43	1002.64	0.78	415.71	0.60	0%	Interpolated
1053	1054	0.00	0.00	8	228	1005.34	1004.43	0.40	296.92	0.43	0%	
1078	1083	0.00	0.00	8	230	1106.00	1098.26	3.37	862.35	1.24	0%	Interpolated
1079	1078	0.00	0.00	8	236	1119.96	1106.10	5.87	1138.56	1.64	0%	
1080	1079	0.00	0.00	8	246	1138.95	1120.06	7.68	1302.30	1.88	0%	
1082	1081	0.00	0.00	8	250	1097.30	1096.30	0.40	297.27	0.43	0%	
1083	1082	0.00	0.00	8	214	1098.26	1097.40	0.40	298.09	0.43	0%	
336	1106	0.00	0.00	8	100	1009.60	1009.16	0.44	311.30	0.45	0%	Interpolated
1112	891	0.00	0.00	8	414	995.01	993.22	0.43	309.01	0.44	0%	
1114	1115	0.00	0.00	10	404	1077.14	1076.02	0.28	448.88	0.65	0%	
1116	1117	0.00	0.00	10	282	1076.26	1075.48	0.28	448.53	0.65	0%	
1117	992	0.00	0.00	10	105	1075.38	1075.10	0.27	440.03	0.63	0%	
1133	1134	0.00	0.00	8	118	1023.30	1016.85	5.49	1100.99	1.59	0%	
1134	1135	0.00	0.00	8	75	1016.75	1012.87	5.15	1067.01	1.54	0%	
1135	2932	0.00	0.00	8	255	1012.77	985.05	10.89	1550.99	2.23	0%	
1146	1145	0.00	0.00	15	178	1040.17	1039.89	0.16	997.25	1.44	0%	
1147	1146	0.00	0.00	15	365	1040.75	1040.17	0.16	1001.74	1.44	0%	
1148	1147	0.00	0.00	15	179	1041.03	1040.75	0.16	994.85	1.43	0%	
1191	202	0.00	0.00	12	274	968.26	967.83	0.16	549.27	0.79	0%	
1216	1366	0.00	0.00	8	388	974.80	973.25	0.40	296.96	0.43	0%	MinimumSlope
1215	1216	0.00	0.00	8	379	976.32	974.80	0.40	297.67	0.43	0%	MinimumSlope
1214	1215	0.00	0.00	8	273	977.41	976.32	0.40	297.03	0.43	0%	MinimumSlope
1213	1214	0.00	0.00	8	468	979.28	977.41	0.40	297.26	0.43	0%	MinimumSlope
1212	1213	0.00	0.00	8	68	979.55	979.28	0.40	295.50	0.43	0%	MinimumSlope
1232	1212	0.00	0.00	8	273	980.64	979.55	0.40	296.91	0.43	0%	MinimumSlope
1060	1232	0.00	0.00	8	182	981.37	980.64	0.40	297.62	0.43	0%	MinimumSlope
1231	1060	0.00	0.00	8	154	981.99	981.37	0.40	298.23	0.43	0%	MinimumSlope
65	1231	0.00	0.00	8	69	982.27	981.99	0.41	299.85	0.43	0%	MinimumSlope
1230	65	0.00	0.00	8	52	982.48	982.27	0.41	299.15	0.43	0%	MinimumSlope
1229	1230	0.00	0.00	8	200	983.28	982.48	0.40	297.02	0.43	0%	MinimumSlope
1228	1229	0.00	0.00	8	223	984.17	983.28	0.40	297.20	0.43	0%	MinimumSlope
1245	149	0.00	0.00	8	430	1004.91	1003.19	0.40	297.43	0.43	0%	Interpolated
1248	1243	0.00	0.00	15	109	992.27	990.42	1.70	3272.25	4.71	0%	
1249	1248	0.00	0.00	15	253	1013.52	992.27	8.41	7287.56	10.49	0%	
1250	1249	0.00	0.00	15	185	1028.92	1013.52	8.33	7250.82	10.44	0%	
1251	1250	0.00	0.00	15	134	1030.02	1028.92	0.82	2278.44	3.28	0%	
1252	1251	0.00	0.00	15	249	1034.52	1030.02	1.81	3376.31	4.86	0%	
1253	1252	0.00	0.00	15	199	1053.52	1034.52	9.53	7758.68	11.17	0%	
1255	1254	0.00	0.00	15	181	1065.02	1057.52	4.14	5110.62	7.36	0%	
1256	1255	0.00	0.00	15	146	1066.52	1065.02	1.02	2543.22	3.66	0%	
1254	1253	0.00	0.00	15	134	1056.52	1053.52	2.24	3763.57	5.42	0%	
360	1274	0.00	0.00	12	340	1007.95	1007.20	0.22	650.49	0.94	0%	Interpolated
1274	1273	0.00	0.00	12	223	1007.20	1006.71	0.22	649.12	0.93	0%	Interpolated
1298	1299	0.00	0.00	8	53	960.36	960.16	0.38	288.35	0.42	0%	
2404	1298	0.00	0.00	8	20	961.68	960.36	6.69	1215.83	1.75	0%	
1309	1310	0.00	0.00	8	15	970.26	970.20	0.40	296.60	0.43	0%	Interpolated
1310	1311	0.00	0.00	8	135	970.20	969.66	0.40	297.40	0.43	0%	Interpolated
1311	1312	0.00	0.00	8	396	969.66	968.08	0.40	296.84	0.43	0%	Interpolated
1312	1313	0.00	0.00	8	382	968.08	966.38	0.45	297.51	0.43	0%	Interpolated
1331	2439	0.00	0.00	8	420	969.42	964.66	1.13	500.20	0.72	0%	Interpolated
1331	1332	0.00	0.00	8	336	969.42	968.08	0.40	296.72	0.43	0%	Interpolated
1332	1308	0.00	0.00	8	304	968.08	966.86	0.40	297.61	0.43	0%	Interpolated
1366	1365	0.00	0.00	8	322	973.25	971.96	0.40	297.61	0.43	0%	MinimumSlope
1416	1417	0.00	0.00	8	150	999.35	998.75	0.40	297.72	0.43	0%	Interpolated
1415	1416	0.00	0.00	8	300	1000.55	999.35	0.40	297.06	0.43	0%	Interpolated
1414	1415	0.00	0.00	8	199	1001.35	1000.55	0.40	298.19	0.43	0%	Interpolated
1413	1414	0.00	0.00	8	181	1002.07	1001.35	0.40	296.08	0.43	0%	Interpolated
1419	1413	0.00	0.00	8	384	1003.61	1002.07	0.40	297.63	0.43	0%	Interpolated
1420	1419	0.00	0.00	8	225	1004.51	1003.61	0.40	297.07	0.43	0%	Interpolated
1421	1420	0.00	0.00	8	224	1005.40	1004.51	0.40	296.15	0.43	0%	Interpolated

1421	1422	0.00	0.00	8	267	1005.40	1004.33	0.40	297.80	0.43	0%	Interpolated
1422	2331	0.00	0.00	8	101	1004.33	1003.93	0.40	296.02	0.43	0%	Interpolated
1423	1424	0.00	0.00	8	140	1003.28	1002.72	0.40	297.24	0.43	0%	Interpolated
1424	1411	0.00	0.00	8	313	1002.72	1001.48	0.40	296.05	0.43	0%	Interpolated
1465	1464	0.00	0.00	8	280	1033.59	1027.43	2.20	697.44	1.00	0%	Interpolated
1466	1465	0.00	0.00	8	282	1039.84	1033.59	2.22	700.33	1.01	0%	Interpolated
119	1466	0.00	0.00	8	484	1041.77	1039.84	0.40	296.95	0.43	0%	MinimumSlope
118	1494	0.00	0.00	8	303	1041.81	1040.60	0.40	296.84	0.43	0%	Interpolated
1495	265	0.00	0.00	8	157	1038.81	1037.37	0.92	450.40	0.65	0%	Interpolated
1535	69	0.00	0.00	10	310	963.58	961.81	0.57	643.60	0.93	0%	Interpolated
Jun-138	1536	0.00	0.00	8	400	972.99	971.39	0.40	297.11	0.43	0%	Interpolated
1536	1537	0.00	0.00	8	243	971.39	970.42	0.40	297.12	0.43	0%	Interpolated
1537	1538	0.00	0.00	8	109	970.42	969.98	0.40	298.77	0.43	0%	Interpolated
1538	1539	0.00	0.00	8	321	969.98	968.70	0.40	296.77	0.43	0%	Interpolated
1539	1540	0.00	0.00	8	404	968.70	967.08	0.40	297.53	0.43	0%	Interpolated
1540	1541	0.00	0.00	8	400	967.08	965.48	0.40	297.38	0.43	0%	ROOT CUT.Interpolated
1541	2847	0.00	0.00	8	176	965.48	964.78	0.40	296.66	0.43	0%	ROOT CUT.Interpolated
1542	1544	0.00	0.00	8	223	963.92	963.03	0.40	296.81	0.43	0%	Interpolated
1544	1545	0.00	0.00	8	308	963.03	961.80	0.40	297.18	0.43	0%	Interpolated
1545	1546	0.00	0.00	8	306	961.80	960.57	0.40	297.78	0.43	0%	Interpolated
1546	1547	0.00	0.00	8	308	960.57	959.34	0.40	297.10	0.43	0%	Interpolated
1552	2451	0.00	0.00	8	286	964.30	963.16	0.40	296.93	0.43	0%	Interpolated
1555	1556	0.00	0.00	24	134	960.58	960.28	0.22	4162.02	5.99	0%	
1556	1557	0.00	0.00	24	162	960.11	959.97	0.09	2590.02	3.73	0%	
1557	1558	0.00	0.00	24	200	959.97	959.87	0.05	1967.55	2.83	0%	
2380	841	0.00	0.00	10	216	978.13	970.30	3.63	1624.06	2.34	0%	Interpolated
1568	1567	0.00	0.00	24	288	959.30	959.04	0.09	2644.29	3.81	0%	
1558	1568	0.00	0.00	24	368	959.80	959.40	0.11	2902.52	4.18	0%	
1578	1552	0.00	0.00	8	400	965.90	964.30	0.40	297.14	0.43	0%	Interpolated
1579	1578	0.00	0.00	8	489	967.86	965.90	0.40	297.53	0.43	0%	
1587	1552	0.00	0.00	8	404	965.92	964.30	0.40	297.68	0.43	0%	
2373	1587	0.00	0.00	8	412	966.92	965.92	0.24	231.58	0.33	0%	
Jun-140	1587	0.00	0.00	8	377	967.43	965.92	0.40	297.38	0.43	0%	line dead ends before 7th st. intersection
1597	1596	0.00	0.00	8	494	990.21	988.23	0.40	297.66	0.43	0%	
1598	2343	0.00	0.00	8	200	991.82	991.02	0.40	297.57	0.43	0%	
1598	2874	0.00	0.00	8	421	991.82	988.50	0.79	417.62	0.60	0%	
1596	622	0.00	0.00	8	375	988.23	986.73	0.40	297.20	0.43	0%	
1600	1309	0.00	0.00	8	136	970.81	970.26	0.40	298.44	0.43	0%	
1602	1601	0.00	0.00	8	174	984.66	982.55	1.21	517.81	0.75	0%	
1602	1603	0.00	0.00	8	240	984.66	982.27	1.00	469.46	0.68	0%	
1608	1609	0.00	0.00	8	413	990.82	989.21	0.39	293.60	0.42	0%	
1615	1616	0.00	0.00	8	248	992.80	991.80	0.40	298.33	0.43	0%	removed from Greasline (4th st carwash)
1616	2318	0.00	0.00	8	205	991.80	990.98	0.40	297.50	0.43	0%	
1617	2319	0.00	0.00	8	203	990.17	989.35	0.40	298.66	0.43	0%	
1618	889	0.00	0.00	8	178	991.41	988.54	1.62	597.61	0.86	0%	
2872	886	0.00	0.00	8	166	990.77	990.10	0.40	298.61	0.43	0%	
886	2320	0.00	0.00	8	202	990.10	989.30	0.40	296.06	0.43	0%	
1619	2321	0.00	0.00	8	204	988.46	987.65	0.40	296.37	0.43	0%	
893	1617	0.00	0.00	8	58	993.62	990.17	5.96	1147.22	1.65	0%	
1580	1579	0.00	0.00	8	201	968.66	967.86	0.40	296.42	0.43	0%	
1951	885	0.00	0.00	8	407	996.05	994.42	0.40	297.48	0.43	0%	trouble line
2387	885	0.00	0.00	8	412	995.52	994.42	0.27	242.81	0.35	0%	8' - 8" DIP CONNECTS TO EXIST 8" VCP @ MH 203
1417	2322	0.00	0.00	8	196	998.75	997.96	0.40	298.06	0.43	0%	ROOT CUT 08
1627	2883	0.00	0.00	8	231	997.17	996.24	0.40	298.05	0.43	0%	
777	1633	0.00	0.00	8	374	1000.39	996.91	0.93	453.53	0.65	0%	
1650	777	0.00	0.00	8	379	1003.89	1000.39	0.92	451.47	0.65	0%	
729	728	0.00	0.00	8	224	1004.53	1003.63	0.40	297.69	0.43	0%	
1635	1636	0.00	0.00	8	280	1005.95	1004.83	0.40	297.27	0.43	0%	
1413	1635	0.00	0.00	8	286	1007.10	1005.95	0.40	297.91	0.43	0%	
1419	1644	0.00	0.00	8	313	1008.63	1007.39	0.40	295.68	0.43	0%	
1644	1645	0.00	0.00	8	256	1007.39	1006.36	0.40	297.94	0.43	0%	
1646	729	0.00	0.00	8	155	1005.15	1004.53	0.40	297.14	0.43	0%	
1650	1652	0.00	0.00	8	412	1003.89	1002.24	0.40	297.57	0.43	0%	
1656	1648	0.00	0.00	8	382	1037.32	1035.79	0.40	297.48	0.43	0%	
1659	1419	0.00	0.00	8	296	1004.79	1003.61	0.40	296.83	0.43	0%	
1660	1659	0.00	0.00	8	221	1005.68	1004.79	0.40	297.97	0.43	0%	
1661	1660	0.00	0.00	8	222	1006.57	1005.68	0.40	297.40	0.43	0%	
1657	1656	0.00	0.00	8	98	1037.71	1037.32	0.40	296.76	0.43	0%	
1676	9035	0.00	0.00	8	331	1039.22	1037.90	0.40	296.75	0.43	0%	
1688	1689	0.00	0.00	8	199	1041.62	1040.83	0.40	296.49	0.43	0%	
1687	1688	0.00	0.00	8	254	1042.64	1041.62	0.40	297.83	0.43	0%	
1662	2879	0.00	0.00	8	283	1018.88	1017.75	0.40	297.22	0.43	0%	
1437	824	0.00	0.00	8	354	1016.43	1015.02	0.40	296.81	0.43	0%	
1711	1701	0.00	0.00	8	668	1023.98	1021.31	0.40	297.18	0.43	0%	
1698	1687	0.00	0.00	8	217	1043.51	1042.64	0.40	297.75	0.43	0%	
1696	1437	0.00	0.00	8	329	1017.75	1016.43	0.40	297.58	0.43	0%	
1704	1696	0.00	0.00	8	325	1019.05	1017.75	0.40	297.38	0.43	0%	
1707	1708	0.00	0.00	8	199	1026.54	1025.74	0.40	298.10	0.43	0%	ROOT CUT
1708	2877	0.00	0.00	8	353	1025.74	1024.33	0.40	297.19	0.43	0%	
1714	1704	0.00	0.00	8	234	1019.99	1019.05	0.40	297.63	0.43	0%	
1715	1714	0.00	0.00	8	435	1021.73	1019.99	0.40	297.19	0.43	0%	
1716	1715	0.00	0.00	8	190	1022.49	1021.73	0.40	296.92	0.43	0%	
1717	1716	0.00	0.00	8	188	1023.24	1022.49	0.40	297.01	0.43	0%	ROOT CUT 08
1718	1717	0.00	0.00	8	202	1024.05	1023.24	0.40	297.80	0.43	0%	ROOT CUT 08
1719	1718	0.00	0.00	8	200	1024.85	1024.05	0.40	297.02	0.43	0%	
1744	1743	0.00	0.00	8	358	1024.25	1022.82	0.40	297.15	0.43	0%	
1752	1751	0.00	0.00	8	76	1046.46	1046.16	0.39	295.29	0.43	0%	
1751	1750	0.00	0.00	8	175	1046.16	1045.46	0.40	297.57	0.43	0%	
1750	1749	0.00	0.00	8	227	1045.46	1044.55	0.40	297.60	0.43	0%	
1749	1748	0.00	0.00	8	230	1044.55	1043.63	0.40	297.42	0.43	0%	
1748	1747	0.00	0.00	8	352	1043.63	1027.78	4.50	996.93	1.44	0%	
1747	1746	0.00	0.00	8	352	1027.78	1026.37	0.40	297.54	0.43	0%	
1746	1745	0.00	0.00	8	351	1026.37	1024.97	0.40	296.96	0.43	0%	
1745	1744	0.00	0.00	8	179	1024.97	1024.25	0.40	298.12	0.43	0%	ROOT CUT 08
1767	1768	0.00	0.00	8	257	1038.73	1037.70	0.40	297.39	0.43	0%	
1768	1769	0.00	0.00	8	337	1037.70	1036.35	0.40	297.50	0.43	0%	

1769	1770	0.00	0.00	8	155	1036.35	1035.73	0.40	297.27	0.43	0%	
1770	1771	0.00	0.00	8	154	1035.73	1035.11	0.40	298.21	0.43	0%	
1771	1772	0.00	0.00	8	280	1035.11	1033.99	0.40	297.44	0.43	0%	
1772	1773	0.00	0.00	8	332	1033.99	1032.66	0.40	297.63	0.43	0%	
1773	1774	0.00	0.00	8	124	1032.66	1032.16	0.40	298.11	0.43	0%	
1774	1775	0.00	0.00	8	277	1032.16	1031.05	0.40	297.69	0.43	0%	
1775	1776	0.00	0.00	8	367	1031.05	1029.58	0.40	297.31	0.43	0%	
1776	124	0.00	0.00	8	404	1029.58	1027.96	0.40	297.64	0.43	0%	
1787	2180	0.00	0.00	8	146	971.35	970.31	0.71	396.71	0.57	0%	
1788	2179	0.00	0.00	12	66	969.75	968.15	2.43	2160.60	3.11	0%	
2178	1790	0.00	0.00	12	334	963.68	962.80	0.26	711.01	1.02	0%	
1791	1535	0.00	0.00	8	245	964.56	963.58	0.40	297.44	0.43	0%	
1838	2381	0.00	0.00	8	276	969.60	963.22	2.31	714.90	1.03	0%	
1839	1838	0.00	0.00	8	130	972.65	969.60	2.35	720.16	1.04	0%	
1845	2381	0.00	0.00	8	244	965.52	963.12	0.98	465.80	0.67	0%	
1847	1839	0.00	0.00	8	487	984.10	972.65	2.35	720.97	1.04	0%	
1846	1845	0.00	0.00	8	242	967.88	965.52	0.98	464.42	0.67	0%	
1853	1846	0.00	0.00	8	183	969.67	967.88	0.98	465.44	0.67	0%	
1855	1853	0.00	0.00	8	206	971.69	969.67	0.98	465.64	0.67	0%	
1847	843	0.00	0.00	8	393	984.10	982.53	0.40	297.29	0.43	0%	
844	9085	0.00	0.00	8	390	979.19	975.20	1.02	475.39	0.68	0%	
1894	1855	0.00	0.00	8	196	973.61	971.69	0.98	465.14	0.67	0%	
1859	843	0.00	0.00	8	388	984.67	982.53	0.55	348.92	0.50	0%	
1859	Jun-165	0.00	0.00	8	362	984.67	982.89	0.49	329.78	0.47	0%	
1861	1860	0.00	0.00	8	194	977.44	975.53	0.98	466.08	0.67	0%	
1862	1861	0.00	0.00	8	195	979.35	977.44	0.98	465.40	0.67	0%	
1863	1859	0.00	0.00	8	388	985.61	984.72	0.23	225.19	0.32	0%	
1868	1862	0.00	0.00	8	216	981.47	979.35	0.98	465.27	0.67	0%	
1870	1868	0.00	0.00	8	239	983.81	981.47	0.98	465.44	0.67	0%	
1871	1863	0.00	0.00	8	457	989.99	985.71	0.94	455.13	0.66	0%	
1895	1870	0.00	0.00	8	404	987.75	983.81	0.98	464.34	0.67	0%	
1896	1871	0.00	0.00	8	399	991.58	989.99	0.40	296.89	0.43	0%	
1871	1870	0.00	0.00	8	409	989.99	983.81	1.51	577.99	0.83	0%	
1860	1894	0.00	0.00	8	196	975.53	973.61	0.98	465.14	0.67	0%	
1895	1896	0.00	0.00	8	407	987.75	984.42	0.82	425.25	0.61	0%	
1896	1904	0.00	0.00	8	413	984.42	982.13	0.56	350.20	0.50	0%	
1904	2894	0.00	0.00	8	418	982.13	978.87	0.78	414.97	0.60	0%	
1907	1904	0.00	0.00	8	407	985.31	982.13	0.78	415.42	0.60	0%	
1908	1907	0.00	0.00	8	237	987.15	985.31	0.78	414.43	0.60	0%	
2463	1931	0.00	0.00	8	409	986.45	984.14	0.56	353.30	0.51	0%	
1953	1931	0.00	0.00	8	413	985.24	983.44	0.44	310.17	0.45	0%	
1930	1931	0.00	0.00	8	191	984.30	983.54	0.40	296.85	0.43	0%	
1929	1930	0.00	0.00	8	197	985.09	984.30	0.40	297.63	0.43	0%	
1928	1929	0.00	0.00	8	217	985.96	985.09	0.40	297.98	0.43	0%	
1927	1928	0.00	0.00	8	211	986.80	985.96	0.40	296.45	0.43	0%	
21702	1951	0.00	0.00	8	224	996.94	996.05	0.40	296.28	0.43	0%	
1963	1953	0.00	0.00	8	201	990.90	985.24	2.82	788.67	1.14	0%	
1962	1963	0.00	0.00	8	19	991.43	990.90	2.81	788.19	1.13	0%	
2396	1962	0.00	0.00	8	179	996.46	991.43	2.82	788.72	1.14	0%	
2798	2397	0.00	0.00	8	408	1016.77	999.53	4.23	966.26	1.39	0%	
9075	9109	0.00	0.00	8	290	1023.35	1021.00	0.81	423.01	0.61	0%	
1982	1981	0.00	0.00	8	67	987.40	987.13	0.40	299.13	0.43	0%	
1985	9080	0.00	0.00	8	262	1039.69	1038.64	0.40	297.81	0.43	0%	
763	2003	0.00	0.00	8	190	988.92	988.16	0.40	297.18	0.43	0%	
2003	1982	0.00	0.00	8	189	988.16	987.40	0.40	298.17	0.43	0%	
9064	1988	0.00	0.00	8	258	1037.94	1032.27	2.20	697.27	1.00	0%	
1997	14763	0.00	0.00	8	131	999.34	988.32	8.40	1362.25	1.96	0%	
1996	1997	0.00	0.00	8	149	1011.85	999.34	8.40	1362.62	1.96	0%	
Jun-179	1996	0.00	0.00	8	310	1037.90	1011.85	8.40	1362.33	1.96	0%	
767	766	0.00	0.00	8	224	1032.70	990.51	18.80	2038.18	2.93	0%	
768	767	0.00	0.00	8	157	1044.73	1032.70	7.64	1299.43	1.87	0%	
1989	9067	0.00	0.00	8	77	1043.83	1042.13	2.21	698.26	1.01	0%	
2370	2371	0.00	0.00	8	383	1057.03	1049.21	2.04	672.01	0.97	0%	
72	2073	0.00	0.00	8	369	1089.73	1080.01	2.63	762.89	1.10	0%	
1132	1133	0.00	0.00	8	200	1024.10	1023.30	0.40	297.02	0.43	0%	
2134	821	0.00	0.00	8	229	1054.23	1053.31	0.40	298.04	0.43	0%	
8	2134	0.00	0.00	8	229	1059.52	1054.23	2.31	714.15	1.03	0%	
2149	1787	0.00	0.00	8	370	972.82	971.35	0.40	296.14	0.43	0%	
2184	2185	0.00	0.00	12	365	993.84	993.04	0.22	649.04	0.93	0%	MinimumSlope
2186	2187	0.00	0.00	12	146	991.84	991.52	0.22	648.07	0.93	0%	MinimumSlope
2187	2188	0.00	0.00	12	409	991.52	990.60	0.23	657.42	0.95	0%	MinimumSlope
2188	2189	0.00	0.00	12	273	990.60	990.02	0.21	638.48	0.92	0%	MinimumSlope
2331	1423	0.00	0.00	8	162	1003.93	1003.28	0.40	297.96	0.43	0%	
2185	2186	0.00	0.00	12	543	993.04	991.84	0.22	651.37	0.94	0%	MinimumSlope
Jun-192	2230	0.00	0.00	10	162	1021.73	1021.28	0.28	449.14	0.65	0%	
2275	2276	0.00	0.00	8	52	1004.95	1004.90	0.10	145.69	0.21	0%	
2276	2277	0.00	0.00	8	207	1004.90	996.28	4.16	958.57	1.38	0%	
2277	610	0.00	0.00	8	153	996.18	993.78	1.57	589.22	0.85	0%	
2284	2283	0.00	0.00	8	376	1021.21	1019.80	0.37	287.72	0.41	0%	
2283	2282	0.00	0.00	8	299	1019.70	1018.60	0.37	285.00	0.41	0%	
2282	694	0.00	0.00	8	93	1018.50	1018.13	0.40	296.71	0.43	0%	
2179	2178	0.00	0.00	12	400	964.61	963.73	0.22	650.05	0.94	0%	
2180	1788	0.00	0.00	12	254	970.31	969.75	0.22	650.33	0.94	0%	
2317	365	0.00	0.00	8	200	1046.43	1045.63	0.40	297.22	0.43	0%	
2318	1617	0.00	0.00	8	205	990.98	990.17	0.40	295.68	0.43	0%	
2319	889	0.00	0.00	8	203	989.35	988.54	0.40	296.83	0.43	0%	
2320	1619	0.00	0.00	8	209	989.30	988.46	0.40	297.99	0.43	0%	
2321	1927	0.00	0.00	8	211	987.65	986.80	0.40	298.26	0.43	0%	
2322	1627	0.00	0.00	8	196	997.96	997.17	0.40	298.07	0.43	0%	trouble line
2343	1597	0.00	0.00	8	204	991.02	990.21	0.40	296.53	0.43	0%	
2362	2361	0.00	0.00	10	199	973.34	972.63	0.36	509.23	0.73	0%	
2361	2358	0.00	0.00	10	535	972.53	971.02	0.28	452.94	0.65	0%	
2358	2357	0.00	0.00	21	377	970.10	969.72	0.10	1955.80	2.82	0%	
2357	2356	0.00	0.00	21	381	969.62	969.24	0.10	1946.72	2.80	0%	
2356	1191	0.00	0.00	21	141	969.14	969.00	0.10	1939.06	2.79	0%	
Jun-209	2364	0.00	0.00	8	173	1021.14	1018.86	1.32	539.27	0.78	0%	

2019	Jun-209	0.00	0.00	8	160	1027.12	1021.24	3.67	901.11	1.30	0%	
2366	2019	0.00	0.00	8	330	1052.57	1027.22	7.68	1302.81	1.88	0%	
Jun-210	2366	0.00	0.00	8	300	1070.07	1052.67	5.80	1146.73	1.65	0%	
Jun-210	2368	0.00	0.00	8	331	1070.52	1067.40	0.94	456.35	0.66	0%	ROOT CUT 08
2368	2369	0.00	0.00	8	354	1067.30	1062.49	1.36	547.89	0.79	0%	ROOT CUT
2369	9068	0.00	0.00	8	295	1062.39	1057.11	1.79	628.68	0.91	0%	ROOT CUT
2371	1989	0.00	0.00	8	245	1049.21	1043.83	2.20	696.99	1.00	0%	
2372	2379	0.00	0.00	8	230	987.96	987.50	0.20	210.25	0.30	0%	
2379	2380	0.00	0.00	8	182	986.38	978.22	4.49	996.38	1.43	0%	
2375	2372	0.00	0.00	8	410	989.38	987.74	0.40	297.26	0.43	0%	
2376	2373	0.00	0.00	8	411	991.45	967.22	5.90	1141.61	1.64	0%	
2377	2375	0.00	0.00	8	195	991.09	990.00	0.56	358.27	0.52	0%	
2381	2345	0.00	0.00	8	192	963.12	962.11	0.53	341.12	0.49	0%	
2345	2382	0.00	0.00	8	206	962.01	960.10	0.93	453.00	0.65	0%	
2384	888	0.00	0.00	8	337	992.98	991.63	0.40	297.43	0.43	0%	
2383	2384	0.00	0.00	8	172	994.78	992.98	1.05	480.88	0.69	0%	
2387	2383	0.00	0.00	8	410	995.52	994.88	0.16	185.73	0.27	0%	
1953	2393	0.00	0.00	8	417	985.24	983.25	0.48	324.84	0.47	0%	
2393	2394	0.00	0.00	8	143	984.14	981.85	1.60	594.78	0.86	0%	
2394	2395	0.00	0.00	8	250	981.75	970.25	4.60	1007.94	1.45	0%	
2396	2402	0.00	0.00	8	198	996.46	988.10	4.21	964.75	1.39	0%	
2402	2398	0.00	0.00	8	218	988.00	984.86	1.44	564.50	0.81	0%	
2398	2399	0.00	0.00	8	200	985.66	977.02	4.32	977.19	1.41	0%	
2400	2401	0.00	0.00	8	208	1000.30	986.44	6.66	1213.33	1.75	0%	
2397	2396	0.00	0.00	8	19	996.96	996.66	1.56	586.81	0.85	0%	
2403	2405	0.00	0.00	10	304	961.68	961.68	0.00	15.46	0.02	0%	
2405	2404	0.00	0.00	10	313	961.68	961.68	0.00	15.22	0.02	0%	
2410	2413	0.00	0.00	10	239	1078.35	1077.68	0.28	450.89	0.65	0%	
2411	2410	0.00	0.00	10	402	1079.47	1078.35	0.28	450.00	0.65	0%	
9145	2411	0.00	0.00	10	103	1079.76	1079.47	0.28	452.60	0.65	0%	
2413	1114	0.00	0.00	10	192	1077.68	1077.14	0.28	451.61	0.65	0%	
9080	2797	0.00	0.00	8	330	1038.64	1016.77	6.63	1208.37	1.74	0%	
2797	2798	0.00	0.00	8	65	1016.85	1016.77	0.12	164.89	0.24	0%	
2801	1608	0.00	0.00	8	312	992.09	990.82	0.41	299.93	0.43	0%	
2802	2803	0.00	0.00	10	294	971.12	970.30	0.28	450.45	0.65	0%	
2803	2804	0.00	0.00	10	294	970.30	970.21	0.03	149.12	0.21	0%	
2804	2805	0.00	0.00	8	294	970.21	969.03	0.40	297.87	0.43	0%	
2805	1361	0.00	0.00	8	400	969.03	967.43	0.40	297.27	0.43	0%	
2806	144	0.00	0.00	8	41	985.94	985.94	0.00	23.11	0.03	0%	
2843	2844	0.00	0.00	12	338	957.60	956.57	0.30	764.89	1.10	0%	
2844	2845	0.00	0.00	12	416	956.61	955.62	0.24	675.96	0.97	0%	
1618	2872	0.00	0.00	8	160	991.41	990.77	0.40	297.30	0.43	0%	
2847	1542	0.00	0.00	8	215	964.78	963.92	0.40	297.22	0.43	0%	ROOT CUT
2874	1908	0.00	0.00	8	173	988.50	987.15	0.78	415.07	0.60	0%	
2877	1711	0.00	0.00	8	87	1024.33	1023.98	0.40	298.06	0.43	0%	
2883	1628	0.00	0.00	8	233	996.24	995.31	0.40	297.06	0.43	0%	
Jun-165	2899	0.00	0.00	15	58	982.89	976.16	11.61	8561.69	12.33	0%	
2076	9003	0.00	0.00	10	400	1091.56	1090.44	0.28	450.98	0.65	0%	
9003	72	0.00	0.00	10	143	1090.34	1089.83	0.36	509.26	0.73	0%	
9010	9011	0.00	0.00	8	146	1045.00	1036.24	6.02	1153.30	1.66	0%	
9012	9013	0.00	0.00	8	169	1023.50	1006.57	10.03	1492.08	2.15	0%	
9011	9012	0.00	0.00	8	115	1036.04	1030.06	5.18	1070.03	1.54	0%	
9013	9014	0.00	0.00	10	310	1006.27	1005.03	0.40	539.04	0.78	0%	
9014	2121	0.00	0.00	10	111	1004.93	1003.57	1.23	943.33	1.36	0%	
9035	1657	0.00	0.00	8	48	1037.90	1037.71	0.39	294.60	0.42	0%	
9066	9064	0.00	0.00	8	130	1040.80	1037.94	2.20	696.80	1.00	0%	
9067	9066	0.00	0.00	8	60	1042.13	1040.80	2.20	697.23	1.00	0%	
9068	2370	0.00	0.00	8	63	1057.11	1057.03	0.13	167.58	0.24	0%	ROOT CUT
9109	2400	0.00	0.00	8	204	1021.00	1000.30	10.17	1498.92	2.16	0%	
332	1108	0.00	0.00	8	282	1007.94	1006.70	0.44	311.92	0.45	0%	
9120	9121	0.00	0.00	8	258	1003.95	1002.19	0.68	388.54	0.56	0%	
9121	9122	0.00	0.00	8	257	1002.19	1000.48	0.66	383.13	0.55	0%	
9122	650	0.00	0.00	8	181	1000.48	999.45	0.57	354.12	0.51	0%	
9179	9180	0.00	0.00	8	235	997.00	995.82	0.50	333.26	0.48	0%	
9180	9181	0.00	0.00	8	177	995.72	988.75	3.95	933.86	1.34	0%	
9204	9203	0.00	0.00	10	143	1003.91	1003.05	0.60	660.89	0.95	0%	
9203	9202	0.00	0.00	10	400	1003.05	998.15	1.22	943.29	1.36	0%	
9202	9201	0.00	0.00	10	400	998.15	993.25	1.22	943.29	1.36	0%	
9201	9200	0.00	0.00	10	50	993.25	992.90	0.70	711.21	1.02	0%	
1030	948	0.00	0.00	8	399	1030.50	1021.07	2.36	722.59	1.04	0%	
564	370	0.00	0.00	15	149	1038.66	1038.10	0.38	1541.77	2.22	0%	
1145	565	0.00	0.00	15	234	1039.89	1039.22	0.29	1344.05	1.94	0%	
1494	1495	0.00	0.00	8	445	1040.60	1038.81	0.40	297.96	0.43	0%	
306	307	0.00	0.00	8	269	1001.52	993.71	2.90	800.61	1.15	0%	
1415	652	0.00	0.00	8	388	1012.65	1011.10	0.40	297.21	0.43	0%	
2879	1437	0.00	0.00	8	329	1017.75	1016.43	0.40	297.95	0.43	0%	
2364	551	0.00	0.00	8	89	1018.66	1018.26	0.45	315.93	0.45	0%	
1701	2364	0.00	0.00	8	662	1021.31	1018.66	0.40	297.46	0.43	0%	
1689	1676	0.00	0.00	18	401	1040.83	1039.22	0.40	2589.07	3.73	0%	
768	Jun-179	0.00	0.00	8	99	1044.73	1037.90	6.91	1235.90	1.78	0%	
1630	1038	0.00	0.00	8	271	997.39	996.31	0.40	296.64	0.43	0%	
2399	2467	0.00	0.00	8	199	976.92	971.68	2.64	763.43	1.10	0%	
1931	2909	0.00	0.00	8	418	983.37	982.59	0.19	203.05	0.29	0%	
891	888	0.00	0.00	8	411	993.17	991.54	0.40	296.19	0.43	0%	
1609	9078	0.00	0.00	8	407	989.21	987.62	0.39	293.78	0.42	0%	
2463	616	0.00	0.00	8	409	988.55	986.28	0.56	350.24	0.50	0%	
1601	1600	0.00	0.00	8	280	982.55	970.81	4.20	962.99	1.39	0%	
841	838	0.00	0.00	10	233	970.30	961.85	3.63	1623.47	2.34	0%	
837	1895	0.00	0.00	8	412	990.21	987.75	0.60	363.09	0.52	0%	
1896	2895	0.00	0.00	8	421	984.42	981.01	0.81	422.95	0.61	0%	
1115	992	0.00	0.00	10	330	1075.92	1074.95	0.29	461.79	0.66	0%	
43984	748	0.00	0.00	8	329	1198.95	1197.08	0.57	354.53	0.51	0%	
203	9000	0.00	0.00	12	180	967.17	966.52	0.36	833.09	1.20	0%	

Table 4: Future Conditions - Pipe Capacity											
Node ID #		Peak Flow		Size	Length	US Invert	DS Invert	Slope	Capacity		Sanitary Sewer % Full
From	To	(gpm)	(MGD)	(in)	(ft)	(ft)	(ft)	(%)	(gpm)	(MGD)	(%)
Jun-347	Jun-349	452.96	0.65	8	80	956.50	956.50	0.00	16.62	0.02	2725%
Jun-348	Jun-350	452.96	0.65	8	80	956.50	956.50	0.00	16.62	0.02	2725%
Jun-342	Jun-344	5525.98	7.96	24	100	946.00	946.00	0.00	278.27	0.40	1986%
Jun-341	Jun-343	5520.65	7.95	24	100	946.00	946.00	0.00	278.27	0.40	1984%
2840	2831	8602.10	12.39	60	143	954.84	954.84	0.00	2678.38	3.86	321%
2464	2466	205.69	0.30	10	414	979.83	979.80	0.01	72.54	0.10	284%
2835	2836	4528.23	6.52	36	208	955.63	955.62	0.00	1797.82	2.59	252%
2746	Jun-322	13672.83	19.69	36	110	953.90	953.79	0.10	8204.47	11.81	167%
Jun-328	Jun-332	2462.56	3.55	18	140	941.50	941.30	0.14	1544.38	2.22	159%
Jun-329	Jun-333	2462.56	3.55	18	140	941.50	941.30	0.14	1544.38	2.22	159%
1796	Jun-339	5520.65	7.95	24	14	956.13	956.10	0.21	4073.52	5.87	136%
Jun-327	Jun-331	4373.82	6.30	24	140	941.50	941.30	0.14	3326.02	4.79	132%
Jun-330	Jun-334	4373.82	6.30	24	140	941.50	941.30	0.14	3326.02	4.79	132%
2449	2857	12977.34	18.69	60	201	962.12	962.10	0.01	10105.64	14.55	128%
2382	2851	8596.10	12.38	60	23	957.32	957.32	0.00	6737.47	9.70	128%
1238	1239	3090.57	4.45	33	390	984.28	984.22	0.02	2552.22	3.68	121%
2802	1198	8564.23	12.33	42	345	968.25	968.13	0.03	7295.18	10.51	117%
1808	1803	2142.65	3.09	15	101	951.59	951.00	0.59	1925.00	2.77	111%
2440	2442	9643.16	13.89	48	76	964.19	964.21	-0.03	9050.49	13.03	107%
2934	2933	840.96	1.21	15	97	984.10	984.00	0.10	807.43	1.16	104%
2933	2932	840.96	1.21	15	91	982.27	982.17	0.11	832.47	1.20	101%
614	85	109.02	0.16	8	120	989.51	989.43	0.07	121.17	0.17	90%
137	138	6488.04	9.34	36	346	973.50	973.22	0.08	7375.80	10.62	88%
511	2849	8603.69	12.39	60	10	955.65	955.65	0.00	9967.74	14.35	86%
2914	9148	292.47	0.42	8	38	978.41	978.21	0.52	339.77	0.49	86%
444	2414	694.03	1.00	15	104	1033.53	1033.42	0.11	816.82	1.18	85%
Jun-407	Jun-406	1202.27	1.73	18	400	974.67	974.18	0.12	1430.92	2.06	84%
821	822	297.87	0.43	10	222	1053.31	1052.91	0.18	361.43	0.52	82%
2769	2768	7875.90	11.34	36	400	987.83	987.25	0.14	9879.24	14.23	80%
1027	89	2278.62	3.28	24	188	985.63	985.43	0.11	2873.78	4.14	79%
1071	1072	6166.68	8.88	27	31	983.44	983.30	0.45	8078.95	11.63	76%
834	539	220.84	0.32	8	174	959.75	959.08	0.38	291.60	0.42	76%
649	9107	7560.86	10.89	36	398	998.27	997.68	0.15	9983.65	14.38	76%
1810	1809	2142.65	3.09	24	104	953.80	953.69	0.11	2855.31	4.11	75%
1070	1071	5721.27	8.24	27	215	984.40	983.54	0.40	7627.74	10.98	75%
2150	1946	1360.66	1.96	21	265	962.79	962.56	0.09	1815.36	2.61	75%
2764	2763	7875.75	11.34	42	452	964.58	964.25	0.07	10575.86	15.23	74%
1504	1505	2164.80	3.12	27	201	1021.94	1021.82	0.06	2946.71	4.24	73%
29	1182	6486.87	9.34	30	147	989.25	988.79	0.31	8913.74	12.84	73%
Jun-373	29	6356.03	9.15	30	401	990.49	989.25	0.31	8871.03	12.77	72%
26	27	6356.04	9.15	30	404	992.99	991.74	0.31	8878.66	12.79	72%
27	Jun-373	6356.04	9.15	30	404	991.74	990.49	0.31	8878.66	12.79	72%
24	25	6356.04	9.15	30	406	995.49	994.23	0.31	8884.77	12.79	72%
Jun-371	Jun-372	6356.21	9.15	30	406	998.03	996.77	0.31	8885.32	12.79	72%
959	960	535.56	0.77	15	326	1073.14	1072.85	0.09	749.38	1.08	71%
Jun-372	24	6356.04	9.15	30	412	996.77	995.49	0.31	8897.60	12.81	71%
25	26	6356.04	9.15	30	398	994.23	992.99	0.31	8900.81	12.82	71%
2763	2762	7875.69	11.34	42	401	964.25	963.93	0.08	11060.45	15.93	71%
2762	2761	7875.64	11.34	42	400	963.93	963.61	0.08	11063.91	15.93	71%
2761	2760	7875.60	11.34	42	287	963.61	963.38	0.08	11071.22	15.94	71%
2760	2312	7875.57	11.34	42	185	963.38	963.23	0.08	11143.84	16.05	71%
2833	2834	4528.73	6.52	36	81	955.90	955.85	0.06	6442.86	9.28	70%
2178	1790	495.09	0.71	12	334	963.68	962.80	0.26	711.01	1.02	70%
529	534	4494.61	6.47	18	16	957.67	958.08	-2.50	6462.58	9.31	70%
2356	1191	1918.42	2.76	24	141	969.14	969.00	0.10	2768.45	3.99	69%
2168	1794	11038.29	15.90	48	270	956.69	956.47	0.08	15949.60	22.97	69%
2357	2356	1918.49	2.76	24	381	969.62	969.24	0.10	2779.38	4.00	69%
2772	2771	7803.24	11.24	36	158	991.14	990.84	0.19	11306.38	16.28	69%
822	823	297.85	0.43	10	221	1052.81	1052.24	0.26	432.78	0.62	69%
2358	2357	1918.64	2.76	24	377	970.10	969.72	0.10	2792.35	4.02	69%
410	411	1171.87	1.69	18	298	1012.62	1012.10	0.17	1707.80	2.46	69%
409	410	1171.87	1.69	18	383	1013.40	1012.72	0.18	1722.49	2.48	68%
762	211	1934.92	2.79	24	113	971.96	971.84	0.11	2865.23	4.13	68%
1202	1201	8551.41	12.31	39	357	969.56	969.00	0.16	12724.75	18.32	67%
1168	453	468.48	0.67	12	20	1011.45	1011.40	0.25	698.02	1.01	67%
105	1070	301.94	0.43	10	441	985.63	984.40	0.28	450.34	0.65	67%

1812	1811	2142.67	3.09	24	90	954.31	954.19	0.13	3204.70	4.61	67%
106	105	301.00	0.43	10	401	986.75	985.63	0.28	450.64	0.65	67%
1201	231	8552.11	12.32	39	289	968.86	968.40	0.16	12813.62	18.45	67%
9096	9095	7560.75	10.89	36	381	1000.28	999.55	0.19	11360.65	16.36	67%
211	212	1939.12	2.79	24	397	971.84	971.40	0.11	2931.27	4.22	66%
1075	1076	3617.07	5.21	27	237	986.33	985.84	0.21	5478.35	7.89	66%
107	106	295.67	0.43	10	401	987.87	986.75	0.28	450.64	0.65	66%
109	108	295.66	0.43	10	161	988.65	988.20	0.28	450.73	0.65	66%
108	107	295.66	0.43	10	116	988.20	987.87	0.28	454.22	0.65	65%
966	967	541.72	0.78	15	273	1070.24	1069.94	0.11	833.07	1.20	65%
231	2802	8552.87	12.32	39	53	968.34	968.25	0.17	13188.07	18.99	65%
1198	1194	8564.20	12.33	42	332	968.18	967.80	0.11	13240.30	19.07	65%
2834	2835	4528.57	6.52	36	247	955.83	955.65	0.07	7004.01	10.09	65%
1074	1075	3617.07	5.21	27	223	986.87	986.38	0.22	5652.81	8.14	64%
1069	1070	3617.07	5.21	27	399	985.33	984.45	0.22	5655.02	8.14	64%
447	406	1769.42	2.55	24	403	1031.48	1031.08	0.10	2771.17	3.99	64%
Jun-336	1803	2462.56	3.55	18	20	952.50	952.32	0.90	3876.37	5.58	64%
Jun-337	1803	2462.56	3.55	18	20	952.50	952.32	0.90	3876.37	5.58	64%
1194	226	8564.26	12.33	42	396	967.80	967.33	0.12	13490.69	19.43	63%
411	412	1171.87	1.69	18	274	1012.00	1011.44	0.20	1848.59	2.66	63%
2469	2468	209.39	0.30	12	192	973.47	973.36	0.06	331.59	0.48	63%
139	228	6588.64	9.49	36	296	971.38	970.90	0.16	10453.81	15.05	63%
482	483	182.96	0.26	8	76	1017.40	1017.11	0.38	290.59	0.42	63%
2191	2192	1808.64	2.60	21	243	988.25	987.72	0.22	2881.09	4.15	63%
228	28	6589.50	9.49	36	293	970.85	970.37	0.16	10510.13	15.13	63%
2195	1070	1811.31	2.61	21	381	985.24	984.40	0.22	2892.45	4.17	63%
2189	2190	1808.66	2.60	21	455	990.02	989.02	0.22	2888.55	4.16	63%
2192	2193	1808.64	2.60	21	341	987.72	986.97	0.22	2889.37	4.16	63%
2194	2195	1808.65	2.60	21	500	986.34	985.24	0.22	2890.60	4.16	63%
2190	2191	1808.65	2.60	21	350	989.02	988.25	0.22	2890.94	4.16	63%
2193	2194	1808.64	2.60	21	285	986.97	986.34	0.22	2895.36	4.17	62%
529	528	4529.18	6.52	36	140	957.68	957.57	0.08	7275.08	10.48	62%
543	542	13055.68	18.80	60	185	959.95	959.87	0.04	21080.84	30.36	62%
1076	1069	3617.07	5.21	27	174	985.79	985.38	0.24	5850.05	8.42	62%
28	1203	6616.62	9.53	36	18	970.27	970.24	0.17	10732.97	15.46	62%
2312	2314	8025.68	11.56	42	287	963.23	962.91	0.11	13072.10	18.82	61%
415	416	1884.50	2.71	21	337	1007.31	1006.47	0.25	3076.41	4.43	61%
2188	2189	1737.82	2.50	21	273	990.60	990.02	0.21	2839.53	4.09	61%
2902	1841	406.62	0.59	15	270	973.51	973.32	0.07	665.98	0.96	61%
254	165	1991.12	2.87	21	231	994.33	993.68	0.28	3270.12	4.71	61%
Jun-369	20	5371.05	7.73	30	401	1001.77	1000.53	0.31	8871.03	12.77	61%
413	414	1884.54	2.71	21	423	1008.89	1007.81	0.26	3115.58	4.49	60%
Jun-368	Jun-369	5372.25	7.74	30	406	1003.03	1001.77	0.31	8883.35	12.79	60%
20	Jun-370	5370.94	7.73	30	406	1000.53	999.27	0.31	8884.77	12.79	60%
Jun-367	Jun-368	5373.16	7.74	30	399	1004.27	1003.03	0.31	8898.13	12.81	60%
Jun-370	Jun-371	5369.95	7.73	30	399	999.27	998.03	0.31	8899.92	12.82	60%
1073	1074	3617.07	5.21	27	193	987.35	986.87	0.25	6002.30	8.64	60%
539	538	13065.10	18.81	60	348	959.08	958.92	0.05	21733.81	31.30	60%
2846	2850	8604.94	12.39	60	5	956.76	956.76	0.00	14327.22	20.63	60%
1811	1810	2142.66	3.09	24	224	954.17	953.80	0.16	3574.12	5.15	60%
164	254	1945.59	2.80	21	144	994.73	994.33	0.28	3245.53	4.67	60%
218	219	905.91	1.30	15	304	966.49	965.38	0.37	1519.05	2.19	60%
2179	2178	383.26	0.55	12	400	964.61	963.73	0.22	650.05	0.94	59%
224	225	912.54	1.31	15	34	946.18	946.05	0.38	1551.94	2.23	59%
219	220	905.91	1.30	15	247	950.28	949.34	0.38	1550.73	2.23	58%
540	539	13056.75	18.80	60	305	959.23	959.08	0.05	22452.16	32.33	58%
Jun-358	Jun-359	3891.58	5.60	27	401	1015.46	1014.22	0.31	6698.14	9.65	58%
9098	9097	7560.76	10.89	36	400	1002.30	1001.29	0.25	13037.10	18.77	58%
9097	9096	7560.75	10.89	36	400	1001.29	1000.28	0.25	13037.10	18.77	58%
414	415	1884.52	2.71	21	143	1007.71	1007.31	0.28	3254.23	4.69	58%
Jun-361	Jun-362	3879.35	5.59	27	404	1011.74	1010.49	0.31	6703.82	9.65	58%
Jun-363	Jun-364	3874.45	5.58	27	401	1009.25	1008.01	0.31	6698.55	9.65	58%
Jun-359	Jun-360	3886.51	5.60	27	398	1014.22	1012.98	0.31	6720.54	9.68	58%
Jun-360	Jun-361	3882.58	5.59	27	398	1012.98	1011.74	0.31	6720.63	9.68	58%
Jun-364	Jun-365	3871.55	5.58	27	404	1008.01	1006.76	0.31	6703.73	9.65	58%
Jun-366	Jun-367	3868.47	5.57	27	403	1005.52	1004.27	0.31	6705.73	9.66	58%
Jun-362	Jun-363	3876.51	5.58	27	398	1010.49	1009.25	0.31	6720.54	9.68	58%
626	409	1171.87	1.69	18	449	1015.36	1014.25	0.25	2032.52	2.93	58%
Jun-365	Jun-366	3873.35	5.58	27	398	1006.76	1005.52	0.31	6720.54	9.68	58%

221	223	905.91	1.30	15	362	949.20	947.78	0.39	1573.76	2.27	58%
161	162	1941.01	2.80	21	390	999.31	998.14	0.30	3378.02	4.86	57%
220	221	905.91	1.30	15	35	949.34	949.20	0.40	1582.90	2.28	57%
1799	1801	11046.54	15.91	48	368	953.10	952.66	0.12	19320.69	27.82	57%
1798	1799	11046.56	15.91	48	301	953.50	953.14	0.12	19323.61	27.83	57%
1797	1798	11046.61	15.91	48	451	954.08	953.54	0.12	19334.32	27.84	57%
223	224	905.90	1.30	15	402	947.78	946.18	0.40	1586.01	2.28	57%
1801	1803	11046.54	15.91	48	100	952.62	952.50	0.12	19355.79	27.87	57%
2169	2168	11038.28	15.90	48	283	957.08	956.74	0.12	19356.24	27.87	57%
416	417	1884.51	2.71	21	448	1006.37	1005.07	0.29	3318.58	4.78	57%
Jun-192	2230	254.05	0.37	10	162	1021.73	1021.28	0.28	449.14	0.65	57%
2422	2420	1076.87	1.55	21	429	1062.08	1061.67	0.10	1905.47	2.74	57%
483	478	179.81	0.26	8	307	1017.04	1015.63	0.46	318.61	0.46	56%
9132	9130	2142.70	3.09	24	155	954.94	954.65	0.19	3806.33	5.48	56%
Jun-351	218	905.92	1.30	15	124	967.00	966.49	0.41	1611.49	2.32	56%
478	467	168.43	0.24	8	327	1015.53	1014.20	0.41	299.86	0.43	56%
2853	762	1928.84	2.78	24	52	972.04	971.96	0.15	3440.34	4.95	56%
1203	208	6616.62	9.53	36	172	970.24	969.88	0.21	11852.76	17.07	56%
Jun-435	Jun-434	2035.71	2.93	24	400	988.56	987.87	0.17	3656.71	5.27	56%
2845	2831	425.83	0.61	15	86	955.47	955.39	0.09	766.26	1.10	56%
Jun-439	Jun-438	2039.75	2.94	24	401	991.36	990.66	0.17	3674.57	5.29	56%
Jun-437	Jun-436	2036.01	2.93	24	402	989.96	989.26	0.17	3670.42	5.29	55%
Jun-438	Jun-437	2036.98	2.93	24	402	990.66	989.96	0.17	3672.29	5.29	55%
Jun-434	Jun-433	2035.70	2.93	24	402	987.87	987.17	0.17	3672.74	5.29	55%
Jun-436	Jun-435	2035.70	2.93	24	400	989.26	988.56	0.17	3680.12	5.30	55%
125	Jun-405	777.39	1.12	18	167	973.69	973.49	0.12	1412.35	2.03	55%
1191	202	1918.40	2.76	24	274	968.26	967.83	0.16	3487.63	5.02	55%
9131	1812	2142.67	3.09	24	76	954.46	954.31	0.20	3903.52	5.62	55%
2134	821	163.35	0.24	8	229	1054.23	1053.31	0.40	298.04	0.43	55%
226	1193	9480.38	13.65	48	52	967.33	967.28	0.10	17306.25	24.92	55%
87	88	302.69	0.44	10	368	988.00	986.45	0.42	553.41	0.80	55%
1549	1550	2636.07	3.80	27	37	957.71	957.65	0.16	4825.90	6.95	55%
798	627	1173.28	1.69	18	284	1017.18	1016.39	0.28	2156.00	3.10	54%
Jun-405	123	777.39	1.12	18	399	973.49	973.00	0.12	1431.33	2.06	54%
Jun-406	125	777.39	1.12	18	399	974.18	973.69	0.12	1431.37	2.06	54%
1270	1269	2731.94	3.93	30	261	1014.19	1013.93	0.10	5032.41	7.25	54%
391	1270	2731.95	3.93	30	398	1014.69	1014.29	0.10	5055.26	7.28	54%
1363	1353	9565.11	13.77	48	269	966.39	966.12	0.10	17709.39	25.50	54%
1796	Jun-340	5525.98	7.96	24	14	956.29	955.90	2.79	10251.48	14.76	54%
Jun-408	Jun-407	777.39	1.12	18	401	975.17	974.67	0.12	1442.46	2.08	54%
Jun-411	Jun-410	777.40	1.12	18	401	976.67	976.17	0.12	1443.18	2.08	54%
Jun-410	Jun-409	777.40	1.12	18	400	976.17	975.67	0.12	1444.13	2.08	54%
Jun-409	Jun-408	777.39	1.12	18	400	975.67	975.17	0.12	1444.58	2.08	54%
1049	1050	297.99	0.43	12	350	1050.35	1049.79	0.16	554.42	0.80	54%
2768	2767	7875.83	11.34	36	400	987.19	985.90	0.32	14734.18	21.22	53%
1050	1052	297.83	0.43	12	346	1049.69	1049.13	0.16	557.79	0.80	53%
9130	9131	2142.68	3.09	24	91	954.65	954.46	0.21	4014.79	5.78	53%
Jun-475	798	1143.44	1.65	18	363	1018.18	1017.18	0.28	2145.21	3.09	53%
2241	2242	390.54	0.56	12	400	1016.87	1015.75	0.28	733.34	1.06	53%
1239	1453	3090.29	4.45	33	389	984.22	983.91	0.08	5804.78	8.36	53%
2238	2241	390.51	0.56	12	378	1017.93	1016.87	0.28	733.89	1.06	53%
2242	2243	389.46	0.56	12	400	1015.75	1014.63	0.28	733.34	1.06	53%
165	166	1991.12	2.87	21	375	993.68	992.29	0.37	3754.55	5.41	53%
627	626	1173.41	1.69	18	280	1016.29	1015.46	0.30	2223.67	3.20	53%
2015	557	44.61	0.06	10	102	980.60	980.59	0.01	84.57	0.12	53%
2807	1052	14.31	0.02	8	30	1060.14	1060.14	0.00	27.16	0.04	53%
453	503	496.82	0.72	12	21	1011.30	1011.20	0.47	945.83	1.36	53%
Jun-335	1803	4373.82	6.30	24	20	952.50	952.32	0.90	8348.24	12.02	52%
Jun-338	1803	4373.82	6.30	24	20	952.50	952.32	0.90	8348.24	12.02	52%
Jun-464	Jun-463	243.67	0.35	10	401	982.18	980.98	0.30	466.03	0.67	52%
406	407	1769.14	2.55	24	406	1030.78	1030.18	0.15	3384.13	4.87	52%
2237	2238	386.30	0.56	12	102	1018.22	1017.93	0.28	739.08	1.06	52%
44	2149	335.75	0.48	12	404	973.69	972.82	0.22	642.97	0.93	52%
9181	1077	3617.07	5.21	27	12	988.75	988.71	0.33	6935.16	9.99	52%
Jun-465	Jun-464	243.27	0.35	10	400	983.38	982.18	0.30	466.84	0.67	52%
9108	649	7560.78	10.89	36	35	998.16	998.27	-0.31	14528.37	20.92	52%
455	454	309.87	0.45	12	146	1012.13	1011.86	0.19	596.96	0.86	52%
Jun-463	Jun-462	241.81	0.35	10	397	980.98	979.79	0.30	466.45	0.67	52%
Jun-466	Jun-465	242.22	0.35	10	399	984.58	983.38	0.30	467.25	0.67	52%

1501	1502	2038.69	2.94	27	365	1023.89	1023.50	0.11	3935.92	5.67	52%
5	Jun-356	1776.51	2.56	21	404	1019.20	1017.95	0.31	3429.85	4.94	52%
445	446	1769.84	2.55	24	395	1032.88	1032.28	0.15	3428.75	4.94	52%
401	124	1769.03	2.55	24	53	1028.05	1027.97	0.15	3429.22	4.94	52%
Jun-355	5	1766.68	2.54	21	401	1020.44	1019.20	0.31	3427.25	4.94	52%
Jun-356	Jun-357	1764.88	2.54	21	404	1017.95	1016.70	0.31	3429.81	4.94	51%
167	168	1991.09	2.87	21	304	991.23	990.03	0.40	3874.97	5.58	51%
168	169	1991.18	2.87	21	405	990.03	988.43	0.40	3875.45	5.58	51%
2236	2237	378.51	0.55	12	88	1018.47	1018.22	0.28	737.09	1.06	51%
446	447	1769.66	2.55	24	391	1032.18	1031.58	0.15	3446.36	4.96	51%
2836	2837	4527.76	6.52	36	387	955.18	954.73	0.12	8845.50	12.74	51%
Jun-461	Jun-460	238.94	0.34	10	210	978.59	977.96	0.30	466.86	0.67	51%
2180	1788	332.78	0.48	12	254	970.31	969.75	0.22	650.33	0.94	51%
Jun-354	Jun-355	1759.32	2.53	21	398	1021.68	1020.44	0.31	3438.28	4.95	51%
2235	2236	372.37	0.54	12	54	1018.62	1018.47	0.28	728.14	1.05	51%
Jun-462	Jun-461	238.66	0.34	10	400	979.79	978.59	0.30	466.92	0.67	51%
169	88	1991.06	2.87	21	401	988.43	986.83	0.40	3895.52	5.61	51%
166	167	1991.12	2.87	21	265	992.29	991.23	0.40	3901.17	5.62	51%
1068	1055	6199.88	8.93	36	369	1003.45	1002.64	0.22	12154.87	17.50	51%
1066	1067	6199.82	8.93	36	300	1005.54	1004.88	0.22	12160.27	17.51	51%
3	Jun-354	1745.46	2.51	21	401	1022.92	1021.68	0.31	3427.20	4.94	51%
Jun-460	Jun-459	237.53	0.34	10	400	977.96	976.76	0.30	466.80	0.67	51%
2439	2440	9643.63	13.89	48	389	964.66	964.21	0.12	18996.24	27.35	51%
848	526	281.61	0.41	12	299	1060.78	1060.30	0.16	554.86	0.80	51%
1055	9098	6215.54	8.95	36	152	1002.64	1002.30	0.22	12259.78	17.65	51%
Jun-440	Jun-439	2044.28	2.94	24	399	992.20	991.36	0.21	4036.37	5.81	51%
2442	2443	9649.73	13.90	48	129	964.08	963.93	0.12	19055.55	27.44	51%
162	163	1945.51	2.80	21	396	998.14	996.59	0.39	3855.06	5.55	50%
208	1202	8551.41	12.31	39	79	969.78	969.56	0.28	16946.97	24.40	50%
402	401	1769.03	2.55	24	144	1028.38	1028.15	0.16	3513.82	5.06	50%
9135	9134	1528.88	2.20	24	151	955.48	955.30	0.12	3037.83	4.37	50%
403	402	1769.03	2.55	24	62	1028.58	1028.48	0.16	3520.21	5.07	50%
133	132	718.81	1.04	18	400	977.66	977.17	0.12	1430.78	2.06	50%
2447	2448	12978.70	18.69	60	322	962.47	962.26	0.07	25860.28	37.24	50%
407	408	1769.12	2.55	24	399	1029.82	1029.18	0.16	3525.26	5.08	50%
Jun-357	Jun-358	1723.73	2.48	21	398	1016.70	1015.46	0.31	3438.28	4.95	50%
9106	9105	7665.62	11.04	36	368	995.86	994.58	0.35	15295.59	22.03	50%
2450	2451	13036.53	18.77	60	408	961.72	961.45	0.07	26061.46	37.53	50%
408	403	1769.03	2.55	24	309	1029.18	1028.68	0.16	3538.49	5.10	50%
2445	2446	12926.35	18.61	60	337	962.98	962.76	0.07	25868.60	37.25	50%
1791	2177	8021.01	11.55	42	404	962.67	961.99	0.17	16063.01	23.13	50%
2444	2445	12926.19	18.61	60	351	963.23	963.00	0.07	25921.09	37.33	50%
134	133	718.81	1.04	18	402	978.16	977.66	0.12	1441.54	2.08	50%
2759	2438	9644.93	13.89	48	75	964.72	964.63	0.12	19354.50	27.87	50%
Jun-413	Jun-412	718.82	1.04	18	401	979.16	978.66	0.12	1443.32	2.08	50%
Jun-412	134	718.82	1.04	18	401	978.66	978.16	0.12	1443.48	2.08	50%
132	Jun-411	718.80	1.04	18	400	977.17	976.67	0.12	1444.44	2.08	50%
2770	2769	7875.99	11.34	36	400	989.38	987.89	0.37	15834.83	22.80	50%
1945	1944	1360.65	1.96	21	264	961.92	961.40	0.20	2737.94	3.94	50%
456	455	309.64	0.45	12	380	1013.00	1012.23	0.20	623.56	0.90	50%
1944	1942	1360.66	1.96	21	435	961.40	960.54	0.20	2740.27	3.95	50%
1942	1941	1360.65	1.96	21	212	960.54	960.12	0.20	2745.90	3.95	50%
1192	1363	9481.77	13.65	48	341	966.79	966.39	0.12	19141.46	27.56	50%
2438	2439	9644.63	13.89	48	82	964.78	964.68	0.12	19482.84	28.06	50%
Jun-417	142	416.54	0.60	12	401	1002.48	1001.00	0.37	842.15	1.21	49%
2446	2447	12980.11	18.69	60	373	962.74	962.49	0.07	26245.09	37.79	49%
1550	2169	2661.17	3.83	27	285	957.65	957.08	0.20	5383.16	7.75	49%
2452	9322	13045.96	18.79	60	265	960.77	960.59	0.07	26403.92	38.02	49%
9322	9323	13045.02	18.78	60	234	960.54	960.38	0.07	26491.04	38.15	49%
142	141	415.49	0.60	12	402	1001.00	999.51	0.37	843.94	1.22	49%
9095	9108	7560.75	10.89	36	395	999.55	998.16	0.35	15381.19	22.15	49%
1141	1510	577.36	0.83	15	259	1029.99	1029.42	0.22	1178.85	1.70	49%
2424	2423	1076.87	1.55	18	388	1066.15	1065.02	0.29	2204.24	3.17	49%
2443	2444	12928.56	18.62	60	290	963.45	963.25	0.07	26593.52	38.29	49%
1946	1945	1360.66	1.96	21	309	962.56	961.92	0.21	2803.05	4.04	49%
2766	2765	7875.79	11.34	36	404	982.86	981.28	0.39	16230.15	23.37	49%
2758	2759	1675.12	2.41	21	146	965.29	964.83	0.32	3465.22	4.99	48%
9137	9136	1529.04	2.20	24	400	956.41	955.89	0.13	3170.92	4.57	48%
Jun-322	Jun-324	2462.56	3.55	18	64	954.50	953.50	1.56	5107.56	7.35	48%

Jun-322	Jun-325	2462.56	3.55	18	64	954.50	953.50	1.56	5107.56	7.35	48%
1281	1280	2587.97	3.73	24	274	976.72	975.70	0.37	5372.69	7.74	48%
268	1504	2164.80	3.12	27	302	1022.45	1022.03	0.14	4495.39	6.47	48%
78	77	399.29	0.57	12	401	1035.56	1034.12	0.36	830.90	1.20	48%
79	78	399.12	0.57	12	401	1037.00	1035.56	0.36	830.89	1.20	48%
Jun-388	Jun-387	398.95	0.57	12	401	1039.88	1038.44	0.36	830.90	1.20	48%
77	76	399.57	0.58	12	399	1034.12	1032.68	0.36	832.26	1.20	48%
Jun-387	79	399.19	0.57	12	400	1038.44	1037.00	0.36	831.85	1.20	48%
9323	544	13044.17	18.78	60	250	960.33	960.15	0.07	27185.08	39.15	48%
76	75	398.60	0.57	12	400	1032.68	1031.24	0.36	831.49	1.20	48%
480	481	141.79	0.20	8	181	1019.00	1018.28	0.40	296.53	0.43	48%
9138	9137	1529.09	2.20	24	310	956.82	956.41	0.13	3200.41	4.61	48%
842	543	365.16	0.53	10	19	960.62	960.47	0.81	766.39	1.10	48%
9139	9138	1529.14	2.20	24	323	957.25	956.82	0.13	3210.35	4.62	48%
823	1049	298.00	0.43	10	323	1052.24	1050.50	0.54	626.01	0.90	48%
963	966	541.72	0.78	15	353	1071.28	1070.55	0.21	1142.35	1.64	47%
9136	9135	1528.95	2.20	24	305	955.89	955.48	0.13	3224.80	4.64	47%
2121	2114	402.99	0.58	10	289	1003.57	1000.68	1.00	852.37	1.23	47%
2114	1137	402.99	0.58	10	166	1000.68	999.02	1.00	852.42	1.23	47%
207	209	1924.65	2.77	24	408	974.92	974.04	0.22	4087.16	5.89	47%
1511	1141	577.40	0.83	15	96	1030.22	1029.99	0.24	1227.76	1.77	47%
661	9142	1421.69	2.05	21	124	959.04	958.74	0.24	3034.21	4.37	47%
1519	1549	2634.11	3.79	27	352	958.48	957.71	0.22	5637.37	8.12	47%
1528	1519	2635.78	3.80	27	365	959.28	958.48	0.22	5642.55	8.13	47%
1532	1531	2629.44	3.79	27	288	962.22	961.59	0.22	5632.73	8.11	47%
1530	1529	2634.82	3.79	27	337	960.84	960.10	0.22	5644.81	8.13	47%
541	540	13057.32	18.80	60	197	959.38	959.23	0.08	27977.02	40.29	47%
96	Jun-399	824.94	1.19	15	399	1045.17	1043.19	0.50	1769.44	2.55	47%
1529	1528	2636.55	3.80	27	371	960.10	959.28	0.22	5660.73	8.15	47%
1531	1530	2629.36	3.79	27	341	961.59	960.84	0.22	5648.07	8.13	47%
2420	2419	1076.87	1.55	21	398	1061.57	1061.01	0.14	2313.24	3.33	47%
481	482	141.65	0.20	8	176	1018.18	1017.44	0.42	304.37	0.44	47%
39	38	1193.84	1.72	21	398	980.47	979.78	0.17	2565.58	3.69	47%
2175	2174	8494.84	12.23	48	430	961.18	960.72	0.11	18273.41	26.31	46%
1533	1532	2629.53	3.79	27	286	962.85	962.22	0.22	5658.90	8.15	46%
863	1534	2629.76	3.79	27	394	964.36	963.49	0.22	5661.99	8.15	46%
1534	1533	2629.63	3.79	27	290	963.49	962.85	0.22	5662.15	8.15	46%
206	207	1924.66	2.77	24	396	975.80	974.92	0.22	4147.91	5.97	46%
417	160	1901.59	2.74	21	227	1004.93	1003.92	0.44	4110.00	5.92	46%
1453	1454	3090.16	4.45	33	398	983.82	983.40	0.11	6685.66	9.63	46%
1454	1455	3090.09	4.45	33	405	983.32	982.89	0.11	6700.22	9.65	46%
528	527	4529.16	6.52	36	293	957.47	956.99	0.16	9826.12	14.15	46%
202	203	1918.36	2.76	24	295	967.83	967.17	0.22	4164.29	6.00	46%
1795	1796	11046.64	15.91	48	11	956.30	956.28	0.19	24067.22	34.66	46%
1278	1279	2587.92	3.73	24	298	974.12	972.89	0.41	5655.41	8.14	46%
537	536	13064.73	18.81	60	351	958.53	958.25	0.08	28600.56	41.18	46%
2314	1791	8025.68	11.56	42	69	962.81	962.67	0.20	17573.79	25.31	46%
544	543	13043.37	18.78	60	251	960.15	959.95	0.08	28608.70	41.20	46%
9105	9104	7708.11	11.10	36	395	994.58	992.90	0.42	16913.39	24.36	46%
155	154	3016.44	4.34	30	399	977.88	977.19	0.17	6632.47	9.55	45%
61	60	135.88	0.20	8	403	1025.41	1023.78	0.40	298.98	0.43	45%
Jun-419	Jun-418	235.45	0.34	10	400	1005.44	1003.96	0.37	518.57	0.75	45%
2173	2172	8494.78	12.23	48	410	958.77	958.31	0.11	18715.75	26.95	45%
Jun-420	Jun-419	235.21	0.34	10	400	1006.92	1005.44	0.37	518.38	0.75	45%
2176	2175	8492.88	12.23	48	400	961.63	961.18	0.11	18740.93	26.99	45%
154	153	3016.44	4.34	30	401	977.19	976.49	0.17	6665.27	9.60	45%
Jun-421	Jun-420	234.47	0.34	10	400	1008.40	1006.92	0.37	518.60	0.75	45%
32	31	1248.99	1.80	21	403	974.97	974.16	0.20	2764.75	3.98	45%
Jun-418	Jun-417	233.85	0.34	10	400	1003.96	1002.48	0.37	518.49	0.75	45%
33	32	1240.37	1.79	21	406	975.78	974.97	0.20	2751.35	3.96	45%
1267	1266	2778.74	4.00	30	455	1011.84	1011.16	0.15	6170.85	8.89	45%
1941	661	1360.64	1.96	21	449	960.12	959.04	0.24	3024.07	4.35	45%
34	33	1236.04	1.78	21	397	976.57	975.78	0.20	2747.76	3.96	45%
31	30	1237.69	1.78	21	405	974.16	973.35	0.20	2756.68	3.97	45%
1266	1265	2778.70	4.00	30	398	1011.06	1010.46	0.15	6191.09	8.92	45%
2230	2232	327.73	0.47	12	266	1021.28	1020.54	0.28	731.13	1.05	45%
1280	1278	2587.96	3.73	24	318	975.56	974.19	0.43	5776.91	8.32	45%
35	34	1230.75	1.77	21	397	977.36	976.57	0.20	2747.76	3.96	45%
2232	2233	327.71	0.47	12	258	1020.54	1019.82	0.28	731.95	1.05	45%

163	164	1945.46	2.80	21	374	996.59	994.73	0.50	4347.81	6.26	45%
2234	2235	326.57	0.47	12	180	1019.12	1018.62	0.28	730.97	1.05	45%
2177	2176	8491.49	12.23	48	311	961.99	961.63	0.12	19010.71	27.38	45%
2233	2234	327.39	0.47	12	250	1019.82	1019.12	0.28	733.36	1.06	45%
60	59	133.32	0.19	8	396	1023.78	1022.18	0.40	298.83	0.43	45%
46	45	286.24	0.41	12	400	975.43	974.57	0.22	642.82	0.93	45%
36	35	1225.24	1.76	21	405	978.17	977.36	0.20	2757.87	3.97	44%
111	110	200.12	0.29	10	401	990.89	989.77	0.28	450.55	0.65	44%
112	111	199.85	0.29	10	402	992.01	990.89	0.28	450.11	0.65	44%
Jun-353	3	1752.10	2.52	21	401	1024.58	1022.92	0.41	3965.41	5.71	44%
2419	2430	1076.87	1.55	21	390	1060.91	1060.30	0.16	2437.97	3.51	44%
2418	2417	1086.95	1.57	21	282	1059.61	1059.16	0.16	2464.14	3.55	44%
37	36	1217.04	1.75	21	408	978.99	978.17	0.20	2763.02	3.98	44%
1502	1503	2038.68	2.94	27	318	1023.48	1023.01	0.15	4629.84	6.67	44%
Jun-457	Jun-471	598.54	0.86	15	68	975.95	975.75	0.29	1363.95	1.96	44%
38	37	1202.92	1.73	21	397	979.78	978.99	0.20	2749.46	3.96	44%
123	2249	777.39	1.12	18	400	973.00	972.24	0.19	1780.67	2.56	44%
1193	1192	9480.34	13.65	48	291	967.28	966.84	0.15	21721.79	31.28	44%
153	Jun-471	3016.44	4.34	30	393	976.49	975.75	0.19	6919.27	9.96	44%
2414	445	1770.44	2.55	24	206	1033.42	1032.98	0.21	4070.09	5.86	43%
Jun-458	Jun-457	598.57	0.86	15	120	976.31	975.95	0.30	1377.45	1.98	43%
75	74	654.42	0.94	15	403	1031.24	1029.79	0.36	1507.42	2.17	43%
74	73	654.34	0.94	15	400	1029.79	1028.35	0.36	1507.68	2.17	43%
70	Jun-385	654.26	0.94	15	408	1024.02	1022.55	0.36	1507.75	2.17	43%
143	1238	112.68	0.16	8	75	984.81	984.58	0.31	259.72	0.37	43%
73	Jun-386	654.33	0.94	15	405	1028.35	1026.89	0.36	1508.49	2.17	43%
Jun-385	Jun-384	653.71	0.94	15	406	1022.55	1021.09	0.36	1507.71	2.17	43%
71	70	654.16	0.94	15	399	1025.46	1024.02	0.36	1509.50	2.17	43%
Jun-386	71	654.21	0.94	15	396	1026.89	1025.46	0.36	1509.95	2.17	43%
45	44	278.49	0.40	12	409	974.57	973.69	0.22	642.87	0.93	43%
Jun-459	Jun-458	598.69	0.86	15	148	976.76	976.31	0.30	1383.47	1.99	43%
Jun-429	Jun-428	2836.44	4.08	30	154	984.39	984.13	0.17	6563.06	9.45	43%
9107	9106	7560.83	10.89	36	399	997.68	995.86	0.46	17521.32	25.23	43%
110	109	194.33	0.28	10	400	989.77	988.65	0.28	450.74	0.65	43%
30	2361	1188.85	1.71	21	409	973.35	972.53	0.20	2759.64	3.97	43%
2111	2112	355.94	0.51	8	122	1015.20	1011.43	3.10	827.12	1.19	43%
156	155	2853.69	4.11	30	399	978.57	977.88	0.17	6632.22	9.55	43%
157	156	2853.69	4.11	30	399	979.26	978.57	0.17	6632.30	9.55	43%
158	157	2853.69	4.11	30	399	979.95	979.26	0.17	6632.39	9.55	43%
2108	2107	355.94	0.51	8	144	1024.69	1020.22	3.10	827.54	1.19	43%
2113	2121	355.94	0.51	8	142	1007.98	1003.57	3.10	827.73	1.19	43%
2112	2113	355.94	0.51	8	111	1011.43	1007.98	3.10	827.84	1.19	43%
2107	2110	355.94	0.51	8	65	1020.22	1018.20	3.10	827.95	1.19	43%
2110	2111	355.94	0.51	8	97	1018.20	1015.20	3.10	827.98	1.19	43%
Jun-424	159	2853.69	4.11	30	403	981.35	980.65	0.17	6653.34	9.58	43%
159	158	2853.69	4.11	30	402	980.65	979.95	0.17	6658.71	9.59	43%
Jun-425	Jun-424	2853.69	4.11	30	401	982.05	981.35	0.17	6667.76	9.60	43%
9104	2772	7803.34	11.24	36	356	992.90	991.14	0.49	18241.36	26.27	43%
Jun-432	Jun-431	2836.44	4.08	30	399	986.47	985.78	0.17	6631.39	9.55	43%
Jun-426	Jun-425	2836.44	4.08	30	399	982.74	982.05	0.17	6634.30	9.55	43%
Jun-430	Jun-429	2836.44	4.08	30	399	985.08	984.39	0.17	6635.13	9.55	43%
Jun-427	Jun-426	2836.44	4.08	30	398	983.43	982.74	0.17	6641.04	9.56	43%
1279	185	2587.86	3.73	24	238	972.78	971.65	0.47	6064.53	8.73	43%
Jun-433	Jun-432	2836.44	4.08	30	401	987.17	986.47	0.17	6668.59	9.60	43%
2407	2108	351.57	0.51	8	59	1026.51	1024.69	3.09	826.84	1.19	43%
Jun-428	Jun-427	2836.44	4.08	30	400	984.13	983.43	0.17	6672.09	9.61	43%
Jun-431	Jun-430	2836.44	4.08	30	400	985.78	985.08	0.17	6672.17	9.61	43%
960	963	541.72	0.78	15	352	1072.29	1071.38	0.26	1277.32	1.84	42%
2410	2413	190.67	0.27	10	239	1078.35	1077.68	0.28	450.89	0.65	42%
612	613	109.04	0.16	8	166	990.50	990.00	0.30	257.96	0.37	42%
9179	9180	3607.74	5.20	27	235	997.00	995.82	0.50	8541.19	12.30	42%
113	112	190.16	0.27	10	401	993.13	992.01	0.28	450.51	0.65	42%
2448	2449	12977.88	18.69	60	130	962.24	962.12	0.09	30779.81	44.32	42%
1	2	905.97	1.30	18	222	969.40	968.78	0.28	2159.35	3.11	42%
2413	1114	189.20	0.27	10	192	1077.68	1077.14	0.28	451.61	0.65	42%
613	614	109.04	0.16	8	95	989.90	989.61	0.31	260.29	0.37	42%
2426	2425	1076.87	1.55	18	401	1069.67	1068.07	0.40	2579.93	3.72	42%
Jun-476	Jun-475	893.25	1.29	18	305	1019.02	1018.18	0.28	2142.90	3.09	42%
1343	2443	3284.59	4.73	33	463	965.52	964.84	0.15	7888.14	11.36	42%

209	210	1924.64	2.77	24	318	974.04	973.16	0.28	4625.81	6.66	42%
2411	2410	187.15	0.27	10	402	1079.47	1078.35	0.28	450.00	0.65	42%
2166	2167	552.39	0.80	15	240	1012.75	1012.08	0.28	1328.38	1.91	42%
2167	412	551.89	0.79	15	623	1012.08	1010.34	0.28	1327.97	1.91	42%
2165	2166	552.16	0.80	15	260	1013.48	1012.75	0.28	1332.00	1.92	41%
Jun-477	Jun-476	893.41	1.29	18	204	1019.59	1019.02	0.28	2159.60	3.11	41%
1237	1238	3053.80	4.40	30	435	985.22	984.28	0.22	7414.98	10.68	41%
2164	2165	544.68	0.78	15	130	1013.84	1013.48	0.28	1323.69	1.91	41%
2361	2358	1918.91	2.76	24	535	972.53	971.02	0.28	4676.66	6.73	41%
1503	268	2049.70	2.95	27	221	1022.92	1022.54	0.17	4998.97	7.20	41%
9148	9149	1133.99	1.63	18	381	978.21	976.46	0.46	2769.78	3.99	41%
90	91	2278.55	3.28	24	441	984.29	982.52	0.40	5572.36	8.02	41%
9099	9098	960.99	1.38	18	374	1003.54	1002.30	0.33	2354.18	3.39	41%
2023	2024	541.72	0.78	15	229	1068.28	1067.64	0.28	1327.46	1.91	41%
479	480	118.13	0.17	8	152	1019.68	1019.10	0.38	290.13	0.42	41%
2417	2416	1076.87	1.55	21	249	1059.06	1058.60	0.18	2646.71	3.81	41%
2425	2424	1083.83	1.56	18	401	1067.97	1066.25	0.43	2675.99	3.85	41%
89	90	2278.59	3.28	24	279	985.43	984.29	0.41	5629.66	8.11	40%
9084	2901	394.64	0.57	15	390	974.59	974.00	0.15	977.17	1.41	40%
2129	2128	391.40	0.56	15	396	1010.73	1010.14	0.15	970.03	1.40	40%
2125	49	391.32	0.56	15	148	1008.74	1008.52	0.15	970.34	1.40	40%
2128	2127	391.32	0.56	15	241	1010.14	1009.78	0.15	970.79	1.40	40%
2132	2131	391.55	0.56	15	314	1011.82	1011.35	0.15	972.04	1.40	40%
2126	2125	391.34	0.56	15	352	1009.27	1008.74	0.15	975.10	1.40	40%
2131	2130	391.29	0.56	15	213	1011.35	1011.03	0.15	975.10	1.40	40%
2127	2126	391.37	0.56	15	338	1009.78	1009.27	0.15	975.38	1.40	40%
420	421	13.78	0.02	8	19	1062.61	1062.61	0.00	34.36	0.05	40%
2130	2129	391.28	0.56	15	199	1011.03	1010.73	0.15	976.57	1.41	40%
536	535	13064.53	18.81	60	96	958.23	958.21	0.02	32702.37	47.09	40%
2185	2186	1153.04	1.66	21	543	993.04	991.84	0.22	2896.86	4.17	40%
Jun-322	Jun-323	4373.85	6.30	24	64	954.50	953.50	1.56	10999.77	15.84	40%
Jun-322	Jun-326	4373.85	6.30	24	64	954.50	953.50	1.56	10999.77	15.84	40%
86	87	200.38	0.29	10	143	988.60	988.10	0.35	503.99	0.73	40%
1182	1181	6486.87	9.34	36	404	988.79	987.19	0.40	16324.26	23.51	40%
1180	450	6486.87	9.34	36	295	985.88	984.71	0.40	16349.79	23.54	40%
1181	1180	6486.87	9.34	36	330	987.19	985.88	0.40	16350.87	23.55	40%
135	136	6486.88	9.34	36	332	976.14	974.82	0.40	16368.31	23.57	40%
2172	2171	8494.81	12.23	48	421	958.31	957.69	0.15	21449.87	30.89	40%
9102	9101	782.44	1.13	18	324	1005.39	1004.63	0.23	1980.49	2.85	40%
136	137	6486.98	9.34	36	330	974.82	973.50	0.40	16420.38	23.65	40%
160	161	1941.00	2.80	21	190	1000.52	999.31	0.64	4915.27	7.08	39%
449	448	6486.87	9.34	36	286	979.42	978.27	0.40	16439.84	23.67	39%
178	1281	2588.00	3.73	24	232	978.18	976.88	0.56	6593.46	9.49	39%
2184	2185	1132.31	1.63	21	365	993.84	993.04	0.22	2886.53	4.16	39%
2186	2187	1130.23	1.63	21	146	991.84	991.52	0.22	2882.19	4.15	39%
9140	9139	1421.65	2.05	24	359	957.86	957.25	0.17	3629.03	5.23	39%
9141	9140	1421.69	2.05	24	376	958.50	957.86	0.17	3629.27	5.23	39%
9145	2411	176.93	0.25	10	103	1079.76	1079.47	0.28	452.60	0.65	39%
2857	2450	12976.45	18.69	60	335	962.10	961.74	0.11	33195.17	47.80	39%
Jun-441	Jun-440	2045.97	2.95	24	401	993.62	992.20	0.35	5236.10	7.54	39%
Jun-450	Jun-449	1430.43	2.06	21	399	1004.86	1003.45	0.35	3662.13	5.27	39%
Jun-451	Jun-450	1430.57	2.06	21	399	1006.27	1004.86	0.35	3662.50	5.27	39%
Jun-452	Jun-451	1429.88	2.06	21	399	1007.68	1006.27	0.35	3662.45	5.27	39%
Jun-448	Jun-447	1428.89	2.06	21	400	1002.03	1000.62	0.35	3659.93	5.27	39%
Jun-453	Jun-452	1428.53	2.06	21	399	1009.09	1007.68	0.35	3662.13	5.27	39%
Jun-447	Jun-446	1426.07	2.05	21	281	1000.62	999.63	0.35	3656.79	5.27	39%
Jun-443	Jun-442	1426.01	2.05	21	399	995.71	994.30	0.35	3661.95	5.27	39%
Jun-449	Jun-448	1429.50	2.06	21	400	1003.45	1002.03	0.35	3671.97	5.29	39%
Jun-446	Jun-445	1425.63	2.05	21	307	999.63	998.54	0.35	3670.62	5.29	39%
Jun-442	Jun-441	1421.90	2.05	21	193	994.30	993.62	0.35	3661.26	5.27	39%
Jun-445	Jun-444	1424.54	2.05	21	400	998.54	997.12	0.35	3671.42	5.29	39%
190	Jun-453	1424.27	2.05	21	217	1009.86	1009.09	0.35	3671.42	5.29	39%
Jun-444	Jun-443	1420.23	2.05	21	399	997.12	995.71	0.35	3663.92	5.28	39%
1373	1418	3284.62	4.73	33	400	972.57	971.89	0.17	8486.70	12.22	39%
412	413	1884.57	2.71	21	215	1010.34	1008.99	0.63	4881.39	7.03	39%
2462	2427	856.89	1.23	18	98	1071.81	1071.52	0.30	2219.92	3.20	39%
448	135	6486.87	9.34	36	225	978.17	977.22	0.42	16860.45	24.28	38%
557	558	170.77	0.25	10	147	980.59	980.19	0.27	443.94	0.64	38%
1114	1115	172.61	0.25	10	404	1077.14	1076.02	0.28	448.88	0.65	38%

2163	2164	510.54	0.74	15	140	1014.23	1013.84	0.28	1328.00	1.91	38%
2187	2188	1122.11	1.62	21	409	991.52	990.60	0.23	2923.79	4.21	38%
2149	1787	334.07	0.48	12	370	972.82	971.35	0.40	873.11	1.26	38%
2152	2151	1360.68	1.96	21	382	965.38	964.10	0.33	3566.46	5.14	38%
1342	1343	3284.73	4.73	33	381	966.32	965.65	0.18	8622.17	12.42	38%
1404	1405	170.56	0.25	10	199	979.40	978.85	0.28	448.36	0.65	38%
1115	992	175.29	0.25	10	330	1075.92	1074.95	0.29	461.79	0.66	38%
958	959	535.56	0.77	15	316	1074.14	1073.14	0.32	1412.70	2.03	38%
1405	2333	170.56	0.25	10	218	978.85	978.24	0.28	450.72	0.65	38%
2333	1378	171.31	0.25	10	166	978.24	977.77	0.28	453.24	0.65	38%
466	456	209.38	0.30	12	374	1013.60	1012.93	0.18	555.21	0.80	38%
363	1511	579.66	0.83	15	328	1031.54	1030.30	0.38	1543.87	2.22	38%
1794	1795	11046.64	15.91	48	18	956.41	956.36	0.28	29457.08	42.42	38%
2243	2163	496.40	0.71	15	144	1014.63	1014.23	0.28	1324.58	1.91	37%
2423	2422	1076.87	1.55	21	401	1062.96	1062.08	0.22	2886.11	4.16	37%
9134	9132	1528.84	2.20	24	146	955.26	954.94	0.22	4119.76	5.93	37%
215	214	173.45	0.25	10	402	988.19	986.98	0.30	467.64	0.67	37%
364	362	372.88	0.54	15	393	1037.25	1036.62	0.16	1005.97	1.45	37%
967	2023	541.72	0.78	15	193	1069.84	1069.18	0.34	1471.29	2.12	37%
138	139	6588.64	9.49	36	351	973.22	971.55	0.48	17902.34	25.78	37%
9000	204	1924.67	2.77	24	6	966.52	966.50	0.35	5240.21	7.55	37%
193	192	888.40	1.28	18	399	1014.09	1012.68	0.35	2428.05	3.50	37%
Jun-384	Jun-477	893.56	1.29	18	417	1021.09	1019.59	0.36	2451.00	3.53	36%
2171	2169	8495.24	12.23	48	349	957.69	957.08	0.17	23368.69	33.65	36%
192	191	882.38	1.27	18	399	1012.68	1011.27	0.35	2427.99	3.50	36%
194	193	882.02	1.27	18	399	1015.50	1014.09	0.35	2428.08	3.50	36%
1282	178	2283.31	3.29	24	260	979.51	978.18	0.51	6288.84	9.06	36%
1283	1282	2283.37	3.29	24	460	981.86	979.51	0.51	6289.34	9.06	36%
91	1283	2283.36	3.29	24	129	982.52	981.86	0.51	6292.15	9.06	36%
203	9000	1918.51	2.76	24	180	967.17	966.52	0.36	5289.80	7.62	36%
Jun-346	1797	5525.98	7.96	24	14	954.50	954.08	3.00	15241.73	21.95	36%
210	2853	1924.64	2.77	24	307	973.16	972.04	0.36	5310.97	7.65	36%
Jun-345	1797	5520.65	7.95	24	14	954.50	954.08	3.00	15241.73	21.95	36%
214	213	168.71	0.24	10	400	986.98	985.78	0.30	466.83	0.67	36%
216	215	168.72	0.24	10	399	989.39	988.19	0.30	467.11	0.67	36%
2901	2902	406.89	0.59	15	219	974.00	973.56	0.20	1126.90	1.62	36%
Jun-454	194	875.88	1.26	18	399	1016.91	1015.50	0.35	2427.99	3.50	36%
152	151	86.43	0.12	8	317	1015.14	1014.31	0.26	240.56	0.35	36%
Jun-455	Jun-454	866.74	1.25	18	399	1018.32	1016.91	0.35	2428.02	3.50	36%
212	208	1936.95	2.79	24	425	971.40	969.78	0.38	5430.85	7.82	36%
611	612	91.29	0.13	8	265	991.39	990.60	0.30	256.77	0.37	36%
2832	2833	4528.90	6.52	36	182	956.36	955.92	0.24	12741.73	18.35	36%
454	1168	310.05	0.45	12	71	1011.78	1011.50	0.40	872.78	1.26	36%
217	216	165.46	0.24	10	399	990.59	989.39	0.30	467.12	0.67	35%
992	958	424.56	0.61	15	280	1074.78	1074.10	0.24	1200.89	1.73	35%
Jun-32	465	285.17	0.41	12	194	1058.72	1058.06	0.34	807.49	1.16	35%
191	190	856.33	1.23	18	399	1011.27	1009.86	0.35	2427.81	3.50	35%
85	86	200.38	0.29	10	143	989.24	988.60	0.45	569.57	0.82	35%
1067	1068	6199.82	8.93	36	299	1004.83	1003.45	0.46	17624.25	25.38	35%
2151	2150	1360.67	1.96	21	315	964.10	962.84	0.40	3897.53	5.61	35%
1269	1268	2778.75	4.00	30	236	1013.93	1013.34	0.25	7978.58	11.49	35%
88	1027	2278.69	3.28	24	121	986.35	985.68	0.55	6551.39	9.43	35%
40	2462	684.00	0.98	12	406	1079.99	1071.81	2.01	1966.80	2.83	35%
994	993	234.71	0.34	12	168	1075.67	1075.27	0.24	677.21	0.98	35%
213	Jun-466	161.33	0.23	10	401	985.78	984.58	0.30	466.11	0.67	35%
2782	171	260.29	0.37	12	84	997.37	997.12	0.30	754.98	1.09	34%
1341	1342	3285.00	4.73	33	400	967.18	966.32	0.21	9533.93	13.73	34%
4	1	906.07	1.30	18	96	969.90	969.50	0.41	2631.37	3.79	34%
Jun-380	2312	150.26	0.22	8	397	966.66	963.23	0.86	436.83	0.63	34%
1362	1363	519.50	0.75	18	380	966.91	966.39	0.14	1511.64	2.18	34%
171	172	260.29	0.37	12	451	997.12	995.77	0.30	758.07	1.09	34%
57	56	150.51	0.22	8	403	973.75	970.19	0.88	441.89	0.64	34%
56	Jun-380	150.42	0.22	8	399	970.19	966.66	0.88	441.95	0.64	34%
558	559	171.57	0.25	10	259	980.19	979.27	0.36	508.26	0.73	34%
559	2470	188.21	0.27	10	413	979.17	977.40	0.43	557.89	0.80	34%
2451	2452	13047.44	18.79	60	431	961.43	960.80	0.15	38725.14	55.76	34%
55	2829	391.37	0.56	15	354	987.10	986.34	0.21	1164.10	1.68	34%
1809	1808	2142.97	3.09	15	31	953.67	951.69	6.47	6389.75	9.20	34%
Jun-394	2184	1115.45	1.61	15	400	1000.85	993.84	1.75	3326.25	4.79	34%

2427	2426	859.51	1.24	18	348	1071.50	1070.12	0.40	2574.27	3.71	33%
1303	2446	296.28	0.43	12	207	963.59	962.74	0.41	889.00	1.28	33%
996	995	225.47	0.32	12	213	1077.31	1076.80	0.24	677.64	0.98	33%
9071	95	89.99	0.13	8	147	1021.72	1021.23	0.33	271.47	0.39	33%
64	63	97.84	0.14	8	269	1029.03	1027.95	0.40	297.86	0.43	33%
995	994	234.71	0.34	12	387	1076.70	1075.67	0.27	714.82	1.03	33%
Jun-470	Jun-469	278.48	0.40	15	399	1024.23	1023.77	0.12	853.20	1.23	33%
707	706	147.41	0.21	8	144	1046.28	1044.95	0.92	451.90	0.65	33%
63	62	97.43	0.14	8	233	1027.95	1027.01	0.40	298.80	0.43	33%
2254	4	785.22	1.13	18	207	970.73	970.00	0.35	2425.74	3.49	32%
1354	1353	154.96	0.22	12	377	966.56	966.11	0.12	479.03	0.69	32%
Jun-381	64	96.52	0.14	8	387	1030.59	1029.03	0.40	298.57	0.43	32%
2395	Jun-207	216.42	0.31	10	44	969.95	969.68	0.62	671.14	0.97	32%
Jun-382	Jun-381	96.03	0.14	8	393	1032.18	1030.59	0.40	299.00	0.43	32%
2250	2251	785.20	1.13	24	206	971.91	971.75	0.08	2453.22	3.53	32%
Jun-383	Jun-382	95.21	0.14	8	405	1033.82	1032.18	0.40	299.01	0.43	32%
460	457	278.38	0.40	12	315	1023.88	1022.62	0.40	875.98	1.26	32%
461	460	278.81	0.40	12	162	1024.63	1023.98	0.40	878.87	1.27	32%
174	175	274.32	0.40	12	204	991.37	990.57	0.39	868.45	1.25	32%
2251	2252	785.20	1.13	24	475	971.75	971.37	0.08	2488.52	3.58	32%
2252	2253	785.20	1.13	24	400	971.37	971.05	0.08	2488.96	3.58	32%
2253	2254	785.19	1.13	24	400	971.05	970.73	0.08	2488.96	3.58	32%
50	51	391.32	0.56	15	164	990.78	990.38	0.24	1242.75	1.79	31%
702	444	198.07	0.29	10	333	1035.35	1033.53	0.55	630.07	0.91	31%
62	61	93.73	0.13	8	396	1027.01	1025.41	0.40	298.80	0.43	31%
703	702	198.26	0.29	10	338	1037.21	1035.35	0.55	632.35	0.91	31%
2249	2250	785.20	1.13	24	407	972.24	971.91	0.08	2506.53	3.61	31%
150	Jun-423	89.63	0.13	8	399	1012.84	1011.36	0.37	286.24	0.41	31%
9142	9141	1421.68	2.05	24	90	958.74	958.50	0.27	4544.46	6.54	31%
53	54	391.33	0.56	15	230	988.19	987.62	0.25	1251.05	1.80	31%
52	53	391.31	0.56	15	108	988.46	988.19	0.25	1256.62	1.81	31%
151	150	88.74	0.13	8	398	1014.31	1012.84	0.37	285.61	0.41	31%
705	704	198.27	0.29	10	310	1040.62	1038.88	0.56	638.42	0.92	31%
704	703	198.28	0.29	10	297	1038.88	1037.21	0.56	639.29	0.92	31%
81	84	91.39	0.13	8	290	997.31	996.16	0.40	295.99	0.43	31%
Jun-414	Jun-413	413.34	0.60	18	400	979.59	979.16	0.11	1339.63	1.93	31%
1008	1005	199.97	0.29	12	169	1091.89	1091.52	0.22	648.19	0.93	31%
526	Jun-32	284.74	0.41	12	355	1060.30	1058.72	0.44	924.07	1.33	31%
1510	1509	577.35	0.83	15	334	1029.34	1027.48	0.56	1874.23	2.70	31%
183	184	260.29	0.37	12	428	1002.17	1000.57	0.37	847.65	1.22	31%
465	464	279.37	0.40	12	347	1058.06	1056.56	0.43	910.61	1.31	31%
2829	2830	391.33	0.56	15	232	986.34	985.74	0.26	1278.58	1.84	31%
2896	2897	327.83	0.47	15	285	977.46	976.94	0.18	1073.91	1.55	31%
2898	2899	326.98	0.47	15	380	976.32	975.63	0.18	1071.17	1.54	31%
Jun-423	Jun-422	87.19	0.13	8	401	1011.36	1009.88	0.37	285.66	0.41	31%
176	177	275.45	0.40	12	118	989.77	989.27	0.42	902.55	1.30	31%
175	176	274.32	0.40	12	189	990.57	989.77	0.42	902.42	1.30	30%
84	85	91.39	0.13	8	155	996.16	995.52	0.41	301.66	0.43	30%
1743	9071	89.99	0.13	8	274	1022.82	1021.72	0.40	297.62	0.43	30%
173	174	270.86	0.39	12	155	992.02	991.37	0.42	896.11	1.29	30%
54	55	391.30	0.56	15	196	987.62	987.10	0.27	1295.27	1.87	30%
2086	658	200.58	0.29	8	186	1063.36	1059.64	2.00	664.78	0.96	30%
2083	2086	200.58	0.29	8	186	1067.08	1063.36	2.00	664.80	0.96	30%
2429	183	262.94	0.38	12	402	1003.77	1002.17	0.40	874.39	1.26	30%
Jun-416	Jun-415	415.01	0.60	12	400	984.27	980.29	0.99	1381.60	1.99	30%
2931	9148	841.53	1.21	18	276	979.51	978.21	0.47	2803.41	4.04	30%
2899	9084	379.43	0.55	15	390	975.58	974.59	0.25	1265.64	1.82	30%
1340	1341	3285.25	4.73	33	396	968.42	967.29	0.29	10992.28	15.83	30%
2767	2766	7875.84	11.34	36	280	985.80	982.90	1.04	26402.15	38.02	30%
730	1628	27.38	0.04	8	233	995.40	995.31	0.04	92.31	0.13	30%
9118	9102	782.43	1.13	18	238	1006.39	1005.39	0.42	2648.76	3.81	30%
2771	2770	7876.03	11.34	36	138	990.84	989.38	1.06	26682.36	38.42	30%
Jun-422	Jun-421	83.78	0.12	8	400	1009.88	1008.40	0.37	285.79	0.41	29%
2895	2896	328.11	0.47	15	294	978.05	977.46	0.20	1125.85	1.62	29%
2932	2931	841.53	1.21	18	164	980.39	979.56	0.51	2909.77	4.19	29%
1036	888	123.89	0.18	10	408	992.58	991.54	0.25	430.35	0.62	29%
534	533	8569.78	12.34	60	160	958.08	957.94	0.09	30012.59	43.22	29%
1787	2180	333.58	0.48	12	146	971.35	970.31	0.71	1169.64	1.68	29%
1273	1272	175.05	0.25	12	516	1006.71	1005.68	0.20	619.26	0.89	28%

2897	2898	327.66	0.47	15	290	976.94	976.32	0.21	1162.43	1.67	28%
458	456	297.38	0.43	12	312	1018.52	1016.69	0.59	1060.80	1.53	28%
9101	9099	782.43	1.13	18	232	1004.63	1003.54	0.47	2797.91	4.03	28%
1077	1073	3617.07	5.21	27	118	988.71	987.35	1.16	12955.81	18.66	28%
1243	1242	2778.68	4.00	30	402	990.02	988.42	0.40	10068.16	14.50	28%
1241	1237	2778.66	4.00	30	399	986.82	985.22	0.40	10098.87	14.54	28%
2830	2934	840.96	1.21	15	117	985.74	984.00	1.48	3061.06	4.41	27%
2894	2895	307.80	0.44	15	412	978.87	978.05	0.20	1120.92	1.61	27%
1242	1241	2778.67	4.00	30	397	988.42	986.82	0.40	10129.22	14.59	27%
513	512	8604.34	12.39	60	250	956.21	955.97	0.10	31382.47	45.19	27%
1455	2941	3090.02	4.45	33	246	982.81	982.06	0.30	11351.03	16.35	27%
2837	2838	4527.76	6.52	36	128	954.71	954.18	0.41	16679.25	24.02	27%
184	170	260.29	0.37	12	333	1000.57	998.97	0.48	960.19	1.38	27%
2839	2840	8602.62	12.39	60	139	955.01	954.87	0.10	32112.42	46.24	27%
1274	1273	172.84	0.25	12	223	1007.20	1006.71	0.22	649.12	0.93	27%
467	466	174.92	0.25	12	178	1014.10	1013.70	0.23	657.47	0.95	27%
Jun-349	Jun-351	452.96	0.65	8	80	956.50	967.00	-13.13	1702.94	2.45	27%
Jun-350	Jun-351	452.96	0.65	8	80	956.50	967.00	-13.13	1702.94	2.45	27%
185	863	2606.36	3.75	24	51	965.00	964.36	1.27	9901.55	14.26	26%
47	46	276.61	0.40	12	410	977.79	975.43	0.58	1051.58	1.51	26%
845	848	278.24	0.40	12	225	1062.23	1060.88	0.60	1073.24	1.55	26%
512	511	8603.93	12.39	60	204	955.92	955.70	0.11	33299.48	47.95	26%
2758	2759	8074.86	11.63	48	146	965.29	964.83	0.32	31411.82	45.23	26%
Jun-396	Jun-395	849.27	1.22	15	399	1014.95	1007.91	1.76	3336.45	4.80	25%
1015	4	74.73	0.11	8	313	971.23	970.00	0.39	294.60	0.42	25%
Jun-397	Jun-396	843.81	1.22	15	404	1022.07	1014.95	1.76	3337.31	4.81	25%
Jun-398	Jun-397	840.59	1.21	15	399	1029.11	1022.07	1.76	3336.37	4.80	25%
94	Jun-398	837.33	1.21	15	399	1036.15	1029.11	1.76	3336.49	4.80	25%
1374	1373	3285.03	4.73	33	406	974.35	972.70	0.41	13117.97	18.89	25%
Jun-399	94	832.34	1.20	15	399	1043.19	1036.15	1.76	3336.37	4.80	25%
180	181	180.46	0.26	12	234	1005.20	1004.56	0.27	724.88	1.04	25%
Jun-395	Jun-394	830.66	1.20	15	400	1007.91	1000.85	1.76	3338.18	4.81	25%
993	992	234.71	0.34	12	84	1075.17	1074.78	0.46	943.98	1.36	25%
1268	1267	2778.75	4.00	30	258	1013.24	1011.94	0.50	11331.77	16.32	25%
170	2782	260.29	0.37	12	272	998.97	997.37	0.59	1063.02	1.53	24%
140	Jun-416	415.21	0.60	12	400	990.28	984.27	1.50	1698.92	2.45	24%
1379	1380	3094.31	4.46	33	453	981.51	979.79	0.38	12683.40	18.26	24%
1790	2177	493.11	0.71	12	33	962.70	961.99	2.15	2029.75	2.92	24%
Jun-415	Jun-414	414.49	0.60	18	400	980.29	979.59	0.17	1708.98	2.46	24%
1361	1362	223.19	0.32	15	380	967.43	966.91	0.14	929.14	1.34	24%
181	182	177.23	0.26	12	106	1004.56	1004.26	0.28	738.12	1.06	24%
706	705	198.28	0.29	10	104	1041.60	1040.62	0.94	827.32	1.19	24%
2466	2894	284.64	0.41	15	407	979.80	978.87	0.23	1201.58	1.73	24%
2088	2090	233.32	0.34	8	179	1041.49	1033.62	4.40	985.68	1.42	24%
2090	1132	233.32	0.34	8	241	1033.62	1023.00	4.40	986.05	1.42	24%
2087	2088	233.32	0.34	8	201	1050.35	1041.49	4.40	986.16	1.42	24%
1014	1015	70.25	0.10	8	223	972.22	971.33	0.40	297.17	0.43	24%
1013	1014	70.25	0.10	8	214	973.18	972.32	0.40	297.80	0.43	24%
2941	1379	3089.99	4.45	33	134	982.06	981.51	0.41	13191.15	19.00	23%
658	2087	233.32	0.34	8	205	1059.64	1050.35	4.53	1000.06	1.44	23%
2081	2083	154.34	0.22	8	60	1068.28	1067.08	2.00	664.98	0.96	23%
1006	1007	203.38	0.29	12	204	1090.42	1089.60	0.40	878.27	1.26	23%
889	9078	151.89	0.22	12	410	988.54	987.62	0.22	656.42	0.95	23%
2	Jun-348	452.96	0.65	8	70	968.68	956.50	17.40	1960.76	2.82	23%
2	Jun-347	452.96	0.65	8	70	968.68	956.50	17.40	1960.76	2.82	23%
335	328	67.93	0.10	8	404	1000.32	998.72	0.40	295.76	0.43	23%
2765	2764	7875.78	11.34	36	400	981.13	973.87	1.81	34947.22	50.32	23%
1265	1244	2778.69	4.00	30	425	1010.36	1007.81	0.60	12353.70	17.79	22%
546	555	127.02	0.18	10	344	990.26	988.74	0.44	566.46	0.82	22%
1505	1506	2164.79	3.12	27	313	1021.62	1019.56	0.66	9767.70	14.07	22%
1380	1378	3094.14	4.46	33	396	979.62	977.77	0.47	14066.42	20.26	22%
2757	2746	784.25	1.13	24	346	954.56	953.99	0.16	3571.48	5.14	22%
1517	1520	116.45	0.17	12	303	958.81	958.36	0.15	533.66	0.77	22%
1378	1374	3285.18	4.73	33	398	976.60	974.45	0.54	15116.06	21.77	22%
1005	1006	203.38	0.29	12	147	1091.19	1090.52	0.46	936.30	1.35	22%
2157	2156	1349.56	1.94	18	82	971.72	969.80	2.34	6248.98	9.00	22%
1024	1025	96.94	0.14	10	400	1002.01	1000.89	0.28	450.85	0.65	22%
1023	1024	96.95	0.14	10	399	1003.23	1002.11	0.28	451.45	0.65	21%
95	554	98.60	0.14	10	158	1021.13	1020.67	0.29	459.82	0.66	21%

2430	2418	1079.90	1.56	21	88	1060.30	1059.71	0.67	5038.47	7.26	21%
2156	2152	1353.48	1.95	18	180	969.75	965.43	2.40	6325.69	9.11	21%
1025	1026	96.93	0.14	10	300	1000.79	999.94	0.28	453.52	0.65	21%
9078	623	92.12	0.13	10	410	987.52	986.47	0.26	431.17	0.62	21%
1022	1023	96.94	0.14	10	394	1004.45	1003.33	0.28	454.45	0.65	21%
555	556	127.02	0.18	10	372	988.74	986.92	0.49	596.11	0.86	21%
2174	2173	8494.83	12.23	48	375	960.72	958.77	0.52	40300.35	58.03	21%
1831	2845	419.32	0.60	15	339	963.74	961.60	0.63	1996.11	2.87	21%
131	1022	94.33	0.14	10	388	1005.63	1004.55	0.28	449.56	0.65	21%
554	553	98.60	0.14	10	306	1020.57	1019.64	0.30	470.19	0.68	21%
2838	2756	4527.90	6.52	36	97	954.16	954.83	-0.69	21615.06	31.13	21%
297	131	94.33	0.14	10	154	1006.16	1005.73	0.28	451.08	0.65	21%
675	9091	61.06	0.09	8	232	1067.20	1066.30	0.39	293.00	0.42	21%
2848	1375	70.33	0.10	12	303	972.47	972.29	0.06	337.83	0.49	21%
Jun-324	Jun-328	2462.56	3.55	18	140	953.50	941.50	8.57	11962.73	17.23	21%
Jun-325	Jun-329	2462.56	3.55	18	140	953.50	941.50	8.57	11962.73	17.23	21%
533	532	8569.61	12.34	60	207	957.94	957.59	0.17	41650.71	59.98	21%
547	546	117.62	0.17	10	412	992.22	990.36	0.45	572.87	0.82	21%
548	547	117.62	0.17	10	403	994.14	992.32	0.45	572.93	0.83	21%
1803	1807	26707.46	38.46	60	181	951.00	948.00	1.66	130412.83	187.79	20%
115	114	91.89	0.13	10	402	995.37	994.25	0.28	450.03	0.65	20%
43	42	402.10	0.58	12	415	1104.64	1096.20	2.03	1975.87	2.85	20%
42	41	396.05	0.57	12	396	1096.20	1088.15	2.03	1976.01	2.85	20%
9149	2157	1349.56	1.94	18	173	976.46	971.72	2.74	6760.74	9.74	20%
9117	9118	598.38	0.86	18	263	1007.83	1006.39	0.55	3026.01	4.36	20%
141	140	415.37	0.60	12	401	999.51	990.28	2.30	2102.39	3.03	20%
179	180	171.19	0.25	12	130	1005.72	1005.20	0.40	875.00	1.26	20%
1506	1507	2695.72	3.88	30	299	1019.47	1017.21	0.76	13865.10	19.97	19%
114	113	87.56	0.13	10	401	994.25	993.13	0.28	450.50	0.65	19%
41	40	384.18	0.55	12	401	1088.15	1079.99	2.03	1976.80	2.85	19%
450	449	6486.87	9.34	36	310	984.71	979.52	1.67	33565.27	48.33	19%
553	552	98.60	0.14	10	74	1019.54	1019.27	0.36	514.46	0.74	19%
2850	513	8604.77	12.39	60	249	956.76	956.27	0.20	44928.64	64.70	19%
882	889	149.53	0.22	12	411	989.85	988.54	0.32	782.45	1.13	19%
2468	2467	209.33	0.30	12	225	973.36	971.91	0.64	1111.61	1.60	19%
80	81	55.09	0.08	8	443	1005.31	1003.52	0.40	298.86	0.43	18%
552	551	98.60	0.14	10	229	1019.17	1018.26	0.40	537.22	0.77	18%
128	129	54.30	0.08	8	148	1011.91	1011.32	0.40	297.29	0.43	18%
130	80	54.30	0.08	8	454	1007.13	1005.31	0.40	297.47	0.43	18%
457	458	287.49	0.41	12	300	1022.52	1018.62	1.30	1580.15	2.28	18%
1409	1404	53.65	0.08	8	330	980.72	979.40	0.40	297.42	0.43	18%
2907	2893	216.26	0.31	15	407	967.06	966.12	0.23	1207.38	1.74	18%
1132	2914	292.47	0.42	8	359	1023.00	979.41	12.13	1637.18	2.36	18%
527	2832	4529.05	6.52	36	68	957.05	956.40	0.96	25437.21	36.63	18%
2849	2839	8603.33	12.39	60	272	955.65	955.03	0.23	48368.02	69.65	18%
2416	2415	1076.87	1.55	21	402	1058.50	1054.59	0.97	6077.17	8.75	18%
1500	1501	2038.78	2.94	27	356	1027.16	1023.91	0.91	11513.32	16.58	18%
172	173	260.29	0.37	12	333	995.77	992.02	1.13	1470.62	2.12	18%
1507	391	2704.40	3.89	30	256	1017.13	1014.78	0.92	15299.87	22.03	18%
1547	1548	79.56	0.11	10	222	959.34	958.72	0.28	450.29	0.65	18%
1353	2758	9645.76	13.89	48	53	966.11	965.60	0.96	54646.24	78.69	18%
177	178	297.40	0.43	12	413	989.27	983.02	1.51	1704.62	2.45	17%
333	334	45.78	0.07	8	398	1006.23	1004.98	0.31	263.32	0.38	17%
747	746	191.28	0.28	8	374	1109.35	1088.45	5.58	1110.82	1.60	17%
1520	1550	106.81	0.15	12	354	958.36	957.65	0.20	620.51	0.89	17%
2335	1411	50.53	0.07	8	48	983.13	982.94	0.39	295.37	0.43	17%
1272	179	169.61	0.24	12	16	1005.64	1005.70	-0.38	992.77	1.43	17%
1411	1410	50.54	0.07	8	189	982.94	982.19	0.40	296.08	0.43	17%
752	753	156.34	0.23	8	395	1145.64	1130.61	3.80	916.65	1.32	17%
Jun-323	Jun-327	4373.82	6.30	24	140	953.50	941.50	8.57	25763.22	37.10	17%
Jun-326	Jun-330	4373.82	6.30	24	140	953.50	941.50	8.57	25763.22	37.10	17%
1410	1409	50.53	0.07	8	367	982.19	980.72	0.40	297.69	0.43	17%
1043	1036	101.96	0.15	10	241	993.88	992.68	0.50	601.57	0.87	17%
753	747	191.28	0.28	8	356	1130.48	1109.48	5.90	1141.88	1.64	17%
464	463	279.06	0.40	12	398	1056.46	1050.55	1.48	1687.87	2.43	17%
535	534	13064.48	18.81	60	41	958.33	958.08	0.62	79507.38	114.49	16%
538	537	13064.96	18.81	60	46	958.82	958.53	0.63	80421.59	115.81	16%
888	882	135.69	0.20	12	411	991.54	990.00	0.37	848.30	1.22	16%
1021	297	70.78	0.10	10	52	1006.40	1006.26	0.27	443.72	0.64	16%

1375	1369	70.34	0.10	12	246	972.24	971.99	0.10	441.97	0.64	16%
Jun-393	Jun-392	76.41	0.11	10	400	1049.80	1048.53	0.32	480.11	0.69	16%
1816	9133	611.45	0.88	15	279	971.04	964.45	2.37	3864.75	5.57	16%
Jun-389	83	80.85	0.12	10	400	1044.20	1042.76	0.36	511.57	0.74	16%
1052	2409	351.58	0.51	12	109	1049.13	1046.27	2.63	2248.51	3.24	16%
Jun-390	Jun-389	79.71	0.11	10	402	1045.65	1044.20	0.36	512.07	0.74	16%
1369	1368	70.33	0.10	12	85	971.94	971.85	0.11	451.92	0.65	16%
Jun-391	Jun-390	78.96	0.11	10	401	1047.09	1045.65	0.36	510.65	0.74	15%
1788	2179	332.68	0.48	12	66	969.75	968.15	2.43	2160.60	3.11	15%
83	82	78.58	0.11	10	400	1042.76	1041.32	0.36	511.56	0.74	15%
1108	333	44.60	0.06	8	120	1006.70	1006.24	0.38	291.25	0.42	15%
Jun-392	Jun-391	78.25	0.11	10	400	1048.53	1047.09	0.36	511.23	0.74	15%
1246	1247	2778.68	4.00	30	403	1002.33	997.05	1.31	18268.81	26.31	15%
9180	9181	3607.74	5.20	27	177	995.72	988.75	3.95	23933.91	34.46	15%
1548	1549	67.77	0.10	10	360	958.72	957.71	0.28	451.41	0.65	15%
334	335	44.60	0.06	8	399	1004.98	1003.38	0.40	297.51	0.43	15%
530	529	421.62	0.61	24	117	957.90	957.78	0.10	2813.51	4.05	15%
616	2911	34.26	0.05	10	372	980.47	980.20	0.07	229.67	0.33	15%
1418	1340	3285.33	4.73	33	291	971.89	968.52	1.16	22134.75	31.87	15%
1244	1246	2778.69	4.00	30	383	1007.71	1002.43	1.38	18740.80	26.99	15%
2001	2158	201.49	0.29	18	27	978.03	978.00	0.11	1363.79	1.96	15%
82	Jun-388	75.04	0.11	10	400	1041.32	1039.88	0.36	511.57	0.74	15%
1355	1354	70.66	0.10	12	395	967.04	966.56	0.12	483.26	0.70	15%
51	52	391.32	0.56	15	169	990.38	988.46	1.14	2680.13	3.86	15%
422	657	32.75	0.05	8	394	1061.93	1061.03	0.23	224.72	0.32	15%
2062	420	125.49	0.18	8	383	1075.64	1062.61	3.40	866.87	1.25	14%
2063	2062	125.48	0.18	8	21	1076.37	1075.64	3.40	867.16	1.25	14%
2409	2408	351.58	0.51	12	314	1046.27	1036.54	3.10	2439.79	3.51	14%
2408	2407	351.57	0.51	12	324	1036.54	1026.51	3.10	2440.25	3.51	14%
1364	1358	42.75	0.06	8	288	970.75	969.60	0.40	296.81	0.43	14%
1359	1360	42.77	0.06	8	120	968.91	968.43	0.40	297.23	0.43	14%
1358	1359	42.70	0.06	8	173	969.60	968.91	0.40	296.84	0.43	14%
746	2063	125.49	0.18	8	350	1088.45	1076.37	3.45	872.80	1.26	14%
1365	1364	42.77	0.06	8	301	971.96	970.75	0.40	297.85	0.43	14%
1360	1361	42.67	0.06	8	250	968.43	967.43	0.40	297.20	0.43	14%
1007	998	203.38	0.29	12	95	1085.92	1085.02	0.95	1421.96	2.05	14%
1509	1506	577.35	0.83	15	298	1027.40	1019.56	2.63	4077.22	5.87	14%
19511	9106	102.26	0.15	15	409	996.20	995.86	0.08	724.79	1.04	14%
1247	1243	2778.68	4.00	30	394	996.95	990.79	1.56	19950.74	28.73	14%
2909	2464	100.16	0.14	10	407	982.59	979.64	0.72	725.63	1.04	14%
205	206	1924.67	2.77	24	148	979.52	975.80	2.52	13958.83	20.10	14%
462	461	278.96	0.40	12	413	1033.83	1024.73	2.20	2057.11	2.96	14%
1287	189	20.59	0.03	8	460	967.75	967.27	0.10	151.84	0.22	14%
542	541	13056.83	18.80	60	41	959.87	959.48	0.94	98423.57	141.73	13%
2467	2395	216.50	0.31	15	406	971.68	969.95	0.43	1639.88	2.36	13%
746	2064	65.80	0.09	8	76	1088.45	1087.59	1.14	501.61	0.72	13%
549	548	117.62	0.17	10	301	997.66	994.24	1.14	908.15	1.31	13%
1426	1425	50.64	0.07	8	350	987.99	985.47	0.72	398.74	0.57	13%
1610	9078	67.39	0.10	10	15	987.58	987.52	0.39	531.46	0.77	13%
1425	2335	50.55	0.07	8	325	985.47	983.13	0.72	398.74	0.57	13%
1137	2830	449.63	0.65	12	195	999.02	985.74	6.81	3616.39	5.21	12%
1368	1370	70.36	0.10	12	378	971.85	971.22	0.17	565.96	0.81	12%
2024	2025	546.55	0.79	15	403	1067.64	1055.08	3.12	4435.11	6.39	12%
1603	1594	57.50	0.08	8	404	982.27	978.23	1.00	470.11	0.68	12%
1594	1593	57.47	0.08	8	407	978.23	974.16	1.00	470.10	0.68	12%
1593	1585	57.45	0.08	8	415	974.16	970.01	1.00	470.00	0.68	12%
1585	1576	57.43	0.08	8	412	970.01	965.89	1.00	470.17	0.68	12%
1576	2450	57.42	0.08	8	179	965.89	964.10	1.00	470.11	0.68	12%
124	1500	1915.78	2.76	27	47	1027.96	1027.16	1.70	15690.56	22.59	12%
58	57	133.15	0.19	8	401	995.48	973.75	5.42	1094.53	1.58	12%
2892	Jun-320	242.35	0.35	18	108	966.06	965.80	0.24	2004.37	2.89	12%
550	549	117.62	0.17	10	190	1000.24	997.76	1.30	973.34	1.40	12%
623	1603	57.55	0.08	8	407	986.47	982.27	1.03	477.73	0.69	12%
332	1108	37.39	0.05	8	282	1007.94	1006.70	0.44	311.92	0.45	12%
2487	2846	8600.47	12.38	60	83	957.22	956.80	0.50	71919.20	103.56	12%
657	658	32.75	0.05	8	408	1061.03	1059.64	0.34	274.26	0.39	12%
Jun-343	Jun-345	5520.65	7.95	24	30	946.00	954.50	-28.33	46840.60	67.45	12%
Jun-344	Jun-346	5525.98	7.96	24	29	946.00	954.50	-29.22	47567.60	68.50	12%
463	462	278.99	0.40	12	313	1043.34	1033.93	3.01	2404.67	3.46	12%

129	130	54.30	0.08	8	422	1011.32	1007.13	0.99	468.44	0.67	12%
2470	2469	188.21	0.27	12	285	977.41	973.47	1.38	1629.92	2.35	12%
556	557	127.02	0.18	10	366	986.82	980.69	1.68	1103.34	1.59	12%
2893	2892	221.02	0.32	18	27	966.12	966.06	0.22	1929.40	2.78	11%
654	730	27.40	0.04	8	214	996.09	995.50	0.28	246.93	0.36	11%
1611	944	67.14	0.10	12	411	986.05	985.26	0.19	607.40	0.87	11%
282	126	54.30	0.08	8	198	1027.01	1024.83	1.10	492.69	0.71	11%
1220	2848	31.75	0.05	8	472	974.36	972.57	0.38	289.59	0.42	11%
59	58	133.24	0.19	8	396	1022.18	995.48	6.74	1220.23	1.76	11%
3013	1043	32.37	0.05	8	190	994.64	993.88	0.40	296.98	0.43	11%
2027	1816	611.45	0.88	15	146	978.50	971.04	5.12	5683.29	8.18	11%
1841	1831	419.68	0.60	15	394	973.32	963.74	2.43	3920.65	5.65	11%
9061	2057	111.72	0.16	8	31	1030.25	1028.70	4.98	1049.22	1.51	11%
2775	9062	111.71	0.16	8	107	1000.92	995.59	5.00	1050.73	1.51	11%
2058	9061	111.72	0.16	8	225	1041.52	1030.25	5.00	1050.94	1.51	11%
9062	2002	111.71	0.16	8	192	995.59	985.97	5.00	1050.94	1.51	11%
2056	2775	111.71	0.16	8	263	1014.09	1000.92	5.00	1051.02	1.51	11%
2061	2058	111.72	0.16	8	289	1055.99	1041.52	5.00	1051.31	1.51	11%
2057	2056	111.72	0.16	8	292	1028.70	1014.09	5.00	1051.37	1.51	11%
2002	2001	111.71	0.16	8	159	985.97	978.03	5.00	1051.31	1.51	11%
1357	1356	70.13	0.10	12	355	970.25	969.44	0.23	662.06	0.95	11%
420	2061	111.73	0.16	8	130	1062.61	1055.99	5.10	1061.23	1.53	11%
189	188	22.09	0.03	8	395	967.27	966.47	0.20	211.54	0.30	10%
944	1915	67.05	0.10	12	415	985.26	984.36	0.22	645.63	0.93	10%
Jun-207	2907	216.40	0.31	15	369	969.68	967.06	0.71	2117.14	3.05	10%
1082	1081	30.28	0.04	8	250	1097.30	1096.30	0.40	297.27	0.43	10%
574	2015	43.75	0.06	10	343	981.52	980.60	0.27	441.60	0.64	10%
2064	2073	65.80	0.09	8	379	1087.59	1080.01	2.00	664.88	0.96	10%
2073	2072	65.80	0.09	8	80	1080.01	1078.40	2.00	665.17	0.96	10%
182	2429	251.08	0.36	12	15	1004.26	1003.77	3.36	2538.92	3.66	10%
188	187	20.59	0.03	8	402	966.47	965.67	0.20	209.73	0.30	10%
1026	87	96.93	0.14	10	298	992.01	988.00	1.35	989.36	1.42	10%
2756	2746	4528.06	6.52	36	27	954.77	953.90	3.20	46417.87	66.84	10%
532	2382	8576.87	12.35	60	36	957.59	957.32	0.76	88326.77	127.19	10%
1825	2757	369.48	0.53	24	273	955.08	954.56	0.19	3840.41	5.53	10%
1370	1357	70.33	0.10	12	335	971.22	970.25	0.29	746.22	1.07	9%
1917	2463	66.94	0.10	12	406	982.71	981.64	0.26	711.49	1.02	9%
2293	788	24.08	0.03	8	103	1040.24	1039.93	0.30	257.79	0.37	9%
3012	1629	27.64	0.04	8	217	995.09	994.23	0.40	296.22	0.43	9%
1630	3012	27.64	0.04	8	209	995.93	995.09	0.40	297.77	0.43	9%
1629	1043	27.63	0.04	8	87	994.23	993.88	0.40	297.89	0.43	9%
1628	3013	27.36	0.04	8	168	995.31	994.64	0.40	296.92	0.43	9%
362	363	581.83	0.84	15	76	1036.62	1031.79	6.34	6326.30	9.11	9%
1221	1222	27.20	0.04	8	428	979.99	978.28	0.40	297.25	0.43	9%
1219	2306	27.08	0.04	8	98	975.53	975.14	0.40	296.06	0.43	9%
1236	1221	27.13	0.04	8	320	981.27	979.99	0.40	297.12	0.43	9%
1222	1218	27.16	0.04	8	407	978.28	976.65	0.40	297.63	0.43	9%
316	1236	26.97	0.04	8	128	981.78	981.27	0.40	296.45	0.43	9%
1218	1219	27.08	0.04	8	279	976.65	975.53	0.40	297.67	0.43	9%
2306	1220	27.07	0.04	8	195	975.14	974.36	0.40	297.66	0.43	9%
9091	674	61.06	0.09	8	83	1066.30	1064.60	2.05	672.40	0.97	9%
2831	2746	8923.04	12.85	60	83	954.69	953.90	0.96	99010.56	142.58	9%
48	47	276.62	0.40	12	400	997.51	977.79	4.92	3075.43	4.43	9%
368	364	71.19	0.10	15	316	1037.57	1037.25	0.10	799.96	1.15	9%
328	2771	72.79	0.10	8	257	998.72	990.84	3.06	822.63	1.18	9%
Jun-340	Jun-342	5525.98	7.96	24	20	956.10	946.00	50.50	62534.44	90.05	9%
Jun-339	Jun-341	5520.65	7.95	24	20	956.10	946.00	50.50	62534.44	90.05	9%
998	997	203.38	0.29	12	101	1085.02	1082.21	2.79	2316.69	3.34	9%
621	619	34.37	0.05	10	410	982.48	981.62	0.21	394.93	0.57	9%
1610	1611	67.30	0.10	12	479	987.58	986.05	0.32	783.32	1.13	9%
861	862	24.45	0.04	8	331	973.01	971.76	0.38	288.76	0.42	8%
672	671	61.06	0.09	8	55	1054.90	1053.59	2.39	726.11	1.05	8%
673	672	61.06	0.09	8	311	1062.34	1054.90	2.39	726.76	1.05	8%
671	670	61.06	0.09	8	54	1053.59	1052.31	2.39	726.80	1.05	8%
2025	9143	562.90	0.81	15	90	1055.08	1048.64	7.12	6704.90	9.66	8%
674	673	61.06	0.09	8	94	1064.60	1062.34	2.40	728.27	1.05	8%
281	282	54.30	0.08	8	199	1030.80	1027.01	1.90	648.23	0.93	8%
1288	1287	20.58	0.03	8	218	968.35	967.75	0.28	246.61	0.36	8%
2415	2414	1076.87	1.55	21	401	1054.55	1036.83	4.42	12960.07	18.66	8%

1817	2027	566.84	0.82	15	198	993.51	978.50	7.59	6923.04	9.97	8%
187	186	21.08	0.03	8	267	965.67	964.87	0.30	257.47	0.37	8%
1308	1307	37.86	0.05	12	18	965.76	965.72	0.22	463.12	0.67	8%
295	296	24.08	0.03	8	270	1019.70	1018.63	0.40	296.07	0.43	8%
789	2293	24.08	0.03	8	82	1040.57	1040.24	0.40	298.89	0.43	8%
Jun-332	Jun-336	2462.56	3.55	18	20	941.30	952.50	-56.00	30577.20	44.03	8%
Jun-333	Jun-337	2462.56	3.55	18	20	941.30	952.50	-56.00	30577.20	44.03	8%
663	662	61.06	0.09	8	133	971.44	967.91	2.65	764.99	1.10	8%
Jun-469	Jun-468	279.78	0.40	15	400	1023.77	1015.91	1.97	3522.85	5.07	8%
Jun-10	1021	24.08	0.03	8	12	1015.70	1015.65	0.42	305.08	0.44	8%
2911	2466	34.25	0.05	10	45	980.20	980.08	0.27	442.03	0.64	8%
Jun-374	48	237.18	0.34	12	400	1017.06	997.51	4.88	3062.03	4.41	8%
1915	1917	66.99	0.10	12	414	984.36	982.71	0.40	875.20	1.26	8%
2463	2464	70.36	0.10	12	418	981.64	979.80	0.44	919.67	1.32	8%
624	620	34.41	0.05	10	411	985.07	983.92	0.28	450.95	0.65	8%
623	624	34.47	0.05	10	498	986.47	985.07	0.28	452.02	0.65	8%
619	616	34.33	0.05	10	411	981.62	980.47	0.28	450.90	0.65	8%
620	2342	34.38	0.05	10	264	983.92	983.18	0.28	451.62	0.65	8%
551	550	117.62	0.17	10	465	1018.16	1002.41	3.38	1568.00	2.26	8%
786	789	24.08	0.03	8	305	1042.00	1040.57	0.47	321.81	0.46	7%
838	842	35.36	0.05	10	395	961.85	960.62	0.31	475.64	0.68	7%
66	1515	31.55	0.05	12	305	959.91	959.61	0.10	434.31	0.63	7%
1429	1428	50.62	0.07	8	342	1010.74	1003.23	2.20	697.07	1.00	7%
1464	1463	50.59	0.07	8	259	1027.43	1021.73	2.20	696.91	1.00	7%
1463	1430	50.59	0.07	8	246	1021.73	1016.31	2.20	697.04	1.00	7%
9143	2026	562.90	0.81	15	219	1048.64	1027.72	9.53	7758.66	11.17	7%
1428	1427	50.56	0.07	8	348	1003.23	995.57	2.20	697.06	1.00	7%
1430	1429	50.61	0.07	8	253	1016.31	1010.74	2.20	697.75	1.00	7%
1981	2401	32.70	0.05	10	246	987.13	986.44	0.28	451.00	0.65	7%
117	1426	50.55	0.07	8	221	992.86	987.99	2.20	697.34	1.00	7%
1427	117	50.56	0.07	8	123	995.57	992.86	2.21	698.12	1.01	7%
2026	1817	562.90	0.81	15	341	1027.72	993.51	10.03	7957.97	11.46	7%
144	143	21.02	0.03	8	249	985.94	984.94	0.40	298.08	0.43	7%
2072	2080	46.83	0.07	8	132	1078.40	1075.76	2.00	664.43	0.96	7%
2080	2081	46.83	0.07	8	374	1075.76	1068.28	2.00	664.65	0.96	7%
290	292	24.08	0.03	8	285	1028.30	1026.75	0.54	346.89	0.50	7%
997	996	203.38	0.29	12	99	1082.11	1077.41	4.74	3016.16	4.34	7%
9015	9016	28.17	0.04	8	330	1059.90	1057.26	0.80	420.12	0.60	7%
Jun-331	Jun-335	4373.82	6.30	24	20	941.30	952.50	-56.00	65851.80	94.83	7%
Jun-334	Jun-338	4373.82	6.30	24	20	941.30	952.50	-56.00	65851.80	94.83	7%
1892	530	275.10	0.40	24	52	958.02	957.90	0.23	4246.12	6.11	6%
666	665	61.06	0.09	8	191	1001.37	993.61	4.07	947.82	1.36	6%
664	663	61.06	0.09	8	294	983.40	971.44	4.07	948.27	1.37	6%
421	422	13.77	0.02	8	324	1062.61	1061.93	0.21	215.31	0.31	6%
1876	1877	243.77	0.35	24	424	959.73	958.93	0.19	3824.29	5.51	6%
Jun-468	Jun-467	278.24	0.40	15	401	1015.91	1003.72	3.04	4378.86	6.31	6%
2072	2071	18.97	0.03	8	49	1078.40	1078.20	0.41	299.30	0.43	6%
1877	1878	243.77	0.35	24	335	958.88	958.24	0.19	3848.47	5.54	6%
1878	1879	243.73	0.35	24	408	958.19	957.39	0.20	3895.48	5.61	6%
1882	1884	244.64	0.35	24	429	956.53	955.67	0.20	3939.29	5.67	6%
186	185	21.18	0.03	8	25	964.87	965.00	-0.53	341.08	0.49	6%
1879	1882	244.54	0.35	24	376	957.34	956.58	0.20	3956.80	5.70	6%
9016	2097	28.17	0.04	10	38	1057.16	1057.05	0.29	456.21	0.66	6%
1938	1939	242.30	0.35	24	321	962.12	961.48	0.20	3926.76	5.65	6%
1875	1874	243.08	0.35	24	324	961.04	960.39	0.20	3939.76	5.67	6%
1939	1875	242.29	0.35	24	170	961.43	961.09	0.20	3935.98	5.67	6%
1884	1825	245.27	0.35	24	279	955.67	955.08	0.21	4043.55	5.82	6%
776	775	16.81	0.02	8	202	1035.08	1034.37	0.35	278.84	0.40	6%
67	66	26.29	0.04	10	270	960.62	959.91	0.26	436.71	0.63	6%
2851	2487	8600.52	12.38	60	5	957.32	957.22	2.00	143272.21	206.31	6%
824	1692	17.76	0.03	8	293	1015.02	1013.85	0.40	296.80	0.43	6%
1658	1645	17.75	0.03	8	288	1007.51	1006.36	0.40	296.93	0.43	6%
1666	1667	17.73	0.03	8	373	1012.87	1011.38	0.40	297.24	0.43	6%
1645	1636	17.73	0.03	8	383	1006.36	1004.83	0.40	297.27	0.43	6%
1692	1666	17.74	0.03	8	244	1013.85	1012.87	0.40	297.64	0.43	6%
1636	728	17.71	0.03	8	299	1004.83	1003.63	0.40	297.59	0.43	6%
2342	621	34.37	0.05	10	145	983.18	982.50	0.47	584.05	0.84	6%
1313	1308	37.87	0.05	12	374	966.58	965.76	0.22	649.16	0.93	6%
2362	2361	29.70	0.04	10	199	973.34	972.63	0.36	509.23	0.73	6%

665	664	61.06	0.09	8	201	993.61	983.40	5.07	1058.49	1.52	6%
1874	1876	243.83	0.35	24	261	960.34	959.73	0.23	4252.90	6.12	6%
575	574	25.27	0.04	10	216	982.11	981.52	0.27	445.43	0.64	6%
1648	776	16.81	0.02	8	177	1035.79	1035.08	0.40	297.85	0.43	6%
292	294	24.08	0.03	8	288	1026.75	1024.35	0.83	429.43	0.62	6%
662	661	61.06	0.09	8	165	967.91	959.04	5.37	1089.46	1.57	6%
2774	9104	25.29	0.04	10	161	993.37	992.90	0.29	461.20	0.66	5%
99	67	19.24	0.03	10	170	960.92	960.62	0.18	357.68	0.52	5%
1744	1743	15.66	0.02	8	358	1024.25	1022.82	0.40	297.15	0.43	5%
1289	1288	20.58	0.03	8	228	969.95	968.35	0.70	393.76	0.57	5%
1356	1355	70.12	0.10	12	247	969.39	967.04	0.95	1350.79	1.95	5%
126	127	54.30	0.08	8	102	1024.56	1019.51	4.96	1046.68	1.51	5%
127	128	54.30	0.08	8	148	1019.51	1011.91	5.13	1064.68	1.53	5%
1012	1013	67.82	0.10	8	358	1013.06	983.28	8.31	1354.87	1.95	5%
1307	1303	43.70	0.06	12	523	965.74	963.59	0.41	888.43	1.28	5%
676	675	28.15	0.04	8	334	1072.35	1067.20	1.54	583.45	0.84	5%
2928	1051	14.31	0.02	8	154	1064.07	1063.45	0.40	297.84	0.43	5%
1940	1938	242.33	0.35	24	182	962.79	962.17	0.34	5132.16	7.39	5%
2928	2929	13.80	0.02	8	393	1064.07	1062.50	0.40	297.13	0.43	5%
9133	9132	611.45	0.88	15	33	964.45	954.94	28.58	13432.36	19.34	5%
310	309	13.73	0.02	8	24	981.62	981.52	0.42	304.82	0.44	5%
1515	1517	31.52	0.05	12	303	959.61	958.81	0.26	711.93	1.03	4%
1384	1317	18.76	0.03	10	470	972.85	971.53	0.28	451.83	0.65	4%
296	Jun-10	24.08	0.03	8	192	1018.63	1015.70	1.53	580.55	0.84	4%
1081	2135	40.21	0.06	12	261	1095.89	1094.61	0.49	970.37	1.40	4%
668	667	61.06	0.09	8	112	1024.38	1012.95	10.24	1503.92	2.17	4%
1570	1892	169.72	0.24	24	194	958.46	958.02	0.23	4190.39	6.03	4%
667	666	61.06	0.09	8	103	1012.95	1001.37	11.27	1578.33	2.27	4%
289	290	24.08	0.03	8	337	1034.80	1028.75	1.79	629.47	0.91	4%
Jun-320	1936	242.35	0.35	24	178	965.80	964.86	0.53	6398.76	9.21	4%
1366	1365	11.14	0.02	8	322	973.25	971.96	0.40	297.61	0.43	4%
1936	1937	242.34	0.35	24	305	964.86	963.18	0.55	6525.85	9.40	4%
1937	1940	242.32	0.35	24	70	963.18	962.79	0.55	6547.81	9.43	4%
294	295	24.08	0.03	8	205	1024.24	1020.20	1.97	659.19	0.95	4%
727	654	17.71	0.03	8	200	998.40	996.19	1.10	493.97	0.71	4%
835	834	20.94	0.03	8	390	965.99	959.75	1.60	594.95	0.86	4%
862	863	24.45	0.04	8	299	971.65	965.10	2.19	695.23	1.00	4%
2465	2464	34.05	0.05	15	166	979.89	979.64	0.15	974.35	1.40	3%
484	479	30.18	0.04	8	128	1024.31	1019.68	3.61	893.54	1.29	3%
788	289	24.08	0.03	8	216	1039.83	1034.80	2.33	718.04	1.03	3%
855	854	9.87	0.01	8	143	979.07	978.50	0.40	297.27	0.43	3%
864	865	9.87	0.01	8	164	1010.07	1009.41	0.40	297.94	0.43	3%
284	281	23.89	0.03	8	304	1037.96	1030.80	2.36	721.75	1.04	3%
1667	1658	17.72	0.03	8	297	1011.38	1007.51	1.30	536.82	0.77	3%
1634	654	9.78	0.01	8	444	997.86	996.09	0.40	296.87	0.43	3%
2393	2909	9.62	0.01	10	413	983.10	982.59	0.12	299.33	0.43	3%
1634	1633	7.10	0.01	8	426	997.86	996.91	0.22	222.11	0.32	3%
1633	1630	7.08	0.01	8	426	996.91	995.93	0.23	225.36	0.32	3%
858	857	9.87	0.01	8	329	986.70	985.14	0.47	323.47	0.47	3%
953	864	9.87	0.01	8	77	1010.57	1010.17	0.52	339.41	0.49	3%
1039	1038	9.79	0.01	8	240	997.65	996.41	0.52	337.90	0.49	3%
2401	2469	23.07	0.03	8	403	986.44	973.47	3.22	843.18	1.21	3%
1319	1313	27.22	0.04	12	291	968.11	966.56	0.53	1011.09	1.46	3%
1037	1036	9.79	0.01	8	264	994.32	992.73	0.60	364.46	0.52	3%
49	50	391.32	0.56	15	52	1008.52	990.78	34.40	14737.77	21.22	3%
1569	1570	74.65	0.11	24	174	958.64	958.46	0.10	2833.74	4.08	3%
1051	2807	14.31	0.02	8	221	1063.45	1060.14	1.50	574.75	0.83	2%
1318	1319	26.43	0.04	12	302	970.12	968.21	0.63	1102.84	1.59	2%
1640	879	7.10	0.01	8	181	999.91	999.19	0.40	296.40	0.43	2%
1038	1037	9.79	0.01	8	249	996.31	994.42	0.76	409.84	0.59	2%
2158	9149	201.49	0.29	18	36	978.00	976.46	4.27	8440.55	12.15	2%
879	1631	7.10	0.01	8	404	999.19	997.57	0.40	297.50	0.43	2%
1652	1639	7.09	0.01	8	387	1002.24	1000.69	0.40	297.59	0.43	2%
950	951	7.10	0.01	8	338	1018.54	1017.18	0.40	298.04	0.43	2%
854	861	17.76	0.03	8	199	978.30	973.29	2.52	745.74	1.07	2%
1631	1630	7.08	0.01	8	409	997.57	995.93	0.40	297.49	0.43	2%
1639	1640	7.09	0.01	8	194	1000.69	999.91	0.40	298.09	0.43	2%
670	669	61.06	0.09	8	40	1052.31	1039.50	32.07	2662.08	3.83	2%
728	727	17.71	0.03	8	180	1003.63	998.50	2.85	793.41	1.14	2%

Jun-377	Jun-376	6.58	0.01	8	400	1021.90	1020.28	0.40	298.98	0.43	2%
2916	2917	6.49	0.01	8	30	979.09	978.97	0.40	295.72	0.43	2%
Jun-378	Jun-377	6.40	0.01	8	401	1023.52	1021.90	0.40	298.89	0.43	2%
Jun-376	Jun-375	6.35	0.01	8	399	1020.28	1018.67	0.40	298.65	0.43	2%
651	Jun-53	28.63	0.04	12	38	996.56	996.20	0.95	1348.39	1.94	2%
2929	9015	28.17	0.04	8	31	1062.50	1059.90	8.35	1358.24	1.96	2%
Jun-379	Jun-378	6.19	0.01	8	213	1024.38	1023.52	0.40	298.75	0.43	2%
1317	1318	18.76	0.03	12	117	970.63	970.13	0.43	906.45	1.31	2%
9200	9162	9.33	0.01	10	29	992.90	992.82	0.28	451.23	0.65	2%
Jun-375	Jun-374	6.02	0.01	8	399	1018.67	1017.06	0.40	298.53	0.43	2%
669	668	61.06	0.09	8	35	1039.50	1024.38	42.66	3070.29	4.42	2%
2097	2096	23.81	0.03	8	202	1057.05	1043.31	6.80	1225.85	1.77	2%
2095	2094	23.81	0.03	8	196	1029.60	1016.26	6.81	1226.65	1.77	2%
2096	2095	23.81	0.03	8	201	1043.31	1029.60	6.81	1226.69	1.77	2%
2094	1137	23.81	0.03	8	253	1016.26	999.02	6.81	1226.70	1.77	2%
2398	2393	9.62	0.01	10	407	984.66	983.20	0.36	510.70	0.74	2%
9072	2936	8.61	0.01	10	38	1010.78	1010.67	0.29	461.47	0.66	2%
2071	422	18.97	0.03	8	327	1078.20	1061.93	4.98	1048.57	1.51	2%
2401	2398	9.63	0.01	10	410	986.44	984.66	0.43	561.47	0.81	2%
582	577	7.79	0.01	10	466	984.98	983.64	0.29	457.05	0.66	2%
577	576	6.48	0.01	10	313	983.64	982.95	0.22	400.23	0.58	2%
576	575	6.48	0.01	10	283	982.85	982.19	0.23	411.39	0.59	2%
1791	1535	4.66	0.01	8	245	964.56	963.58	0.40	297.44	0.43	2%
951	952	9.87	0.01	8	94	1017.08	1015.37	1.81	632.51	0.91	2%
2097	2109	4.36	0.01	8	83	1057.05	1056.72	0.40	296.97	0.43	1%
2109	2108	4.36	0.01	8	282	1025.82	1024.69	0.40	297.64	0.43	1%
857	856	9.87	0.01	8	121	985.04	982.50	2.09	679.84	0.98	1%
1040	1039	9.79	0.01	8	172	1001.51	997.75	2.19	695.42	1.00	1%
1988	1042	9.79	0.01	8	303	1032.27	1025.60	2.20	697.13	1.00	1%
580	582	6.48	0.01	10	276	985.92	985.08	0.30	470.60	0.68	1%
2135	1008	40.21	0.06	18	500	1094.51	1091.89	0.52	2958.45	4.26	1%
9085	2901	12.80	0.02	15	402	975.20	974.60	0.15	970.99	1.40	1%
775	1634	16.81	0.02	8	380	1034.27	1006.00	7.44	1281.78	1.85	1%
357	2774	3.87	0.01	8	213	994.22	993.37	0.40	296.68	0.43	1%
856	855	9.87	0.01	8	124	982.40	979.17	2.59	757.15	1.09	1%
68	99	5.40	0.01	10	126	961.22	960.92	0.24	415.86	0.60	1%
69	68	4.62	0.01	10	295	961.81	961.22	0.20	380.93	0.55	1%
9060	420	2.53	0.00	8	44	1062.70	1062.61	0.21	213.66	0.31	1%
2806	144	0.27	0.00	8	41	985.94	985.94	0.00	23.11	0.03	1%
865	866	9.87	0.01	8	393	1009.31	995.55	3.51	880.07	1.27	1%
1982	1981	3.06	0.00	8	67	987.40	987.13	0.40	299.13	0.43	1%
783	786	3.16	0.00	8	207	1043.00	1042.10	0.43	309.92	0.45	1%
866	858	9.87	0.01	8	190	995.45	986.90	4.50	996.62	1.44	1%
Jun-218	2465	9.62	0.01	15	192	980.18	979.89	0.15	975.50	1.40	1%
952	953	9.87	0.01	8	94	1015.27	1010.57	4.99	1049.80	1.51	1%
1565	1569	25.16	0.04	24	159	958.79	958.64	0.09	2705.05	3.90	1%
1041	1040	9.79	0.01	8	203	1012.17	1001.61	5.19	1071.20	1.54	1%
1011	1012	12.99	0.02	8	107	1023.93	1013.16	10.05	1490.05	2.15	1%
1042	1041	9.79	0.01	8	205	1025.60	1012.32	6.48	1196.65	1.72	1%
1535	69	4.65	0.01	10	310	963.58	961.81	0.57	643.60	0.93	1%
Jun-403	Jun-402	2.05	0.00	8	357	992.80	991.37	0.40	297.51	0.43	1%
Jun-404	Jun-403	1.98	0.00	8	201	993.61	992.80	0.40	298.05	0.43	1%
Jun-402	116	1.96	0.00	8	280	991.37	990.25	0.40	297.30	0.43	1%
116	109	1.83	0.00	8	400	990.25	988.65	0.40	297.26	0.43	1%
1566	1565	23.67	0.03	24	46	958.90	958.72	0.39	4291.55	6.18	1%
1567	1566	11.95	0.02	24	122	958.98	958.87	0.09	2254.51	3.25	1%
2844	2845	1.54	0.00	12	416	956.61	955.62	0.24	675.96	0.97	0%
1465	1464	1.58	0.00	8	280	1033.59	1027.43	2.20	697.44	1.00	0%
589	2916	2.37	0.00	8	25	980.42	979.10	5.29	1081.62	1.56	0%
1054	1055	0.19	0.00	8	229	1004.43	1002.64	0.78	415.71	0.60	0%
1568	1567	0.11	0.00	24	288	959.30	959.04	0.09	2644.29	3.81	0%
6	Jun-2	0.00	0.00	8	300	1200.31	1198.95	0.45	316.61	0.46	0%
7	6	0.00	0.00	8	129	1200.89	1200.41	0.37	286.54	0.41	0%
9	8	0.00	0.00	8	277	1070.11	1063.52	2.38	725.35	1.04	0%
10	9	0.00	0.00	8	281	1071.52	1070.11	0.50	332.84	0.48	0%
11	10	0.00	0.00	8	264	1072.52	1071.52	0.38	289.11	0.42	0%
12	11	0.00	0.00	8	248	1073.52	1072.52	0.40	298.41	0.43	0%
15	641	0.00	0.00	8	94	1081.02	1077.97	3.23	845.14	1.22	0%
14	15	0.00	0.00	8	242	1088.27	1081.02	3.00	813.67	1.17	0%

13	14	0.00	0.00	8	326	1095.28	1088.27	2.15	689.07	0.99	0%
19	13	0.00	0.00	8	298	1104.53	1095.28	3.10	828.16	1.19	0%
18	19	0.00	0.00	8	286	1110.52	1104.79	2.00	665.39	0.96	0%
17	18	0.00	0.00	8	298	1118.92	1110.52	2.82	789.79	1.14	0%
16	17	0.00	0.00	8	287	1133.94	1118.92	5.24	1075.84	1.55	0%
2920	21	0.00	0.00	8	78	1140.88	1139.34	1.97	659.22	0.95	0%
21	22	0.00	0.00	8	191	1139.34	1138.00	0.70	393.32	0.57	0%
22	23	0.00	0.00	8	295	1138.00	1135.38	0.89	442.87	0.64	0%
23	16	0.00	0.00	8	267	1135.38	1133.94	0.54	345.26	0.50	0%
92	93	0.00	0.00	10	260	1020.02	1012.52	2.88	1446.65	2.08	0%
93	9072	0.00	0.00	10	294	1012.52	1010.78	0.59	655.48	0.94	0%
104	119	0.00	0.00	8	319	1043.07	1041.77	0.41	300.15	0.43	0%
104	118	0.00	0.00	8	313	1043.07	1041.81	0.40	298.37	0.43	0%
131	128	0.00	0.00	8	301	1013.11	1011.91	0.40	296.95	0.43	0%
145	2806	0.00	0.00	8	220	987.02	985.94	0.49	329.02	0.47	0%
146	145	0.00	0.00	8	386	990.05	987.02	0.79	416.50	0.60	0%
147	146	0.00	0.00	8	401	992.85	990.05	0.70	392.78	0.57	0%
148	147	0.00	0.00	8	335	995.19	992.85	0.70	392.93	0.57	0%
149	148	0.00	0.00	8	400	1003.19	995.19	2.00	664.97	0.96	0%
195	196	0.00	0.00	8	345	1007.92	1006.55	0.40	296.36	0.43	0%
196	180	0.00	0.00	8	302	1006.55	1005.35	0.40	296.47	0.43	0%
265	266	0.00	0.00	8	210	1037.37	1033.72	1.74	620.09	0.89	0%
266	267	0.00	0.00	8	191	1033.72	1033.72	0.00	10.77	0.02	0%
267	268	0.00	0.00	8	207	1033.72	1032.50	0.59	360.75	0.52	0%
269	195	0.00	0.00	8	132	1009.05	1008.52	0.40	297.35	0.43	0%
271	269	0.00	0.00	8	374	1016.52	1009.05	2.00	664.61	0.96	0%
272	271	0.00	0.00	8	143	1039.12	1016.52	15.84	1871.04	2.69	0%
285	284	0.00	0.00	8	297	1048.28	1037.96	3.48	876.57	1.26	0%
308	306	0.00	0.00	8	354	1004.52	1001.52	0.85	432.61	0.62	0%
314	313	0.00	0.00	8	133	986.52	985.52	0.75	408.19	0.59	0%
315	314	0.00	0.00	8	373	992.52	986.52	1.61	596.23	0.86	0%
307	315	0.00	0.00	8	202	993.71	992.52	0.59	360.78	0.52	0%
313	311	0.00	0.00	8	168	985.52	984.95	0.34	273.71	0.39	0%
311	310	0.00	0.00	8	318	984.95	981.62	1.05	480.71	0.69	0%
1106	332	0.00	0.00	8	278	1009.16	1007.94	0.44	311.24	0.45	0%
358	357	0.00	0.00	8	394	995.80	994.22	0.40	297.71	0.43	0%
359	360	0.00	0.00	12	410	1008.85	1007.95	0.22	649.64	0.94	0%
365	364	0.00	0.00	8	388	1045.63	1037.85	2.00	665.39	0.96	0%
366	2317	0.00	0.00	8	200	1050.92	1046.43	2.24	704.16	1.01	0%
367	366	0.00	0.00	8	277	1054.05	1050.92	1.13	499.64	0.72	0%
370	368	0.00	0.00	15	262	1038.10	1037.57	0.20	1130.88	1.63	0%
418	419	0.00	0.00	8	205	1065.60	1063.99	0.78	416.36	0.60	0%
419	9060	0.00	0.00	8	428	1063.99	1062.70	0.30	258.06	0.37	0%
485	484	0.00	0.00	8	90	1027.06	1024.31	3.04	819.80	1.18	0%
486	485	0.00	0.00	8	125	1028.26	1027.16	0.88	440.62	0.63	0%
487	486	0.00	0.00	8	380	1051.27	1031.72	5.14	1066.16	1.54	0%
488	487	0.00	0.00	8	263	1058.52	1053.32	1.97	660.43	0.95	0%
489	488	0.00	0.00	8	378	1059.63	1058.62	0.27	243.04	0.35	0%
490	489	0.00	0.00	8	185	1060.63	1059.73	0.49	327.53	0.47	0%
517	515	0.00	0.00	8	199	1063.55	1062.79	0.38	290.70	0.42	0%
515	490	0.00	0.00	8	438	1062.79	1060.93	0.42	306.30	0.44	0%
518	517	0.00	0.00	8	330	1072.90	1063.65	2.80	786.84	1.13	0%
Jun-40	557	0.00	0.00	10	74	988.32	980.69	10.36	2742.80	3.95	0%
565	564	0.00	0.00	15	342	1039.22	1038.66	0.16	1017.24	1.46	0%
579	581	0.00	0.00	8	354	981.91	980.65	0.36	280.61	0.40	0%
874	579	0.00	0.00	8	234	984.16	981.91	0.96	461.03	0.66	0%
584	585	0.00	0.00	8	80	990.36	990.01	0.44	311.73	0.45	0%
585	586	0.00	0.00	8	42	989.91	989.61	0.71	396.09	0.57	0%
586	580	0.00	0.00	8	318	989.51	987.52	0.63	371.83	0.54	0%
581	587	0.00	0.00	8	105	980.45	980.02	0.41	300.24	0.43	0%
587	2916	0.00	0.00	8	195	979.92	979.10	0.42	305.00	0.44	0%
610	609	0.00	0.00	8	150	993.32	992.71	0.41	300.11	0.43	0%
609	611	0.00	0.00	8	288	992.61	991.49	0.39	293.33	0.42	0%
622	623	0.00	0.00	8	39	986.73	986.57	0.41	300.23	0.43	0%
628	272	0.00	0.00	8	216	1040.15	1039.12	0.48	324.27	0.47	0%
Jun-49	628	0.00	0.00	8	170	1040.93	1040.25	0.40	297.69	0.43	0%
641	12	0.00	0.00	8	150	1077.87	1073.52	2.91	801.41	1.15	0%
Jun-51	651	0.00	0.00	12	285	999.28	996.56	0.95	1352.86	1.95	0%
652	653	0.00	0.00	8	299	1011.10	996.71	4.82	1031.55	1.49	0%

653	654	0.00	0.00	8	175	996.61	995.92	0.39	256.36	0.37	0%
677	676	0.00	0.00	8	297	1080.12	1072.35	2.62	760.46	1.10	0%
678	677	0.00	0.00	8	251	1094.52	1080.12	5.74	1126.02	1.62	0%
679	678	0.00	0.00	8	239	1107.10	1094.62	5.21	1073.33	1.55	0%
680	679	0.00	0.00	8	300	1119.93	1107.20	4.24	968.37	1.39	0%
681	680	0.00	0.00	8	300	1133.78	1120.03	4.59	1007.10	1.45	0%
696	691	0.00	0.00	8	170	1015.34	1015.01	0.19	206.84	0.30	0%
691	692	0.00	0.00	8	140	1014.91	1014.34	0.41	299.57	0.43	0%
692	693	0.00	0.00	8	475	1014.24	1012.32	0.40	298.81	0.43	0%
693	453	0.00	0.00	8	103	1012.22	1011.82	0.39	293.26	0.42	0%
694	695	0.00	0.00	8	262	1018.13	1017.18	0.36	283.11	0.41	0%
695	696	0.00	0.00	8	142	1017.08	1015.34	1.23	520.50	0.75	0%
708	707	0.00	0.00	8	129	1047.63	1046.38	0.97	462.60	0.67	0%
709	708	0.00	0.00	8	426	1053.35	1051.63	0.40	298.81	0.43	0%
710	709	0.00	0.00	8	177	1056.09	1053.45	1.49	573.76	0.83	0%
711	710	0.00	0.00	8	250	1057.69	1056.19	0.60	364.20	0.52	0%
724	711	0.00	0.00	8	304	1060.04	1057.69	0.77	413.53	0.60	0%
748	749	0.00	0.00	8	393	1197.08	1187.70	2.39	726.12	1.05	0%
749	750	0.00	0.00	8	400	1187.57	1179.49	2.02	667.79	0.96	0%
750	751	0.00	0.00	8	394	1179.36	1158.83	5.21	1072.62	1.54	0%
751	752	0.00	0.00	8	390	1158.69	1145.77	3.31	855.51	1.23	0%
764	763	0.00	0.00	8	135	989.46	988.92	0.40	297.58	0.43	0%
765	764	0.00	0.00	8	167	990.13	989.46	0.40	297.63	0.43	0%
766	765	0.00	0.00	8	94	990.51	990.13	0.40	298.68	0.43	0%
650	Jun-51	0.00	0.00	12	112	999.51	999.28	0.21	627.84	0.90	0%
985	787	0.00	0.00	8	132	1043.95	1043.44	0.39	204.66	0.29	0%
787	783	0.00	0.00	8	146	1043.70	1043.10	0.41	301.12	0.43	0%
808	807	0.00	0.00	8	282	1138.07	1137.80	0.10	145.41	0.21	0%
807	736	0.00	0.00	8	349	1137.70	1135.88	0.52	339.40	0.49	0%
736	806	0.00	0.00	8	103	1135.78	1135.34	0.43	306.88	0.44	0%
806	681	0.00	0.00	8	206	1135.24	1133.88	0.66	382.19	0.55	0%
809	810	0.00	0.00	8	215	1143.37	1141.42	0.91	447.81	0.64	0%
810	811	0.00	0.00	8	179	1141.32	1140.83	0.27	246.10	0.35	0%
811	812	0.00	0.00	8	157	1140.73	1140.07	0.42	305.18	0.44	0%
812	808	0.00	0.00	8	382	1139.97	1138.17	0.47	322.51	0.46	0%
830	831	0.00	0.00	8	297	994.04	989.25	1.61	597.16	0.86	0%
831	832	0.00	0.00	8	223	989.15	982.64	2.92	803.68	1.16	0%
832	833	0.00	0.00	8	224	982.54	977.06	2.45	735.28	1.06	0%
833	835	0.00	0.00	8	394	976.96	966.09	2.76	781.12	1.12	0%
2374	837	0.00	0.00	8	367	991.93	990.31	0.44	312.48	0.45	0%
843	9084	0.00	0.00	8	417	983.16	977.02	1.47	570.13	0.82	0%
844	9084	0.00	0.00	8	401	979.19	976.59	0.65	378.72	0.55	0%
869	868	0.00	0.00	8	205	1062.54	1061.49	0.51	336.41	0.48	0%
868	724	0.00	0.00	8	178	1061.39	1060.14	0.70	394.09	0.57	0%
872	871	0.00	0.00	8	262	986.79	985.96	0.32	264.50	0.38	0%
871	874	0.00	0.00	8	247	985.76	984.36	0.57	353.83	0.51	0%
880	881	0.00	0.00	8	411	995.00	991.84	0.77	412.16	0.59	0%
881	882	0.00	0.00	8	409	991.74	990.10	0.40	297.49	0.43	0%
883	882	0.00	0.00	8	254	991.01	990.10	0.36	281.41	0.41	0%
884	883	0.00	0.00	8	255	992.02	991.11	0.36	280.95	0.40	0%
885	884	0.00	0.00	8	410	994.42	992.12	0.56	352.03	0.51	0%
893	881	0.00	0.00	8	351	993.62	991.94	0.48	325.16	0.47	0%
899	900	0.00	0.00	8	133	1052.11	1051.56	0.41	302.03	0.43	0%
900	285	0.00	0.00	8	314	1051.56	1050.30	0.40	297.60	0.43	0%
901	902	0.00	0.00	8	186	1055.31	1054.66	0.35	277.80	0.40	0%
902	903	0.00	0.00	8	180	1054.46	1053.62	0.47	320.74	0.46	0%
903	899	0.00	0.00	8	346	1053.52	1052.31	0.35	278.08	0.40	0%
Jun-87	901	0.00	0.00	8	20	1055.41	1055.31	0.49	330.40	0.48	0%
918	Jun-87	0.00	0.00	8	117	1055.83	1055.41	0.36	281.55	0.41	0%
919	918	0.00	0.00	8	116	1056.54	1055.93	0.52	340.34	0.49	0%
920	919	0.00	0.00	8	332	1075.89	1056.54	5.82	1134.29	1.63	0%
921	920	0.00	0.00	8	154	1078.24	1075.99	1.46	568.71	0.82	0%
948	949	0.00	0.00	8	85	1021.07	1019.09	2.34	719.41	1.04	0%
949	950	0.00	0.00	8	87	1018.99	1018.64	0.40	298.07	0.43	0%
986	985	0.00	0.00	8	234	1048.47	1044.02	1.90	648.52	0.93	0%
987	986	0.00	0.00	8	118	1050.54	1048.47	1.76	622.95	0.90	0%
988	987	0.00	0.00	8	316	1056.39	1050.54	1.85	639.21	0.92	0%
989	988	0.00	0.00	8	97	1057.37	1056.44	0.96	460.69	0.66	0%
990	989	0.00	0.00	8	122	1073.48	1057.42	13.12	1702.47	2.45	0%

631	1028	0.00	0.00	8	143	1042.30	1041.73	0.40	297.12	0.43	0%
1028	Jun-49	0.00	0.00	8	230	1041.63	1040.93	0.30	259.15	0.37	0%
1029	1030	0.00	0.00	8	184	1038.00	1030.60	4.02	942.59	1.36	0%
1032	7	0.00	0.00	8	130	1201.30	1200.79	0.39	264.31	0.38	0%
1031	1032	0.00	0.00	8	403	1203.00	1201.40	0.40	296.35	0.43	0%
1053	1054	0.00	0.00	8	228	1005.34	1004.43	0.40	296.92	0.43	0%
1078	1083	0.00	0.00	8	230	1106.00	1098.26	3.37	862.35	1.24	0%
1079	1078	0.00	0.00	8	236	1119.96	1106.10	5.87	1138.56	1.64	0%
1080	1079	0.00	0.00	8	246	1138.95	1120.06	7.68	1302.30	1.88	0%
1083	1082	0.00	0.00	8	214	1098.26	1097.40	0.40	298.09	0.43	0%
336	1106	0.00	0.00	8	100	1009.60	1009.16	0.44	311.30	0.45	0%
1112	891	0.00	0.00	8	414	995.01	993.22	0.43	309.01	0.44	0%
1116	1117	0.00	0.00	10	282	1076.26	1075.48	0.28	448.53	0.65	0%
1117	992	0.00	0.00	10	105	1075.38	1075.10	0.27	440.03	0.63	0%
1133	1134	0.00	0.00	8	118	1023.30	1016.85	5.49	1100.99	1.59	0%
1134	1135	0.00	0.00	8	75	1016.75	1012.87	5.15	1067.01	1.54	0%
1135	2932	0.00	0.00	8	255	1012.77	985.05	10.89	1550.99	2.23	0%
1146	1145	0.00	0.00	15	178	1040.17	1039.89	0.16	997.25	1.44	0%
1147	1146	0.00	0.00	15	365	1040.75	1040.17	0.16	1001.74	1.44	0%
1148	1147	0.00	0.00	15	179	1041.03	1040.75	0.16	994.85	1.43	0%
1216	1366	0.00	0.00	8	388	974.80	973.25	0.40	296.96	0.43	0%
1215	1216	0.00	0.00	8	379	976.32	974.80	0.40	297.67	0.43	0%
1214	1215	0.00	0.00	8	273	977.41	976.32	0.40	297.03	0.43	0%
1213	1214	0.00	0.00	8	468	979.28	977.41	0.40	297.26	0.43	0%
1212	1213	0.00	0.00	8	68	979.55	979.28	0.40	295.50	0.43	0%
1232	1212	0.00	0.00	8	273	980.64	979.55	0.40	296.91	0.43	0%
1060	1232	0.00	0.00	8	182	981.37	980.64	0.40	297.62	0.43	0%
1231	1060	0.00	0.00	8	154	981.99	981.37	0.40	298.23	0.43	0%
65	1231	0.00	0.00	8	69	982.27	981.99	0.41	299.85	0.43	0%
1230	65	0.00	0.00	8	52	982.48	982.27	0.41	299.15	0.43	0%
1229	1230	0.00	0.00	8	200	983.28	982.48	0.40	297.02	0.43	0%
1228	1229	0.00	0.00	8	223	984.17	983.28	0.40	297.20	0.43	0%
1245	149	0.00	0.00	8	430	1004.91	1003.19	0.40	297.43	0.43	0%
1248	1243	0.00	0.00	15	109	992.27	990.42	1.70	3272.25	4.71	0%
1249	1248	0.00	0.00	15	253	1013.52	992.27	8.41	7287.56	10.49	0%
1250	1249	0.00	0.00	15	185	1028.92	1013.52	8.33	7250.82	10.44	0%
1251	1250	0.00	0.00	15	134	1030.02	1028.92	0.82	2278.44	3.28	0%
1252	1251	0.00	0.00	15	249	1034.52	1030.02	1.81	3376.31	4.86	0%
1253	1252	0.00	0.00	15	199	1053.52	1034.52	9.53	7758.68	11.17	0%
1255	1254	0.00	0.00	15	181	1065.02	1057.52	4.14	5110.62	7.36	0%
1256	1255	0.00	0.00	15	146	1066.52	1065.02	1.02	2543.22	3.66	0%
1254	1253	0.00	0.00	15	134	1056.52	1053.52	2.24	3763.57	5.42	0%
360	1274	0.00	0.00	12	340	1007.95	1007.20	0.22	650.49	0.94	0%
1298	1299	0.00	0.00	8	53	960.36	960.16	0.38	288.35	0.42	0%
2404	1298	0.00	0.00	8	20	961.68	960.36	6.69	1215.83	1.75	0%
1309	1310	0.00	0.00	8	15	970.26	970.20	0.40	296.60	0.43	0%
1310	1311	0.00	0.00	8	135	970.20	969.66	0.40	297.40	0.43	0%
1311	1312	0.00	0.00	8	396	969.66	968.08	0.40	296.84	0.43	0%
1312	1313	0.00	0.00	8	382	968.08	966.38	0.45	297.51	0.43	0%
1331	2439	0.00	0.00	8	420	969.42	964.66	1.13	500.20	0.72	0%
1331	1332	0.00	0.00	8	336	969.42	968.08	0.40	296.72	0.43	0%
1332	1308	0.00	0.00	8	304	968.08	966.86	0.40	297.61	0.43	0%
1416	1417	0.00	0.00	8	150	999.35	998.75	0.40	297.72	0.43	0%
1415	1416	0.00	0.00	8	300	1000.55	999.35	0.40	297.06	0.43	0%
1414	1415	0.00	0.00	8	199	1001.35	1000.55	0.40	298.19	0.43	0%
1413	1414	0.00	0.00	8	181	1002.07	1001.35	0.40	296.08	0.43	0%
1419	1413	0.00	0.00	8	384	1003.61	1002.07	0.40	297.63	0.43	0%
1420	1419	0.00	0.00	8	225	1004.51	1003.61	0.40	297.07	0.43	0%
1421	1420	0.00	0.00	8	224	1005.40	1004.51	0.40	296.15	0.43	0%
1421	1422	0.00	0.00	8	267	1005.40	1004.33	0.40	297.80	0.43	0%
1422	2331	0.00	0.00	8	101	1004.33	1003.93	0.40	296.02	0.43	0%
1423	1424	0.00	0.00	8	140	1003.28	1002.72	0.40	297.24	0.43	0%
1424	1411	0.00	0.00	8	313	1002.72	1001.48	0.40	296.05	0.43	0%
1466	1465	0.00	0.00	8	282	1039.84	1033.59	2.22	700.33	1.01	0%
119	1466	0.00	0.00	8	484	1041.77	1039.84	0.40	296.95	0.43	0%
118	1494	0.00	0.00	8	303	1041.81	1040.60	0.40	296.84	0.43	0%
1495	265	0.00	0.00	8	157	1038.81	1037.37	0.92	450.40	0.65	0%
Jun-138	1536	0.00	0.00	8	400	972.99	971.39	0.40	297.11	0.43	0%
1536	1537	0.00	0.00	8	243	971.39	970.42	0.40	297.12	0.43	0%

1537	1538	0.00	0.00	8	109	970.42	969.98	0.40	298.77	0.43	0%
1538	1539	0.00	0.00	8	321	969.98	968.70	0.40	296.77	0.43	0%
1539	1540	0.00	0.00	8	404	968.70	967.08	0.40	297.53	0.43	0%
1540	1541	0.00	0.00	8	400	967.08	965.48	0.40	297.38	0.43	0%
1541	2847	0.00	0.00	8	176	965.48	964.78	0.40	296.66	0.43	0%
1542	1544	0.00	0.00	8	223	963.92	963.03	0.40	296.81	0.43	0%
1544	1545	0.00	0.00	8	308	963.03	961.80	0.40	297.18	0.43	0%
1545	1546	0.00	0.00	8	306	961.80	960.57	0.40	297.78	0.43	0%
1546	1547	0.00	0.00	8	308	960.57	959.34	0.40	297.10	0.43	0%
1552	2451	0.00	0.00	8	286	964.30	963.16	0.40	296.93	0.43	0%
1555	1556	0.00	0.00	24	134	960.58	960.28	0.22	4162.02	5.99	0%
1556	1557	0.00	0.00	24	162	960.11	959.97	0.09	2590.02	3.73	0%
1557	1558	0.00	0.00	24	200	959.97	959.87	0.05	1967.55	2.83	0%
2380	841	0.00	0.00	10	216	978.13	970.30	3.63	1624.06	2.34	0%
1558	1568	0.00	0.00	24	368	959.80	959.40	0.11	2902.52	4.18	0%
1578	1552	0.00	0.00	8	400	965.90	964.30	0.40	297.14	0.43	0%
1579	1578	0.00	0.00	8	489	967.86	965.90	0.40	297.53	0.43	0%
1587	1552	0.00	0.00	8	404	965.92	964.30	0.40	297.68	0.43	0%
2373	1587	0.00	0.00	8	412	966.92	965.92	0.24	231.58	0.33	0%
Jun-140	1587	0.00	0.00	8	377	967.43	965.92	0.40	297.38	0.43	0%
1597	1596	0.00	0.00	8	494	990.21	988.23	0.40	297.66	0.43	0%
1598	2343	0.00	0.00	8	200	991.82	991.02	0.40	297.57	0.43	0%
1598	2874	0.00	0.00	8	421	991.82	988.50	0.79	417.62	0.60	0%
1596	622	0.00	0.00	8	375	988.23	986.73	0.40	297.20	0.43	0%
1600	1309	0.00	0.00	8	136	970.81	970.26	0.40	298.44	0.43	0%
1602	1601	0.00	0.00	8	174	984.66	982.55	1.21	517.81	0.75	0%
1602	1603	0.00	0.00	8	240	984.66	982.27	1.00	469.46	0.68	0%
1608	1609	0.00	0.00	8	413	990.82	989.21	0.39	293.60	0.42	0%
1615	1616	0.00	0.00	8	248	992.80	991.80	0.40	298.33	0.43	0%
1616	2318	0.00	0.00	8	205	991.80	990.98	0.40	297.50	0.43	0%
1617	2319	0.00	0.00	8	203	990.17	989.35	0.40	298.66	0.43	0%
1618	889	0.00	0.00	8	178	991.41	988.54	1.62	597.61	0.86	0%
2872	886	0.00	0.00	8	166	990.77	990.10	0.40	298.61	0.43	0%
886	2320	0.00	0.00	8	202	990.10	989.30	0.40	296.06	0.43	0%
1619	2321	0.00	0.00	8	204	988.46	987.65	0.40	296.37	0.43	0%
893	1617	0.00	0.00	8	58	993.62	990.17	5.96	1147.22	1.65	0%
1580	1579	0.00	0.00	8	201	968.66	967.86	0.40	296.42	0.43	0%
1951	885	0.00	0.00	8	407	996.05	994.42	0.40	297.48	0.43	0%
2387	885	0.00	0.00	8	412	995.52	994.42	0.27	242.81	0.35	0%
1417	2322	0.00	0.00	8	196	998.75	997.96	0.40	298.06	0.43	0%
1627	2883	0.00	0.00	8	231	997.17	996.24	0.40	298.05	0.43	0%
777	1633	0.00	0.00	8	374	1000.39	996.91	0.93	453.53	0.65	0%
1650	777	0.00	0.00	8	379	1003.89	1000.39	0.92	451.47	0.65	0%
729	728	0.00	0.00	8	224	1004.53	1003.63	0.40	297.69	0.43	0%
1635	1636	0.00	0.00	8	280	1005.95	1004.83	0.40	297.27	0.43	0%
1413	1635	0.00	0.00	8	286	1007.10	1005.95	0.40	297.91	0.43	0%
1419	1644	0.00	0.00	8	313	1008.63	1007.39	0.40	295.68	0.43	0%
1644	1645	0.00	0.00	8	256	1007.39	1006.36	0.40	297.94	0.43	0%
1646	729	0.00	0.00	8	155	1005.15	1004.53	0.40	297.14	0.43	0%
1650	1652	0.00	0.00	8	412	1003.89	1002.24	0.40	297.57	0.43	0%
1656	1648	0.00	0.00	8	382	1037.32	1035.79	0.40	297.48	0.43	0%
1659	1419	0.00	0.00	8	296	1004.79	1003.61	0.40	296.83	0.43	0%
1660	1659	0.00	0.00	8	221	1005.68	1004.79	0.40	297.97	0.43	0%
1661	1660	0.00	0.00	8	222	1006.57	1005.68	0.40	297.40	0.43	0%
1657	1656	0.00	0.00	8	98	1037.71	1037.32	0.40	296.76	0.43	0%
1676	9035	0.00	0.00	8	331	1039.22	1037.90	0.40	296.75	0.43	0%
1688	1689	0.00	0.00	8	199	1041.62	1040.83	0.40	296.49	0.43	0%
1687	1688	0.00	0.00	8	254	1042.64	1041.62	0.40	297.83	0.43	0%
1662	2879	0.00	0.00	8	283	1018.88	1017.75	0.40	297.22	0.43	0%
1437	824	0.00	0.00	8	354	1016.43	1015.02	0.40	296.81	0.43	0%
1711	1701	0.00	0.00	8	668	1023.98	1021.31	0.40	297.18	0.43	0%
1698	1687	0.00	0.00	8	217	1043.51	1042.64	0.40	297.75	0.43	0%
1696	1437	0.00	0.00	8	329	1017.75	1016.43	0.40	297.58	0.43	0%
1704	1696	0.00	0.00	8	325	1019.05	1017.75	0.40	297.38	0.43	0%
1707	1708	0.00	0.00	8	199	1026.54	1025.74	0.40	298.10	0.43	0%
1708	2877	0.00	0.00	8	353	1025.74	1024.33	0.40	297.19	0.43	0%
1714	1704	0.00	0.00	8	234	1019.99	1019.05	0.40	297.63	0.43	0%
1715	1714	0.00	0.00	8	435	1021.73	1019.99	0.40	297.19	0.43	0%
1716	1715	0.00	0.00	8	190	1022.49	1021.73	0.40	296.92	0.43	0%

1717	1716	0.00	0.00	8	188	1023.24	1022.49	0.40	297.01	0.43	0%
1718	1717	0.00	0.00	8	202	1024.05	1023.24	0.40	297.80	0.43	0%
1719	1718	0.00	0.00	8	200	1024.85	1024.05	0.40	297.02	0.43	0%
1752	1751	0.00	0.00	8	76	1046.46	1046.16	0.39	295.29	0.43	0%
1751	1750	0.00	0.00	8	175	1046.16	1045.46	0.40	297.57	0.43	0%
1750	1749	0.00	0.00	8	227	1045.46	1044.55	0.40	297.60	0.43	0%
1749	1748	0.00	0.00	8	230	1044.55	1043.63	0.40	297.42	0.43	0%
1748	1747	0.00	0.00	8	352	1043.63	1027.78	4.50	996.93	1.44	0%
1747	1746	0.00	0.00	8	352	1027.78	1026.37	0.40	297.54	0.43	0%
1746	1745	0.00	0.00	8	351	1026.37	1024.97	0.40	296.96	0.43	0%
1745	1744	0.00	0.00	8	179	1024.97	1024.25	0.40	298.12	0.43	0%
1767	1768	0.00	0.00	8	257	1038.73	1037.70	0.40	297.39	0.43	0%
1768	1769	0.00	0.00	8	337	1037.70	1036.35	0.40	297.50	0.43	0%
1769	1770	0.00	0.00	8	155	1036.35	1035.73	0.40	297.27	0.43	0%
1770	1771	0.00	0.00	8	154	1035.73	1035.11	0.40	298.21	0.43	0%
1771	1772	0.00	0.00	8	280	1035.11	1033.99	0.40	297.44	0.43	0%
1772	1773	0.00	0.00	8	332	1033.99	1032.66	0.40	297.63	0.43	0%
1773	1774	0.00	0.00	8	124	1032.66	1032.16	0.40	298.11	0.43	0%
1774	1775	0.00	0.00	8	277	1032.16	1031.05	0.40	297.69	0.43	0%
1775	1776	0.00	0.00	8	367	1031.05	1029.58	0.40	297.31	0.43	0%
1776	124	0.00	0.00	8	404	1029.58	1027.96	0.40	297.64	0.43	0%
1838	2381	0.00	0.00	8	276	969.60	963.22	2.31	714.90	1.03	0%
1839	1838	0.00	0.00	8	130	972.65	969.60	2.35	720.16	1.04	0%
1845	2381	0.00	0.00	8	244	965.52	963.12	0.98	465.80	0.67	0%
1847	1839	0.00	0.00	8	487	984.10	972.65	2.35	720.97	1.04	0%
1846	1845	0.00	0.00	8	242	967.88	965.52	0.98	464.42	0.67	0%
1853	1846	0.00	0.00	8	183	969.67	967.88	0.98	465.44	0.67	0%
1855	1853	0.00	0.00	8	206	971.69	969.67	0.98	465.64	0.67	0%
1847	843	0.00	0.00	8	393	984.10	982.53	0.40	297.29	0.43	0%
844	9085	0.00	0.00	8	390	979.19	975.20	1.02	475.39	0.68	0%
1894	1855	0.00	0.00	8	196	973.61	971.69	0.98	465.14	0.67	0%
1859	843	0.00	0.00	8	388	984.67	982.53	0.55	348.92	0.50	0%
1859	Jun-165	0.00	0.00	8	362	984.67	982.89	0.49	329.78	0.47	0%
1861	1860	0.00	0.00	8	194	977.44	975.53	0.98	466.08	0.67	0%
1862	1861	0.00	0.00	8	195	979.35	977.44	0.98	465.40	0.67	0%
1863	1859	0.00	0.00	8	388	985.61	984.72	0.23	225.19	0.32	0%
1868	1862	0.00	0.00	8	216	981.47	979.35	0.98	465.27	0.67	0%
1870	1868	0.00	0.00	8	239	983.81	981.47	0.98	465.44	0.67	0%
1871	1863	0.00	0.00	8	457	989.99	985.71	0.94	455.13	0.66	0%
1895	1870	0.00	0.00	8	404	987.75	983.81	0.98	464.34	0.67	0%
1896	1871	0.00	0.00	8	399	991.58	989.99	0.40	296.89	0.43	0%
1871	1870	0.00	0.00	8	409	989.99	983.81	1.51	577.99	0.83	0%
1860	1894	0.00	0.00	8	196	975.53	973.61	0.98	465.14	0.67	0%
1895	1896	0.00	0.00	8	407	987.75	984.42	0.82	425.25	0.61	0%
1896	1904	0.00	0.00	8	413	984.42	982.13	0.56	350.20	0.50	0%
1904	2894	0.00	0.00	8	418	982.13	978.87	0.78	414.97	0.60	0%
1907	1904	0.00	0.00	8	407	985.31	982.13	0.78	415.42	0.60	0%
1908	1907	0.00	0.00	8	237	987.15	985.31	0.78	414.43	0.60	0%
2463	1931	0.00	0.00	8	409	986.45	984.14	0.56	353.30	0.51	0%
1953	1931	0.00	0.00	8	413	985.24	983.44	0.44	310.17	0.45	0%
1930	1931	0.00	0.00	8	191	984.30	983.54	0.40	296.85	0.43	0%
1929	1930	0.00	0.00	8	197	985.09	984.30	0.40	297.63	0.43	0%
1928	1929	0.00	0.00	8	217	985.96	985.09	0.40	297.98	0.43	0%
1927	1928	0.00	0.00	8	211	986.80	985.96	0.40	296.45	0.43	0%
Jun-59	1951	0.00	0.00	8	224	996.94	996.05	0.40	296.28	0.43	0%
1963	1953	0.00	0.00	8	201	990.90	985.24	2.82	788.67	1.14	0%
1962	1963	0.00	0.00	8	19	991.43	990.90	2.81	788.19	1.13	0%
2396	1962	0.00	0.00	8	179	996.46	991.43	2.82	788.72	1.14	0%
2798	2397	0.00	0.00	8	408	1016.77	999.53	4.23	966.26	1.39	0%
9075	9109	0.00	0.00	8	290	1023.35	1021.00	0.81	423.01	0.61	0%
1985	9080	0.00	0.00	8	262	1039.69	1038.64	0.40	297.81	0.43	0%
763	2003	0.00	0.00	8	190	988.92	988.16	0.40	297.18	0.43	0%
2003	1982	0.00	0.00	8	189	988.16	987.40	0.40	298.17	0.43	0%
9064	1988	0.00	0.00	8	258	1037.94	1032.27	2.20	697.27	1.00	0%
1997	14763	0.00	0.00	8	131	999.34	988.32	8.40	1362.25	1.96	0%
1996	1997	0.00	0.00	8	149	1011.85	999.34	8.40	1362.62	1.96	0%
Jun-179	1996	0.00	0.00	8	310	1037.90	1011.85	8.40	1362.33	1.96	0%
767	766	0.00	0.00	8	224	1032.70	990.51	18.80	2038.18	2.93	0%
768	767	0.00	0.00	8	157	1044.73	1032.70	7.64	1299.43	1.87	0%

1989	9067	0.00	0.00	8	77	1043.83	1042.13	2.21	698.26	1.01	0%
2370	2371	0.00	0.00	8	383	1057.03	1049.21	2.04	672.01	0.97	0%
72	2073	0.00	0.00	8	369	1089.73	1080.01	2.63	762.89	1.10	0%
1132	1133	0.00	0.00	8	200	1024.10	1023.30	0.40	297.02	0.43	0%
8	2134	0.00	0.00	8	229	1059.52	1054.23	2.31	714.15	1.03	0%
2331	1423	0.00	0.00	8	162	1003.93	1003.28	0.40	297.96	0.43	0%
2275	2276	0.00	0.00	8	52	1004.95	1004.90	0.10	145.69	0.21	0%
2276	2277	0.00	0.00	8	207	1004.90	996.28	4.16	958.57	1.38	0%
2277	610	0.00	0.00	8	153	996.18	993.78	1.57	589.22	0.85	0%
2284	2283	0.00	0.00	8	376	1021.21	1019.80	0.37	287.72	0.41	0%
2283	2282	0.00	0.00	8	299	1019.70	1018.60	0.37	285.00	0.41	0%
2282	694	0.00	0.00	8	93	1018.50	1018.13	0.40	296.71	0.43	0%
2317	365	0.00	0.00	8	200	1046.43	1045.63	0.40	297.22	0.43	0%
2318	1617	0.00	0.00	8	205	990.98	990.17	0.40	295.68	0.43	0%
2319	889	0.00	0.00	8	203	989.35	988.54	0.40	296.83	0.43	0%
2320	1619	0.00	0.00	8	209	989.30	988.46	0.40	297.99	0.43	0%
2321	1927	0.00	0.00	8	211	987.65	986.80	0.40	298.26	0.43	0%
2322	1627	0.00	0.00	8	196	997.96	997.17	0.40	298.07	0.43	0%
2343	1597	0.00	0.00	8	204	991.02	990.21	0.40	296.53	0.43	0%
Jun-209	2364	0.00	0.00	8	173	1021.14	1018.86	1.32	539.27	0.78	0%
2019	Jun-209	0.00	0.00	8	160	1027.12	1021.24	3.67	901.11	1.30	0%
2366	2019	0.00	0.00	8	330	1052.57	1027.22	7.68	1302.81	1.88	0%
Jun-210	2366	0.00	0.00	8	300	1070.07	1052.67	5.80	1146.73	1.65	0%
Jun-210	2368	0.00	0.00	8	331	1070.52	1067.40	0.94	456.35	0.66	0%
2368	2369	0.00	0.00	8	354	1067.30	1062.49	1.36	547.89	0.79	0%
2369	9068	0.00	0.00	8	295	1062.39	1057.11	1.79	628.68	0.91	0%
2371	1989	0.00	0.00	8	245	1049.21	1043.83	2.20	696.99	1.00	0%
2372	2379	0.00	0.00	8	230	987.96	987.50	0.20	210.25	0.30	0%
2379	2380	0.00	0.00	8	182	986.38	978.22	4.49	996.38	1.43	0%
2375	2372	0.00	0.00	8	410	989.38	987.74	0.40	297.26	0.43	0%
2376	2373	0.00	0.00	8	411	991.45	967.22	5.90	1141.61	1.64	0%
2377	2375	0.00	0.00	8	195	991.09	990.00	0.56	358.27	0.52	0%
2381	2345	0.00	0.00	8	192	963.12	962.11	0.53	341.12	0.49	0%
2345	2382	0.00	0.00	8	206	962.01	960.10	0.93	453.00	0.65	0%
2384	888	0.00	0.00	8	337	992.98	991.63	0.40	297.43	0.43	0%
2383	2384	0.00	0.00	8	172	994.78	992.98	1.05	480.88	0.69	0%
2387	2383	0.00	0.00	8	410	995.52	994.88	0.16	185.73	0.27	0%
1953	2393	0.00	0.00	8	417	985.24	983.25	0.48	324.84	0.47	0%
2393	2394	0.00	0.00	8	143	984.14	981.85	1.60	594.78	0.86	0%
2394	2395	0.00	0.00	8	250	981.75	970.25	4.60	1007.94	1.45	0%
2396	2402	0.00	0.00	8	198	996.46	988.10	4.21	964.75	1.39	0%
2402	2398	0.00	0.00	8	218	988.00	984.86	1.44	564.50	0.81	0%
2398	2399	0.00	0.00	8	200	985.66	977.02	4.32	977.19	1.41	0%
2400	2401	0.00	0.00	8	208	1000.30	986.44	6.66	1213.33	1.75	0%
2397	2396	0.00	0.00	8	19	996.96	996.66	1.56	586.81	0.85	0%
2403	2405	0.00	0.00	10	304	961.68	961.68	0.00	15.46	0.02	0%
2405	2404	0.00	0.00	10	313	961.68	961.68	0.00	15.22	0.02	0%
9080	2797	0.00	0.00	8	330	1038.64	1016.77	6.63	1208.37	1.74	0%
2797	2798	0.00	0.00	8	65	1016.85	1016.77	0.12	164.89	0.24	0%
2801	1608	0.00	0.00	8	312	992.09	990.82	0.41	299.93	0.43	0%
2802	2803	0.00	0.00	10	294	971.12	970.30	0.28	450.45	0.65	0%
2803	2804	0.00	0.00	10	294	970.30	970.21	0.03	149.12	0.21	0%
2804	2805	0.00	0.00	8	294	970.21	969.03	0.40	297.87	0.43	0%
2805	1361	0.00	0.00	8	400	969.03	967.43	0.40	297.27	0.43	0%
2843	2844	0.00	0.00	12	338	957.60	956.57	0.30	764.89	1.10	0%
1618	2872	0.00	0.00	8	160	991.41	990.77	0.40	297.30	0.43	0%
2847	1542	0.00	0.00	8	215	964.78	963.92	0.40	297.22	0.43	0%
2874	1908	0.00	0.00	8	173	988.50	987.15	0.78	415.07	0.60	0%
2877	1711	0.00	0.00	8	87	1024.33	1023.98	0.40	298.06	0.43	0%
2883	1628	0.00	0.00	8	233	996.24	995.31	0.40	297.06	0.43	0%
Jun-165	2899	0.00	0.00	15	58	982.89	976.16	11.61	8561.69	12.33	0%
2076	9003	0.00	0.00	10	400	1091.56	1090.44	0.28	450.98	0.65	0%
9003	72	0.00	0.00	10	143	1090.34	1089.83	0.36	509.26	0.73	0%
9010	9011	0.00	0.00	8	146	1045.00	1036.24	6.02	1153.30	1.66	0%
9012	9013	0.00	0.00	8	169	1023.50	1006.57	10.03	1492.08	2.15	0%
9011	9012	0.00	0.00	8	115	1036.04	1030.06	5.18	1070.03	1.54	0%
9013	9014	0.00	0.00	10	310	1006.27	1005.03	0.40	539.04	0.78	0%
9014	2121	0.00	0.00	10	111	1004.93	1003.57	1.23	943.33	1.36	0%
9035	1657	0.00	0.00	8	48	1037.90	1037.71	0.39	294.60	0.42	0%

9066	9064	0.00	0.00	8	130	1040.80	1037.94	2.20	696.80	1.00	0%
9067	9066	0.00	0.00	8	60	1042.13	1040.80	2.20	697.23	1.00	0%
9068	2370	0.00	0.00	8	63	1057.11	1057.03	0.13	167.58	0.24	0%
9109	2400	0.00	0.00	8	204	1021.00	1000.30	10.17	1498.92	2.16	0%
9120	9121	0.00	0.00	8	258	1003.95	1002.19	0.68	388.54	0.56	0%
9121	9122	0.00	0.00	8	257	1002.19	1000.48	0.66	383.13	0.55	0%
9122	650	0.00	0.00	8	181	1000.48	999.45	0.57	354.12	0.51	0%
9204	9203	0.00	0.00	10	143	1003.91	1003.05	0.60	660.89	0.95	0%
9203	9202	0.00	0.00	10	400	1003.05	998.15	1.22	943.29	1.36	0%
9202	9201	0.00	0.00	10	400	998.15	993.25	1.22	943.29	1.36	0%
9201	9200	0.00	0.00	10	50	993.25	992.90	0.70	711.21	1.02	0%
1030	948	0.00	0.00	8	399	1030.50	1021.07	2.36	722.59	1.04	0%
564	370	0.00	0.00	15	149	1038.66	1038.10	0.38	1541.77	2.22	0%
1145	565	0.00	0.00	15	234	1039.89	1039.22	0.29	1344.05	1.94	0%
1494	1495	0.00	0.00	8	445	1040.60	1038.81	0.40	297.96	0.43	0%
306	307	0.00	0.00	8	269	1001.52	993.71	2.90	800.61	1.15	0%
122	121	0.00	0.00	8	235	992.79	991.85	0.40	297.17	0.43	0%
121	120	0.00	0.00	8	400	991.85	990.25	0.40	297.39	0.43	0%
120	109	0.00	0.00	8	400	990.25	988.65	0.40	297.26	0.43	0%
Jun-401	103	0.00	0.00	8	399	1061.27	1059.03	0.56	352.03	0.51	0%
103	102	0.00	0.00	8	399	1059.03	1057.05	0.50	331.00	0.48	0%
102	101	0.00	0.00	8	399	1057.05	1055.07	0.50	331.00	0.48	0%
1415	652	0.00	0.00	8	388	1012.65	1011.10	0.40	297.21	0.43	0%
101	100	0.00	0.00	8	399	1055.07	1053.09	0.50	331.00	0.48	0%
100	Jun-400	0.00	0.00	8	399	1053.09	1051.11	0.50	331.00	0.48	0%
Jun-400	98	0.00	0.00	8	399	1051.11	1049.13	0.50	331.01	0.48	0%
98	97	0.00	0.00	8	399	1049.13	1047.15	0.50	331.00	0.48	0%
97	96	0.00	0.00	8	399	1047.15	1045.17	0.50	331.00	0.48	0%
Jun-456	201	0.00	0.00	8	399	1027.98	1026.37	0.40	298.48	0.43	0%
201	200	0.00	0.00	8	399	1026.37	1024.76	0.40	298.44	0.43	0%
200	199	0.00	0.00	8	399	1024.76	1023.15	0.40	298.48	0.43	0%
2879	1437	0.00	0.00	8	329	1017.75	1016.43	0.40	297.95	0.43	0%
199	198	0.00	0.00	8	399	1023.15	1021.54	0.40	298.47	0.43	0%
198	197	0.00	0.00	8	399	1021.54	1019.93	0.40	298.47	0.43	0%
197	Jun-455	0.00	0.00	8	399	1019.93	1018.32	0.40	298.47	0.43	0%
2364	551	0.00	0.00	8	89	1018.66	1018.26	0.45	315.93	0.45	0%
1701	2364	0.00	0.00	8	662	1021.31	1018.66	0.40	297.46	0.43	0%
1689	1676	0.00	0.00	18	401	1040.83	1039.22	0.40	2589.07	3.73	0%
768	Jun-179	0.00	0.00	8	99	1044.73	1037.90	6.91	1235.90	1.78	0%
1630	1038	0.00	0.00	8	271	997.39	996.31	0.40	296.64	0.43	0%
2399	2467	0.00	0.00	8	199	976.92	971.68	2.64	763.43	1.10	0%
1931	2909	0.00	0.00	8	418	983.37	982.59	0.19	203.05	0.29	0%
891	888	0.00	0.00	8	411	993.17	991.54	0.40	296.19	0.43	0%
1609	9078	0.00	0.00	8	407	989.21	987.62	0.39	293.78	0.42	0%
2463	616	0.00	0.00	8	409	988.55	986.28	0.56	350.24	0.50	0%
1601	1600	0.00	0.00	8	280	982.55	970.81	4.20	962.99	1.39	0%
841	838	0.00	0.00	10	233	970.30	961.85	3.63	1623.47	2.34	0%
837	1895	0.00	0.00	8	412	990.21	987.75	0.60	363.09	0.52	0%
1896	2895	0.00	0.00	8	421	984.42	981.01	0.81	422.95	0.61	0%
43984	748	0.00	0.00	8	329	1198.95	1197.08	0.57	354.53	0.51	0%

Appendix D: Cost Estimate

Preliminary Engineer's Estimate

Future Sanitary Sewer System - North District
City of Faribault, MN



Date: November 2020

Item No.	Item	Estimated Quantity	Unit	Unit Price	Total Amount
1	Mobilization	1	LUMP SUM	\$150,000.00	\$150,000.00
2	Connect to Existing Manhole	120	EACH	\$2,500.00	\$300,000.00
3	Lift Station	1	LUMP SUM	\$300,000.00	\$300,000.00
4	24" Steel Casing Pipe (Jacked/Augered)	400	LIN FT	\$375.00	\$150,000.00
5	8" PVC, Sanitary Sewer Pipe	16470	LIN FT	\$35.00	\$576,450.00
6	10" PVC, Sanitary Sewer Pipe	12940	LIN FT	\$55.00	\$711,700.00
7	12" PVC, Sanitary Sewer Pipe	9730	LIN FT	\$60.00	\$583,800.00
8	15" PVC, Sanitary Sewer Pipe	9400	LIN FT	\$70.00	\$658,000.00
9	18" PVC, Sanitary Sewer Pipe	13780	LIN FT	\$90.00	\$1,240,200.00
10	21" PVC, Sanitary Sewer Pipe	14160	LIN FT	\$95.00	\$1,345,200.00
11	24" PVC, Sanitary Sewer Pipe	6860	LIN FT	\$100.00	\$686,000.00
12	27" PVC, Sanitary Sewer Pipe	5360	LIN FT	\$105.00	\$562,800.00
13	30" RCP, Sanitary Sewer Pipe	6550	LIN FT	\$130.00	\$851,500.00
14	36" RCP, Sanitary Sewer Pipe	7230	LIN FT	\$205.00	\$1,482,150.00
15	42" RCP, Sanitary Sewer Pipe	2490	LIN FT	\$275.00	\$684,750.00
16	48" RCP, Sanitary Sewer Pipe	4500	LIN FT	\$315.00	\$1,417,500.00
17	6" Sanitary Forcemain	2350	LIN FT	\$35.00	\$82,250.00
18	4' Diameter Sanitary Sewer MH, Incl. Castings & Rings	158	EACH	\$4,000.00	\$632,000.00
19	5' Diameter Sanitary Sewer MH, Incl. Castings & Rings	36	EACH	\$8,500.00	\$306,000.00
20	6' Diameter Sanitary Sewer MH, Incl. Castings & Rings	22	EACH	\$12,000.00	\$264,000.00
21	7' Diameter Sanitary Sewer MH, Incl. Castings & Rings	1	EACH	\$15,000.00	\$15,000.00
22	8' Diameter Sanitary Sewer MH, Incl. Castings & Rings	8	EACH	\$18,000.00	\$144,000.00
23	Bypass Pumping	1	LS	\$100,000.00	\$100,000.00
				Subtotal:	\$13,243,300.00
				10% Contingency:	\$1,325,000.00
				Total Estimated Construction Cost:	\$14,568,300.00
				Design, Administration, Construction Engineering, Testing:	\$2,913,700.00
				Total Estimated Project Cost:	\$17,482,000.00

Preliminary Engineer's Estimate

Future Sanitary Sewer System - South District
City of Faribault, MN



Date: November 2020

Item No.	Item	Estimated Quantity	Unit	Unit Price	Total Amount
1	Mobilization	1	LUMP SUM	\$150,000.00	\$150,000.00
2	Connect to Existing Manhole	71	EACH	\$2,500.00	\$177,500.00
3	Lift Station	1	LUMP SUM	\$300,000.00	\$300,000.00
4	36" Steel Casing Pipe (Jacked/Augered)	400	LIN FT	\$575.00	\$230,000.00
5	12" PVC, Sanitary Sewer Pipe	5900	LIN FT	\$60.00	\$354,000.00
6	15" PVC, Sanitary Sewer Pipe	1590	LIN FT	\$70.00	\$111,300.00
7	18" PVC, Sanitary Sewer Pipe	2020	LIN FT	\$90.00	\$181,800.00
8	21" PVC, Sanitary Sewer Pipe	9880	LIN FT	\$95.00	\$938,600.00
9	24" PVC, Sanitary Sewer Pipe	7530	LIN FT	\$100.00	\$753,000.00
10	27" PVC, Sanitary Sewer Pipe	5730	LIN FT	\$105.00	\$601,650.00
11	30" RCP, Sanitary Sewer Pipe	10790	LIN FT	\$130.00	\$1,402,700.00
12	33" RCP, Sanitary Sewer Pipe	5950	LIN FT	\$170.00	\$1,011,500.00
13	36" RCP, Sanitary Sewer Pipe	5850	LIN FT	\$205.00	\$1,199,250.00
14	39" RCP, Sanitary Sewer Pipe	780	LIN FT	\$250.00	\$195,000.00
15	42" RCP, Sanitary Sewer Pipe	1080	LIN FT	\$275.00	\$297,000.00
16	48" RCP, Sanitary Sewer Pipe	1910	LIN FT	\$315.00	\$601,650.00
17	60" RCP, Sanitary Sewer Pipe	7660	LIN FT	\$360.00	\$2,757,600.00
18	6" Sanitary Forcemain	1990	LIN FT	\$35.00	\$69,650.00
19	4' Diameter Sanitary Sewer MH, Incl. Castings & Rings	33	EACH	\$4,000.00	\$132,000.00
20	5' Diameter Sanitary Sewer MH, Incl. Castings & Rings	57	EACH	\$8,500.00	\$484,500.00
21	6' Diameter Sanitary Sewer MH, Incl. Castings & Rings	22	EACH	\$12,000.00	\$264,000.00
22	7' Diameter Sanitary Sewer MH, Incl. Castings & Rings	2	EACH	\$15,000.00	\$30,000.00
23	8' Diameter Sanitary Sewer MH, Incl. Castings & Rings	41	EACH	\$18,000.00	\$738,000.00
24	9' Diameter Sanitary Sewer MH, Incl. Castings & Rings	8	EACH	\$21,000.00	\$168,000.00
25	Bypass Pumping	1	LS	\$100,000.00	\$100,000.00
Subtotal:					\$13,248,700.00
10% Contingency:					\$1,325,000.00
Total Estimated Construction Cost:					\$14,573,700.00
Design, Administration, Construction Engineering, Testing:					\$2,914,800.00
Total Estimated Project Cost:					\$17,488,500.00

Preliminary Engineer's Estimate

Future Sanitary Sewer System - East District
City of Faribault, MN



Date: November 2020

Item No.	Item	Estimated Quantity	Unit	Unit Price	Total Amount
1	Mobilization	1	LUMP SUM	\$10,000.00	\$10,000.00
2	Connect to Existing Manhole	26	EACH	\$2,500.00	\$65,000.00
3	15" PVC, Sanitary Sewer	4030	LIN FT	\$90.00	\$362,700.00
4	21" PVC, Sanitary Sewer	2630	LIN FT	\$95.00	\$249,850.00
5	Bypass Pumping	1	LS	\$10,000.00	\$10,000.00
				Subtotal:	\$697,550.00
				10% Contingency:	\$70,000.00
				Total Estimated Construction Cost:	\$767,550.00
				Design, Administration, Construction Engineering, Testing:	\$153,600.00
				Total Estimated Project Cost:	\$921,150.00



Request for Council Action

TO: Mayor and City Council
THROUGH:
FROM: Tim Murray, City Administrator
MEETING DATE: January 11, 2022
SUBJECT: Approve City Council Appointments to Committees, Boards, and Commissions

Background:

At the Work Session on January 4, 2022 (the "Annual Planning Session"), the Mayor and City Councilmembers discussed their appointments to those committees, boards, and commissions that include one or more Council representatives. The attached list reflects the appointments determined at that meeting.

Non-councilmember appointment applications are scheduled to be reviewed at the January 18, 2022 Work Session, with the approval of the appointments to be made at the regular City Council meeting on January 25, 2022.

Recommendation:

Approve City Council Appointments to Committees, Boards, and Commissions and shown on the attached list

Attachments:

1. 2022-01-11 Council Appointments to Committees-Boards-Commissions



2022 CITY COUNCIL COMMITTEES

JOINT COMMITTEE (Work Session) (7)

Meets the first and third Tuesday of every month at 6:00 pm. Other meetings as needed.

Members: Mayor and all City Councilmembers

ANNEXATION COMMITTEE (3)

Meets as needed.

Members: Mayor Voracek, Councilmembers Ross and Spooner

Staff Liaison: City Administrator & City Planner

LABOR COMMITTEE (2)

Meets as needed.

Members: Mayor Voracek and Councilmember Ross

Staff Liaison: City Administrator & Human Resources Manager

AD HOC

Special committees established at Council discretion on an issue-by-issue basis. The Mayor serves on all established Ad Hoc Committees, along with two other Council members.



2022 COUNCIL APPOINTMENTS AND REPRESENTATIVES

Committees/Boards/Commissions with all members appointed by City Council

(List only includes those with Council appointees)

<u>Committee Name</u>	<u>Council Appointees</u>	<u>Staff Rep.</u>
1) CHARITABLE GAMBLING ADVISORY BOARD	Caron	H. Slechta
2) ECONOMIC DEVELOPMENT AUTHORITY	Viscomi, Mayor Voracek	D. Kuennen
3) HOUSING AND REDEVELOPMENT AUTHORITY	Wood	D. Kuennen
4) PARKS AND RECREATION ADVISORY BOARD	Caron	P. Peanasky
5) TOURISM COMMISSION	Viscomi	H. Slechta

Committees/Boards/Commissions with only Council/City representatives appointed by City Council

<u>Committee Name</u>	<u>Council Appointees</u>	<u>Staff Rep.</u>
1) ALEXANDER PARK COMMITTEE	Spooner, Mayor Voracek	P. Peanasky
2) BMX TRACK BOARD	Ross, Wood	P. Peanasky
3) BUCKHAM WEST (SENIOR CENTER)	Ross	P. Peanasky
4) FARIBAULT HOUSE BUILDING COMMITTEE	van Sluis	N/A
5) ICE ARENA BOARD	van Sluis, Mayor Voracek	P. Peanasky
6) JOINT DISPATCH BOARD	van Sluis	D. Dienst
7) MAIN STREET COMMITTEE	Viscomi	D. Kuennen
8) MILL TOWNS TRAIL BOARD	van Sluis, Wood	M. Duchene
9) PARADISE CENTER FOR THE ARTS BOARD	van Sluis	N/A
10) RIVER BEND NATURE CENTER	Spooner	N/A
11) SOCCER COMPLEX BOARD	van Sluis	P. Peanasky
12) TOWNSHIP FIRE CONTRACT COMMITTEE	Spooner, Mayor Voracek	D. Dienst



Request for Council Action

TO: Mayor and City Council
THROUGH: Tim Murray, City Administrator
FROM: Travis Block, Public Works Director
MEETING DATE: January 11, 2022
SUBJECT: Resolution 2022-010 Amend Official Downtown Parking Restrictions Map

Background:

The Official Downtown Parking Restrictions Map was last updated on April 4, 2021, with the passing of Resolution 2021-031 which includes six (6) 15-Minute parking stalls on 3rd St. NE in front of the post office. The stalls allow 15-minute parking between 8am-7pm Monday-Saturday. Prior to 2019, the stalls were signed for 15-minute parking from 8am-5pm Monday-Friday.

The matter was discussed at the January 4, 2022 Council Work Session where staff recommended changing the enforcement hours of the stalls to 8am-5pm Monday-Friday to better align with business uses in the area. The Council concurred with the recommendation. The attached Resolution 2022-010 amends the Official Downtown Parking Restrictions Map.

Recommendation:

Approve Resolution 2022-010

Attachments:

1. Resolution 2022-010 Amend Official Downtown Parking Restrictions Map
2. Official Downtown Parking Restrictions Map Jan. 11, 2022

CITY OF FARIBAULT

RESOLUTION 2022-010
AMEND OFFICIAL DOWNTOWN PARKING RESTRICTIONS MAP

WHEREAS, the City of Faribault maintains an Official Downtown Parking Restrictions Map; and

WHEREAS, staff review of the map has identified changes that need to be made to the map; and

WHEREAS, the matter was discussed at the Council Work Session on January 4, 2022 where Council directed City Staff to amend the Official Downtown Parking Restrictions Map.

NOW, THEREFORE BE IT RESOLVED AS FOLLOWS:

Section 1. The City Council of the City of Faribault hereby amends the Official Downtown Parking Restriction Map and approves the public parking and parking restrictions as shown on the Official Downtown Parking Restrictions Map dated January 11, 2022, hereto attached. Said restrictions shall supersede all previous resolutions related to parking restrictions in the downtown.

Section 2. The City Council hereby directs the Director of Public Works to affect said parking restrictions.

Section 3. The Director of Public Works is hereby directed to maintain the Official Downtown Parking Restrictions Map and update the map as directed by the City Council.

Section 4. This resolution shall become effective immediately upon its passage and without publication.

Date Adopted: January 11, 2022

Faribault City Council

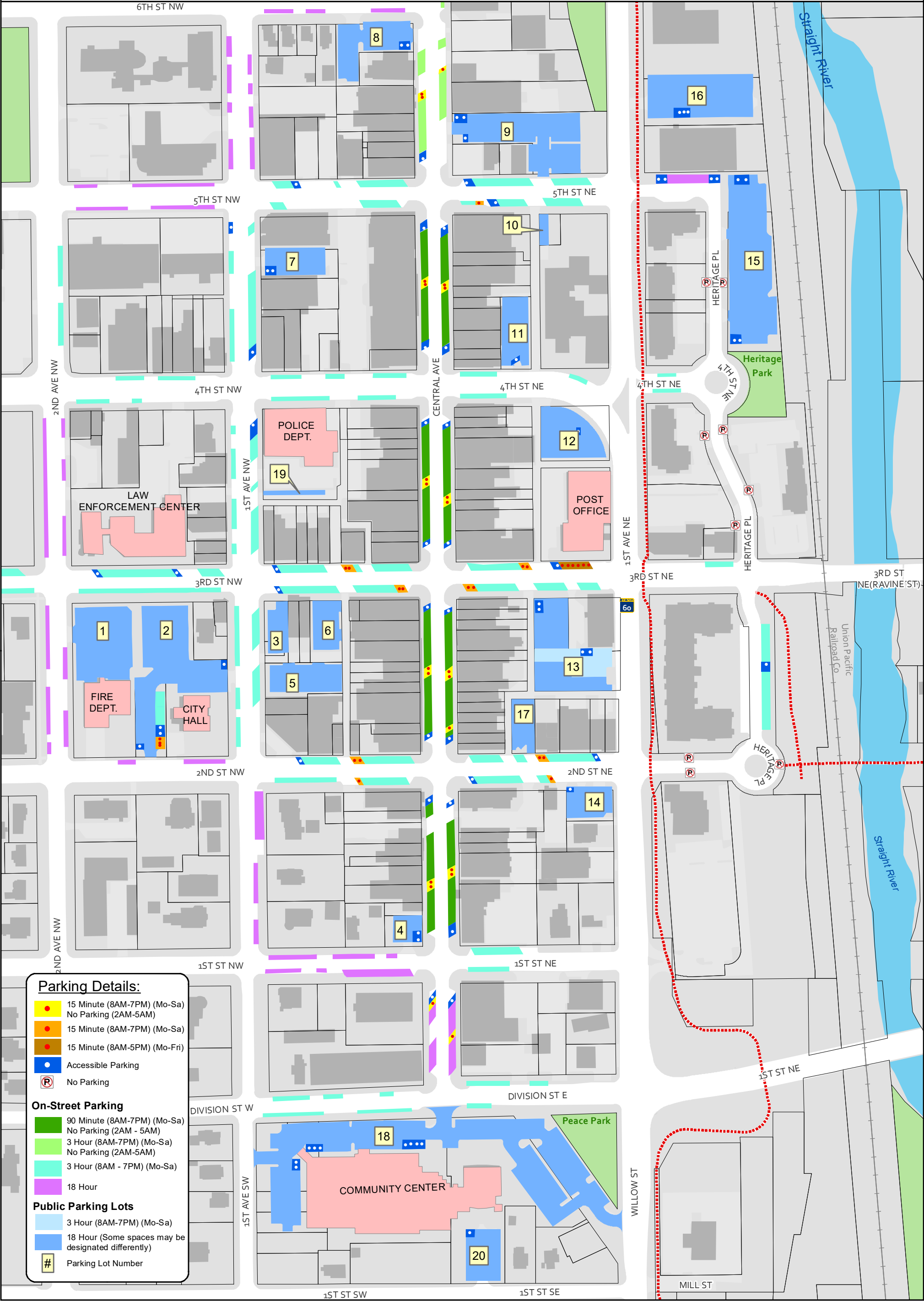
Kevin F. Voracek, Mayor

ATTEST:

Timothy C. Murray, City Administrator

Official Downtown Parking Restrictions Map

Faribault, Minnesota





Request for Council Action

TO: Mayor and City Council
THROUGH: Tim Murray, City Administrator
FROM: Heather Slechta, Assistant to the City Administrator
MEETING DATE: January 11, 2022
SUBJECT: Resolution 2022-011 Approve 2022 Massage License Renewals

Background:

Staff has received applications for the renewal Massage Licenses from the following individuals:

Brenda Nelson	Janell Mary Lindblom
Nicole Nechanicky	Keri Jo Simon
Valerie Fisher	Sharon Ann Madison
Michelle Bottke	Julie Ann Bayardo
Amy Lynn Regenscheid	Stacey Ann Jennings
Joy Viengxone Luong	Carrie Fahlin
Sarah Elizabeth Vermuele	Brooke Moreno
Susan Joann Jameson	Shannan Lynn Walker

The applicants have paid all required fees and submitted all the required paperwork. The Police Department has completed the required background investigations and has approved the licenses.

Recommendation:

Approve Resolution 2022-011

Attachments:

1. Resolution 2022-011 Massage Therapist Licenses Renewals

CITY OF FARIBAULT

RESOLUTION #2022-011

APPROVE 2022 MASSAGE LICENSE RENEWALS

WHEREAS, the following have presented application to the City of Faribault for renewal of their Massage Therapist Licenses:

Brenda Nelson	Janell Mary Lindblom
Nicole Nechanicky	Keri Jo Simon
Valerie Fisher	Sharon Ann Madison
Michelle Bottke	Julie Ann Bayardo
Amy Lynn Regenscheid	Stacey Ann Jennings
Joy Viengxone Luong	Carrie Fahlin
Sarah Elizabeth Vermuele	Brooke Moreno
Susan Joann Jameson	Shannan Lynn Walker

WHEREAS, all of the above named have paid the proper fee and provided the required documentation; and

WHEREAS, the Police Department has completed the required background investigations and has approved the licenses; and

WHEREAS, the above named have current Massage Therapist licenses with the City of Faribault.

NOW, THEREFORE, BE IT RESOLVED, that the above-named applicants be granted Massage Therapist licenses with the City of Faribault for the term of February 1, 2022 to January 31, 2023.

Date Adopted: January 11, 2022

Faribault City Council

Kevin F. Voracek, Mayor

ATTEST:

Timothy C. Murray, City Administrator



Request for Council Action

TO: Mayor and City Council
THROUGH: Tim Murray, City Administrator
FROM: Heather Slechta, Assistant to the City Administrator
MEETING DATE: January 11, 2022
SUBJECT: Resolution 2022-012 Approve 2022 Salvage Dealer License Renewals

Background:

Staff have received applications for the renewal of Salvage Dealer Licenses for the following companies:

David King dba Kelly's Faribault Auto Parts
Gary Pettipiece dba Harley's Auto Salvage

The applicants have paid all required fees and submitted all the required paperwork. The Police Department has completed the required background investigations and has approved the licenses.

Recommendation:

Approve Resolution 2022-012

Attachments:

1. Resolution 2022-012 Salvage Dealers License Renewals

CITY OF FARIBAULT

RESOLUTION #2022-012

APPROVE 2022 SALVAGE DEALER LICENSE RENEWALS

WHEREAS, the City of Faribault Administration Office have received applications for the renewal of their Salvage Dealers licenses for:

David King dba Kelly's Faribault Auto Parts
Gary Pettipiece dba Harley's Auto Salvage

WHEREAS, the above named have provided proper fees; provided proof of Minnesota Workers Compensation Insurance; proof of \$1,000 Surety Bond and provided the necessary Tax Information Form, and;

WHEREAS, the Police Department conducted the required background investigations and has approved the renewal of these licenses; and

WHEREAS, pending the review and approval of the submitted bonds by the City Attorney; and

WHEREAS, the above named have current licenses with the City of Faribault.

NOW, THEREFORE, BE IT RESOLVED, that David King dba Kelly's Auto Salvage and Gary Pettipiece dba Harley's Auto & Recycling, each be granted Salvage Dealer Licenses with the City of Faribault for the term of February 1, 2022 to January 31, 2023.

Date Adopted: January 11, 2022

Faribault City Council

Kevin F. Voracek, Mayor

ATTEST:

Timothy C. Murray, City Administrator



Request for Council Action

TO: Mayor and City Council
THROUGH: Tim Murray, City Administrator
FROM: Heather Slechta, Assistant to the City Administrator
MEETING DATE: January 11, 2022
SUBJECT: Resolution 2022-013 Approve 2022 Vehicles for Hire License Renewal

Background:

Staff has received an application for the renewal of a Vehicle for Hire license for Access On Time Companies, Inc. dba First Choice Shuttle, 1333 South Trail Drive. The applicant has paid all required fees and submitted all required paperwork. The Police Department has completed the required background investigations and has approved the licenses. The City Attorney has reviewed and approved the Certificates of Insurance provided.

Recommendation:

Approve Resolution 2022-013

Attachments:

1. Resolution 2022-013 Vehicles for Hire License Renewal

CITY OF FARIBAULT

RESOLUTION #2022-013

APPROVE 2022 VEHICLES FOR HIRE LICENSE RENEWAL

WHEREAS, the City of Faribault has received an application for the renewal of vehicle for hire license for Access On Time Companies, Inc. dba First Choice Shuttle, 1333 South Trail Drive; and

WHEREAS, the City of Faribault has received the proper fees and the required Certificates of Insurance; has been provided proof of Certification of Compliance with the Minnesota Workers Compensation Insurance law; and been provided the necessary Tax Information Form; and

WHEREAS, the Police Department has completed the required background investigations and has approved the licenses; and

WHEREAS, the City Attorney has reviewed and approved the Certificates of Insurance provided; and

WHEREAS, Access On Time Companies, Inc., 1333 South Trail Drive, P.O. Box 06 has a current taxicab license with the City of Faribault.

NOW, THEREFORE BE IT RESOLVED, that the taxicab company listed above be granted renewal of their vehicle for hire license with the City of Faribault for the term of February 1, 2022 to January 31, 2023.

Date Adopted: January 11, 2022

Faribault City Council

Kevin F. Voracek, Mayor

ATTEST:

Timothy C. Murray, City Administrator



Request for Council Action

TO: Mayor and City Council
THROUGH: Tim Murray, City Administrator
FROM: Travis Block, Public Works Director
MEETING DATE: January 11, 2022
SUBJECT: Approve Task Order No. 11 with Foth for Airfield Lighting Improvements Project at Airport

Background:

Attached is a copy of Task Order No.11 with Foth (Engineering Consultants for the Municipal Airport), for a design services contract for \$72,750.00. The task order includes the scope of services for an airfield lighting improvement project that is included in the approved 2022 Budget and CIP. Under the proposed project, runway lighting will be replaced with LED fixtures, electrical service feed improvements and improvements to the electrical vault will be made.

The task order includes project management, surveying, design and bidding services for the project. These services will be reimbursed under Federal Aviation Administration (FAA) and Minnesota Department of Transportation (MnDOT) grant funding for the project at the rate of 90/5/5% Federal, State and Local split. The Airport fund (225) will provide the local share funding.

The tentative project schedule is as follows:

Preliminary Plans	February 2, 2022
Final Review Package to FAA	February 23, 2022
Approve Plans & Specifications, Establish Bid Date	March 8, 2022
Bid Opening	March 30, 2022

Recommendation:

Approve Task Order No.11 with Foth for Airfield Lighting Improvements Project at Airport

Attachments:

1. Task Order No.11
2. AIR F 22-02 CIP Sheet

TASK ORDER NO. 11

For

Foth Infrastructure & Environment, LLC

In accordance with Section 1 of the Agreement between CITY and Consultant for Aviation Planning, Engineering and Surveying Services dated December 23, 2019 ("Agreement"), CITY and Consultant agree as follows:

Specific Project Data

A. Title: **Airfield Lighting Improvements**

B. Description:

The City of Faribault desires to replace improve the airfield lights and airfield signs at the Faribault Municipal Airport. The runway edge lights and taxiway edge lights will be replaced with LED fixtures. The cable that powers the runway edge lights is nearing the end of its useful life and also needs to be replaced. The airfield signs will be upgraded to LED with LED power kits. The wind cone will also be replaced with an LED wind cone. Improvements are also needed to the hangar that houses the electrical equipment that provide power to the airfield lights and signs. Improvements include a wall with locking door, and a new ceiling. Lastly, a Categorical Exclusion (CATEX) will need to be completed and submitted to the FAA.

1. Services of Consultant

See Attachment No. 1 – Scope of Services

2. CITY's Responsibilities

CITY's responsibilities in accordance with Section 3, of the Contract between Owner and Consultant for Professional Services dated December 23, 2019.

3. Times for Rendering Services

<u>Task</u>	<u>Completion Date</u>
Preliminary Plans	February 2, 2022
Final Review Package to FAA	February 23, 2022
Plans Available to Bid	March 8, 2022
Bid Opening	March 30, 2022

4. Payments to Engineer

METHOD OF PAYMENT, LUMP SUM:

The total compensation for services identified under Section 1 of the Task Order shall be \$72,750 based on the following distribution:

PHASE	COMPENSATION
Project Management	\$12,000
Survey and Mapping	\$3,750
Preliminary Design and CATEX	\$23,000
Final Design	\$22,000
Construction Safety and Phasing	\$3,000
Bidding	\$9,000
Total	\$72,750

5. List of Subconsultant's as it pertains to this Task Order:

RLP Architects – Architectural Design of Improvements to Existing Vault
Jones, Haugh, & Smith – Survey and Mapping

The Effective Date of this Task Order is January 11, 2022.

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Task Order in duplicate on the respective dates indicated below.

CITY: **City of Faribault**

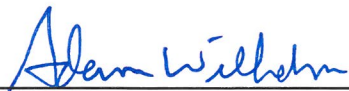
ATTEST:

Kevin F. Voracek, Mayor

Tim Murray, City Administrator

Date: _____

Consultant: **Foth Infrastructure &
Environment, LLC**



Adam Wilhelm, Client Director

Date: 1/6/2022

ATTACHMENT NO.1 - SCOPE OF SERVICES

Airfield Lighting Improvements Design and Bidding Phase Services

The scope of services to be performed by the Consultant includes all detail work, services, materials, equipment and supplies necessary to provide plans and specifications airfield lighting improvements. The estimated project construction budget is approximately \$300,000, with funding from FAA AIP, State of MN, and local funding. Refer to Exhibit 1 for project limits.

The Consultant shall complete the scope of services in accordance with generally accepted standards of practice and shall include all work necessary to complete the tasks outlined in this agreement.

TASK A – PROJECT MANAGEMENT

A1.0 PROJECT ADMINISTRATION

A1.1 Project Management and Administration

The Consultant shall be responsible for the development and tracking of the scope of services for the duration of this contract. This includes task identification, staff scheduling and coordination, project communications, monthly progress reporting and invoicing and other important elements of the project. The duration is assumed to be 3 months.

A1.2 Project Development Team Meetings

The Consultant will maintain communications with the Project Development Team (PDT). The PDT will include the Faribault Municipal Airport (commission, city staff, FBO, and/or tenants), the Consultant, and Subconsultants. The Consultant and the PDT will meet periodically to review progress and to discuss specific elements of the design. The meetings will also serve to establish schedules, verify project goals, promote a dialog between the various entities, improve the decision-making process, and expedite design development. The Consultant will prepare minutes of meetings and keep documentation of other communications. For budget purposes, it is assumed that two meetings will be held, and the meetings will be attended by an average of two staff members of the Consultant.

The following project meetings are included with the Scope of Services:

- ✧ Kickoff meeting and on-site Review of Airfield Lights and Signs– 1 meeting
- ✧ Plan Review Meeting – 1 meeting

A1.3 FAA Coordination

During the course of the scope of services the Consultant will communicate with the FAA Great Lakes Region on design details and coordination issues. The Airport will be included in all communications, and communication on program direction, funding, and schedule will originate from the Airport. Anticipated coordination items for the project include:

- ✧ Submittal of 30% Engineer's Report to FAA with Preliminary Plans.
- ✧ Submittal of Final Plans, Final Engineer's Report, Final Project Specifications, and Final CSPP.

A1.4 Update DBE Program

The Consultant will update the City of Faribault DBE program to meet the current FAA AIP requirements. Updated DBE program will establish the overall program goal, and the project DBE goal. The City of Faribault shall provide historical information concerning awarded federal projects, past DBE goals and accomplishments, and a copy of the current DBE program.

TASK B – SURVEY AND MAPPING

B1.0 DESIGN SURVEYS

The Consultant will perform field and office tasks required to collect additional topographic information deemed necessary to complete the scope of services. The Airport will provide any available mapping of the project area. The specific survey tasks to be performed include the following:

B1.1 Supplemental Control Surveys

The Consultant will utilize existing Primary Airport Control (PAC) and Secondary Airport Control (SAC) point(s) if available, in establishing supplemental survey control points for the project. Horizontal control will be in state-plane coordinates and vertical control per USGS datum.

B1.2 Supplemental Topographic Survey

The Consultant will perform topographic surveys required to establish accurate locations of runway edge lights, runway end lights, runway threshold lights, taxiway edge lights, airfield signs, and any handholes/manholes for the airfield lighting circuits. Topographic survey will also be obtained to establish pavement edges for the runway and taxiways at select locations.

TASK C – DESIGN SERVICES

C1.0 PRELIMINARY DESIGN (30%)

C1.1 Preliminary Engineer's Report

The Consultant will prepare and submit a Preliminary Engineer's Report to the Airport and FAA Great Lakes Region. Preliminary plans (30%) will accompany the submittal of the preliminary engineer's report. Consultant will prepare a written response to comments received from the FAA and their review.

C1.2 Preliminary Plan Preparation

Preliminary Plans will be developed for the design of the runway and taxiway edge light replacement, runway end and runway threshold light replacement, runway circuit cable replacement, upgrading the existing airfield signs to LED, replacement of the windcone, and miscellaneous improvements to the hangar that houses the electrical equipment that powers the airfield lights and signs. Plans will be considered 30% complete at the time of the preliminary plan submittal to the airport.

The work to be performed by the Consultant under Preliminary Plan Preparation will consist of the following tasks:

Preliminary Title and General Information Sheets

This task consists of assembling the preliminary title and general information sheets. The preliminary title sheets will include the following: Index of Sheets, Legend, Location Map, Project Number, Design Criteria, and Site Layout Plan.

Preliminary Construction (Operational) Safety and Phasing Sheets

This task consists of the developing a suitable plan for construction staging and traffic control measures to be implemented during the light replacement, cable replacement, airfield sign upgrades, and replacement of the wind cone. This includes traffic control devices, procedures, and layouts, per guidance contained in FAA Advisory Circulars.

Preliminary Airfield Electrical and Lighting Plan Sheets

Prepare preliminary plan layout drawings and details for the new LED runway edge lights, new LED runway end and threshold lights, new LED taxiway edge lights, runway cable replacement, upgrade of airfield signs to LED, and replacement of the wind cone. Any necessary conduit replacement/repairs for the runway edge light conduits carrying the runway circuit cable will also be shown in these drawings. Consultant shall also coordinate with the airport to determine if there are any locations adjacent to the runway where counterpoise cable does not exist.

Preliminary Electrical Vault Improvements Sheets

Prepare preliminary plan drawings for the installation of a new wall with locking door, and a new ceiling for the hangar that serves as the electrical vault room at the airport.

C1.3 Engineer's Opinions of Probable Project Costs

The Consultant will prepare an updated opinion of probable construction cost for the project and compare the cost to the Airport's current project budget. The Consultant will, if necessary, make recommendations pertaining to modifications in the project in order to address budgetary concerns, including potential bid alternates. The cost estimate will be based on representative major project elements, historical bid information, and current bidding climate.

C1.4 Categorical Exclusion Preparation

As described in the Environmental Orders (FAA Order 1050.1F and FAA Order 5050.4B), it is anticipated that the project is eligible for a categorical exclusion (CATEX). In order for the Airport to request a CATEX determination from the FAA, the Consultant will review potentially affected environmental resources, review the requirements of the applicable special purpose laws, and consult with the FAA about the type of information needed. As part of this task, the Documented CATEX form from Appendix A of FAA ARP Standard Operating Procedure (SOP) 5.1, along with supporting documentation will be completed in accordance with the provisions of FAA Order 5050.4B, paragraph 302b, and submitted to the FAA Airports District Office.

C2.0 FINAL FAA REVIEW PLANS

C2.1 Incorporate Comments from Preliminary Plan Review

The Consultant will respond to comments resulting from the airport's review of the preliminary plans and the FAA's review of the preliminary plans. Recommended modifications will be incorporated into the Final FAA Review Plans.

C2.2 Final Plan Preparation

Final Plans will be developed under this Task. The sheets included in the Preliminary Plans will be further developed for the Final Plans. Details will be added to the Final Plans, which includes sheets for the new LED runway edge lights, new LED runway end and threshold lights, new LED taxiway edge lights, runway cable replacement, upgrade of airfield signs to LED, and replacement of the wind cone.

Details for vault improvements will be added to the Final Plans, which includes sheets for the new wall with locking door at the electrical vault, and detail sheets for the new ceiling at the electrical vault.

In addition to the sheets noted in the preliminary plans, the following sheets will be included in the Final Plan set:

Estimate of Quantities and Reference Notes

This task consists of developing the bid items to be included in the project and incorporating the bid items into the Estimated Quantities. Estimate reference notes will also be included in the final plan submittal.

C2.3 Engineer's Opinion of Probable Project Costs for Final Plans

The Consultant will revise the preliminary opinion of probable cost as necessary to reflect work contained within the final plans.

C2.4 Project Manual

Under this task, the Consultant will prepare a project manual specific to the construction requirements for the project. The project manual will include front-end documents, general provisions, special provisions, technical specifications, and additional contract forms as required by the FAA and Airport. In general, the project manual will incorporate all required FAA standards, Federal Provisions, and Certifications for an AIP project.

Technical specifications will incorporate current FAA construction requirements in AC 5370-10H. Specifications will also include the CSPP document and any other information as needed for construction.

C2.5 Engineer's Report

The Consultant will revise the Engineer's Report to reflect comments received from submittal of the preliminary Engineer's report. Submittal of this report will accompany the final plans and specifications.

C2.6 Prepare Final FAA Submittal

The Consultant will submit final plans, specifications, and Engineer's Report to FAA Regional personnel.

C2.7 Prepare Bid Documents

The Consultant will coordinate and incorporate review comments by the City & FAA into final construction documents for a single bid package.

C3.0 Construction Safety and Phasing

C3.1 Construction Safety and Phasing Plan (CSPP)

The Consultant will prepare a CSPP to represent the overall safety management strategy that will address the operational effect of construction activity on the active airfield. The CSPP will conform with AC 150/5370-2 and take into account the requirements of FAA SOP # 1.0 and associated checklist.

C3.2 Part 77 Aeronautical Evaluation

Following completion of the CSPP, and associated project phasing plans the Consultant will prepare and submit notification to the FAA of the temporary objects, work areas, equipment stockpiles, and other points of interest as directed by the FAA and in accordance with 14 CFR Part 77 requirements. Submittal of notification will be accomplished by use of form SF 7460-1 and the FAA's on-line OE/AAA system.

TASK D – LETTING SERVICES

The Consultant will coordinate and manage the letting process of the project. The work tasks to be performed or coordinated by the Consultant include the following:

D1.1 Printing of Plans and Specifications

This task consists of printing and handling of the Plans and Specifications. For budget purposes it is estimated that 20 half-size (11"x17") plan sets and specifications will be duplicated and assembled by the Consultant. Three sets will be delivered to the City of Faribault for their use and internal distribution. An electronic PDF set of plans and specifications will be included with the hard copies. This task also includes dissemination of the contract documents and maintaining a "plan holders" list during the bidding phase.

A PDF copy of the half size 11 x 17 plans and project manual will be provided to the FAA.

D1.2 Notice of Project

The Consultant will prepare the formal Notice of Hearing and Letting and handle publication of the Notice of Hearing and Letting in the Minneapolis Star Tribune. Notice of Hearing and Letting will also be provided for electronic posting on the City's web site.

D1.3 Attend Pre-Bid Meeting

The Consultant will coordinate, schedule and oversee a Pre-Bid meeting. The Consultant will produce minutes from these meetings and disseminate minutes to attendees and interested parties.

D1.4 Plan Clarification and Addenda

The Consultant will be available to answer questions from contractors prior to the lettings and will develop addenda as appropriate to interpret, clarify or amend the bidding documents. The Consultant will distribute addenda to planholders.

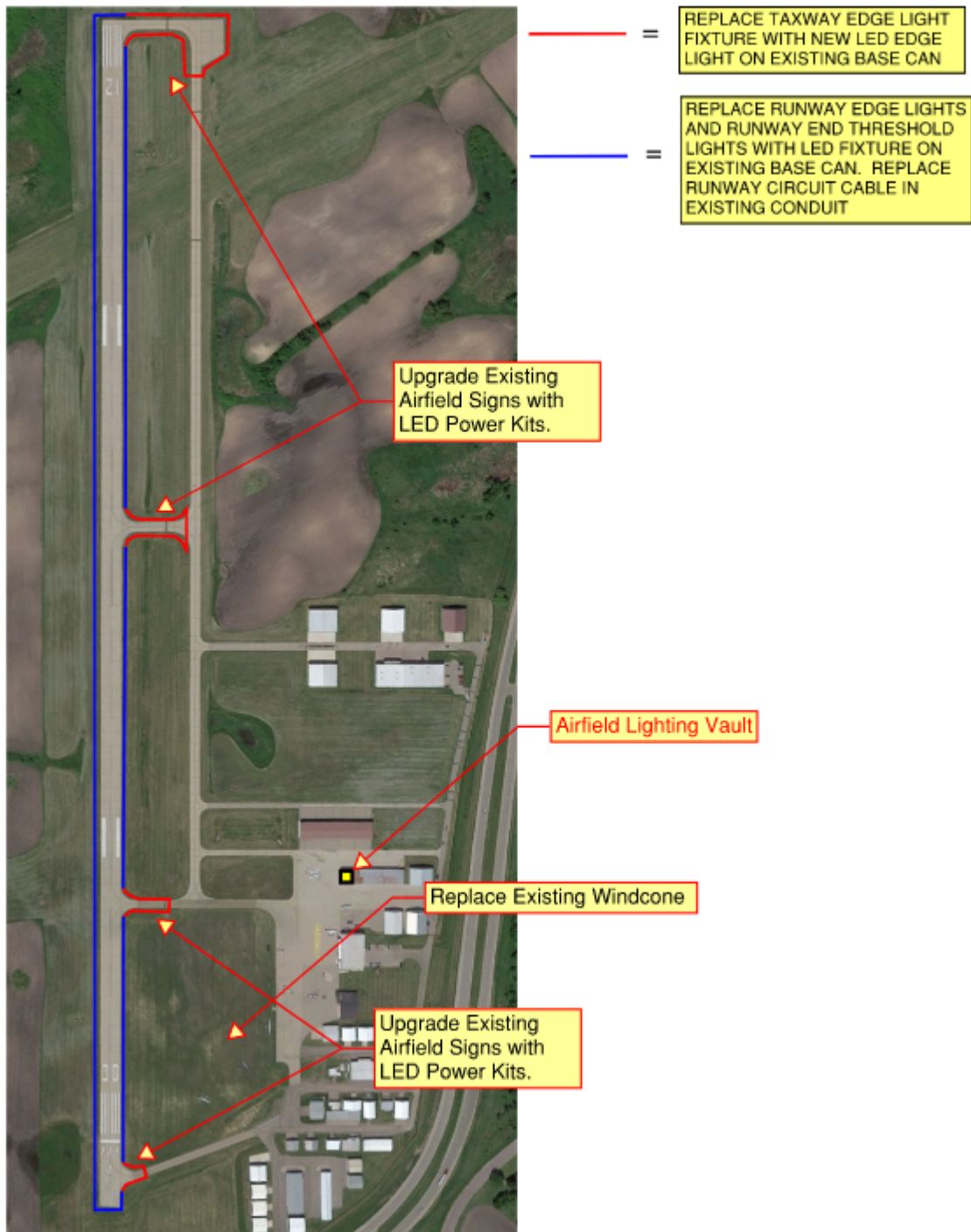
D1.5 Letting, Bid Tabs, and Award Recommendation

The Consultant shall be present when the bids and proposals are opened, prepare tabulations of bid, and advise on the responsiveness of the bidders. The Consultant will assist the City in reviewing the bid tabulations, making the award of contract, and requesting concurrence from the FAA.

Excluded Tasks

Specifically excluded from this scope of services are construction administration, observation, and material testing services. These services will be included in the Scope of a future Task Order.

Exhibit 1 – Project Area



Project # AIR F 22-02

Project Name Upgrade Airfield Lights & Electrical System

Capital Asset #

Unit #

Department Airport
Contact Public Works Director
Type Maintenance
Useful Life 20 years
Category Facilities
Priority I High

Description

Upgrade of the airfield lights and electrical system.

Justification

The lighting and electrical system is a critical component of the airfield operation. The system has reached its useful life. Conversion to LED's will increase efficiency.

Expenditures	2022	2023	2024	2025	2026	Total
Facility Maintenance	770,000					770,000
Total	770,000					770,000

Funding Sources	2022	2023	2024	2025	2026	Total
Airport Fund (225)	38,500					38,500
Federal - FAA	693,000					693,000
State - MnDOT - Aeronautics	38,500					38,500
Total	770,000					770,000



Request for Council Action

TO: Mayor and City Council
THROUGH: Tim Murray, City Administrator
FROM: Dustin Dienst, Fire Chief
MEETING DATE: January 11, 2022
SUBJECT: Resolution 2022-014 Accept Donation from The State Bank of Faribault

Background:

Recognizing the Faribault Fire Department's service to the community, the State Bank of Faribault has made a monetary donation to the Fire Department.

Recommendation:

Approve Resolution 2022-014 Accepting the donation of \$1,000.00 from the State Bank of Faribault

Attachments:

1. Resolution 2022-014 Accept Donation from the State Bank of Faribault

CITY OF FARIBAULT

RESOLUTION #2022-014

ACCEPT DONATION FROM THE STATE BANK OF FARIBAULT

WHEREAS, the Faribault Fire Department is responsible for fire and life safety response in the City of Faribault and the Rural Fire District; and

WHEREAS, the Faribault Fire Department responds to emergencies, promotes fire safety, and conducts regular and specialized training to ensure superior service is provided by the Fire Department; and

WHEREAS, the State Bank of Faribault would like to thank the Fire Department for its service to the community by making a donation to the department.

NOW, THEREFORE BE IT RESOLVED, that the Faribault City Council authorizes the Faribault Fire Department to accept the donation of \$1,000.00 from the State Bank of Faribault.

Date Adopted: January 11, 2022

Faribault City Council

Kevin F. Voracek, Mayor

ATTEST:

Timothy C. Murray, City Administrator



Request for Council Action

TO: Mayor and City Council
THROUGH: Tim Murray, City Administrator
FROM: Dustin Dienst, Fire Chief
MEETING DATE: January 11, 2022
SUBJECT: Resolution 2022-015 Authorize the Faribault Fire Department to Apply for the Hannah Lips Foundation Grant

Background:

The Faribault Fire Department is committed to and expected to provide a timely, safe and effective service to the citizens of our response district. We are also expected to provide that service in a fiscally responsible way. One way of accomplishing this is by seeking out and applying for grants.

The Hannah Lips Foundation is seeking grant applications that relate to supporting the health-related needs of our community as stated in the by-laws of the Foundation.

We are looking for permission to apply for the Hannah Lips Foundation grant. We will be asking for \$17,000 for the purchase of a LUCAS device. The LUCAS device is a manual CPR machine that improves a patient's chances of survival from an incident that stops the heart from functioning.

Recommendation:

Approve Resolution 2022-015 Authorizing the fire department to apply for the Hannah Lips Foundation Grant for the purchase of a new LUCAS device.

Attachments:

1. Resolution 2022-015 Authorize the Faribault Fire Department to Apply for the Hannah Lips Foundation Grant
2. Hannah Lips Grant Summary Form
3. Ad Seeking Grant Applications Ad Nov 2021.docx

CITY OF FARIBAULT

RESOLUTION #2022-015

AUTHORIZE THE FARIBAULT FIRE DEPARTMENT TO APPLY FOR THE HANNAH LIPS FOUNDATION GRANT

WHEREAS, the Faribault Fire Department is responsible for fire and life safety response in the City of Faribault and the Rural Fire District; and

WHEREAS, the Faribault Fire Department responds to medical emergencies that may require specialized equipment to save lives; and

WHEREAS, the Faribault Fire Department also continually seeks out grant opportunities to assist with the purchase of equipment; and

WHEREAS, the Hannah Lips Foundation has a grant program to assist local organizations with the purchase of health related needs; and

WHEREAS, the Faribault Fire Department would like authorization from the City Council to apply for the Hannah Lips Grant.

NOW, THEREFORE BE IT RESOLVED, that the Faribault City Council authorizes the Faribault Fire Department to apply for the Hannah Lips Grant.

Date Adopted: January 11, 2022

Faribault City Council

Kevin F. Voracek, Mayor

ATTEST:

Timothy C. Murray, City Administrator



GRANT SUMMARY FORM

Pre-Application ☐ Application ☒ Award Acceptance ☐ Amendment ☐

Department: Fire

Contact Person: Alex Bolster

Grant Name: The Hannah Lips Foundation

Grantor: Lips Foundation

Total Project Cost: \$ 17,000.00 Total Award Amount: _____

Total Cash Match: \$ 0.00 Total In-Kind Match: _____

Application Date: 01/04/22 Grant Period From 01/01/22 To 01/31/22

Funding Type (Federal, State, Other): Local

CFDA Number: _____ Electronic or Hardcopy Submission: Both

Project Description

Purchase of a new LUCAS device to be used on patients suffering from a cardiac emergencies.

How is the Match Amount Determined::

No match.

Fixed Amount: _____ or % of project cost 0.00% or Other ☐

Explanation of Other:

For this City fiscal year, how much of the required local cash match amount is:

Already In Department Budget: _____ Not Budgeted: _____

Proposed Source of Match: _____

Director Approval

Alex Bolster

Administrator Approval

[Signature]

Hannah Lips Foundation Seeking Grant Applications by January 31, 2022

The Hannah Lips Foundation was organized in November 1978, pursuant to the Last Will and Testament of Hannah Lips.

Mrs. Lips was born in Rice County and spent her life in the Faribault area. Hannah left her entire estate to the Foundation.

According to the Foundation by-laws, charitable gifts may be granted to health care service associations, hospitals, medical research programs or other organizations for health related purposes. In particular, Hannah was interested in supporting endeavors which would support those with developmental disabilities or mental health conditions.

To date, approximately \$500,000.00 has been distributed to more than 20 local organizations to support health related needs.

Grant applications may be obtained by requesting an application packet in writing to:

Hannah Lips Foundation
PO BOX 183
Faribault, MN 55021

OR by contacting one of the following Board members:

President Debbie Purfeerst at 507-323-5093
Secretary Debbie Bellingham at 507-331-2371
Search Committee Chair Dr. Dustin Simpson at 507-363-3748

GRANT APPLICATIONS ARE DUE ON JANUARY 31, 2022.



Request for Council Action

TO: Mayor and City Council
THROUGH: Tim Murray, City Administrator
FROM: Kevin Bushard, Human Resources Manager
MEETING DATE: January 11, 2022
SUBJECT: Approve City of Faribault Employee Choice Vaccination Policy with Attestation Form

Background:

The City of Faribault has created a policy for all employees in regards to vaccinations, testing, and face coverings in response to the COVID-19 mandate. As indicated on [its rulemaking site](#), Minnesota OSHA (MNOSHA) confirmed that it adopted the federal vaccine-or-test Emergency Temporary Standard (ETS) by reference on January 3, 2022. The ETS was effective in Minnesota as of the date of [publication in the State Register](#) (Jan. 3, 2022). MNOSHA will not issue citations for noncompliance with any requirements of the ETS before Jan. 10 and will not issue citations for noncompliance with the standard's testing requirements before Feb. 9, as long as an employer is exercising reasonable, good faith efforts to come into compliance with the standard.

To be in compliance, staff discussed this with City Council at the Work Session held on January 4, 2022. The City Council directed staff to proceed with the vaccine choice for all employees instead of requiring mandatory vaccinations. Staff has developed an attestation form to gather this information from all employees in regards to their vaccination status.

Recommendation:

Approve City of Faribault Employee Choice Vaccination Policy with Attestation Form

Attachments:

1. COVID-19-Vaccine-Attestation-Form-With-COVID-Testing-Consent
2. City of Faribault employee-choice-vaccination-policy

City of Faribault

COVID-19 Vaccine Attestation Form

COVID-19 is a highly communicable, infectious, and serious disease that can lead to hospitalization and sometimes even death. In accordance with anticipated MN OSHA standards, effective January 10, 2022, the City of Faribault is requesting your COVID-19 vaccination status.

Individual's name:
Phone number:
Job Title:

Check one of the following boxes as applicable:

- ☐ I disclose I am fully vaccinated and therefore will not be required to participate in at least weekly COVID-19 testing.

Attach acceptable proof of vaccination status per policy, which includes:

- The record of immunization from a health care provider or pharmacy.
- A copy of the COVID-19 Vaccination Record Card.
- A copy of medical records documenting the vaccination.
- A copy of immunization records from a public health, state, or tribal immunization information system; or
- A copy of any other official documentation that contains the type of vaccine administered, date(s) of administration, and the name of the health care professional(s) or clinic site(s) administering the vaccine(s).

- ☐ I will participate in at least weekly COVID-19 testing. *Pursuant to City of Faribault policy, I understand that my failure to participate in the required steps associated with weekly testing in a timely manner may subject me to discipline up to and including termination.*

- ☐ I disclose I am not fully vaccinated but intend to become fully vaccinated prior to February 9, 2022 and will provide proof of the required one (or two) vaccinations prior to that date.

- ☐ **I am requesting an accommodation consideration from vaccination or from weekly testing.** *Checking this box requires completion of the Medical Accommodation request form or the Religious Accommodation request form and any additionally required paperwork as requested to begin this interactive discussion.*

Signature	Date
------------------	-------------

Data Practices (Tennessen Advisory)

COVID-19 is a highly communicable, infectious, and serious disease that can lead to hospitalization and sometimes even death. According to the Centers for Disease Control and Prevention and the Minnesota Department of Health, the best way to prevent infection and from spreading the disease is by being vaccinated. Testing employees for COVID-19 infection is a critical tool for minimizing potential exposure to COVID-19 and enabling an early response to prevent further transmission of the virus. To protect, to the extent reasonably possible, the health and safety of our employees and our customers from the direct threat resulting from the spread of COVID-19 in the workplace, except for employees who attest and provide proof they have been fully vaccinated against COVID-19, the City of Faribault is requiring mandatory testing for COVID-19 of all employees who are required to access the workplace, as set forth in the City of Faribault's COVID-19 Vaccination, Testing, and Face Covering Policy.

As part of this ongoing testing, employees who do not attest and submit proof of full COVID-19 vaccination will have their information and specimen collected to provide a COVID-19 test result. The COVID-19 test sample and other information collected during the COVID-19 test is classified as private data under the Minnesota Government Data Practices Act.

You are hereby advised you are being requested for nonpublic data as part of the City of Faribault's COVID-19 Vaccination, Testing, and Face Covering Policy. Some of the information you will be asked to provide may be classified by state law as either private or confidential. Private data is defined as information which generally cannot be given to the public but can be given to the subject of the data. Confidential data is defined as information which generally cannot be given to either the public or the subject of the data but is limited to those whose official duties require access.

Specifically, we are requesting information, and may request additional information, into the COVID-19 vaccination status of employees and your individual COVID-19 vaccination status in particular, as part of the implementation and administration of the City of Faribault's COVID-19 Vaccination, Testing, and Face Covering Policy. The data helps us to determine whether you pose a safety risk to yourself, your coworkers, or the public, or whether you will be denied admission to the workplace for the protection of City of Faribault employees and/or the public.

City of Faribault employees have the right to refuse to take a COVID-19 test and are not legally required to provide the requested data. However, if an employee has not attested and submitted proof of full vaccination against COVID-19 and refuses to take a COVID-19 test or does not provide the requested information or sample to conduct a COVID-19 test, the individual: will not be admitted to the workplace; may be subject to discipline, up to and including discharge; and may be sent home and placed on unpaid leave status, all as set forth in the City of Faribault's COVID-19 Vaccination, Testing, and Face Covering Policy.

Access to private information gathered under the City of Faribault's COVID-19 Vaccination, Testing, and Face Covering Policy will be limited to testing site staff, the designated testing laboratory, any designated vendor who will communicate the test results to the employee and/or the City of Faribault, the Minnesota Department of Health, local public health, City of Faribault HR staff, members of City of Faribault staff with a business need to know about the information in the course of their duties or responsibilities, the person who is the subject of private data about him or herself, people who have permission from the subject of the data, participants in any litigation, mediation, veterans preference hearing, grievance arbitration, or other administrative proceeding which results from actions taken, and others authorized by law. If litigation arises, the information and related documents may be provided to the court and parties. In such a case, court rules and orders apply, and the court decides whether such information and documents are public or confidential/sealed.

Advisory provided to the employee by the City of Faribault on or about the 10th day of January, 2022.

I acknowledge receiving this advisory.

Employee Signature

This section to be completed only by employees who are not providing proof of full vaccination and are consenting to COVID-19 testing.

By signing below, I understand, agree, certify, and authorize the following:

- I have read and agree to the terms set forth in the City of Faribault COVID-19 Vaccination, Testing, and Face Covering Policy.
- I have been advised that I have the right to refuse to submit to COVID-19 testing.
- I consent to submit to COVID-19 testing.

My data, including my information and my specimen, may be collected, shared, used, and retained by the City of Faribault as detailed above, and as authorized by law.

My consent will be in effect for the duration of the testing requirement, or until I rescind my consent in writing.

I will hold harmless the City of Faribault, the State of Minnesota, all contracted vendors, and all their respective employees, representatives, officers, agents, and contractors from any and all liability and claims related to or that may arise from COVID-19 testing.

I understand that if I become fully vaccinated against COVID-19, submit a new Vaccination Attestation Form and proof of vaccine to HR that I am fully vaccinated I will be removed from the COVID-19 testing requirement.

Signature

Date

City of Faribault COVID-19 Vaccination, Testing and Face Covering Policy

Purpose

Vaccination is a vital tool to reduce the presence and severity of COVID-19 cases in the workplace, in communities, and in the nation as a whole. The City of Faribault encourages all employees to receive a COVID-19 vaccination to protect themselves and other employees. However, should an employee choose not to be vaccinated, this policy's sections on testing and face coverings will apply. This policy complies with OSHA's Emergency Temporary Standard on Vaccination and Testing (29 CFR 1910.501).

Definitions

- **Close Contact:** individuals are/were within six feet for a cumulative period of 15 minutes or more over 24 hours.
- **Social Distancing:** Individuals are minimally 6 feet apart.
- **Quarantine Period:** The duration of time for which a person who is exposed to COVID-19 must remain away from the worksite. Z
- **Isolation Period:** the duration of time for which a person who test positive for COVID-19 must remain away from the worksite.

Scope

This COVID-19 Policy on vaccination, testing, and face covering use applies to all employees of the City of Faribault, including but not limited to full-time, part-time, seasonal, and temporary.

As a term and condition of employment at the City of Faribault, all employees covered by this policy are required to:

1. Provide proof that they are fully vaccinated with a COVID-19 vaccine; or
2. Provide proof of regular testing for COVID-19 and wear a face covering in accordance with section addressing face coverings of this policy.

All employees are encouraged to be fully vaccinated. Employees are considered fully vaccinated two weeks after completing primary vaccination with a COVID-19 vaccine with, if applicable, at least the minimum recommended interval between doses.

All employees are required to report their vaccination status and, if vaccinated, provide proof of vaccination. Employees must provide truthful and accurate information about their COVID-19 vaccination status, and, if not fully vaccinated, their testing results. Employees not in compliance with this policy will be subject to discipline.

Should there be a need for discipline, the City of Faribault will follow a progressive schedule. There may be circumstances that warrant deviation from the order of discipline which will be determined on a case by case basis. The schedule will consist of the following:

1. Oral reprimand
2. Written reprimand
3. Suspension without pay
4. Discharge

Employees may request an exception from vaccination requirements (if applicable) if the vaccine is medically contraindicated for them or medical necessity requires a delay in vaccination. Employees also may be legally entitled to a reasonable accommodation if they cannot be vaccinated and/or wear a face covering (as otherwise required by this policy) because of a disability, or if the provisions in this policy for vaccination, and/or testing for COVID-19, and/or wearing a face covering conflict with a sincerely held religious belief, practice, or observance. Requests for exceptions and reasonable accommodations must be initiated by the employee by contacting the Human Resources Manager. All such requests will be handled in accordance with applicable laws and regulations and applicable city policies.

Procedures

Overview and General Information

Vaccination

Any City of Faribault employee not fully vaccinated by January 10, 2022 will be subject to the regular testing and face covering requirements of the policy.

To be fully vaccinated by January 10, 2022, an employee must:

- *Obtain the first dose of a two-dose vaccine no later than November 29, 2021 and the second dose no later than December 27, 2021 or*
- *Obtain one dose of a single dose vaccine no later than December 27, 2021.*

Employees will be considered fully vaccinated two weeks after receiving the requisite number of doses of a COVID-19 vaccine as stated above. An employee will be considered partially vaccinated if they have received only one dose of a two-dose vaccine.

Testing and Face Coverings

All employees who are not fully vaccinated as of **January 10, 2022** will be required to undergo regular COVID-19 testing and wear a face covering when in the workplace.

Policies and procedures for testing and face coverings are described in the relevant sections of this policy.

Vaccination Status and Acceptable Forms of Proof of Vaccination

Vaccinated Employees

All vaccinated employees are required to provide proof of COVID-19 vaccination, regardless of where they received vaccination. Proof of vaccination status can be submitted via completing a vaccination attestation form and submitting it to the Human Resources Manager.

Acceptable proof of vaccination status is:

1. *The record of immunization from a health care provider or pharmacy;*
2. *A copy of the COVID-19 Vaccination Record Card;*
3. *A copy of medical records documenting the vaccination;*
4. *A copy of immunization records from a public health, state, or tribal immunization information system; or*
5. *A copy of any other official documentation that contains the type of vaccine administered, date(s) of administration, and the name of the health care professional(s) or clinic site(s) administering the vaccine(s).*

Proof of vaccination generally should include the employee's name, the type of vaccine administered, the date(s) of administration, and the name of the health care professional(s) or clinic site(s) that administered the vaccine. In some cases, state immunization records may not include one or more of these data fields, such as clinic site; in those circumstances the City of Faribault will still accept the state immunization record as acceptable proof of vaccination.

If an employee is unable to produce one of these acceptable forms of proof of vaccination, despite attempts to do so (e.g., by trying to contact the vaccine administrator or state health department), the employee can provide a signed and dated statement attesting to their vaccination status (fully vaccinated or partially vaccinated); attesting that they have lost and are otherwise unable to produce one of the other forms of acceptable proof; and including the following language:

"I declare (or certify, verify, or state) that this statement about my vaccination status is true and accurate. I understand that knowingly providing false information regarding my vaccination status on this form may subject me to criminal penalties."

An employee who attests to their vaccination status in this way should to the best of their recollection, include in their attestation the type of vaccine administered, the date(s) of administration, and the name of the health care professional(s) or clinic site(s) administering the vaccine.

All Employees

All employees, both vaccinated and unvaccinated, must inform City of Faribault of their vaccination status. The following table outlines the requirements for submitting vaccination status documentation.

<i>Vaccination Status</i>	<i>Instructions</i>	<i>Deadline(s)*</i>
Employees who are fully vaccinated.	Submit proof of vaccination that indicates full vaccination.	January 10, 2022
Employees who are partially vaccinated (i.e., one dose of a two dose vaccine series).	Submit proof of vaccination that indicates when the first dose of vaccination was received, followed by proof of the second dose when it is obtained.	January 10, 2022
Employees who are not vaccinated.	Submit statement that you are unvaccinated but are planning to receive a vaccination by the deadline.	January 10, 2022
	Submit statement that you are unvaccinated and not planning to receive a vaccination.	January 10, 2022

**OSHA requires employers to collect all information about employee vaccination status starting January 10, 2022.*

Supporting COVID-19 Vaccination

An employee may take up to four (4) hours of duty time per dose to travel to the vaccination site, receive a vaccination, and return to work. This would mean a maximum of eight (8) hours of duty time for employees receiving two doses. If an employee spends less time getting the vaccine, only the necessary amount of duty time will be granted. Employees who take longer than four (4) hours to get the vaccine must send their supervisor an email documenting the reason for the additional time (e.g., they may need to travel long distances to get the vaccine). Any additional time requested will be granted, if reasonable, but will not be paid; in that situation, the employee can elect to use accrued leave, e.g., sick leave, to cover the additional time. If an employee is vaccinated outside of their approved duty time they will not be compensated.

Employees may utilize up to two sick days following each dose if they have side effects from the COVID-19 vaccination that prevent them from working. Employees who have no sick leave will be granted up to two days of additional sick leave immediately following each dose if necessary. Employees should contact their supervisor should they need to request leave.

Employee Notification of COVID-19, Exposure, and Removal from the Workplace

City of Faribault will require employees to promptly notify their supervisor and human resources when they have tested positive for COVID-19 or have been diagnosed with COVID-19 by a licensed healthcare provider.

A. Screening and Symptoms

Employees must actively monitor their own health. Each day, employees shall use the CDC or MDH check list prior to performing work on-site. The employees shall notify their supervisor if they are experiencing any of the following symptoms:

- Persistent cough
- Runny nose
- Sore throat
- Fever (100.4 degrees oral)
- Shortness of breath or difficulty breathing
- Chills
- Muscle pain
- Nausea, vomiting, or diarrhea within the last 24 hours
- New loss of smell or taste
- Fatigue
- Headache

B. Household Suspected or Confirmed Illness

If an employee, a person in the employee's household, someone under the care of the employee, or someone with whom the employee has had close contact is exhibit any of the symptoms listed above, the employee should notify their supervisor as soon as possible. While employees may not be required to stay away from work under these circumstances, supervisors shall, to the greatest extent possible, work with employees to allow them to work onsite in an isolated environment. If at any time the employee is notified of exposure to suspected or confirmed case of COVID-19, the employee must follow the CDC isolation and quarantine guidelines.

C. Return to Work Criteria

For any employee removed because they are COVID-19 positive, City of Faribault will keep them removed from the workplace until:

- the employee receives a negative result on a COVID-19 nucleic acid amplification test (NAAT) following a positive result on a COVID-19 antigen test if the employee chooses to seek a NAAT test for confirmatory testing, or
- meets the return to work criteria in CDC's "Isolation Guidance", or
- receives a recommendation to return to work from a licensed healthcare provider.

Under CDC's "[Isolation Guidance](#)," asymptomatic employees may return to work once 5 days have passed since the positive test, and symptomatic employees may return to work after all the following are true:

- At least 5 days have passed since symptoms first appeared, and
- At least 24 hours have passed with no fever without fever-reducing medication; and

- Other If you have no symptoms or your symptoms are resolving after 5 days (loss of taste and smell may persist for weeks or months and need not delay the end of isolation).

If an employee has severe COVID-19 or an immune disease, the City of Faribault will follow the guidance of a licensed healthcare provider regarding return to work.

COVID-19 Testing

All employees who are not fully vaccinated will be required to comply with this policy for testing.

Employees who report to the workplace at least once every seven days:

- (A) *must be tested for COVID-19 at least once every seven days; and*
- (B) must provide documentation of the most recent COVID-19 test result to Human Resources or designated supervisor no later than the seventh day following the date on which the employee last provided a test result.

Any employee who does not report to the workplace during a period of seven or more days (e.g., if they were teleworking for two weeks prior to reporting to the workplace):

- (A) must be tested for COVID-19 within seven days prior to returning to the workplace; and
- (B) must provide documentation of that test result to Human Resources or designated supervisor upon return to the workplace.

If an employee does not provide documentation of a COVID-19 test result as required by this policy, they will receive disciplinary action and be removed from the workplace until they provide a test result.

Employees who have received a positive COVID-19 test or have been diagnosed with COVID-19 by a licensed healthcare provider, are not required to undergo COVID-19 testing for 90 days following the date of their positive test or diagnosis.

Employees can fulfill the weekly testing requirement by going to their pharmacy or any healthcare provider that administers testing. Testing must be completed every seven days. Employees need to furnish physical proof of any testing results to their supervisor or the Human Resources Manager, with the employee's name and test result on the form. For any positive results employees must bring in the positive test result upon their return.

The City of Faribault will not cover any costs for the test itself. Time away from work to test will not be covered and sick leave or any accrued leave must be used. Time away from work due to a positive test result to quarantine will need to be covered by sick leave or any accrued leave available.

Face Coverings

City of Faribault will require all employees who are not fully vaccinated to wear a face covering. Face coverings must:

1. completely cover the nose and mouth.
2. be made with two or more layers of a breathable fabric that is tightly woven (i.e., fabrics that do not let light pass through when held up to a light source).
3. be secured to the head with ties, ear loops, or elastic bands that go behind the head. If gaiters are worn, they should have two layers of fabric or be folded to make two layers.
4. fit snugly over the nose, mouth, and chin with no large gaps on the outside of the face; and
5. be a solid piece of material without slits, exhalation valves, visible holes, punctures, or other openings. Acceptable face coverings include clear face coverings or cloth face coverings with a clear plastic panel that, despite the non-cloth material allowing light to pass through, otherwise meet these criteria and which may be used to facilitate communication with people who are deaf or hard-of-hearing or others who need to see a speaker's mouth or facial expressions to understand speech or sign language respectively.

Employees who are not fully vaccinated must wear face coverings over the nose and mouth when indoors and when occupying a vehicle with another person for work purposes. Policies and procedures for face coverings will be implemented, along with the other provisions required by OSHA's COVID-19 Vaccination and Testing ETS, as part of a multi-layered infection control approach for unvaccinated workers.

The following are exceptions to City of Faribault's requirements for face coverings:

1. When an employee is alone in a room with floor to ceiling walls and a closed door.
2. For a limited time, while an employee is eating or drinking at the workplace or for identification purposes in compliance with safety and security requirements.
3. When an employee is wearing a respirator or facemask.
4. Where City of Faribault has determined that the use of face coverings is infeasible or creates a greater hazard (e.g., when it is important to see the employee's mouth for reasons related to their job duties, when the work requires the use of the employee's uncovered mouth, or when the use of a face covering presents a risk of serious injury or death to the employee).

New Hires:

All new employees are required to comply with the vaccination, testing, and face covering requirements outlined in this policy on the first day of employment and as a condition of employment. Potential candidates for employment will be notified of the requirements of this policy prior to the start of employment.

Confidentiality and Privacy:

All medical information collected from individuals, including vaccination information, test results, and any other information obtained as a result of testing, will be treated in accordance with applicable laws and policies on confidentiality and privacy.

Questions:

Please direct any questions regarding this policy to the Human Resources Manager.



Request for Council Action

TO: Mayor and City Council
THROUGH: Tim Murray, City Administrator
FROM: Mark DuChene, City Engineer
MEETING DATE: January 11, 2022
SUBJECT: Resolution 2022-009 Order Improvements and Order Preparation of Plans and Specifications for 2022 Street Overlay and Sidewalk Improvements - City Contract 2022-02

Background:

The attached resolution orders the improvements for the proposed 2022 Street Overlay & Sidewalk Improvements project (Contract 2022-02) by curb and gutter replacement, concrete sidewalk replacement, storm sewer repair, casting adjustment/replacement, pavement milling, bituminous paving, pavement markings, and related improvements on the following streets:

Alexander Drive	(2nd Avenue NW to Fairgrounds Drive)
6th Street NW	(Central Avenue to 8th Avenue NW)
1st Avenue NW	(2nd Street NW to 13th Street NW)
8th Street NW	(Central Avenue to 2nd Avenue NW)
10th Street NW	(Central Avenue to 2nd Avenue NW)*
11th Street NE/NW	(1st Avenue NE to 2nd Avenue NW)*
Newhall Drive	(Parshall Street to Matteson Street)

*Includes New Sidewalk

The purpose of the hearing is to take public comment as part of the consideration by the Council in ordering the improvements. If the project is ordered, plans and specifications will be finalized and brought back to the Council for approval, along with the request for authorization to advertise for public bids.

Due to the COVID 19 pandemic, a traditional open house was not held, but rather, a virtual neighborhood meeting was held and people were encouraged to contact the City Engineer directly with any questions after viewing the virtual open house. Only one comment has been received regarding the replacement of a hazardous sidewalk.

The preliminary total estimated cost of the improvements, including 5% contingency and 15% engineering, is \$1,765,000.00. Proposed funding for the project is as follows:

Street Improvement Fund (401)	\$ 1,699,500.00	96.3%
Water Utility Fund (601)	\$ 24,000.00	1.4%
Sanitary Sewer Utility Fund (602)	\$ 7,250.00	0.4%
Storm Water Utility Fund (603)	\$ 34,250.00	21.9%
Total	\$ 1,765,000.00	100.0%

As detailed in the feasibility report, there are no special assessments proposed as part of this project as revenues for the street improvement fund are designated to come from the franchise fee increases. As such, a simple majority vote of the City Council is required to advance the improvements. Construction is scheduled to begin in May/June, with substantial completion by the end of July 2022.

Recommendation:

Approve Resolution 2022-009

Attachments:

1. Resolution 2022-009 Order Improvements and Order Preparation of Plans and Specs - Contract 2022-02
2. (2022-02) Info Meeting Letter
3. 2022-02 Project Location Map

CITY OF FARIBAULT

RESOLUTION #2022-009

ORDER IMPROVEMENTS AND ORDER PREPARATION OF PLANS AND SPECIFICATIONS FOR 2022 STREET OVERLAY AND SIDEWALK IMPROVEMENTS – CITY CONTRACT 2022-02

WHEREAS, Resolution 2021-278, adopted on December 14, 2021, fixed a date for a Council hearing on the proposed 2022 Street Overlay & Sidewalk Improvements project (Contract 2022-02) by curb and gutter replacement, concrete sidewalk replacement, storm sewer repairs, casting adjustment/replacement, pavement milling, bituminous paving, pavement markings, and related improvements:

Alexander Drive	(2nd Avenue NW to Fairgrounds Drive)
6th Street NW	(Central Avenue to 8th Avenue NW)
1st Avenue NW	(2nd Street NW to 13th Street NW)
8th Street NW	(Central Avenue to 2nd Avenue NW)
10th Street NW	(Central Avenue to 2nd Avenue NW)*
11th Street NE/NW	(1st Avenue NE to 2nd Avenue NW)*
Newhall Drive	(Parshall Street to Matteson Street)

*Includes New Sidewalk

WHEREAS, the total cost of the improvements is estimated to be \$1,765,000.00.

NOW, THEREFORE BE IT RESOLVED, that said improvements are necessary, cost-effective and feasible as detailed in the project feasibility report.

ALSO, BE IT RESOLVED, that the proposed the 2022 Street Overlay & Sidewalk Improvements project (Contract 2022-02) by curb and gutter replacement, concrete sidewalk replacement, storm sewer repairs, casting adjustment/replacement, pavement milling, bituminous paving, pavement markings, and related improvements on the following streets:

Alexander Drive	(2nd Avenue NW to Fairgrounds Drive)
6th Street NW	(Central Avenue to 8th Avenue NW)
1st Avenue NW	(2nd Street NW to 13th Street NW)

8th Street NW	(Central Avenue to 2nd Avenue NW)
10th Street NW	(Central Avenue to 2nd Avenue NW)*
11th Street NE/NW	(1st Avenue NE to 2nd Avenue NW)*
Newhall Drive	(Parshall Street to Matteson Street)

*Includes New Sidewalk

are hereby ordered as proposed in the Council Resolution adopted January 11, 2022.

ALSO, BE IT RESOLVED, that the City Engineer is hereby designated as the engineer for this improvement. The engineer shall prepare plans and specifications for making such improvements.

ALSO, BE IT RESOLVED, that the City Council declares its official intent to reimburse itself for the costs of the improvement from proceeds of a tax exempt bond.

Date Adopted: January 11, 2022

Faribault City Council

Kevin F. Voracek, Mayor

ATTEST:

Timothy C. Murray, City Administrator

December 15, 2021

Dear Property Owner:

The purpose of this letter is to inform you tax records indicate that you are the property owner of property abutting the proposed 2022 Street Overlay and Sidewalk Improvements project (Contract 2022-02), including curb and gutter replacement, concrete sidewalk replacement & construction, storm sewer repairs, casting adjustment/replacement, pavement milling, bituminous paving, pavement markings, and related improvements on the following streets:

Alexander Drive	(2nd Avenue NW to Fairgrounds Drive)
6th Street NW	(Central Avenue to 8th Avenue NW)
1st Avenue NW	(2nd Street NW to 13th Street NW)
8th Street NW	(Central Avenue to 2nd Avenue NW)
10th Street NW	(Central Avenue to 2nd Avenue NW)*
11th Street NE/NW	(1st Avenue NE to 2nd Avenue NW)*
Newhall Drive	(Parshall Street to Matteson Street)

*Includes A Portion of New Sidewalk

Property owners are encouraged to review the virtual project open house presentation located at the following link: <https://storymaps.arcgis.com/stories/c77f7e8bb988414db9bfddee419114d4>

If you have questions after reviewing the project presentation, you are encouraged to contact myself either by phone at 507.333.0360 or email at mduchene@ci.faribault.mn.us and I'd be more than happy to answer any questions. The City Council will formally consider whether or not to proceed with an improvement project at their January 11, 2022, at their regular council meeting as outlined in the attached Public Hearing notice.

As the most common question we get asked following the sending of these notices relates to the costs, I want to inform you that on October 12, 2021, the City Council passed Ordinance 2021-09 which increased the franchise fee amounts paid by all electric and gas utility customers in the City. This increase in franchise fees is being used to fund street improvement projects like this proposed project starting in 2022. As such, the City is **not** proposing to levy any special assessments against the adjacent properties to street projects as was commonly done in previous years.

I urge that if you have any questions or concerns regarding the proposed improvement project that you contact me to discuss. Often times property owners along the project point out issues or concerns that they experience due to living along the proposed project that are not always evident based on a survey.

Sincerely,

A handwritten signature in blue ink, appearing to read "Mark DuChene", with a stylized flourish at the end.

Mark DuChene, PE

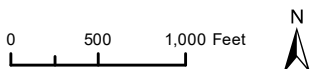
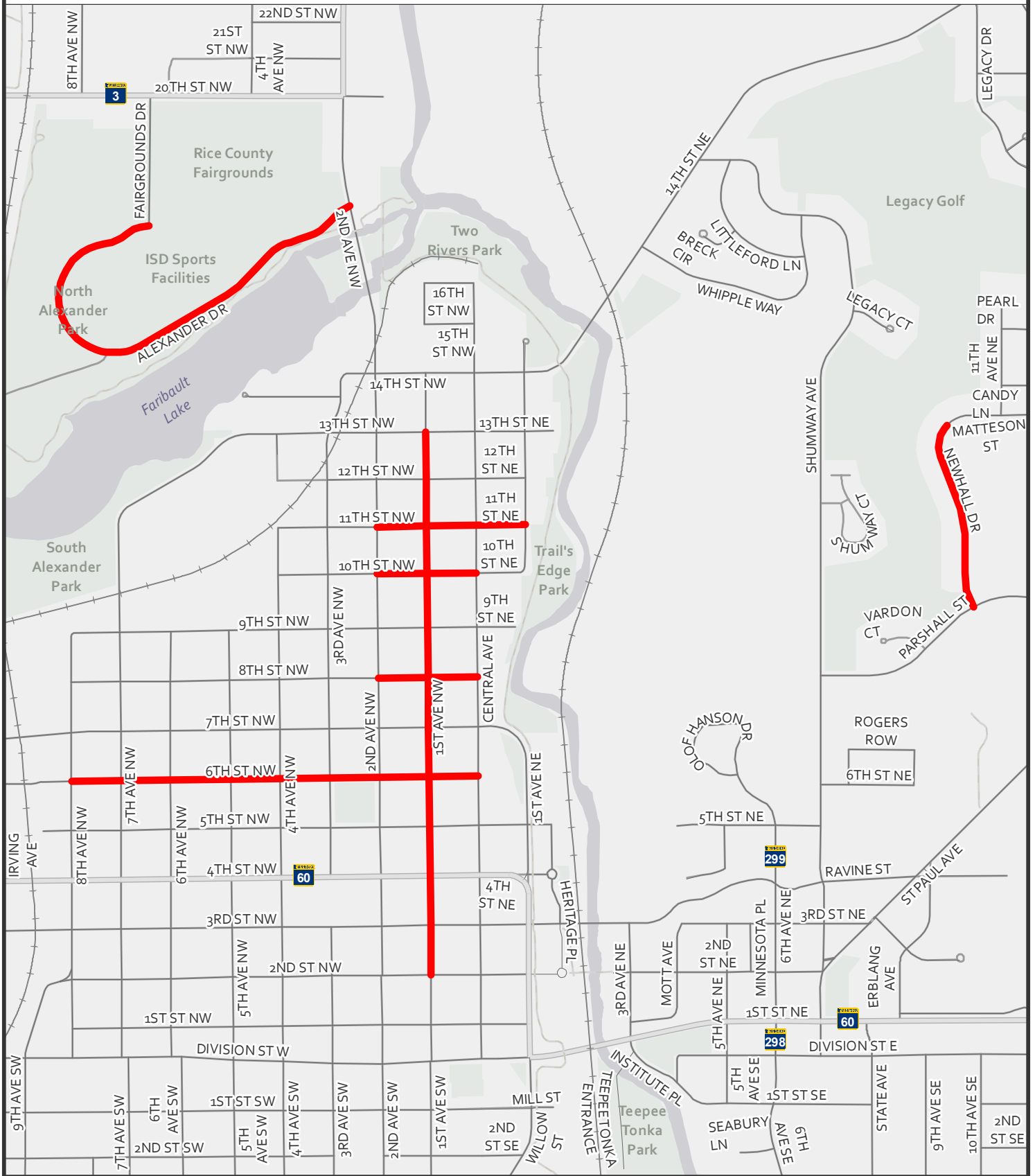
City Engineer

(507) 333-0360

mduchene@ci.faribault.mn.us

Project Location 2022 Street Overlays

This map is neither a legally recorded map nor a survey. This map is a compilation data affecting the area shown; and is for reference purposes only. In using the map, you assume responsibility for the correctness all information extracted from this map.





Request for Council Action

TO: Mayor and City Council
THROUGH: Tim Murray, City Administrator
FROM: Deanna Kuennen, Community & Economic Development Director
MEETING DATE: January 11, 2022
SUBJECT: Approve Summary Publication of Ordinance 2021-14 Amend Northgate Business Park PUD

Background:

On December 28, 2021, the Faribault City Council approved the second reading of Ordinance 2021-14, which removes Lots 3, 4, 7, and 8, Block 1, NORTHGATE SECOND ADDITION from the Northgate Business Park Planned Unit Development (PUD), and allows the lots to develop per the permitted and conditional uses in the existing underlying C-2, Highway Commercial zoning district (see attached). City Staff recommends that the City Council approve the attached summary of Ordinance 2021-14 for publication in the Faribault Daily News on January 18, 2022. Ordinance 2021-14 will not be in effect until the summary of the ordinance is published. Approval of the summary ordinance requires an affirmative vote from at least five (5) City Council members.

Recommendation:

Approve summary publication of Ordinance 2021-14, which amends the Northgate Business Park PUD.

Attachments:

1. Ordinance 2021-14 Summary Publication
2. Ordinance 2021-14 Amend Northgate Business Park PUD

Summary Publication

CITY OF FARIBAULT

ORDINANCE No. 2021-14

AMEND NORTHGATE BUSINESS PARK PUD

On December 28, 2021, the Faribault City Council approved Ordinance 2021-14, which removes Lots 3, 4, 7, and 8, Block 1, NORTHGATE BUSINESS PARK SECOND ADDITION from the Northgate Business Park Planned Unit Development (PUD), and allows the lots to develop per the permitted and conditional uses in the existing underlying C-2, Highway Commercial zoning district. A complete copy of the ordinance is available for public review during regular business hours at City Hall, 208 NW 1st Avenue, Faribault, Minnesota.

Public Hearing:	December 6, 2021
First Reading:	December 14, 2021
Second Reading:	December 28, 2021
Publication:	January 18, 2022

CITY OF FARIBAULT

ORDINANCE #2021-14

AMEND NORTHGATE BUSINESS PARK PUD

WHEREAS, Bhavesh Amin, on behalf of Radhe Krishna, Inc. (the Applicant), in consultation with GPT Development Co., LLC and Gray Family Investments, Limited Partnership (the Property Owners), has requested an amendment to the Northgate Business Park planned unit development (PUD) to remove from the PUD Lots, 3, 4, 7, and 8, Block 1, NORTHGATE SECOND ADDITION (the subject property) legally described in Exhibit A and graphically depicted in Exhibit B; and

WHEREAS, Ordinance 2000-06 created the Northgate Business Park PUD and Ordinance 2002-23 amended the PUD; and

WHEREAS, the Northgate Business Park PUD has provisions that may limit some types of development on the subject property; and

WHEREAS, the subject property has been undeveloped since the creation of the PUD in 2000; and

WHEREAS, Provision 17 of Ordinance 2000-06 states, "In the event that development of the entire site is not complete within five (5) years of the project start date, the City Council may, at its discretion, set a public hearing to review the status and performance of the planned unit development."

WHEREAS, the Applicant wishes to develop the subject property in a manner consistent with the underlying C-2, Highway Commercial zoning district, but that may be inconsistent with some provisions of the PUD, particularly provisions that limit the uses on the subject property to office/retail or restaurant. The Applicant is, therefore, requesting that the subject property be removed from the PUD; and

WHEREAS, this ordinance does not directly affect any private easements, restrictions, and covenants, which the City does not control, but that may further govern the use of the subject property; and

WHEREAS, the Property Owners are responsible for all desired changes to any private easements, restrictions, and covenants that may affect future development on the subject property; and

WHEREAS, the Planning Commission, on November 15, 2021, following proper notice, held a public hearing regarding the Applicant's request; and

WHEREAS, following the public hearing, the Planning Commission recommended approval of the requested PUD amendment based on the following written findings of the Planning Commission outlined in Section 2-180 of the City's Unified Development Ordinance as follows:

1. Criteria: Whether the amendment is consistent with the applicable policies of the City's Land Use Plan.

Finding: The City's Land Use Plan guides the subject property for a mix of commercial/residential uses. The proposed amendment to remove the subject property from the Northgate Business Park PUD overlay zoning district does not conflict with the Land Use Plan. The base zoning associated with the subject property is C-2, Highway Commercial, which is consistent with the City's Land Use Plan.

2. Criteria: Whether the amendment is in the public interest and is not solely for the benefit of a single property owner.

Finding: The subject property has remained undeveloped since the creation of the PUD in 2000. It is in the public interest for this property to develop. The removal of the subject property from the PUD provides additional development opportunities.

3. Criteria: Whether the existing uses of property and the zoning classification of property within the general area of the property in question are compatible with the proposed zoning classification, where the amendment is to change the zoning classification of a particular property.

Finding: This ordinance removes the subject property from the Northgate Business Park PUD, but it maintains the underlying C-2, Highway Commercial zoning district. The existing zoning surrounding the subject property is also C-2, Highway Commercial.

Consequently, this ordinance is compatible with existing property uses and zoning within the general area.

- 4. Criteria: Whether there are reasonable uses of the property in question permitted under the existing zoning classification, where the amendment is to change the zoning classification of a particular property.**

Finding: The Northgate Business Park PUD indicates that the lots in NORTHGATE SECOND ADDITION will develop with office/retail uses and a restaurant use. Since the creation of the PUD in 2000, the subject property has remained undeveloped. It is unreasonable to continue to limit the potential uses of the subject property to the uses outlined in the PUD. This ordinance allows the subject lots to develop with any allowed uses in the underlying C-2, Highway Commercial district in the same way adjacent C-2 property has or can develop.

- 5. Criteria: Whether there has been a change in the character or trend of development in the general area of the property in question, which has taken place since such property was placed in its present zoning classification, where the amendment is to change the zoning classification of a particular property.**

Finding: The subject property has remained undeveloped since the creation of the Northgate Business Park in 2000. There has been less demand for office and retail buildings, particularly in recent years. This trend is expected to continue. Removing the subject property from the PUD does not prevent office and retail uses on the subject property. Rather, it expands the list of uses that can develop on the property. Therefore, it provides flexibility to adjust to development trends.

WHEREAS, the City Council held a public meeting on December 14, 2021, to approve the first reading of Ordinance 2021-14; and

WHEREAS, the City Council also held a public meeting on December 28, 2021 to approve the second reading of Ordinance 2021-14; and

WHEREAS, based on the City Staff report, the results of the public hearing, and the written findings and recommendation of the Planning Commission, the City Council of the City of Faribault concurs with the written findings of the Planning Commission as stated in the above recitals and hereby makes the identical findings.

NOW, THEREFORE, THE CITY OF FARIBAULT ORDAINS:

Section 1: Intent. The intent of this ordinance is to remove Lots 3, 4, 7, and 8, Block 1, NORTHGATE SECOND ADDITION (the subject property) from the Northgate Business Park planned unit development (PUD), which Ordinance 2000-06 created and which Ordinance 2002-23 amended. Removal of the subject property from the PUD is intended to allow the subject property to develop in a manner consistent with the underlying C-2, Highway Commercial zoning district without having to comply with the unique PUD provisions outlined in Ordinance 2000-06, Ordinance 2002-23, and Resolution 2001-148. This ordinance is not intended to directly affect any private easements, restrictions, and covenants, which the City does not control, but that may further govern the use of the subject property. The Property Owners are responsible for any amendment of private easements, covenants, and restrictions affecting the subject property.

Section 2: PUD Amendment. The Faribault City Council hereby amends the Northgate Business Park commercial planned unit development (PUD) as follows:

1. Lots 3, 4, 7, and 8, Block 1, NORTHGATE SECOND ADDITION are hereby removed from the Northgate Business Park PUD, which Ordinance 2000-06 created and which Ordinance 2002-23 amended.
2. Lots 1, 2, 5, and 6, Block 1, NORTHGATE SECOND ADDITION, shall remain in the Northgate Business Park PUD and continue to be governed by Ordinance 2000-06 and Ordinance 2002-23. The City shall not issue a building permit for work associated with Lots 1, 2, 5, and 6 until the City approves an updated development plan for the Northgate Business Park identifying the amended boundaries of PUD and the relationship of the PUD to Lots 3, 4, 7, and 8, which are not in the PUD.

Section 3: Official Zoning Map. The Official Zoning Map of the City of Faribault shall not be republished to show the PUD amendment. However, the City Planner shall appropriately update the Official Zoning Map on file with the City Planning Office to indicate the removal of Lots 3, 4, 7, and 8, Block 1, NORTHGATE SECOND ADDITION from the Northgate Business Park PUD overlay zoning district.

Section 4: Findings and Incorporation of Recitals and Exhibits. The recitals set forth in this ordinance and the exhibits attached hereto are incorporated into and made part of this ordinance and, where applicable, constitute the written findings of the City Council of the City of Faribault.

Section 5: Effective Date. This ordinance shall be effective immediately upon its passage and publication according to the Faribault City Charter.

Public Hearing: December 6, 2021
First Reading: December 14, 2021
Second Reading: December 28, 2021
Published: January 18, 2022

Faribault City Council

Kevin F. Voracek, Mayor

ATTEST:

Timothy C. Murray, City Administrator

**EXHIBIT A:
LEGAL DESCRIPTIONS**

The legal description of the property to be removed from the Northgate Business Park planned unit development (PUD) overlay zoning district is as follows:

Lots 3, 4, 7, and 8, Block 1, NORTHGATE SECOND ADDITION

The legal description of the property to be removed from the Northgate Business Park planned unit development (PUD) overlay zoning district is as follows:

Lots 1, 2, 5, and 6, Block 1, NORTHGATE SECOND ADDITION

**EXHIBIT B
GRAPHIC DEPICTIONS**



Lots 3, 4, 7, and 8, Block 1, NORTHGATE SECOND ADDITION to be removed from the Northgate Business Park PUD



Lots 1, 2, 5, and 6, Block 1, NORTHGATE SECOND ADDITION to remain in the Northgate Business Park PUD



Request for Council Action

TO: Mayor and City Council
THROUGH: Tim Murray, City Administrator
FROM: Deanna Kuennen, Community & Economic Development Director
MEETING DATE: January 11, 2022
SUBJECT: Approve Summary Publication of Ordinance 2021-15 Repeal and Replace Chapter 13, Article 2, Sec. 13-90 of the UDO related to Floodplain Management Districts

Background:

On December 28, 2021, the Faribault City Council approved the second reading of Ordinance 2021-15 related to Faribault's floodplain management district. The ordinance simply amends the date of a flood insurance rate map (FIRM) recently prepared by the Federal Emergency Management Agency (FEMA) (see attached). City Staff recommends that the City Council approve the attached summary of Ordinance 2021-15 for publication in the Faribault Daily News on January 18, 2022. Ordinance 2021-15 will not be in effect until the summary of the ordinance is published. Approval of the summary ordinance requires an affirmative vote from at least five (5) City Council members.

Recommendation:

Approve the summary publication of Ordinance 2021-15 related to Faribault's floodplain management district.

Attachments:

1. Ordinance 2021-15 Summary Publication
2. Ordinance 2021-15 Repeal and Replace Chapter 13 Article 2 Sec 13-90 of the City's UDO related to Floodplain Management Districts

Summary Publication

CITY OF FARIBAULT ORDINANCE No. 2021-15

REPEAL AND REPLACE CHAPTER 13, ARTICLE 2, SECTION 13-90 OF THE CITY'S UNIFIED DEVELOPMENT ORDINANCE RELATED TO FLOODPLAIN MANAGEMENT DISTRICTS

On December 28, 2021, the Faribault City Council approved Ordinance 2021-15 related to Faribault's floodplain management districts. The ordinance amends the Flood Insurance Rate Map (FIRM) panel 27131C0300E, dated April 6, 2022, and the Flood Insurance Study for Rice County, Minnesota, and Incorporated Areas, dated April 6, 2022, recently prepared by the Federal Emergency Management Agency (FEMA). A complete copy of the ordinance is available for public review during regular business hours at City Hall, 208 NW 1st Avenue, Faribault, Minnesota.

Public Hearing:	December 6, 2021
First Reading:	December 14, 2021
Second Reading:	December 28, 2021
Publication:	January 18, 2022

**CITY OF FARIBAULT
ORDINANCE No. 2021-15**

**REPEAL AND REPLACE CHAPTER 13, ARTICLE 2, SECTION 13-90 OF
THE CITY'S UNIFIED DEVELOPMENT ORDINANCE RELATED TO
FLOODPLAIN MANAGEMENT DISTRICTS**

THE CITY OF FARIBAULT ORDAINS:

Section 1. The City Council of the City of Faribault hereby repeals Chapter 13, Article 2, Section 13-90 of the City's Unified Development Ordinance in its entirety and replaces it with the following language:

Sec. 13-90. Establishment of Official Zoning Map.

The Official Zoning Map, together with all materials attached thereto, is hereby adopted by reference and declared to be a part of this ordinance. The attached material includes the following:

- Flood Insurance Study for Rice County, Minnesota, and Incorporated Areas, dated 4/6/2022
- Flood Insurance Rate Map panels 27131C0259D, 27131C0260D, 27131C0266D, 27131C0267D, 27131C0268D, 27131C0269D, and 27131C0275D, dated April 3, 2012
- Flood Insurance Rate Map panel 27131C0300E, dated April 6, 2022
- The Letter of Map Revision (LOMR) for the City of Faribault identified as Case Number 12-05-1808P, with an issuance date of February 17, 2012

Section 2. This ordinance shall take effect upon the date of its publication.

First Reading: December 14, 2021

Second Reading: December 28, 2021

Publication Date: January 18, 2022

Faribault City Council

Kevin F. Voracek, Mayor

ATTEST:

Timothy C. Murray, City Administrator



Request for Council Action

TO: Mayor and City Council
THROUGH: Planning Commission
Tim Murray, City Administrator
FROM: Deanna Kuennen, Community & Economic Development Director
MEETING DATE: January 11, 2022
SUBJECT: Ordinance 2022-1 Amend the Specific Development Standards for Residential Care Facilities Outlined in Chapter 7, Sec. 7-30 of the City's Unified Development Ordinance - 1st Reading

Background:

Residential care facilities are intended to be integrated into neighborhoods throughout the community rather than concentrated in specific neighborhoods. Consequently, the Specific Development Standards currently outlined in the City's Unified Development Ordinance require a minimum of 1,320 feet between residential care facilities. However, state statutes were recently amended to allow less than 1,320 feet of separation with the issuance of a conditional use permit. Therefore, City Staff recommend that the City Council amend the Specific Development Standards to align with state statutes as outlined in the attached proposed ordinance amendment.

Recommendation:

Approve the first reading of Ordinance 2022-1 Amend the Specific Development Standards for Residential Care Facilities outlined in Chapter 7, Sec. 7-30 of the City's Unified Development Ordinance.

Attachments:

1. Ordinance 2022-1 Amend the Specific Development Standards for Residential Care Facilities

**CITY OF FARIBAULT
ORDINANCE No. 2022-1**

**AMEND THE SPECIFIC DEVELOPMENT STANDARDS FOR RESIDENTIAL
CARE FACILITIES OUTLINED IN CHAPTER 7, SEC. 7-30 OF THE CITY'S
UNIFIED DEVELOPMENT ORDINANCE**

WHEREAS, based on the recommendation of the City Planner, the Faribault Planning Commission initiated a zoning text amendment to ensure that the separation requirement for residential care facilities as outlined in Chapter 7, Sec. 7-30 of the City's Unified Development Ordinance is consistent with state statutes; and

WHEREAS, the Planning Commission, on January 3, 2022, following proper notice, held a public hearing regarding the proposed zoning text amendment; and

WHEREAS, following the public hearing, the Planning Commission recommended that the City Council amend the specific development standards for residential care facilities outlined in Chapter 7, Sec. 7-30, of the City's Unified Development Ordinance based on the following written findings of the Planning Commission outlined in Section 2-180 of the City's Unified Development Ordinance as follows:

1. Criteria: Whether the amendment is consistent with the applicable policies of the City's Land Use Plan.

Finding: The City's Land Use Plan guides land use in the city to be consistent with the City's vision. The proposed zoning text amendment promotes the City's vision and values without adversely affecting existing neighborhoods.

2. Criteria: Whether the amendment is in the public interest and is not solely for the benefit of a single property owner.

Finding: It is in the public interest to ensure consistency between the City's Unified Development Ordinance and state statutes as it relates to the required separation between residential care facilities. The proposed amendment allows the City Council to approve less than 1,320 feet between residential care facilities with the issuance of a conditional use permit.

3. Criteria: Whether the existing uses of property and the zoning classification of property within the general area of the property in question are compatible with the proposed zoning

classification, where the amendment is to change the zoning classification of a particular property.

Finding: The proposed text amendment does not change the zoning classification of property in the city. Therefore, this required finding does not apply to the proposed text amendment.

- 4. Criteria: Whether there are reasonable uses of the property in question permitted under the existing zoning classification, where the amendment is to change the zoning classification of a particular property.**

Finding: The proposed text amendment does not change the zoning classification of property in the city. Therefore, this required finding does not apply to the proposed text amendment.

- 5. Criteria: Whether there has been a change in the character or trend of development in the general area of the property in question, which has taken place since such property was placed in its present zoning classification, where the amendment is to change the zoning classification of a particular property.**

Finding: The proposed text amendment does not change the zoning classification of property in the city. Therefore, this required finding does not apply to the proposed text amendment.

WHEREAS, the City Council held a public meeting on January 11, 2022, to consider approval of the first reading of Ordinance 2022-x; and

WHEREAS, the City Council also held a public meeting on January 25, 2022 to consider approval of the second reading of Ordinance 2022-x; and

WHEREAS, based on the City Staff report, the results of the public hearing, and the written findings and recommendation of the Planning Commission, the City Council of the City of Faribault concurs with the written findings of the Planning Commission as stated in the above recitals and hereby makes the identical findings.

NOW, THEREFORE, THE CITY OF FARIBAULT ORDAINS:

Section 1: Findings and Incorporation of Recitals and Exhibits. The recitals set forth in this ordinance are incorporated into and made part of this ordinance and, where applicable, constitute the written findings of the City Council of the City of Faribault.

Section 2: Text Amendment. The City Council of the City of Faribault has hereby determined that Chapter 7, Sec. 7-30 of the City's Unified Development Ordinance related to community residential care facilities be amended by the addition of the underlined language and removal of the ~~stricken-language~~ as follows:

Residential care facility serving more than six persons.

- (1) On-site services shall be for residents of the facility only.
- (2) The facility shall not be located in a two-family or multifamily dwelling unless it occupies the entire structure.
- (3) The minimum lot area required for a residential care facility shall be determined as follows:
 - a. Residential districts. The facility shall have a minimum lot size equal to the minimum lot area for a single-family residence in the specific zoning district, plus three hundred (300) square feet for each resident over the first six (6). To meet this requirement, the number of allowed residents may be limited.
 - b. Commercial districts. The facility shall have a minimum lot size equal to the minimum lot area for the specific zoning district, plus three hundred (300) square feet for each resident over the first six (6). To meet this requirement, the number of allowed residents may be limited.
- (4) ~~A minimum separation distance of one thousand three hundred twenty (1,320) feet shall be provided between residential care facilities serving more than six (6) residents, home day care or child care facilities serving thirteen (13) or more, and correctional residential care facilities, regardless of the licensing status of such facilities. This requirement shall not apply to residential care facilities located in R-4, High Density Residential Districts. A minimum separation distance of one thousand three hundred twenty (1,320) feet shall be provided between residential care facilities serving more than six (6) residents unless one or more of the following conditions apply:~~

- a. The city council grants the residential care facility a conditional use permit;
 - b. The residential care facility is in the R-4, High-Density Residential zoning district;
 - c. The residential care facility is in a hospital licensed by the state; or
 - d. The residential care facility is a foster care or a community residential setting as defined by state statutes.
- (5) To the extent practical, all new construction or additions to existing buildings shall be compatible with the scale and character of the surroundings, and exterior building materials shall be harmonious with other buildings in the neighborhood.
- (6) An appropriate transition area between the residential care facility use and adjacent property shall be provided by landscaping, screening, and other site improvements consistent with the character of the neighborhood.
- (7) If the size, location, licensing, or purpose of a facility with a conditional use permit changes, a new conditional use permit shall be required.
- (8) All necessary permits and/or licenses shall be obtained from the Department of ~~Public Welfare~~ Human Services or any other pertinent state agencies.

Section 3: Effective Date. This ordinance shall be effective immediately upon its passage and publication according to the Faribault City Charter.

Public Hearing: January 3, 2022

First Reading: January 11, 2022

Second Reading: _____

Published: _____

Faribault City Council

Kevin F. Voracek, Mayor

ATTEST:

Timothy C. Murray, City Administrator



Request for Council Action

TO: Mayor and City Council
THROUGH: Planning Commission
Tim Murray, City Administrator
FROM: Deanna Kuennen, Community & Economic Development Director
MEETING DATE: January 11, 2022
SUBJECT: Ordinance 2022-2 Amend Table 11-1 of the City's Unified Development Ordinance Related to Residential Care Facilities in Commercial Districts - 1st Reading

Background:

Table 11-1 of the City's Unified Development Ordinance requires a conditional use permit for residential uses, including residential care facilities, in commercial zoning districts. Table 11-1 does not limit the number of dwellings allowed in a multi-family building, but it limits the number of persons served in a residential care facility to 32. State statutes do not limit the number of persons served in a residential care facility. Therefore, Staff recommends removing the limitation on the number of people served in a residential care facility in commercial districts, as outlined in the proposed ordinance amendment. This will ensure greater consistency between the City's Unified Development Ordinance and state statutes.

Recommendation:

Approve the first reading of Ordinance 2022-2 Amend Table 11-1 of the City's Unified Development Ordinance related to Residential Care Facilities in Commercial Zoning Districts.

Attachments:

1. Ordinance 2022-2 Amend Table 11-1 of the UDO Related to Residential Care Facilities

**CITY OF FARIBAULT
ORDINANCE No. 2022-2**

**AMEND TABLE 11-1 OF THE CITY'S UNIFIED DEVELOPMENT
ORDINANCE RELATED TO RESIDENTIAL CARE FACILITIES IN
COMMERCIAL ZONING DISTRICTS**

WHEREAS, based on the recommendation of the City Planner, the Faribault Planning Commission initiated a zoning text amendment to allow residential care facilities serving more than 32 persons to occur in the C-2, Highway Commercial and the C-3, Community Commercial zoning districts with the approval of a conditional use permit; and

WHEREAS, state statutes do not limit the number of persons served by a residential care facility; and

WHEREAS, the Planning Commission, on January 3, 2022, following proper notice, held a public hearing regarding the proposed zoning text amendment; and

WHEREAS, following the public hearing, the Planning Commission recommended that the City Council amend the specific development standards for residential care facilities outlined in Chapter 7, Sec. 7-30, of the City's Unified Development Ordinance based on the following written findings of the Planning Commission outlined in Section 2-180 of the City's Unified Development Ordinance as follows:

1. Criteria: Whether the amendment is consistent with the applicable policies of the City's Land Use Plan.

Finding: The City's Land Use Plan allows residential uses in commercial districts. The proposed amendment does not conflict with the Land Use Plan.

2. Criteria: Whether the amendment is in the public interest and is not solely for the benefit of a single property owner.

Finding: It is in the public interest to allow residential care facilities in the C-2 and C-3 zoning districts to serve more than 32 persons with the issuance of a conditional use permit. The C-2 and C-3 zoning districts do not limit the number of residents in multi-family developments. Therefore, residential care facilities should not be treated different than multi-family developments in commercial districts.

3. Criteria: Whether the existing uses of property and the zoning classification of property within the general area of the property in question are compatible with the proposed zoning

classification, where the amendment is to change the zoning classification of a particular property.

Finding: The proposed text amendment does not change the zoning classification of property in the city. Therefore, this required finding does not apply to the proposed text amendment.

- 4. Criteria: Whether there are reasonable uses of the property in question permitted under the existing zoning classification, where the amendment is to change the zoning classification of a particular property.**

Finding: The proposed text amendment does not change the zoning classification of property in the city. Therefore, this required finding does not apply to the proposed text amendment.

- 5. Criteria: Whether there has been a change in the character or trend of development in the general area of the property in question, which has taken place since such property was placed in its present zoning classification, where the amendment is to change the zoning classification of a particular property.**

Finding: The proposed text amendment does not change the zoning classification of property in the city. Therefore, this required finding does not apply to the proposed text amendment.

WHEREAS, the City Council held a public meeting on January 11, 2022, to consider approval of the first reading of Ordinance 2022-2; and

WHEREAS, the City Council also held a public meeting on January 25, 2022 to consider approval of the second reading of Ordinance 2022-2; and

WHEREAS, based on the City Staff report, the results of the public hearing, and the written findings and recommendation of the Planning Commission, the City Council of the City of Faribault concurs with the written findings of the Planning Commission as stated in the above recitals and hereby makes the identical findings.

NOW, THEREFORE, THE CITY OF FARIBAULT ORDAINS:

Section 1: Findings and Incorporation of Recitals and Exhibits. The recitals set forth in this ordinance and the exhibits attached hereto are incorporated into and made part of this ordinance and, where applicable, constitute the written findings of the City Council of the City of Faribault.

Section 2: Text Amendment. The City Council of the City of Faribault has hereby determined that the residential uses listed Table 11-1 of the City's Unified Development Ordinance related to community residential care facilities be amended by the addition of the underlined language and removal of the stricken-language as follows:

Table 11-1. Principal uses in commercial districts.

Use	District					Development Standards
	C-1	C-2	C-3	CBD	SH	
Residential uses						
Dwellings						
Dwelling unit as part of mixed-use structure	-	-	-	P	C	X
Multiple-family dwelling	C	C	C	C	-	
Dwelling in conjunction with business	C	C	C	C	C	X
Congregate living						
Residential care facility, serving six or fewer persons	C	C	C	C	C	
Residential care facility, serving seven to sixteen persons	C	C	C	C	C	X
Residential care facility, serving seventeen to thirty-two or more persons	-	C	C	-	X C	<u>X</u>
Nursing home, senior housing facility	C	C	C	C	X C	<u>X</u>

Section 3: Effective Date. This ordinance shall be effective immediately upon its passage and publication according to the Faribault City Charter.

Public Hearing: January 3, 2022

First Reading: January 11, 2022

Second Reading: _____

Published: _____

Faribault City Council

Kevin F. Voracek, Mayor

ATTEST:

Timothy C. Murray, City Administrator



Request for Council Action

TO: Mayor and City Council
THROUGH: Planning Commission
Tim Murray, City Administrator
FROM: Deanna Kuennen, Community & Economic Development Director
MEETING DATE: January 11, 2022
SUBJECT: Ordinance 2022-3 Approve a Zoning Text Amendment to Create a Public/Institutional Zoning District - 1st Reading

Background:

The City's Land Use Plan identifies areas for institutional uses such as government centers, schools, religious institutions, and hospitals (see attached Land Use Plan). However, the City's Unified Development Ordinance does not have a separate zoning district for public/institutional uses. Currently, many existing public/institutional uses (like the hospital) are in the R-4, High-Density Residential District. City Hall and the Rice County Courthouse are in the R-3, Medium-Density Residential zoning district, and the Rice County Administrative Building is in the C-2, Highway Commercial zoning district. Many existing public/institutional uses require a conditional use permit, which, in most cases, would not be necessary if the uses were in a public/institutional zoning district.

The attached Ordinance 2022-3 creates a standalone district for medium to large-scale public/institutional uses. The public/institutional district is intended to encompass individual uses or a cluster of uses that are 2.5 acres or more in area. Smaller public/institutional uses will continue to be allowed as permitted or conditional uses in other zoning districts.

Staff is working with the Planning Commission to update the City's Unified Development Ordinance (UDO) and zoning map to be consistent with the City's adopted Land Use Plan. Over the coming year, Staff will request that the City Council rezone the institutional properties shown on the Land Use Plan to public/institutional. The attached ordinance is a stopgap measure to allow anticipated public/institutional uses (like the proposed Rice County Public Safety Center project) to be placed in a public/institutional zoning district. There will be additional recommendations by Planning Commission brought to City Council for consideration, as Staff and the Planning

Commission work to achieve consistency between the City's adopted Land Use Plan, UDO, and zoning map.

Recommendation:

Approve the first reading of Ordinance 2022-3, which creates a public/institutional zoning district.

Attachments:

1. Ordinance 2022-3 Approve a Zoning Text Amendment to Create a Public-Institutional Zoning District
2. Land Use Plan

**CITY OF FARIBAULT
ORDINANCE No. 2022-3**

**APPROVE A ZONING TEXT AMENDMENT TO CREATE A
PUBLIC/INSTITUTIONAL ZONING DISTRICT**

WHEREAS, the City of Faribault Planning Commission initiated a zoning text amendment to create a public/institutional zoning district in the city; and

WHEREAS, the Planning Commission, on January 3, 2022, following proper notice, held a public hearing regarding the proposed zoning text amendment; and

WHEREAS, following the public hearing, the Planning Commission recommended that the City Council approve a zoning text amendment that creates a public/institutional zoning district based on the following written findings of the Planning Commission outlined in Section 2-180 of the City's Unified Development Ordinance as follows:

1. **Criteria: Whether the amendment is consistent with the applicable policies of the City's Land Use Plan.**

Finding: The Land Use Plan identifies areas for public/institutional uses. The proposed zoning text amendment is consistent with the Land Use Plan.

2. **Criteria: Whether the amendment is in the public interest and is not solely for the benefit of a single property owner.**

Finding: The proposed zoning text amendment is not intended to benefit only one property owner. It will be effective citywide and benefit many different property owners and agencies.

3. **Criteria: Whether the existing uses of property and the zoning classification of property within the general area of the property in question are compatible with the proposed zoning classification, where the amendment is to change the zoning classification of a particular property.**

Finding: The proposed text amendment does not change the zoning classification of property in the city. Therefore, this required finding does not apply to the proposed text amendment.

4. **Criteria: Whether there are reasonable uses of the property in question permitted under the existing zoning classification,**

where the amendment is to change the zoning classification of a particular property.

Finding: The proposed text amendment does not change the zoning classification of property in the city. Therefore, this required finding does not apply to the proposed text amendment.

5. **Criteria: Whether there has been a change in the character or trend of development in the general area of the property in question, which has taken place since such property was placed in its present zoning classification, where the amendment is to change the zoning classification of a particular property.**

Finding: The proposed text amendment does not change the zoning classification of property in the city. Therefore, this required finding does not apply to the proposed text amendment.

WHEREAS, the City Council held a public meeting on January 11, 2022, to consider approval of the first reading of Ordinance 2022-3; and

WHEREAS, the City Council also held a public meeting on January 25, 2022 to consider approval of the second reading of Ordinance 2022-3; and

WHEREAS, based on the City Staff report, the results of the public hearing, and the written findings and recommendation of the Planning Commission, the City Council of the City of Faribault concurs with the written findings of the Planning Commission as stated in the above recitals and hereby makes the identical findings.

NOW, THEREFORE, THE CITY OF FARIBAULT ORDAINS:

Section 1: Findings and Incorporation of Recitals and Exhibits. The recitals set forth in this ordinance are incorporated into and made part of this ordinance and, where applicable, constitute the written findings of the City Council of the City of Faribault.

Section 2: Text Amendment. The City Council of the City of Faribault has hereby determined that Chapter 13, Article 5 of the City's Unified Development Ordinance related to special zoning districts be repealed in its entirety and replaced with the following language:

CHAPTER 13. OVERLAY AND SPECIAL DISTRICTS

ARTICLE 5. SPECIAL DISTRICTS

Sec. 13-500. Overarching purpose of the special districts.

The special districts are established to provide locations for land uses that that are not predominantly residential, commercial, or industrial uses. Such uses include, but are not limited to, public, institutional, parks, open space, agricultural, and airport uses.

Sec. 13-510. Establishment and intent of the special districts.

The establishment and the intent of the special districts are as follows:

O, Open Space/Agricultural District. The intent of the open space/agricultural district is to accommodate open space, parks, outdoor recreation, agriculture, and agricultural business uses within the city. The district may also accommodate airport, public services, and utility uses.

TUD, Transitional Urban Development District. The intent of the transitional urban development district is to serve as a holding zone for lands where future urban expansion is possible but not yet appropriate due to the unavailability of urban facilities and services.

P/I, Public/Institutional District. The intent of the public/institutional district is to accommodate a variety of large-scale public, semi-public, and institutional uses in the city. Such uses include, but are not limited to, government buildings, schools, religious institutions, cemeteries, and hospitals. Other zoning districts may accommodate small-scale public/institutional uses.

Sec. 13-520. Principal uses for the special districts.

- (A) *In general.* All permitted and conditional uses allowed in the district are listed in Table 13-2.
- (B) *Permitted uses.* Uses specified with a "P" are permitted in the district where designated, provided that the use complies with all other applicable provisions of this ordinance. Persons wishing to establish a permitted use, excluding single family residential uses, shall obtain a zoning certificate for such use as specified in Sections 2-190 through 2-250.

- (C) *Conditional uses.* Uses specified with a "C" are allowed as a conditional use in the district where designated, provided that the use complies with all other applicable provisions of this ordinance. Persons wishing to establish or expand a conditional use shall obtain a conditional use permit for such use as specified in Sections 2-260 through 2-340.
- (D) *Prohibited uses.* Any use not listed as either "P" (permitted) or "C" (conditional) in a particular district or any use not determined by the City Planner to be substantially similar to a use listed as permitted or conditional shall be prohibited in that district. Such determination shall be made in the manner provided for in Section 2-50 governing determination of substantially similar uses.
- (E) *Specific development standards.* Permitted and conditional uses specified with an "X" under the Specific Development Standards column shall be subject to the standards identified in Chapter 7, Specific Development Standards.

Table 13-2. Principal uses in the special districts.

Use	O	TUD	P/I	Shoreland District	Development Standards
Residential Uses					
Single-family dwelling, farm-related	P	C	-	P	
Single-family dwelling, not farm-related	-	C	-*	C	X
Dormitories, multi-unit housing, nursing homes, and hospice facilities	-	-	P	C	X
Agricultural Uses					
Agricultural produce sales	P	C	-	C	X
Farms, not including commercial feedlots	P	P	-	P	
Nurseries and tree farms	P	P	-	P	
Wildlife and game refuges	P	P	-	P	
Institutional and Public Uses					
Social, Cultural, Charitable, and Recreational Facilities					

Athletic field, rinks or courts	C	C	P	C	X
Cemetery	C	C	P	C	X
Fairgrounds**	C	C	P	C	
Golf course	C	C	P	C	X
Public and private park, playground	P	P	P	P	X
Libraries	-	-	P	C	X
Community centers, gymnasiums, field house, arenas	-	-	P	C	X
Hospitals, clinics, medical centers	-	-	P	C	X
Schools, colleges, and universities	-	-	P	C	X
Congregational Uses					
Religious Institution, Place of Worship	C	C	P	C	
Commercial uses					
Airports, helipads, and related uses	C	C	P	C	X
Campgrounds	C	C	C	C	X
Kennels—boarding or breeding	C	C	-	C	X
Outdoor recreational area	C	C	P	C	X
Resorts and inns	C	C	C	C	X
Stables—riding or boarding	C	C	C	C	X
Veterinary services	C	C	-	C	X
Public service and utilities					
Communication facilities	C	C	C	C	X
Communication towers	C	C	C	C	see Sec. 6-230
Electric or gas substation	C	C	C	C	X
Essential services	P	P	P	P	

Governmental buildings and structures	C	C	P	C	X
Correctional facilities and jails	-	-	C	C	X
Public utility buildings and structures	C	C	P	C	X

* Use allowed as a permitted accessory use per Section 15-530.

** County fairgrounds are generally exempt from local zoning per MN Statutes Section 38.16.

Sec. 13-530. Permitted accessory uses.

Within the special districts, the following uses shall be permitted as accessory uses. Accessory uses not listed may be allowed by conditional use permit, subject to the standards identified in Sections 2-260 through 2-340.

- (1) Agricultural uses such as pasture, grazing, and domestic and wild crop harvesting in the O, open space/agricultural district and the TUD, transitional urban development district.
- (2) Buildings temporarily located for purposes of construction on the premises for a period not to exceed the time necessary for such construction.
- (3) Dwelling for staff or faculty of an education campus, correctional facility or jail, or religious institution.
- (4) Home occupations, as regulated elsewhere in this ordinance.
- (5) Place of congregation or a place of worship as part of an educational campus, medical center, or hospice facility.
- (6) Parking garages, carports, and parking spaces.
- (7) Private swimming pools, tennis courts, and other recreational facilities that are operated for the use and convenience of residents, students, faculty, or staff, of the principal use and their guests.
- (8) Public swimming pools, tennis courts, and other recreational facilities which are operated by the state, county, city, or public school district for use by the public.
- (9) Tool houses, sheds, and similar buildings for the storage of agricultural equipment and supplies, domestic supplies, and non-commercial recreational equipment.

- (10) Antennae and other communication devices for public or private use, in compliance with the provisions of Section 6-230.
- (11) Living quarters for persons employed on the premises or persons otherwise housed on the premises.
- (12) Boarding or renting of rooms to not more than two (2) persons in the O, open space/agricultural district or the TUD, transitional urban development district.
- (13) Beekeeping in compliance with Section 7-30.
- (14) Limited production, processing and storage (without size limits) operated at a correctional facility.
- (15) Mausoleums, columbariums, and cremation niches in the P/I, public/institutional district.

Sec. 13-540. Accessory buildings and structures.

Accessory buildings and structures shall comply with the provisions of Section 6-180 if related to a residential use and [Section] 6-200 if associated with an agricultural or other non-residential use. Design of such structures is further regulated in Chapter 4, Site Plan Review.

Sec. 13-550. Site design considerations.

Development of land within the special districts shall follow established standards for traffic circulation, landscape design, and other considerations as specified in Chapter 7, Specific Development Standards and Chapter 4, Site Plan Review.

Sec. 13-560. Lot dimension and building bulk regulations.

Lot area and setback requirements for the special districts shall be as specified in Table 13-3. Wetland buffer and buffer setback requirements shall be as specified in Chapter 6 of this Ordinance.

Table 13-3. Lot dimension and setback requirements, special districts.

	O District	TUD District	P/I District
Minimum district size	N/A	N/A	2.5 acres
Minimum lot area	1 acre	1 acre	None

Minimum lot width	200 feet	100 feet	None
Minimum lot depth	200 feet	100 feet	None
Building setback requirements			
Front	50 feet	50 feet	25 Feet
Side	25 feet	25 feet	10 feet*
Rear	25 feet	25 feet	10 feet*

Sec. 13-570. Height.

Except for communication antennas otherwise allowed by conditional use permit, the maximum height of all structures located in the special districts shall be fifty (50) feet. The height limitations of principal structures located in the special districts may be increased by conditional use permit, subject to the standards identified in Sections 2-260 through 2-340. Additionally, the City Council shall consider, but not be limited to, the following factors when determining the maximum height:

- (1) Access to light and air of surrounding properties.
- (2) Shadowing of any adjacent residential areas.
- (3) The scale and character of surrounding uses.
- (4) Preservation of views of landmark buildings, significant open spaces or water bodies.

The height of buildings within the airport overlay district is further regulated as specified in Chapter 13, Article 4.

Sec. 13-580. Parking and loading requirements.

Parking and loading requirements for uses in the special districts shall be as set forth in Chapter 8, Off-Street Parking and Loading.

Sec. 13-590. Signs.

Sign requirements for uses in the special districts shall be as specified in Chapter 9, Signs.

Sec. 13-600. Compliance with performance standards.

All uses in the special districts shall comply with all general performance standards as expressed in Chapter 6, Article 10.

Section 3: Effective Date. This ordinance shall be effective immediately upon its passage and publication per the provisions of the Faribault City Charter.

Public Hearing: January 3, 2022
First Reading: January 11, 2022
Second Reading: _____
Publication: _____

Faribault City Council

Kevin F. Voracek, Mayor

ATTEST:

Timothy C. Murray, City Administrator

