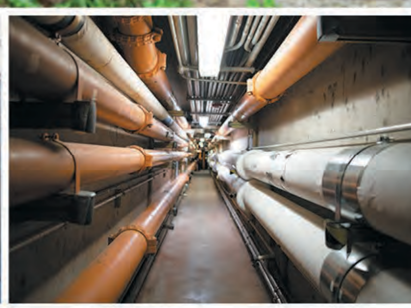
Wastewater Master Plan 2024-2045



Planning for the Future of Springfield's Wastewater System.

CITY OF SPRINGFIELD, OREGON

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Wastewater Master Plan

City of Springfield

April 2024

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Acronyms & Abbreviations

B	
BMP	Best Management Practices
C	
CCTV	Closed Caption Television
CIP	Capital Improvement Project
CIPP	Cured-In-Place Piping
City	City of Springfield
CMOM	Capacity, Management, Operations and Maintenance
COE	City of Eugene
CREAT	Climate Resilience Evaluation and Awareness Tool
CWA	Clean Water Act
D	
d/D	Depth of Water Divided by the Pipe Diameter
DEQ	Oregon Department of Environmental Quality
DWF	Dry Weather Flow
E	
EDSPM	Engineering Design Standards and Procedures Manual
ENR	Engineering New Record
EPA	Environmental Protection Agency
F	
FAQ	Frequently Asked Questions
FOG	Fat Oils and Grease
fps	Feet per Second
FTE	Full-Time Employee
FY	Fiscal Year
G	
GIS	Geographic Information System
gpad	Gallons per Acre per Day
gpm	Gallon per Minute
GWI	Groundwater Infiltration
H	
HB2001	House Bill 2001 by the Oregon Legislature in 2019
I	
I&I	Infiltration and Inflow
ID	Identification
IGA	Intergovernmental Agreement
in	Inch
M	
Metro Plan	1982 Eugene-Springfield Metropolitan Area General Plan
MGD	Million Gallons per Day
MH	Manhole

MWMC	Metropolitan Wastewater Management Commission
N	
NAASCO	National Association of Sewer Service Companies
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resource Conservation Service
O	
O&M	Operations and Maintenance
OAR	Oregon Administrative Rule
OERP	Overflow Emergency Response Plan
P	
PACP®	Pipeline Assessment and Certification Program
PAYGO	Pay-As-You-Go
PVC	Polyvinyl Chloride
Q	
q	Maximum Daily Flow
Q	Capacity of Pipe Flow
R	
RDII	Rainfall-Dependent Infiltration/Inflow
S	
SDC	System Development Charges
SFP	Strategic Financial Plan
SOP	Standard Operating Procedure
SSO	Sanitary Sewer Overflow
State	State of Oregon
T	
TAZ	Traffic Analysis Zone
U	
UGB	Urban Growth Boundary
W	
WPCF	Water Pollution Control Facility
WWMP	Wastewater Master Plan

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CHAPTER 1

Executive Summary

1.1 Purpose of the Wastewater Master Plan

The City of Springfield, Oregon (City) owns and operates a wastewater collection system serving the residents and businesses within its service area. The City has been proactive in updating its wastewater planning documents in recent years and is updating its Wastewater Master Plan (WWMP) to accommodate future growth and needed system improvements. This WWMP will support the City in meeting future conditions based on population and employment projections for the 20-year planning horizon (2045). The City's previous WWMP was completed in 2008.

1.2 Approach

The WWMP includes the following major elements:

- Assessment of land use over the 20-year planning horizon, taking into account future development, recent Urban Growth Boundary (UGB) expansion and anticipated impacts from the House Bill 2001 by the Oregon Legislature in 2019 and Senate Bill 458 in the 2021 Oregon Legislature that allows middle housing and middle housing land divisions in the R-1 land use district.
- Development of dry weather and wet weather flows for the future conditions
- Capacity assessment for existing conditions and future planning horizon
- Development of capital improvement recommendations, project costs, and financial planning options for projects and maintenance required to maintain compliance with NPDES permit requirements and those projects recommended to expand into unserved areas within the UGB through the 20-year planning horizon
- Assessment of the City's Capacity, Management, Operations, and Maintenance (CMOM) program and development of recommendations for policy and procedure updates to support effective preservation, replacement, and rehabilitation of the City's wastewater collection network
- Development of a strategic financial plan for the City to initiate conversations with stakeholders around Capital Improvement Project phasing, funding sources, and associated likely rate impacts

1.3 Organization of the Wastewater Master Plan

The master plan is organized into 12 chapters, as described in **Table 1-1.** Detailed technical information and support documents are included in the appendices.

Table 1-1 | Wastewater Master Plan Organization

Chapter	Description
Chapter 1 – Executive Summary	Purpose and scope of the WWMP. Executive Summary.
Chapter 2 – Introduction	Introduction and background for the project.

Chapter	Description
Chapter 3 – Study Area	Overview of the existing system and key facilities. Description of the existing service area.
Chapter 4 – Existing System Description	
Chapter 5 – Basis for Planning	Regulations and design standard review for purposes of planning
Chapter 6 – Future Land Use Analysis	Assessment of 2045 / buildout condition land use for considering future development, septic system conversion to public collection, UGB expansion and anticipated impacts from HB 2001.
Chapter 7 – Wastewater Flow Projections	Develop future flow conditions derived from population and land use projections
Chapter 8 – Collection System Evaluation	Discussion of the system deficiencies for near-term and long-term planning horizons
Chapter 9 – Recommended Improvements	General overview of improvement recommendations
Chapter 10 – Capital Improvements Program	Improvement recommendations including cost opinions and time frame for implementation
Chapter 11 – CMOM Program	Assessment and recommendations of the City's CMOM program
Chapter 12 – Strategic Financial Plan	Discussion of long-term funding plan that ensures adequate revenue to address the capital needs of the City

1.4 System Description and Service Area

Springfield's wastewater collection system serves an estimated 69,000 people through approximately 27,000 residential, commercial, and industrial connections. The City owns and operates a large and complex wastewater collection system, including 16 pump stations and approximately 250 miles of pipelines varying from 6 inches to 60 inches in diameter. Along with the City of Eugene (COE), the City discharges to a regional collection and treatment system owned by the MWMC. The City's collection system discharges to the MWMC East Bank Interceptor which discharges to the regional Water Pollution Control Facility (WPCF).

The existing wastewater collection system serves areas within Springfield's current City limits. The UGB defines the areas to which the City Limits may extend in the future. The ultimate boundary for the flow projections within the WWMP comprises the UGB.

1.5 Wastewater Flow Projections

1.5.1 Population Projection

To provide a comprehensive analysis of the wastewater flow projections within the City's wastewater conveyance system, four conditions were used to build the future condition scenario (2045). The four conditions are listed below:

- Impacts of development and redevelopment based on projected population and employment growth within the existing wastewater system (See **Table 1-2**).
- Impacts of development and redevelopment based on projected population and employment growth outside of the exiting wastewater system but within the UGB and an estimation of infiltration and inflow (I&I) in these areas (See **Table 1-3**).
- Impact to the City wastewater system based on the connection of verified septic tanks within existing wastewater catchments and within the urbanizable portion of the UGB. There are approximately 219 verified households that are not connected to the City's wastewater collection

system, and instead are serviced by septic tanks. For planning purposes, the WWMP considers that the entirety of the UGB currently serviced by septic systems will be connected to the wastewater collection system within the planning horizon.

- Impacts from the assumed 3 percent growth in population density in R-1 land use districts due to HB 2001 (middle housing).

Table 1-2 | Estimated Households, Population, and Jobs within the Existing Wastewater Catchments

Year	Households	Population	Jobs
2020	24,107	60,992	25,766
2045	28,178	71,291	37,003

Table 1-3 | Estimated Households, Population, and Jobs within New Wastewater Catchments

Year	Households	Population	Jobs
2020	3,204	8,106	5,877
2045	3,926	9,933	9,212

1.5.2 Wastewater Flow Projection

Projected wastewater flows are made up of three components: dry weather flows (DWF), groundwater infiltration (GWI) and rainfall-dependent infiltration/inflow (RDII). DWF is the average wastewater flow from residential, commercial, industrial and institutional sources. GWI is groundwater entering the collection system unrelated to a rain event. RDII is storm water that enters the collection system though I&I.

The City has an on-going flow monitoring program that collects measured flow data and the corresponding rainfall. During dry weather, the flow monitoring measurements show that for most of the system, GWI is negligible in the City's service area. Therefore, the hydraulic model does not include a GWI component. The wet weather flow was calibrated using rainstorm events from four measured events:

- October 16 – 27, 2017
- November 12 – 22, 2017
- April 1 – 14, 2018
- January 15 – 29, 2019

The hydrologic parameters used in the model calibration and validation were used for the near-term condition and long-term condition wet weather flow predictions. This means the rainfall applied to the system in the calibration period behaves the same in the existing and future conditions.

The flow projections developed for this WWMP are based on flow factors derived from flow monitoring data and the City's land use database. As noted previously, during dry weather, the flow monitoring measurements show that for most of the system, GWI is negligible in the City's service area. Equivalent populations, figured with employment numbers, were calculated for existing and future services areas. Unit flows were figured from flow data for existing services areas and applied to future equivalent population growth in those areas. For future service areas within the UGB, a unit flow of 100 gallons per equivalent population was used for DWF.

For the wet weather component of the wastewater flow, the system must be able to collect and convey the peak wet weather flow contribution generated by the winter 5-year, 24-hour duration storm event. Total peak wastewater flow is calculated by combining the maximum day DWF with the wet weather flow derived from a modeled design storm with the peak of the storm occurring at the same time as the peak of the dry weather component. By modeling peak wastewater flow in this manner rather than relying directly on peak flow data from field measurements, the collection system model can simulate severe, but potentially real, operating conditions. The capacity of the collection system is then evaluated under those worst-case conditions. For future service areas (or catchments), a rate of 2,000 gallons per acre per day (gpad) was used for estimating I&I.

1.6 Wastewater System Analysis

The existing wastewater system was evaluated for existing (2020) and future conditions (2045), both during DWF and wet weather flow to identify capacity restrictions. The goal of the analysis was to identify areas where wastewater surcharging has potential to occur during the estimated peak hour 5-year, 24-hour rain event under existing and future conditions.

Problem areas in the gravity collection piping were identified by using the water surface level in the piping compared to the pipe diameter, or d/D ratio. Where flows exceed a d/D of 0.75, the piping was identified for further analysis to determine the cause. The maximum daily flow (q) versus capacity of the piping (Q) was also analyzed to determine if the piping is capacity limited or if backwater effect is occurring from a downstream condition causing the high d/D. If the q/Q is greater than 0.75 then the pipe was identified as capacity limited.

Pump stations that exceed the firm capacity (defined as the largest pump out of service) were identified as deficient. In addition, velocities for the pump station force mains were evaluated to determine whether they exceeded a maximum value of eight feet per second (fps).

1.7 Wastewater Plan Recommendations

The recommended improvements for Springfield's collection system address the collection system deficiencies from the model analysis discussed above for the existing (2020) and future (2045) peak flow conditions. In addition, projects identified in the prior 2008 Master Plan that have not yet been completed and are still a potential concern, are addressed. The projects are divided by near term (0-5 years), intermediate term (6-10 years), and long term (11-20 years) timeframes based on the severity of the capacity restriction and input from City staff. New pipes have been sized to meet the 2045 peak design flows. The projects are listed in order of priority in **Table 1-4** below and have been assigned an identifier for tracking.

Pump stations are identified as needing improvement if they do not meet firm capacity or do not meet velocity requirements. **Table 1-5** below lists pump station project priorities and have been assigned an identifier for tracking.

Figure 1-1 in the Plan shows the locations of the projects.

Table 1-4 | Springfield Capital Improvements Program - Piping

# on Map	CIP	Type	Exist. Dia (in)/ Capacity (gpm)	Proposed Dia (in)/ Capacity (gpm)	Length (ft)	Description	Comments	Priority	Timeline	Modeling/ Planning	Construction Cost	50% Engineering, Admin, Contractor Markup	30% Contingency	Total Cost
1	South Springfield #1	Capacity for future flows. Study/Additional modeling.	12	15	800	Upgrade PVC gravity sewer along S 2nd St south of SR 126 from MH 665196 to 665216.	High priority. Pump station is planned to be built in the near future and development will follow, though no large subdivisions are expected to occur. A study/model under buildout conditions should be conducted before designing.	Near Term	0-5yr	$ 50,000	$ 500,000	$ 250,000	$ 225,000	$ 1,025,000
2	Mid-Springfield #3	Capacity for existing and future flows.	10	12	910	Upgrade PVC gravity sewer along Olympic St. from MH 20977 to 20969.	High priority since existing d/D is greater than 0.8 and relatively low impact construction.	Near Term	0-5yr	-	$ 490,000	$ 245,000	$ 221,000	$ 956,000
3	Gateway #4	Backwater from tie-in with larger pipe.	10	10	610	Install new drop connection MH at Node 26217 at Shelley St. and Don St. Regrade upstream piping on Shelley St. to MH 22870.	Suspected cross-connection in this area causing capacity issues. Drop connection needed for tie-in with 42-inch diameter piping.	Near Term	0-5yr	-	$ 318,000	$ 159,000	$ 143,000	$ 620,000
4	North Springfield #2	Capacity for existing and future flows.	10	12	1900	Upgrade PVC gravity sewer along Marcola Rd. by Kingsford Manufacturing from MH 21059 to 21063.	Area likely to be at full buildout already.	Near Term	0-5yr	-	$ 1,029,000	$ 515,000	$ 463,000	$ 2,007,000
5	Mid-Springfield and 21st Street PS	Study/Additional modeling.	-	-	-	Additional investigation and model update for sewer basin from G St. to D St. and 20th St. to 28th St. Pump station at E St. and 21st St.	The model drainage basin for pump station needs refinement and 15-inch sewer main needs to be added to model.	Near Term	0-5yr	$ 75,000	-	-	-	$ 75,000[a]
6	Downtown #4	Study/Additional modeling.	-	-	-	Additional investigation and model update for sewer basin between Kelly Blvd. & Pioneer Parkway W and E St. & C St.	New sewerline on W D Street may be required. Service laterals crossing private property. There are a lot of problems in the area and the piping is not well mapped out requiring further investigation.	Intermediate Term	6-10 yr	$ 75,000	-	-	-	$ 75,000[a]
7	Gateway #1	Study/Additional modeling.	-	-	-	Additional investigation and model update for Harlow Rd. PS inlet pipe and 8" dia. pipe section (Pipe No. 22949_26230) on Don St. located north of Lochaven Ave.	Inlet to Harlow PS backing up due to PS wetwell operation. Also an 8" pipe connected between an 18" pipe and a 48" pipe on Don Street needs to be investigated further.	Intermediate Term	6-10 yr	$ 50,000	-	-	-	$ 50,000[a]

# on Map	CIP	Type	Exist. Dia (in)/ Capacity (gpm)	Proposed Dia (in)/ Capacity (gpm)	Length (ft)	Description	Comments	Priority	Timeline	Modeling/ Planning	Construction Cost	50% Engineering, Admin, Contractor Markup	30% Contingency	Total Cost
8	North Springfield #1b	Capacity for existing and future flows.	10	12	650	Upgrade PVC gravity sewer behind shopping center area to the southeast of interchange at SR 126 and Mohawk Blvd. from MH 21523 to 21526.	Peak flows are nearing capacity of piping for existing and future conditions.	Intermediate Term	6-10 yr	-	$ 360,000	$ 180,000	$ 162,000	$ 702,000
9	Harbor Drive	Future Service Extension		8 (gravity)/ 5 (force main)	7818	Service requirements: 1) new "Harbor Drive" PS equipped with 2 pumps each with 145 gpm capacity. 2) 134 ft of 5-inch to extend existing "dry pipe" force main 3) 7684 ft of 8-inch pipe to service entire neighborhood.	Most cost effective solution makes use of the existing "dry pipe' force main in place north of the neighborhood.	Intermediate Term	6-10 yr	-	$ 3,949,000	$ 1,975,000	$ 1,777,000	$ 7,701,000
10	Thurston #1	Capacity for future flows.	12-18	15-21	5180	Upgrade concrete pipe and PVC gravity pipe along SR 126 between 60th Pl and S 71st St. From MH 24304 to 25041.	Lower priority triggered by future growth. Monitor growth. Diversion to A Street sewer main (upgraded) should be considered first. Identified in prior sewer plan as needing to be upgraded for existing and future peak flows.	Long Term	11-20 yr	-	$ 3,225,000	$ 1,613,000	$ 1,451,000	$ 6,289,000
11	North Springfield #1a	Capacity for existing and future flows.	12	15	1110	Upgrade concrete gravity sewer north of interchange at SR 126 and Mohawk Boulevard from MH 21610 to 21618.	Peak flows are nearing capacity of piping for existing and future conditions. Identified in prior sewer plan as needing to be upgraded for existing peak flows.	Long Term	11-20 yr	-	$ 670,000	$ 335,000	$ 302,000	$ 1,307,000
12	Gateway #2	Capacity for future flows.	15	18	920	Upgrade concrete gravity sewer along Gateway Street from MH 22309 to 23277.	Peak flows are nearing capacity of piping for future conditions.	Long Term	11-20 yr	-	$ 606,000	$ 303,000	$ 273,000	$ 1,182,000
13	North Springfield Trunk (Vera Area)	Future Service Extension	-	8, 12	9583	Services the development east of the new Vera Pump Station along Hayden Bridge Road.		Long Term	11-20 yr	-	$ 5,144,000	$ 2,572,000	$ 2,315,000	$ 10,031,000
									Subtotal 0-5 yr	$ 125,000	$ 2,337,000			$ 4,683,000
									Subtotal 6-10 yr	$ 125,000	$ 4,309,000			$ 8,528,000
									Subtotal 11-20 yr	$ -	$ 9,645,000			$ 18,809,000
									Total	$ 250,000	$ 16,291,000		$ 32,020,000	$ 32,020,000

[a] Total Cost is unknown until a solution is found during the additional modeling study is completed.

Table 1-5 | Springfield Capital Improvements Program – Pump Stations[a]

# on Map	CIP	Type	Peak Exisitng Flow (gpm)	Peak Future Flow (gpm)	Existing Firm Capacity (gpm) [b]	Proposed Firm Capacity (gpm)	Description	Comments	Priority	Timeline	Construction Cost	50% Engineering, Admin, Contractor Markup	30% Contingency	Total Cost
13	Deadmond Ferry PS	Pump Station Upgrade for existing and future flows.	997	1046	833	1050	Located east of Game Farm Road and Maple Island Road. Upgrade existing pumps.	Near future growth is expected in the area. Cost reflects pump station replacement but may be less if only pumps need to be replaced or modified. Flow monitoring suggested prior to preliminary design.	Near Term	0-5yr	$ 2,782,000	$ 1,391,000	$1,252,000	$ 5,425,000
14	Nugget Way PS	Pump Station Upgrade for existing and future flows.	853	853	597	850	Located at E 19th Avenue and Nugget Way. Upgrade existing pumps.	Near future growth is expected in the area. Cost reflects pump station replacement but may be less if only pumps need to be replaced or modified. Flow monitoring suggested prior to preliminary design.	Near Term	0-5yr	$ 2,318,000	$ 1,159,000	$1,043,000	$ 4,520,000
15	River Glen PS	Pump Station Upgrade for existing and future flows.	Not in model	Not in Model	490	660	Located northwest of intersecton of McKenzie Crest Drive and Royal del Lane Upgrade existing pumps.	Identified in prior sewer plan. Was not in current City model. A flow study/model should be conducted before designing. Cost reflects pump station replacement, but may be less if only pumps need to be replaced or modified.	Intermediate Term	6-10 yr	$ 1,854,000	$ 927,000	$ 834,000	$ 3,615,000
16	Hayden Lo PS	Pump Station Upgrade for existing and future flows.	Not in model	Not in Model	290	490	Located northwest of intersecton of W Street and 31st Street Upgrade existing pumps.	Identified in prior sewer plan. Was not in current City model. A flow study/model should be conducted before designing. Cost reflects pump station replacement, but may be less if only pumps need to be replaced or modified.	Intermediate Term	6-10 yr	$ 1,623,000	$ 812,000	$ 731,000	$ 3,166,000
17	Peace Health PS and Force main	Pump Station for future extension.	Not in model	240	NA	240	Future pump station located in the North Gateway area west of McKenzie River.	Identified in prior sewer plan. To serve PeaceHealth and Riverbend Campus development.	Long Term	11-20 yr	$ 2,076,000	$ 1,038,000	$ 934,000	$ 4,048,000
18	North Gateway PS and Force main	Pump Station for future extension.	Not in model	480	NA	480	Future pump station(s) located and 1,700 feet of 6" force main in the North Gateway area.		Long Term	11-20 yr	$ 2,236,000	$ 1,118,000	$1,006,000	$ 4,360,000
19	28th Street PS and Force main	Pump Station for future extension.	Not in model	780	NA	780	Future pump station(s) located at the south end of 28th Street.		Long Term	11-20 yr	$ 1,098,000	$ 549,000	$ 494,000	$ 2,141,000
										Subtotal 0-5 yr	$ 5,100,000			$ 9,945,000
										Subtotal 6-10 yr	$ 3,477,000			$ 6,781,000
										Subtotal 11-20 yr	$ 5,410,000			$ 10,549,000
										Total	$ 13,987,000			$ 27,275,000

a The COE has reviewed and approved the projects listed in Table 10-2. Please see Section 11.2.4 for description of the inter-governmental agreement between Eugen and Springfield for pump station maintenance.
b From Eugene/Springfield Pump Station Information Spreadsheet

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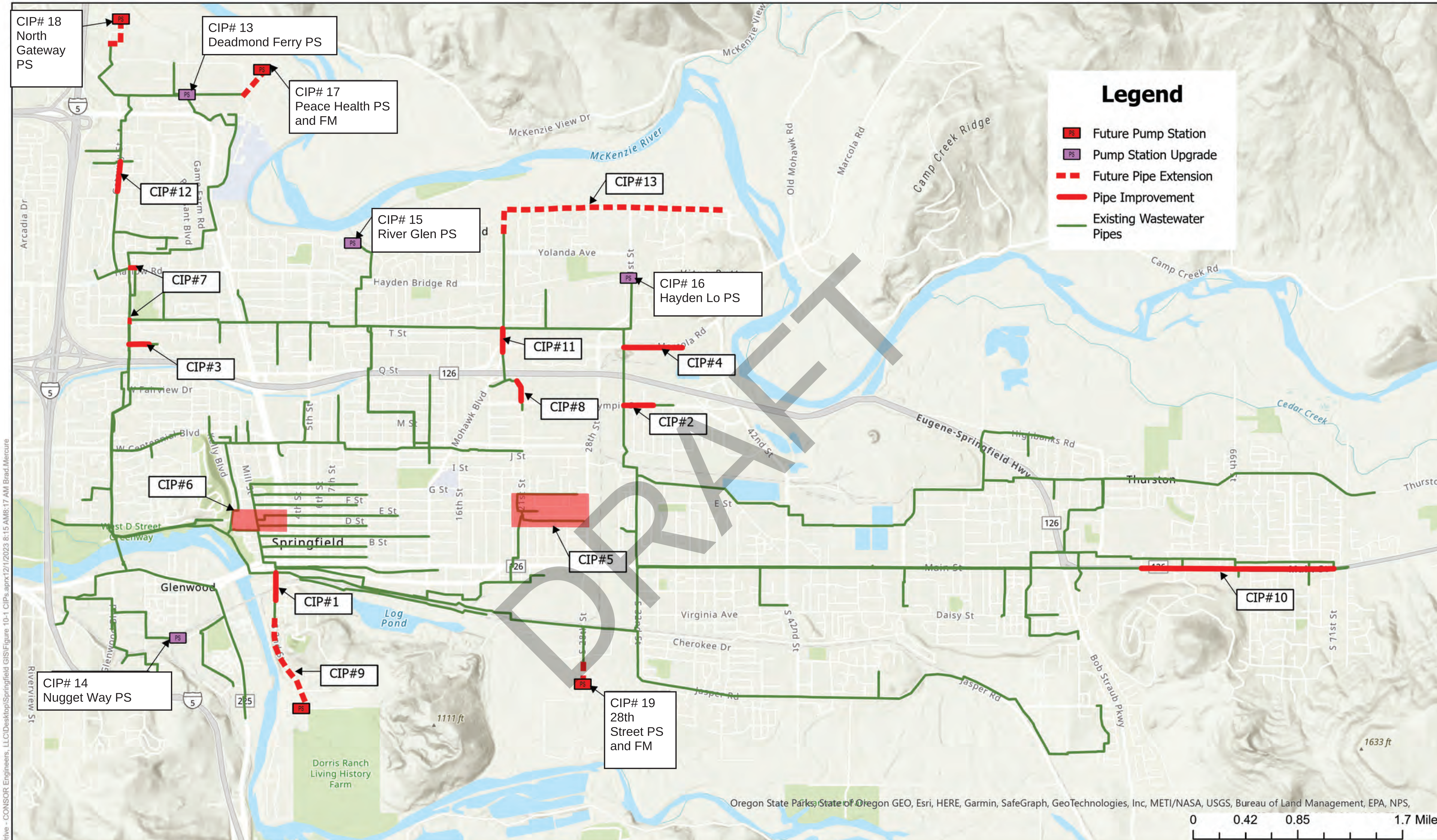

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City of Springfield, OR
Wastewater Master Plan

Figure 1-1
Capital Improvement Program
Piping and Pump Station

November 2023

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1.8 CMOM Program

The CMOM program for the City's wastewater collection system was assessed, and recommendations for policy and procedure updates to support effective preservation, replacement, and rehabilitation of the City's wastewater collection network were provided as part of this Plan. The assessment is based on a review of existing City policies and procedures with City staff, in comparison to the CMOM practices of similarly sized utilities, general industry best practices, and pertinent state and federal regulatory requirements.

CMOM is an industry accepted approach applied by agencies around the country to adaptively manage their wastewater collection infrastructure. In May 2014, the MWMC adopted a regional CMOM Framework Document and directed its partner agencies to develop local CMOM programs to address the ongoing effort to reduce I&I in both the public and private wastewater collection systems with a proactive and continuous approach. In 2015, Springfield Development and Public Works staff drafted a CMOM implementation plan (see **Appendix D**).

The Development and Public Works Department's Operations Division is responsible for maintaining the wastewater collection system. The City currently has nine full-time employees (FTEs) for collection system maintenance with eight field staff. Staff are trained through an apprenticeship program. Currently, there is not a fully trained repair crew for the collection system. In accordance with a long-standing intergovernmental agreement (IGA) with the COE, Springfield's pump stations are operated and maintained by Eugene's Public Works Department, which budgets for one FTE for Springfield's pump stations.

Springfield's CMOM program was compared to two similar sized municipalities that are part of a regional sanitary sewer district that provides service for treatment and interceptors. The review demonstrated that Springfield's CMOM program is comparable to those of the other cities in the analysis. However, at this time, Springfield does not have a target for replacing or rehabilitating piping as compared to the other cities which did have targets. Springfield cleans their entire system on a more frequent basis than the other cities despite having fewer vacuum trucks for the size of the system. Finally, Springfield has fewer staff for their size collection system compared to the other cities.

The following list provides recommendations/updates for Springfield's CMOM program:

- It is recommended that Springfield finalize their CMOM Program document drafted in 2015.
- It is recommended that the City adopt a formal flow monitoring program to assist with capacity assessments.
- It is recommended that the City update the following policies and procedures
  - The City's sewer design standards should include a reference to the plumbing code for private laterals or side sewers.
  - The City's sewer design standards should include references to the City's Industrial Pre-treatment and best management practices (BMP) programs
  - The City should amend Springfield Development Code 4.3.105 and/or the EDSPM to establish collection system capacity standards based on the water level (d) versus the pipe diameter (D):
    - d/D > 0.75 for existing piping
    - d/D = 0.5 for new piping design flows

- It is recommended the City use the future condition model discussed in **Section 5.4** for future development capacity analysis.
- It is recommended that the City review the impacts of HB2001 on land use, densification, and increase in sewer flows on a more frequent basis, i.e., every 5-years.
- It is recommended that the City's Design Standards for pump stations include a reference to the requirements from Oregon Department of Environmental Quality (DEQ) in Oregon Administrative Rules (OAR) 340, Division 52, and the DEQ publication "Oregon Standards for Design and Construction of Wastewater Pump Stations".
- The IGA between Springfield and COE was signed in August of 2000. It is recommended that the document be reviewed and updated as needed.

- To implement the Cleaning and Inspection Program with two vacuum trucks and two closed caption television (CCTV) trucks operating daily for the wastewater and stormwater collection systems per the City's goal, the City would require two additional FTEs.
- The staffing evaluation related to a construction/repair crew is based on the City's preference for providing more pipe repair/replacement capability. If the City is going to implement an ongoing pipe repair/replacement program, it would require four FTEs with dedicated equipment to perform this work compared to contracting it out.
- Springfield's two CCTV trucks and camera equipment are obsolete and need to be replaced. It is recommended that the City purchase two new CCTV trucks with the latest technology.
- The City does inspect manholes (MHs) regularly, but it is recommended that a more formal MH inspection program be outlined in the CMOM plan with a check sheet, mapping, and a regular cycle to inspect the whole system.
- Since the City's collection system is interconnected with COE's and the MWMC's, it is recommended that the City's model analysis be done is conjunction with any regional models that are available.
- It is recommended that the City adopt a target to replace sewer collection piping based on the useful life of the piping. The recommended average number of feet per year that would need to be replaced or rehabilitated is approximately 12,500 feet over a 50-60 year period. The cost would range from $4.8-$12.1 million per year depending on whether full replacement or rehabilitation (i.e. lining existing pipe) is done.

1.9 Strategic Financial Plan

The WWMP includes a Strategic Financial Plan (SFP) to estimate future available funding sources for capital projects and to project potential changes to the City's local wastewater rates that may be needed to support WWMP recommendations and fund ongoing operations, maintenance, and capital replacement costs. The building blocks of the SFP include projections of available revenues (from existing rates and projected rate increases) and costs or "revenue requirements" that the City will incur during the 20-year planning period.

The SFP provides important information for decision-makers to help define expectations related to future capital financing needs and associated wastewater rate increases. Because circumstances and priorities change, these projections typically vary (at least marginally) from approved annual budgeting and rate-setting decisions. Prospective financial and rate planning will involve regularly updating revenue requirement projections in the context of changing economic and credit market conditions, more refined cash flows and cost estimates, and other factors. Accordingly, the SFP elements discussed are intended to serve as a benchmark and reference for the City's prospective budgeting, capital planning, and rate setting decisions. Future updating of the SFP is facilitated by a 20-year cash flow forecasting model that was developed to support this effort.

The WWMP identifies approximately $60 million in pump station and sewer line projects (in 2023 dollars) over the planning period. Additional improvements (estimated to be about $93 million) are for wastewater repair and local sewer extensions, and to address I&I and other issues identified through the City's CMOM program. To implement the capital and CMOM improvements, additional staffing and equipment will also be required over the planning period.

1.9.1 Wastewater System Revenue Requirements

The SFP includes projections of annual revenue requirements that the City will incur for the wastewater system during the 20-year planning period. The primary components of wastewater system revenue requirements are:

- Operating & Maintenance (O&M) costs – The O&M costs include all costs associated with operating and maintaining the system, including personnel (salary and benefits) costs, materials and services costs, and internal service charges.
- Capital expenditures – Funding for capital improvements in the form as annual "pay-as-you-go" (PAYGO) funding from current revenue sources and debt service expenses (principal and interest) on long-term debt used to finance prior investments and future capital improvements.
- Reserves – Annual contingencies and reserves needed to maintain system financial integrity and service reliability, and rate stability. Designated cash reserves benefit the system by strengthening credit quality (supporting more favorable borrowing terms) and the City's ability to address unforeseen emergencies.

The following tables summarize the estimated operations and maintenance costs (**Table 1-6**), estimates for the capital improvement plan (**Table 1-7**) and the specific operating and capital reserves estimated for the current fiscal year (**Table 1-8**).

Table 1-6 | Projected O&M Cost Summary ($ Millions)

Category	Current Budget 2023-24	Projected (Fiscal Year)			
		2028-29	2033-34	2038-39	2043-44
Current Budget Levels					
Salary Expenses	$2.24	$2.79	$3.40	$4.13	$5.03
Benefits	0.70	0.85	1.03	1.25	1.53
Material & Services	1.40	1.66	1.97	2.34	2.78
Internal Service Charges	0.84	1.00	1.18	1.40	1.67
Subtotal	$5.17	$6.29	$7.58	$9.13	$11.00
Project Delivery & CMOM Program					
Salary Expenses	$0.00	$0.55	$0.66	$0.81	$0.98
Benefits	-	0.23	0.29	0.35	0.42
Material & Services	-	0.05	0.06	0.07	0.08
Subtotal	$0.00	$0.83	$1.01	$1.22	$1.49
Total O&M	**$5.17**	**$7.12**	**$8.59**	**$10.35**	**$12.48**

Table 1-7 | Capital Improvement Plan (Inflated $)

Category	Total Cost 20-Year[a]	Estimated Growth Share[b]
CMOM Planning & Implementation		
Wastewater Repair	$ 14,634,735	--
CMOM Planning & Implementation	110,730,093	--
Local Sewer Extensions	13,383,968	--
Harbor Drive Pump Station	1,035,000	--
Equipment	816,780	--
Subtotal	$ 140,600,577	
Master Plan Improvements		
Pipe Projects		
South Springfield #1	$ 1,178,348	100%
Mid-Springfield #3	1,108,718	15%
Gateway #4	687,405	15%
North Springfield #2	2,352,422	15%
Mid-Springfield and 21st Street PS	83,154	15%
Downtown #4	89,076	15%
Gateway #1	61,463	15%
North Springfield #1b	924,400	15%
Harbor Drive	9,710,502	100%
Thurston #1	9,099,067	50%
North Springfield #1a	2,039,943	50%
Gateway #2	1,876,747	50%
North Springfield Trunk (Vera Area)	18,214,036	100%
Pump Stations		
Deadmond Ferry PS	6,170,985	35%
Nugget Way PS	5,320,146	50%
River Glen PS	4,145,436	15%

Category	Total Cost 20-Year[a]	Estimated Growth Share[b]
Hayden Lo PS	4,442,105	15%
Peace Health PS and Force main[c]	6,116,806	100%
North Gateway PS and Force main[c]	7,057,508	100%
28th Street PS and Force main[3]	3,712,464	100%
Subtotal	$ 84,390,732	
Total	**$ 224,991,309**	

[a] Includes 3.5% annual inflation based on 20-year average growth in construction costs as calculated from data published by the ENR.

[b] Preliminary estimate of project costs that expand capacity for future growth, as estimated by the City. Capacity-increasing costs are eligible for funding through SDCs.

[c] Needed for future development, but likely funded directly by developers.

Table 1-8 | Estimated Contingencies and Reserves (FY 2023-24)

Category	FY 2023-24 Estimated ($ Millions)
Operating	
Operating Reserve[a]	$2.12
Working Capital Reserve	0.08
Rate Stability Reserve	2.00
Contingency	0.15
General Operating Reserves	2.01
Subtotal Operating	**$ 6.36**
Capital	
Minimum Capital Reserve	$ 4.00
General Capital Reserve	4.61
SDC – Reimbursement	7.90
SDC – Improvement	3.10
Subtotal Capital	**$ 19.62**

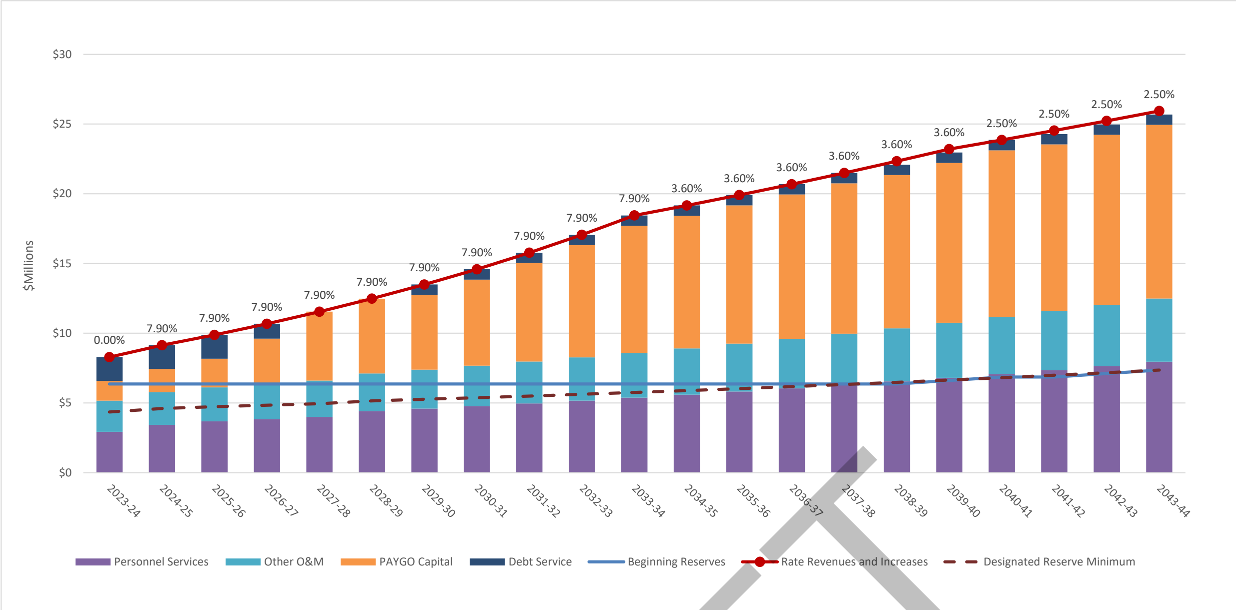
[a] 150 days of operating expenses

1.9.2 Projected Requirements and Rate Increases

The SFP is designed to provide a framework for the City to initiate conversations with stakeholders around CIP phasing, funding sources and associated rate impacts. The capital funding strategy contained herein relies on a combination of PAYGO funding from rates and SDCs, utilization of undesignated capital reserves, limited long-term debt financing to address larger-scale improvements, and direct developer funding to pay for the estimated $225 million in capital projects over the next 20 years. While the City will continue to explore grant funding opportunities, no specific grants have been identified for CIP projects.

The SFP forecasting model was developed as a tool to project system revenue requirements and determine needed wastewater rate adjustments to meet those requirements, in accordance with the capital funding strategy and financial reserve targets described previously. **Figure 1-2** shows the projections of O&M and rate-supported (i.e., PAYGO) capital expenditures and operating reserves over the planning period, and the annual rate revenues (and percent increases), projected to meet the planned expenditures and designated reserve targets. The growth in revenue requirements is attributed to ongoing increases in O&M expenses (both inflationary and additional staffing requirements), as well as PAYGO capital funding.

Figure 1-2 | Projected Wastewater Rate Revenues, Requirements, and Operating Cash Reserves*



*Excludes SDC revenue and capital-related reserves

As shown in **Figure 1-2** a series of rate increases will be necessary to generate adequate revenues to support the CIP, and to fund ongoing operation and maintenance costs. Notably, because of the need to build revenue capacity to support the additional staffing associated with the CMOM program in the short-run and assuming a capital funding plan focused on building PAYGO capacity for asset management needs, the pace of rate increases is projected to be greatest in the first half of the planning period. During these years, system-wide rate increases are projected to exceed assumed general cost inflation (3.5 percent) and result in a more than doubling of the FY 2023-24 rates. As shown in **Figure 1-2**, projected annual rate increases are as follows:

- FY 2023-24 – No additional rate increase in the current year. The City had a two (2) percent increase at the beginning of the FY.
- FY 2024-25 through FY 2033-2034 = 7.9 percent.
- FY 2034-35 and beyond – inflationary increases in the range of 2.5 percent to 3.6 percent.

The projected rate adjustments are based on customer growth and water use trends, as well as the initial capital funding strategy. Future financial and CIP planning may give rise to re-evaluation of planned capital funding sources (e.g., use of debt vs. current revenues) as CIP costs, cash flows and credit market conditions change over time. The SFP is intended to provide a framework for the City to begin conversations around project phasing, funding sources and associated rate impacts.

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CHAPTER 2

Introduction

2.1 Background

The City of Springfield's (City' wastewater system collects, conveys, and treats sanitary wastewater from residential, commercial, and industrial customers within the City's Urban Growth Boundary (UGB). Today, the Springfield wastewater system provides sanitary service to an estimated 69,000 people through approximately 27,000 connections. The City of Springfield operates a large and complex wastewater collection system and is responsible for maintaining and operating 16 pump stations and 250 miles of pipelines varying from 6 inches to 60 inches in diameter. As part of the City's Capacity, Management, Operations and Maintenance (CMOM) program, the City operates, maintains, inspects, and cleans the collection system.

Along with the City of Eugene (COE), Springfield discharges to a regional collection and treatment system owned by the Metropolitan Wastewater Management Commission (MWMC). Springfield's collection system discharges to the East Bank Interceptor which discharges to the regional Water Pollution Control Facility (WPCF).

As part of the discharge permit for the regional facilities, all three entities must create and follow a CMOM program. The CMOM programs address collection system maintenance and reduction of infiltration and inflow (I&I) using cost effective solutions. The Wastewater Master Plan (WWMP) update includes a review of the current CMOM program and recommendations to manage the wet weather flows from Springfield.

The WWMP update identifies near-term and long-term capacity constraints and identifies the system improvements necessary to meet the City's projected population and employment growth through the 20-year planning horizon. The hydraulic model used in the WWMP update was originally developed as part of the 2008 WWMP and has been kept up to date by the City using the current inventory of network and current measured flow data.

The City's previous WWMP was completed in 2008. Since that time, the City has constructed all identified rehabilitation and preservation capital improvement projects, and several upgrade and expansion projects identified to support growth. The City's hydraulic model has been updated to reflect these changes. This WWMP was prepared to update the analysis of the collection system and evaluate future needs of the City.

Goals for the WWMP Update are to identify wastewater collection system facility enhancements and expansion (capital improvements) necessary to serve the community's wastewater needs through the 2045 planning year in order to:

- Protect the health of community members in the City's service area.
- Protect water quality and the environment.
- Eliminate sanitary sewer overflows (SSOs) to the extent practicable.
- Guidance for developers.
- Document current CMOM program and procedures.

- Recommend policy and procedure updates to address regular maintenance of the collection system.
- Address the rehabilitation and replacement schedule for aging pipes and MHs in the collection system.

2.2 Community Engagement

In April 2022, Springfield's Planning Commission, acting in its capacity as Springfield's Committee for Citizen Involvement, reviewed and provided input on a Community Engagement Plan for this update to Springfield's WWMP. Designed with the general public, development and engineering community, decision-makers, and the project team in mind as the intended audience, the Community Engagement Plan has served as a guide for providing adequate opportunities for interested and affected parties, together with the project team, to provide meaningful input and feedback to one another (see **Appendix A**).

In accordance with the Community Engagement Plan, this project used the following outreach and engagement tools:

- Webpage – launched to provide project information in a visual and easy-to understand way in one location.
- Frequently Asked Questions (FAQs) – created and posted on project webpage to share key messages, project information, and answer common questions.
- Survey – developed and distributed electronically to seek input on the prioritization of recommended capital improvements.
- Newsletter Articles, E-Updates, and Social Media Posts – utilized to share project information and opportunities to provide project input, including:
    - MWMC electronic newsletter
    - Development and Public Works electronic newsletter
    - Springfield Utility Board bill insert
    - City and MWMC social media channels (Facebook, Instagram, Twitter)
    - Direct emails to permitted industries and community members who have expressed interest in related Development and Public Works projects
- Public Hearing – facilitated with the Springfield City Council to allow for testimony prior adoption of the WWMP.

CHAPTER 3

Study Area

Developing a long-range wastewater collection management plan for the City requires that a number of local factors be considered, including land use, climate, precipitation, soils, and topography. This information is summarized below for the area to be served by the City's wastewater system (all land within the UGB).

3.1 Existing and Future Service Area

The existing wastewater collection system serves areas within the current City limits. The UGB defines the extent to which the City Limits may extend in the future. The ultimate boundary for the flow projections within the WWMP comprises both the existing City Limits and the UGB. **Figure 3-1** presents a map of the City Limits and the UGB.

3.2 Location and Topography

Springfield, Oregon is located within Lane County and directly east of Eugene, Oregon. The boundary between Springfield and Eugene is delineated by Interstate 5, which forms the western boundary of Springfield. Springfield is bordered by the McKenzie River to the north and the Willamette River to the South. Reviewing the city's geographic information system (GIS) files, elevations within City range from approximately 500 feet to 1,500 feet above sea level with an average elevation of 456 feet. The City covers approximately 15.75 square miles. **Figure 3-2** presents a regional map of Oregon showing the location of the City.

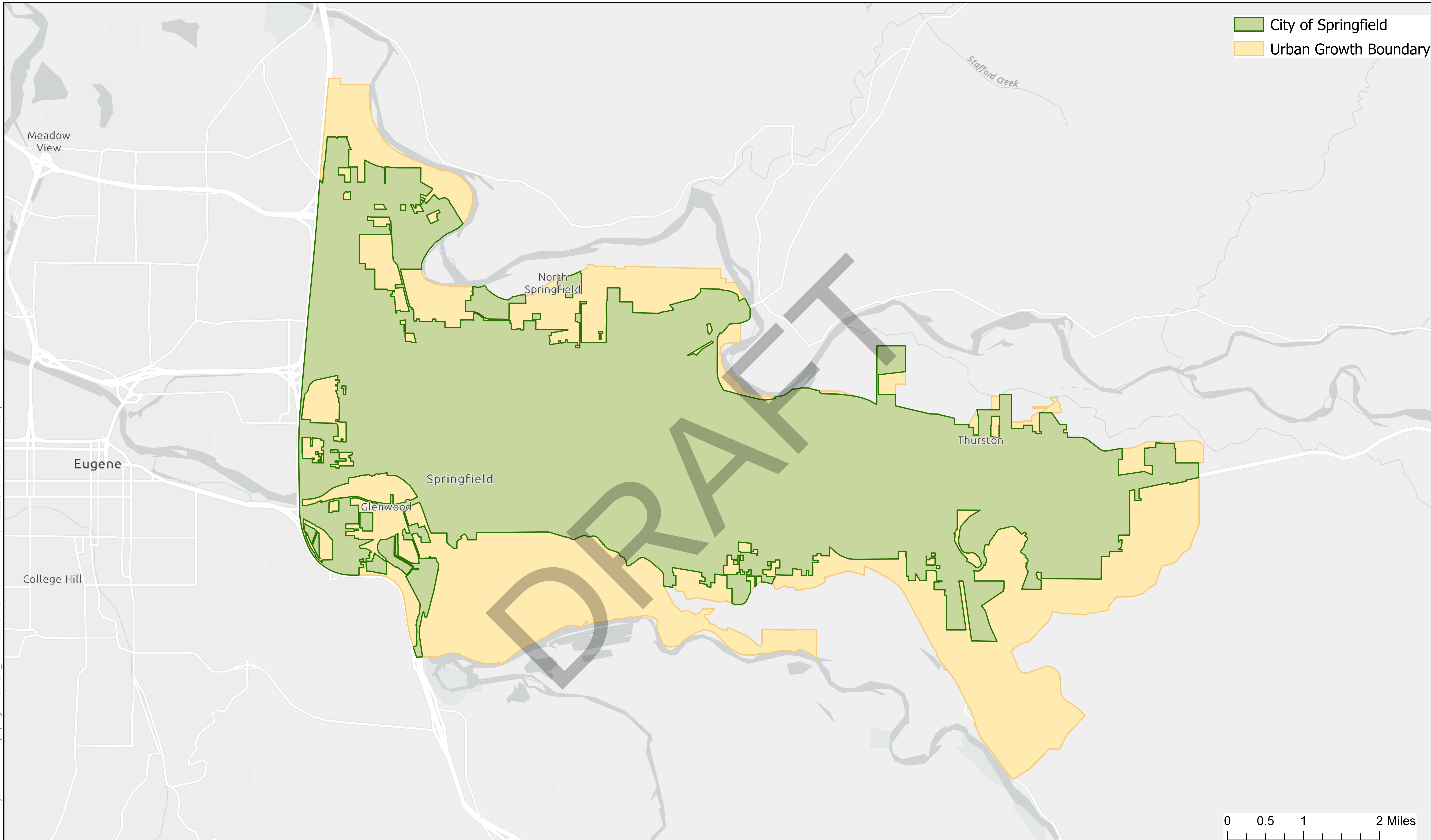
3.3 Climate

The climate within the City is typical for the Willamette Valley Region. Winters are typically rainy and overcast while summers are warm and dry. Temperatures remain moderate throughout the year, only dipping below 30°F or rising above 90°F on occasion. The City receives an average of 157 rainy days and 50-inches of total rainfall every year. Approximately half of the total rainfall occurs during the wet season between November to January. The dry season occurs from July to August.

As with most of the Pacific Northwest, rainfall events are becoming more intense during the winter months and the summers are becoming hotter and drier. The changes in rainfall intensity are taken into account for the future wet weather wastewater flow,

3.4 Soils

The soils within the Willamette Valley are indicative of the Missoula Floods, which occurred during the Ice Age and deposited multiple layers of sedimentary soils onto the valley floor. The National Resource Conservation Service (NRCS) Soil Surveys show that a large portion of the soils in the City are loams, including urban land complex (~26%), silty clay loams (~17.5%), cobbly silty clay (~6.5%), general fluvents (~6%), sandy loam (~6%), cobbly silty clay loam (~5%), silt loam (~5%), loam (~5%), water (~4%), gravelly sandy loam (~2.5%), gravelly silt loam (~2%), and others. All soil data was obtained from the NRCS soil survey study, a summary of which is found in **Figure 3-3**.



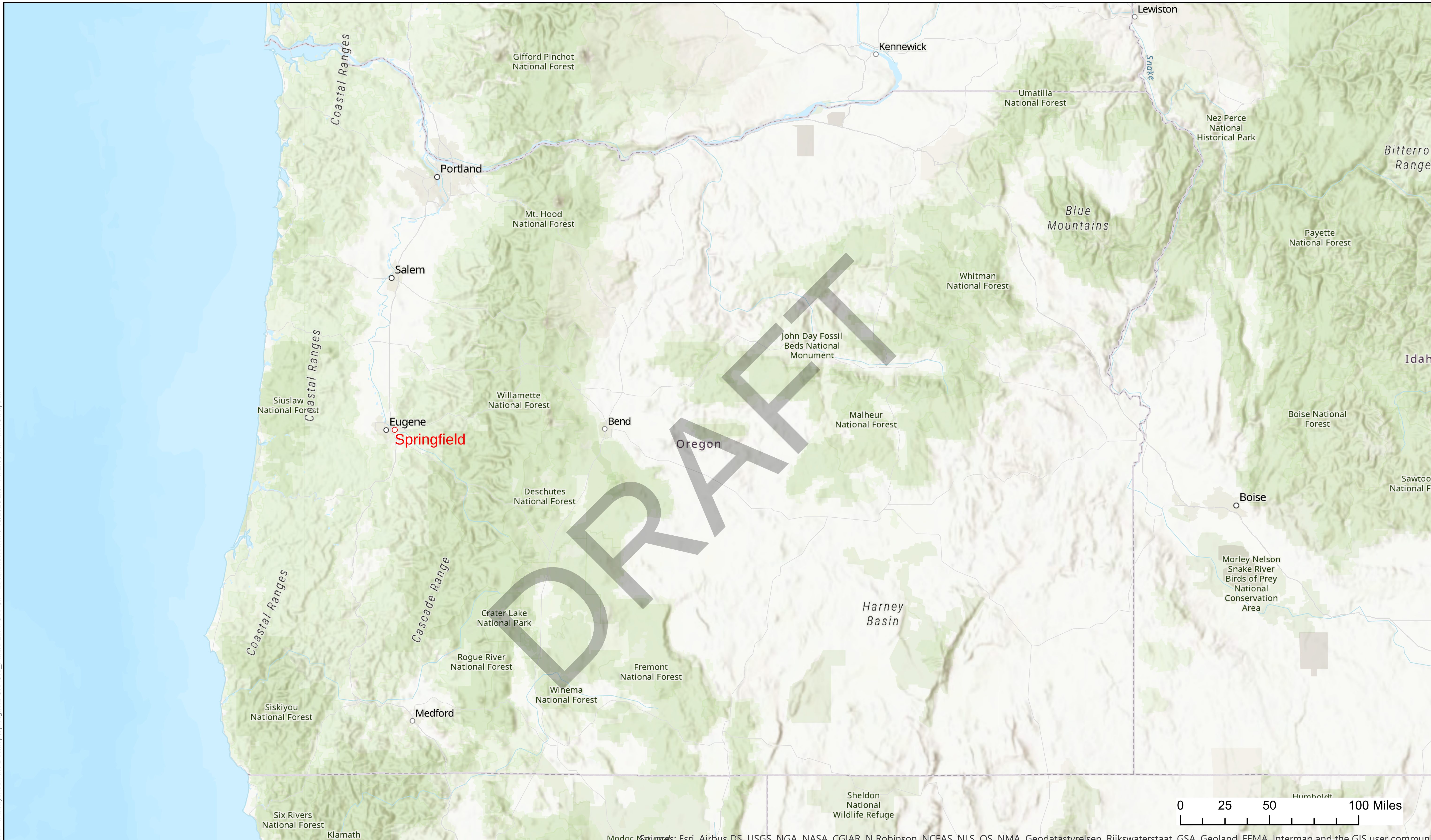
C:\Users\nick.campbell\OneDrive - Murraysmith, Inc\Desktop\Springfield GIS\GIS_Future Land Use\CIP Identification.aprx 6/11/2023 5:48 PM 6:15 AM Nick.Campbell

City of Springfield, OR
Wastewater Master Plan

Figure 3-1
City of Springfield and UGB Extents

July 2023

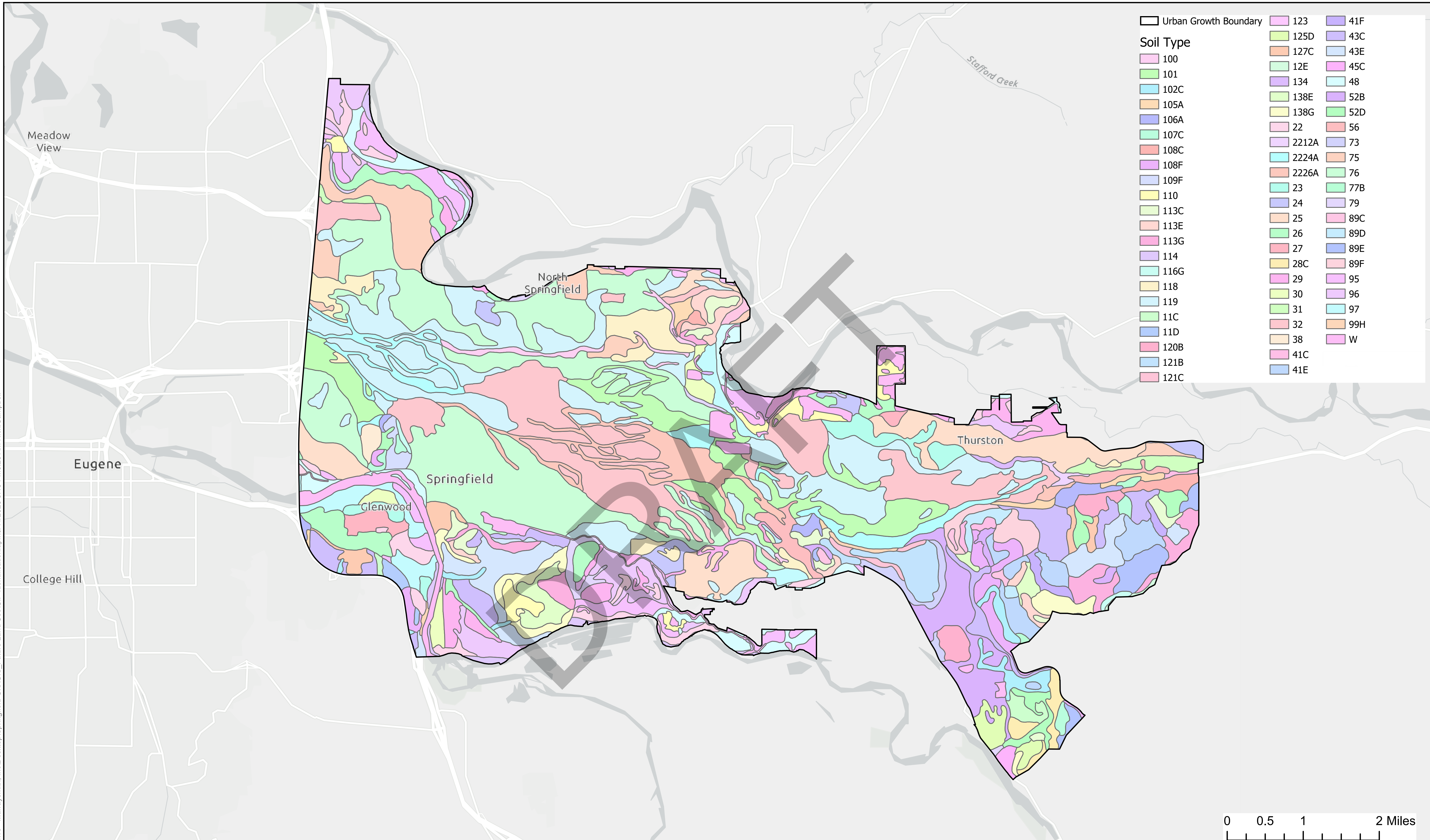
22-3398



consor | SPRINGFIELD OREGON | N | **City of Springfield, OR Wastewater Master Plan** | **Figure 3-2 Regional Map of the State of Oregon**

July 2023

22-3398



City of Springfield, OR
Wastewater Master Plan

Figure 3-3
Soil Types in the UGB

July 2023

22-3398

3.5 Groundwater

Groundwater levels rise and fall with the river stages of the McKenzie and Willamette Rivers. These river levels are influenced both by rainfall as well as numerous dams that are upriver from Springfield. According to the 2008 WWMP, groundwater levels typically remain constant during the dry season (normally 10 to 20 feet below ground surface elevation) and showed an increase of up to 7-feet below grade during the wet season.

3.6 Land Use

The 1982 Eugene-Springfield Metropolitan Area General Plan (Metro Plan) was created to serve as the sole official long-range comprehensive plan of metropolitan Lane County and the Cities of Eugene and Springfield. In 2007, the Oregon Legislature enacted ORS 197.304, also known as House Bill 3337, which was the impetus for Springfield to establish a UGB separate from Eugene's and to begin to create a Springfield-specific comprehensive plan. The goals and policies of the Springfield Comprehensive Plan, along with applicable policies in the Metro Plan, will guide Springfield's growth and development into the future.

While the Metro Plan Diagram shows the general locations of desired land uses for the City and Neighborhood Refinement Plans provide more specific plan designations for targeted specific areas Springfield, the City initiated an effort to create a property-specific Comprehensive Plan Map for Springfield, anticipated for adoption in 2023.

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CHAPTER 4

Existing System Description

This section provides an overview of the existing and future service areas. The City's wastewater collection system serves approximately 69,000 residential customers along with commercial and industrial customers. The City's wastewater and collection and conveyance systems and services are owned and operated by the City. All wastewater is routed to a regional collection and treatment facility owned by the MWMC, which services both the City and the COE. The City's wastewater collection system and the regional MWMC WPCF are shown in **Figure 4-1**.

4.1 Inventory of Existing Facilities

The City's primary collection system shown in **Figure 4-1** consists of MHs, gravity pipes, pump stations, and force mains.

In general, the gravity pipelines follow the topography of the City and drain the wastewater directly to large interceptors or to pump stations which discharge to pressurized force mains. The force mains convey the wastewater to larger interceptors. All wastewater is routed to the East Bank Interceptor near I-5 and the Willamette River which pump from the Willakenzie Pump Station to the WWTP.

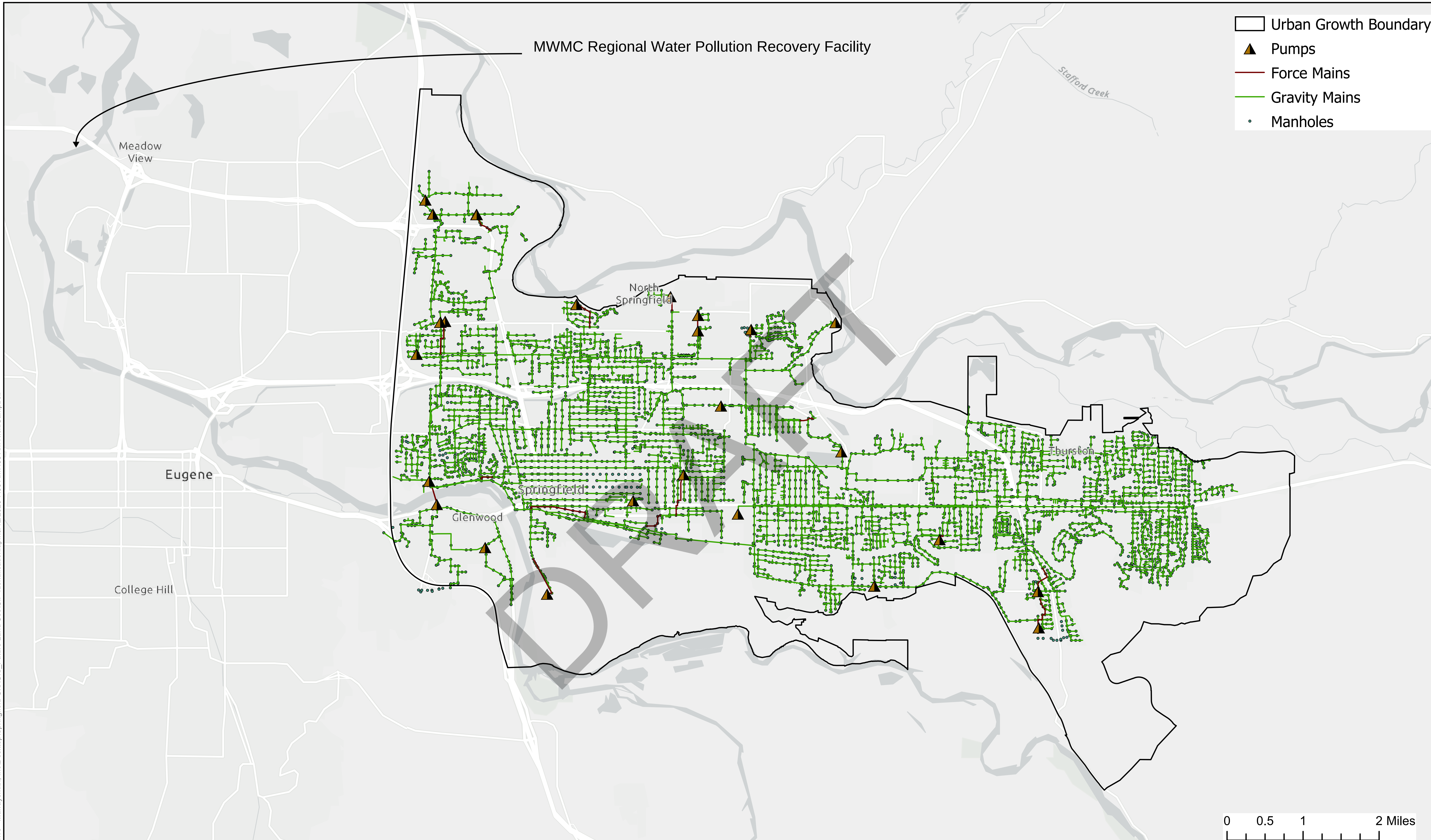
The City collection system includes approximately 250-miles of pipeline ranging in size from 6-inches to 60-inches. The major trunk systems in Springfield are Gateway, Thurston, Main Street, East Springfield Interceptor (owned and operated by MWMC), South Springfield Interceptors, Jasper, Central and Downtown. The City's collection system consists of approximately 28 miles of interceptor and truck lines 10-inches in diameter or larger.

4.1.1 System Description

The original downtown basin is the oldest portion of the Springfield collection system. Constructed before World War I, it was designed to carry and discharge both stormwater and sanitary flows to the Willamette River. In the 1950s, the City constructed a wastewater treatment plant. Wastewater flows remained in the existing conduits, but new conveyance facilities were built to transport stormwater to the Willamette River.

The remainder of the system was developed around the downtown core as the city expanded. The original East Springfield Interceptor was constructed in 1962; the South Springfield Interceptor was constructed in 1997.

The existing Springfield wastewater service area is divided into eight major areas which are generally defined by topographic and demographic features. These areas are individually discussed as follows and shown in **Figure 4-2**.



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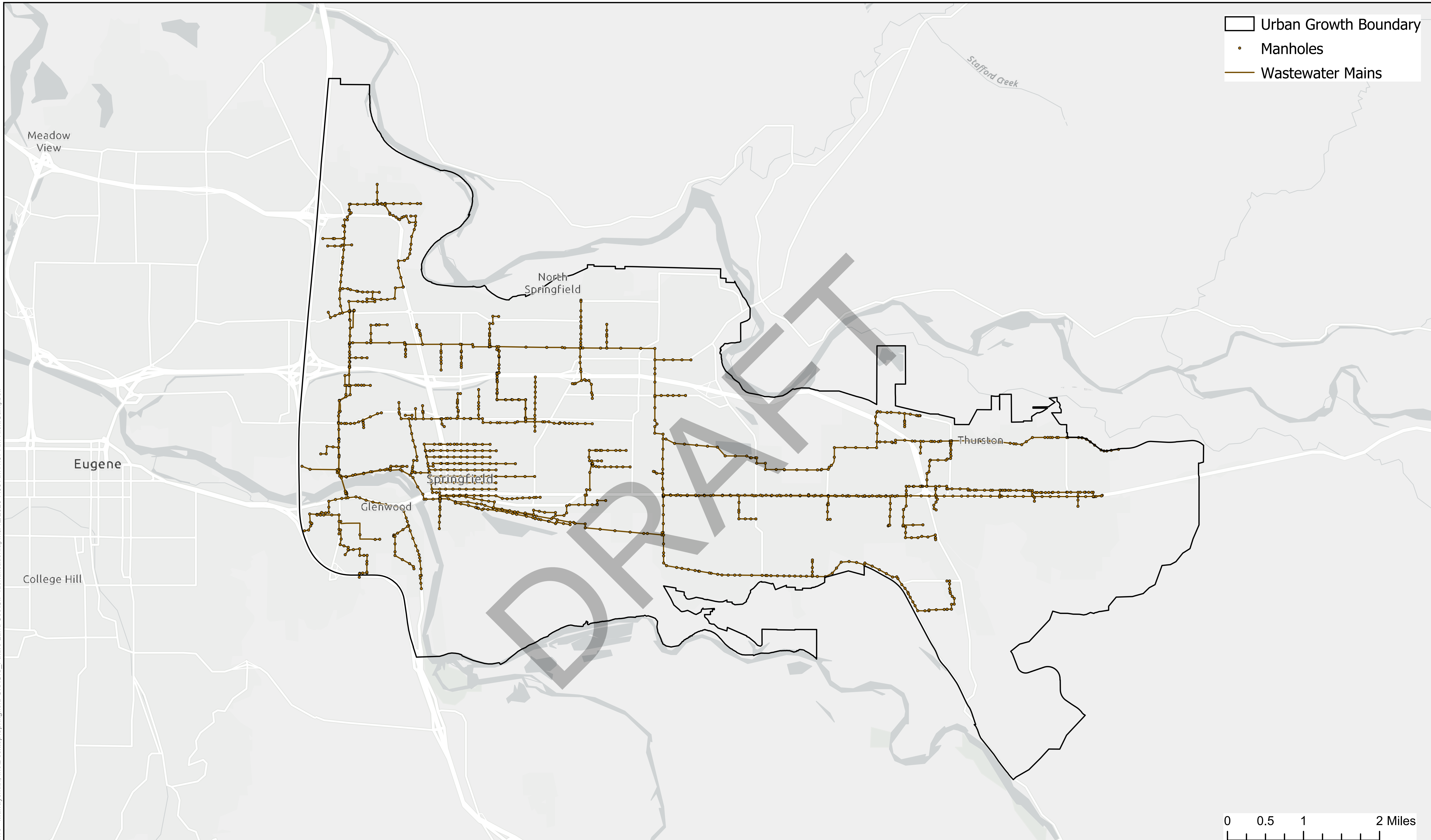
City of Springfield, OR
Wastewater Master Plan

Figure 4-1
City of Springfield
Wastewater Collection System

July 2023

22-3398



City of Springfield, OR
Wastewater Master Plan

Figure 4-2
Skeleton Model

North Springfield/North Branch: The North Springfield/North Branch areas are served by the East Springfield Interceptor. Constructed in 1962 following the annexation of East Springfield (1960), this interceptor consists of 2 miles of 48-inch diameter reinforced concrete pipe running from the connection to the East Bank Interceptor north and east upstream to Laura Street. The North Springfield area is generally bounded by the north city limits, Highway 126 to the south, the head of the East Springfield Interceptor to the east, and the intersection of Lochaven and Don Streets to the west. The North Branch Basin is generally described as a rectangle bounded by Interstate 5, Belt Line Road (OR-569), the Willamette River and an imaginary north/south line running through Kelly Butte.

Typical pipe depth varies from 10 to 18 feet (ground surface to pipe invert), with an average slope of approximately 0.001 feet/ft. From Laura Street to its head near the railroad spur line service 32nd street, the line is 42 inches in diameter, having an average depth of about 12 to 13 feet with a typical slope of 0.001 to 0.0015 feet/ft.

All sanitary sewage generated east of 32nd Street enters the East Springfield Interceptor via the Thurston or Main Street trunk pipelines. Other major tributary lines served by this interceptor include the City Center relief pipeline and the Gateway Street trunk pipeline.

Thurston Road: This area is located in the extreme easterly portion of the City. The Thurston trunk pipeline ranges in size from 15 inches near Thurston Elementary School to 27 inches at the confluence with East Springfield Interceptor. Pipe depths and slopes vary widely as slightly higher relief in the eastern sector allows for shallow trenches and smaller pipes with moderate gradients. West of Highway 126, pipe depths and slopes are deeper with less gradient, respectively, which is more characteristic of the low relief alluvial plains.

Main Street: This basin currently drains southeast Springfield. The Main Street trunk ranges in size from 15 inches near 71st Street to 30 inches at the confluence with the Thurston and East Springfield Interceptor.

Central: The Central Basin encloses the Downtown Basin on all sides except the south. The central trunk system, combined with the Downtown trunk, serves the entire area east of Prescott Street, west of 28th Street, south of Highway 126 and north of South A and Main Streets. The Central trunk was constructed in conjunction with the Downtown trunk.

Two diversion structures remove excessive storm flows from the Central Basin. A 24-inch relief pipeline near 13th and Centennial Boulevard routes flow to the East Springfield Interceptor. A pump station located at “E” and 21st Streets diverts flow to the South A trunk line, reliving the overloaded upper reaches of the Central trunk.

Downtown: The downtown trunk system collects sewage flows generated in the older downtown core area. The total area served is generally bounded by Mill Street to the west, 16th Street to the east, North “G” Street to the north and South A Street to the south.

The original downtown system was constructed prior to World War I. These pipelines collected both sanitary wastes as well as storm water and were discharged directly into the Willamette River. The wastewater and stormwater systems were separated in the early 1950s when the City constructed its wastewater treatment plant. The wastewater collection system remained in the older, formerly combined system with the stormwater system routed into new pipelines.

South A: This basin primarily consists of industrial lands adjacent to South A Street. The South A trunk also provides some relief capacity for the Central Basin.

Glenwood: The Glenwood Basin is bound to the north and east by the Willamette River and to the south and west by Interstate 5. The Glenwood Pump Station (an MWMC owned and operated facility) collects all flows from the Glenwood Basin and pumps them across the Willamette River to the East Bank Interceptor. Additional flows from the Riverview-Augusta and Laurel Hills area in Eugene contribute to the flows at the pump station.

The Glenwood Trunk, a 30-inch pipeline, serves a major portion of the Glenwood basin, and extends east from the Glenwood Pump Station in Franklin Boulevard to the intersection of Franklin Boulevard and McVay Highway (Franklin Boulevard). An 18-inch pipeline continues south down McVay Highway (Franklin Boulevard) to the current end of the pipeline near the intersection with Interstate 5.

Jasper: This basin is in the far southeast section of town and collects flows from the Golden Terrance and Jasper Meadows neighborhoods.

4.1.2 Skeleton Model

The City has developed a calibrated and verified dry and wet weather skeletonized wastewater collection system model representing the major basins and pipelines. In 2018, the City contracted with Sam Novac, P.E., (Novac Industries, LLC) to analyze and update the hydraulic model of the City's collection system to inform needed structural repairs for inclusion in the City's 5-year Capital Improvement Program. Novac Industries first developed a Mike Urban skeletal model supplemented with City GIS data and data from 15 portable flow monitors and a permanent monitor installed in the East Bank Interceptor. In 2019, data from the portable monitors was used to start modeling micro-basins throughout the city.

Springfield uses the skeleton model[1] for wastewater planning and includes 321 different wastewater catchments, 1,314 nodes, five pump stations and 1,330 pipes ranging in size from 8-inches to 60-inches. The skeleton model is shown in **Figure 4-2**.

Part of the WWMP Update effort included converting the City's calibrated existing conditions MIKE URBAN model to the 2023 version of MIKE+ and reviewing for inconsistencies. This process is described in detail in **Appendix B**. As part of the modeling effort, errors were discovered in the skeleton model. The errors were corrected and documented in **Appendix C**. The updated MIKE+ skeleton model is used to project flows and capacity requirements of the system.

4.1.2.1 Pipes

The primary collection system represented in the skeleton model is generally comprised of gravity pipes between 8-inches and 60-inches. **Table 4-1** summarizes the gravity pipe sizes and lengths represented in the model.

Table 4-1 | Gravity Pipe Summary

Pipe Diameter (inches)	Total Length (mile)	Percentage
8	0.15	< 0 %
10	13.19	20 %
12	10.08	14 %
14	0.35	1 %
15	4.85	7 %

[1] Finalized skeleton model dated August2023 (Springfield_28thAddition_Aug2023.mupp/sqlite)

Pipe Diameter (inches)	Total Length (mile)	Percentage
18	7.43	11 %
20	0.37	1 %
21	2.78	4 %
24	6.83	10 %
27	6.46	10 %
30	2.11	3 %
36	1.52	2 %
42	4.17	6 %
48	5.64	8 %
60	1.02	2 %
Total	67	100 %

4.1.2.2 Force Mains

The primary collection system represented in the skeleton model is also comprised of force mains between 8-inches and 36-inches in diameter. Some lift stations within the collection system are served by a dedicated force main discharging to a gravity pipe. Many lift stations are served by a force main connected to a common pressure main with one or more force mains tied into it. This type of interconnection can cause operational problems at the associated lift stations. For instance, when two or more lift stations are operating simultaneously, one of the lift stations may not be capable of pumping against the pressure created by the other. **Table 4-2** summarizes the force main sizes and lengths represented in the skeleton model.

Table 4-2 | Force Main Summary

Pipe Diameter (inches)	Total Length (mile)	Percentage
10	0.14	9 %
12	0.44	27 %
14	0.35	21 %
20	0.16	10 %
24	0.16	10 %
36	0.37	23 %
Total	2	100 %

4.1.2.3 Pump Stations

As per the Eugene/Springfield pump station information spreadsheet[2] provided by the City, the City currently utilizes 19 pump stations, including 16 operated by Eugene City staff under contract and three owned by MWMC. There are five pump stations in the skeleton model. The pump stations are summarized in **Table 4-3**.

[2] Spreadsheet dated 9/16/2016 provided by City on April 26, 2022. City owned pump stations are listed as Springfield Utility Board owned. City verified these are City owned.

Table 4-3 | Pump Station Summary

Name	Owner	Pump Horsepower	# of Pumps	Maximum Flow (MGD)	Firm Capacity (MGD)	TDH (feet)	Standby Power
Springfield Plant	MWMC	(2) 40 hp	2	17	Unknown	Unknown	Generator
Willakenzie	MWMC	(5) 300 hp (1) 150 hp	6	140	127	50	Generator
Glenwood[a]	MWMC	(2) 40 hp	2[b]	8	5	12 – 30	Generator
15th Street	City	(2) 3.7 hp	2	0.5	0.3	10	Unknown
21st and E Street[a]	City	(2) 15 hp	2	2.6	1.6	40	Generator
49th Street	City	(2) 3.4 hp	2	0.8	0.5	15	Generator
Commercial	City	(2) 7.5 hp	2	0.6	0.4	25	Generator
Deadmond Ferry[a]	City	(2) 10 hp	2	1.9	1.2	25	Generator
Harlow Road[a]	City	(3) 75 hp	3	10	5	51	Generator
Hayden Lo	City	(2) 5 hp	2	0.6	0.42	20	Generator
Ken Ray	City	(2) 3 hp	2	0.8	0.5	15	Generator
Marcola Road	City	(2) 2 hp	2	0.15	0.1	13	Unknown
Marshall's Plaza	City	(2) 5 hp	2	0.35	0.22	30	Unknown
Nugget Way[a]	City	(2) 20 hp	2	1.3	0.86	90	Generator
Olympic	City	(2) 3.4 hp	2	0.6	0.4	25	Generator
Otto Street	City	(2) 1.75 hp	2	0.3	0.2	15	Unknown
Ramada	City	(2) 1.5 hp	2	0.3	0.2	18	Generator
River Glen	City	(2) 12 hp	2	1	0.7	54	Generator
Vera Street	City	(2) 7.5 hp	2	0.47	0.6	35	Generator

[a] Pumps included in the skeleton model

[b] Three pumps in model but only two listed on City provided Pump Station Information sheet. MWMC staff confirmed there is space to install up to 4 pumps, as needed.

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CHAPTER 5

Basis for Planning

The MWMC was formed by the City, COE, and Lane County, Oregon through an intergovernmental agreement (IGA) in 1977. MWMC was formed to provide wastewater collection and treatment for these three (3) governmental entities and is responsible for the oversight of the construction, maintenance, and operation of the regional WPCF. The commission is composed of members appointed by the City Councils of Eugene and Springfield and the Lane County Board of Directors. MWMC holds the National Pollutant Discharge Elimination System (NPDES) permit for the treated wastewater discharge to the Willamette River.

5.1 Regulatory Requirements

5.1.1 Federal Discharge Permits

The United States Environmental Protection Agency (EPA) regulates discharges of pollutants from municipal and industrial wastewater treatment plants, wastewater collection system, and stormwater discharges under the Clean Water Act (CWA). Most wastewater discharge permits are maintained under the Oregon Department of Environmental Quality (DEQ); however, the EPA may independently enforce CWA policies.

5.1.2 State Discharge Permits

On October 10, 2022, the DEQ issued a National Pollutant Discharge Elimination System (NPDES) permit (#102486) for Springfield, Eugene and MWMC. The NPDES permit includes conditions under which treated wastewater can be discharged to the Willamette River. Included in those conditions is the requirement that no discharges of untreated wastewater are allowed to the waters of the state and the United States. These conditions necessitate the assumptions for overflow avoidance in Springfield and are consistent with the City's CMOM program.

5.1.3 State Pump Station Requirements

The Oregon DEQ has provided recommendations and requirements regarding wastewater pump station design standards such that overflows or backups only occur under extreme conditions. A pump station must consist of multiple pumps with one spare pump to provide for system redundancy. The wet well rim elevation and the finished floor elevation needs to be at least one-foot above the 100-year flood plain or any distance above the 500-year flood plain, whichever is higher. All pump stations should have an independent second source of electrical power. Each station should have a dedicated alarm for untreated wastewater overflow and separate independent alarm systems to detect other emergency conditions.

The firm capacity (defined as the largest pump out of service) of a pump station must be able to meet the projected peak hourly flow associated with the 5-year, 24-hour storm associated with full buildout conditions. Calculations can be submitted for review and approval to demonstrate capacity in the system to reduce the firm capacity to the peak day flow.

Pump stations in locations of potential severe property damage if an overflow should occur, it is recommended that the design include a MH with a low elevation or an overflow pipe in the collection system that drains to a safer location.

5.2 Design and Planning Criteria

The City of Springfield Development Code 4.3.105 mandates that wastewater pipelines be installed to serve new developments and developments should connect to existing wastewater mains. New pipelines should have sufficient maintenance access and comply with the City's *Engineering Design Standards and Procedures Manual* along with Public Works Standard Construction Specifications and Springfield Municipal Code.

5.2.1 Water Surface Elevation

Historically, the City has defined a deficiency in the collection system by the water surface elevation in MHs predicted by the hydraulic model relative to the ground surface. As a result, pipelines were allowed to surcharge or pressurize for short durations during peak flow periods. See **Appendix D** for the details of the 2008 WWMP collection system capacity standards.

Given changes in climate and the consequential increase in storm event intensity, the City has decided to evaluate the capacity of the collection system using the predicted depth of water divided by the pipe diameter (d/D) criterion. This method relates the percent full of a pipe based on the predicted depth of the water compared to the diameter of a pipe during a specific storm event.

Specifically, the new City capacity requirements define each collection system improvement must meet the criterion of keeping the predicted water depth during the future 5-year, 24-hour storm event divided by the pipe diameter less than or equal to 75% full ($d/D \geq 0.75$). The new criterion also states the replacement pipe to be designed with a $d/D \leq 0.5$ or less than or equal to 50% full using the predicted water level during the future 5-year, 24-hour design storm. This design storm is discussed in **Section 5.4**.

5.2.2 Pump Stations

The City uses the DEQ requirements for wastewater pump station evaluation using the existing condition during the 5-year, 24-hour storm event. Pump stations will be designed using the 2045 future condition flow estimates and the future conditions 5-year, 24-hour design storm. This design storm is discussed in **Section 5.4**.

5.3 Wastewater Collection System Capacity Analysis Approach

For new pipes to future service areas, including areas between the City Limits and the UGB, pipe sizing is based on the predicted flows associated with the 2045 planning horizon land use conditions; the future 5-year, 24-hour design storm; and the 2,000 gallons per acre per day (gpad) I&I allowance adopted by Springfield in the 2008 WWMP.

Where possible, 2 feet per second (fps) minimum velocity is maintained during dry weather flows (DWF). All pipes will be designed using the capacity criteria of $d/D \leq 0.5$.

5.4 Design Storm Selection

Because the Oregon DEQ states that gravity and alternative collection systems are to be designed to handle the peak hourly flow associated with the 5-year, 24-hour storm event, this event was selected for the collection system evaluation.

The 5-year, 24-hour design storm from the NOAA Precipitation Frequency Atlas for Oregon (1973) results in 3.9 inches. During the 2008 WWMP process, the rainfall frequency analysis was updated resulting in new values for design storm events. The updated 2008 values for the SCS Type 1A rainfall depths are shown in **Table 5-1**. The 5-year, 24-hour design storm was applied to the Springfield collection system model in 2008.

Table 5-1 | SCS Type 1 A Rainfall Depths

Storm Event	Rainfall
Water Quality Event	1.4 inches
2-year, 24-hour	3.12 inches
5-year, 24-hour[3]	3.60 inches
10-year, 24-hour	4.46 inches
25-year, 24-hour	5.18 inches
100-year, 24-hour	6.48 inches

The EPA provides a climate resilience evaluation and awareness tool (CREAT). The tool was developed to help utilities develop scenarios to understand the threats based on climate data. CREAT provided site specific projected climate change rainfall increases for the Springfield area. **Table 5-2** shows the increased storm depths using CREAT Version 3.1 dated March 2001. The increase in rainfall depths is projected as "Not as Stormy" and "Stormy" for the year 2035 and 2060. The City chose the "Stormy" 2035 scenarios for the 20-year planning horizon rainfall depth. This depth was applied to the 5-year, 24-hour SCS Type 1A design storm.

Table 5-2 | Updated Storm Depths Using CREAT Version 3.1, March 2021

24-hour Rainfall Depth (Inches)					
Rainfall Event	SCS Type 1A Rainfall Depth	2035 "Not as Stormy" Scenario (+1.5%)	2035 "Stormy" Scenario (+6.9%)	2060 "Not as Stormy" Scenario (+2.9%)	2060 "Stormy" Scenario (+13.4%)
WQ Event	1.40	1.42	1.50	1.44	1.59
2-year	3.12	3.17	3.34	3.21	3.54
5-year[5]	3.60	3.65	3.85	3.70	4.08
10-year	4.46	4.53	4.77	4.59	5.06
25-year	5.18	5.26	5.54	5.33	5.87
100-year	4.48	4.55	4.79	4.61	5.08

In conjunction with the "Stormy" 2035 5-year, 24-hour design storm, the City uses a condition in the hydrologic and hydraulic model (Hot Start) that applies base flow, DWF, and rainfall-dependent infiltration/inflow (RDII), based on the January 2019 measured rainfall event and subsequent wastewater collection system flow response. The Hot Start uses the results from the end of the January 2019 storm event to set the groundwater elevation, I&I flow, DWF and water levels in the collection system.

[3] The SCS Type 1A rainfall depths listed in **Table 5-1** were adopted by Eugene and Springfield after the system evaluation portion of the WWMP completed. Therefore, the rainfall depth used in the evaluation was 3.83 inches, the 5-year, 24-hour storm event. The old rainfall depths were also used for the climate change evaluation (4.1 inches for the 2035 "Stormy" Scenario 5-year, 24-hour storm event).

The combination of the January 2019 Hot Start and the “Stormy” 2035 5-year, 24-hour design storm is the future hydrologic condition used for predicting water levels for the evaluation in the collection system.

CHAPTER 6

Future Land Use Analysis

As part of the WWMP update, the City is estimating potential demand over the planning horizon to meet the needs of current and future customers as well as the requirements of the Oregon DEQ. Land use conditions were assessed to evaluate the future population and employment impacts to the wastewater collection system. The future land use condition included: anticipated development/redevelopment based on population and employment growth, conversion of verified septic systems to City wastewater collection, the annexation of areas within the UGB resulting in provision of wastewater collection service, and an estimation of the housing densification due to House Bill 2001 by the Oregon Legislature in 2019 (HB 2001).

6.1 Methodology

The following conditions were selected as they are expected to contribute the greatest impact to the collection system's ability to properly convey the wastewater flow within the City's system:

- Development and redevelopment based on projected population and employment growth within the existing wastewater collection system.
- Development and redevelopment based on projected population and employment growth outside of the exiting wastewater collection system but within the UGB and an estimation of I&I in these areas.
- Connection of verified septic tanks within existing wastewater catchments and within the UGB.
- Increased population density in residential areas due to HB 2001.

The following sections describe the data, methodology, and assumptions used to analyze the four conditions. The four conditions are used to create the future condition scenario to evaluate the impacts to future wastewater flows in the City's updated WWMP.

6.1.1 2020 Census Traffic Analysis Zone Data

6.1.1.1 Existing Wastewater Catchments

The 2020 Census Traffic Analysis Zone (TAZ) data and 2045 TAZ predictions were utilized to model the existing and future conditions within the City's wastewater catchments. A TAZ is a geographic area delineated by cities for tabulating traffic-related data. A TAZ usually consists of one or more census blocks, block groups, or census tracts. Lane Council of Governments (LCOG) calculated the current population and employment within each TAZ geographic area and has allocated future population and employment to the TAZ areas as part of the regional transportation model. LCOG based Springfield's future population on Portland State University's Population Research Center's forecast for 2045. LCOG based Springfield's employment on the Oregon Employment Department's forecast for Lane County as applied to Springfield's UGB. The future population and employment within each TAZ were based on the plan designations in the Eugene-Springfield Metro Plan. Since the catchments do not perfectly overlap with the TAZ areas, the following procedure was performed in ArcGIS Pro:

- Calculate the household and job density within each TAZ area.
- Intersect the household and job density data within each TAZ area with the wastewater catchments. This resulted in the original TAZ areas being split into multiple smaller sections within each catchment.
- Merge the TAZ areas within each wastewater catchment into a single area that is identical to the catchment area and includes population and employment information.
- Use the household and job density data to approximate the total number of households and jobs within each wastewater catchment.
- As calculated by the Lane Council of Governments, on average there are 2.53 persons per household within the City. Therefore, the total number of households in each wastewater catchment was multiplied by 2.53 to estimate the population within each wastewater catchment. This added to the number of jobs in a TAZ is the equivalent population.

A table of the estimated number of households, population, and jobs for 2020 and 2045 within the existing wastewater catchments is found **Table 6-1**. The methodology used to match the population and job data to the wastewater catchment areas ended up planning for a higher number of people (81,226) and jobs (46,215) than what LCOG had included in the TAZ model (76,660 people and 45,571 jobs).

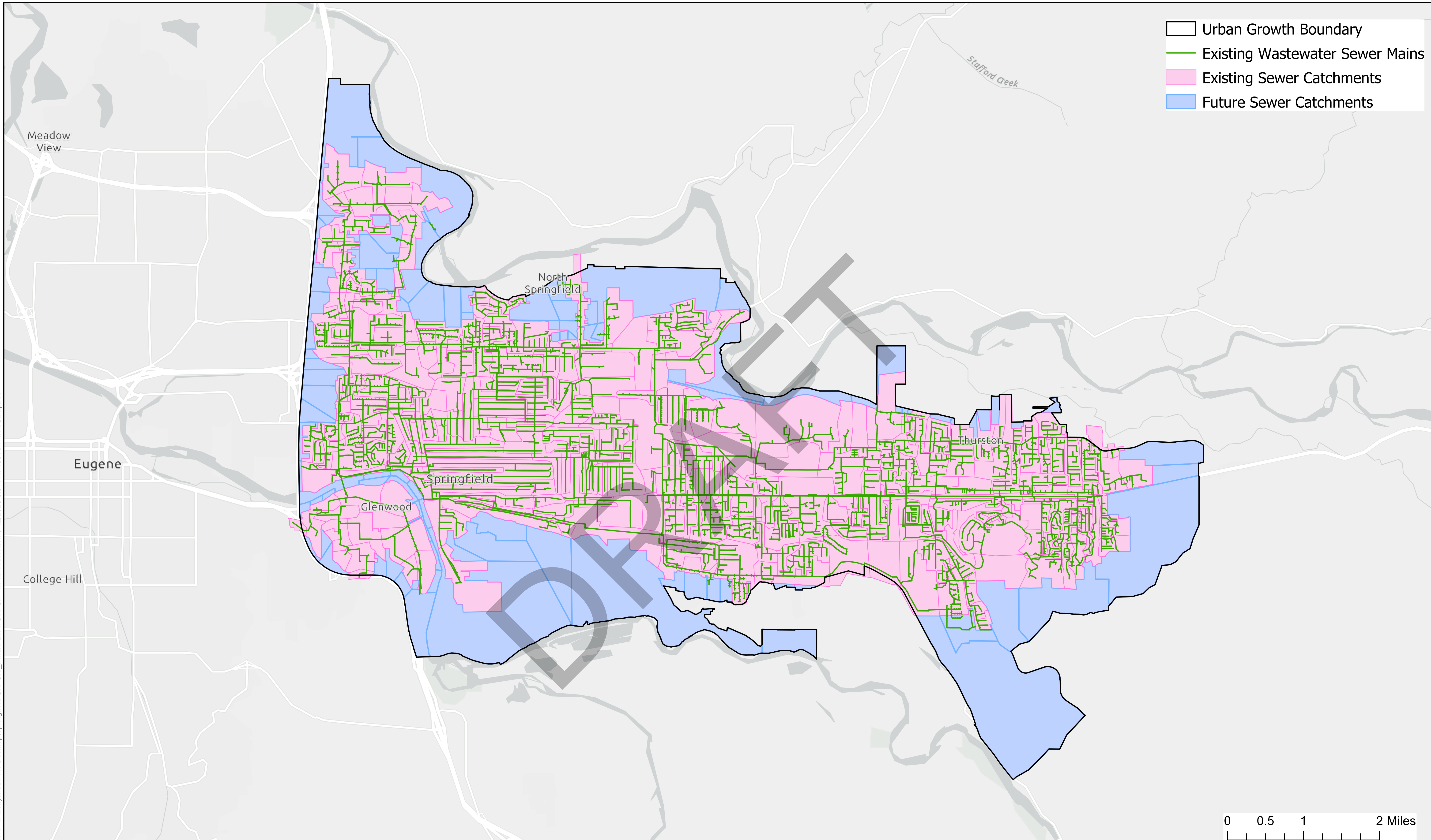
Table 6-1 | Estimated Households, Population, and Jobs within the Existing Wastewater Catchments

Year	Households	Population	Jobs
2020	24,107	60,992	25,766
2045	28,178	71,291	37,003

6.1.1.2 New Wastewater Catchments

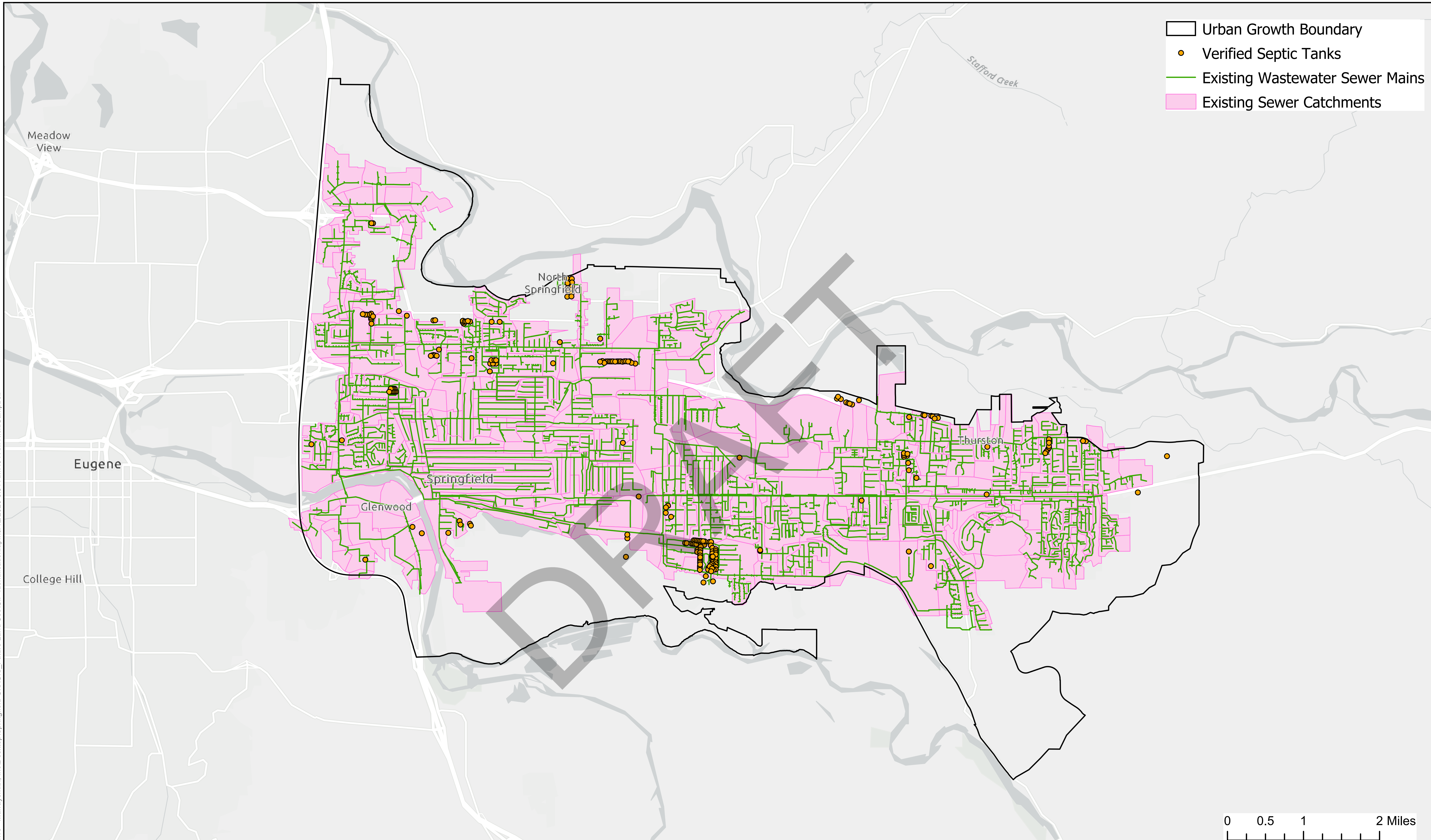
For areas within the UGB and outside of the existing wastewater collection service area, wastewater catchments were estimated based on topography, existing street layout, and known future development plans. The future conveyance within these new wastewater catchments were approximated using the TAZ data and the procedure outlined above. Each new wastewater catchment was manually assigned to an existing wastewater MH based on proximity, topography, street layout, and known future development plans. For each new wastewater catchment, a rate of 2,000 gpad was used for estimating I&I.

A map of the future wastewater catchments in the Springfield UGB and their proximity to the existing wastewater collection system and a table of the estimated number of households, population, and jobs for 2020 and 2045 in the future wastewater catchments outside the existing wastewater collection service areas can be found in **Figure 6-1** and **Table 6-2**, respectively.



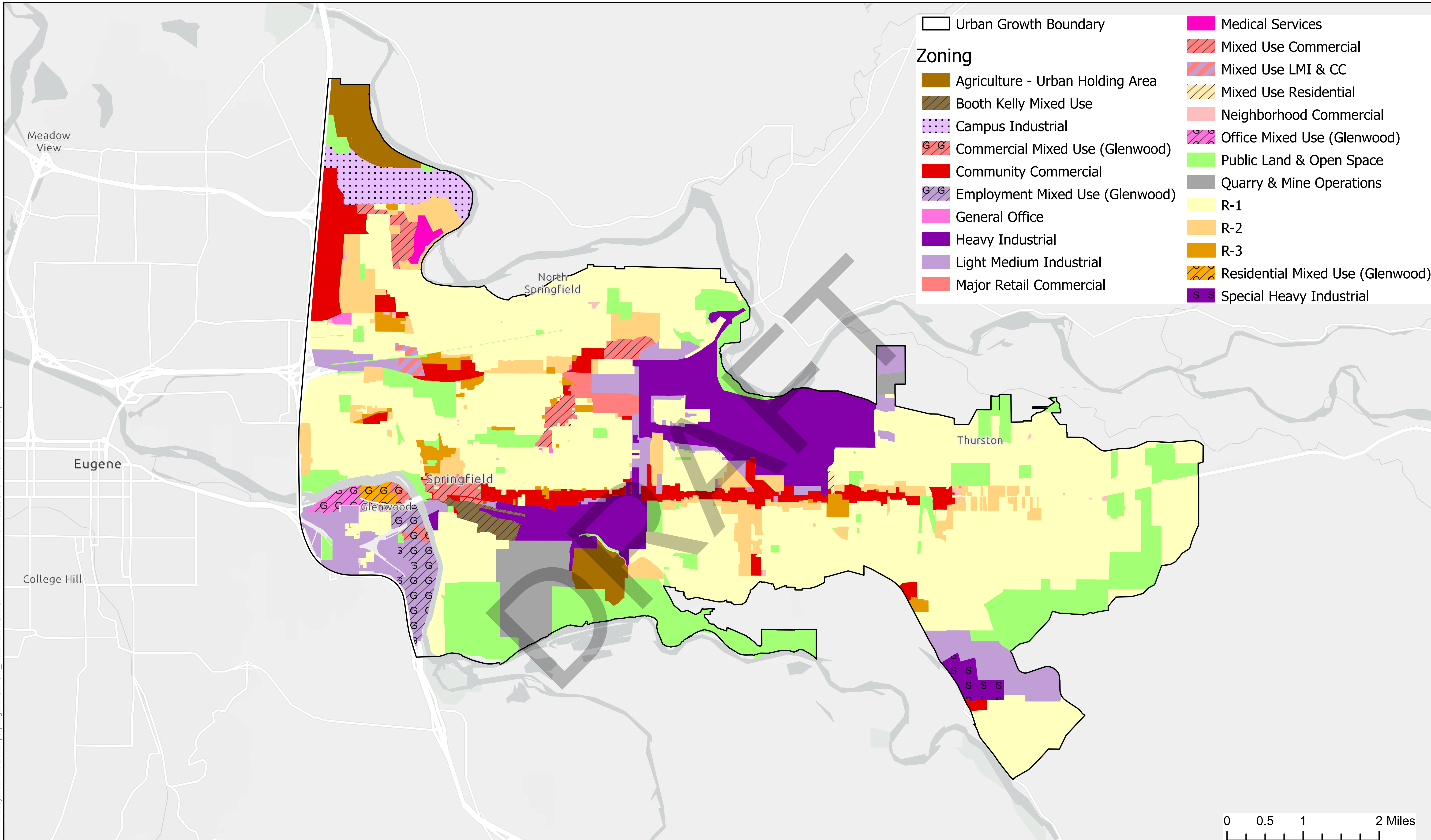
City of Springfield, OR
Wastewater Master Plan

Figure 6-1
Existing and Future Sewer Catchments in the UGB



City of Springfield, OR
Wastewater Master Plan

Figure 6-2
Verified Septic Tanks in the UGB

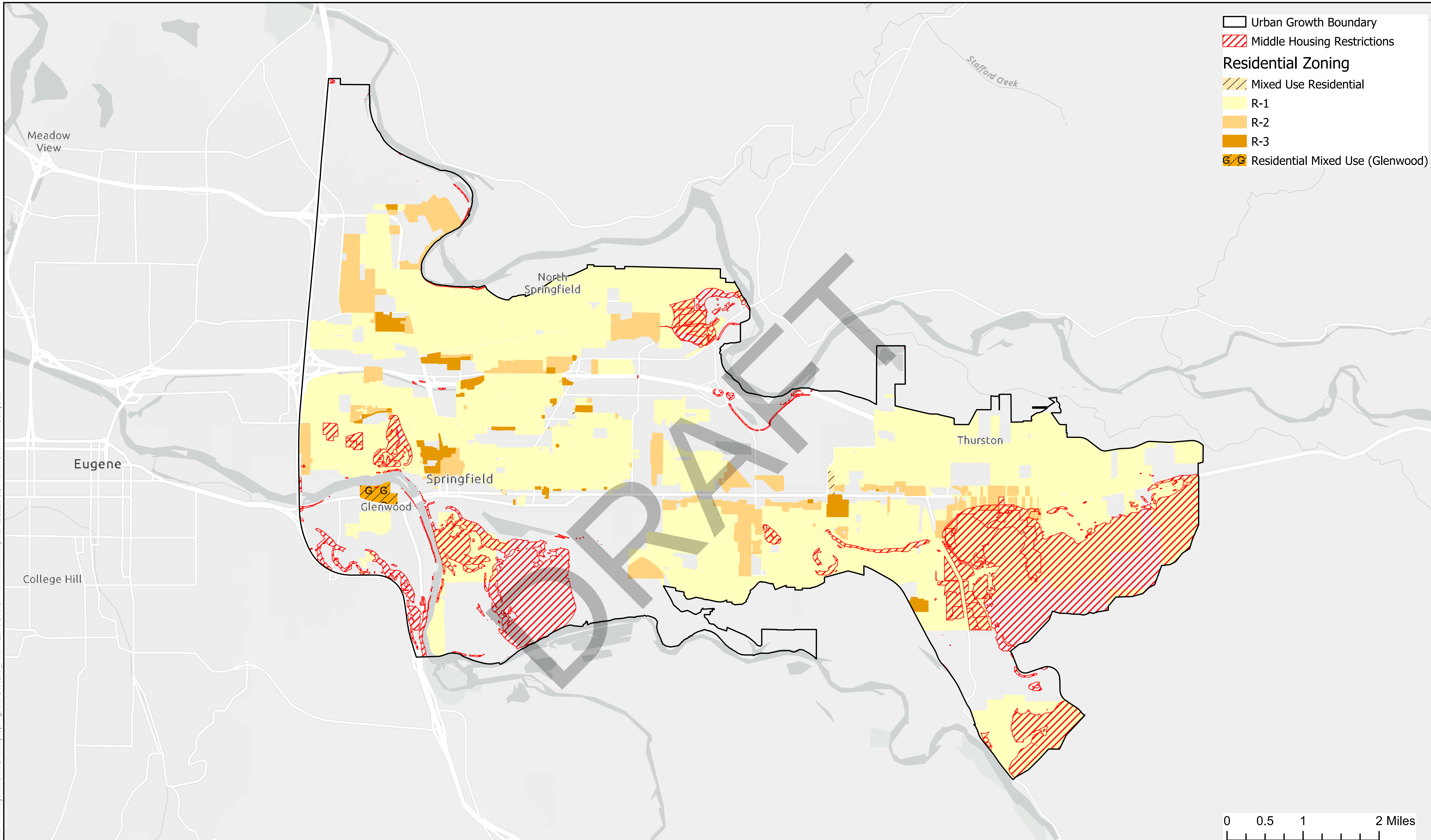


City of Springfield, OR
Wastewater Master Plan

Figure 6-3
City of Springfield
Existing Zoning

July 2023

22-3398



City of Springfield, OR
Wastewater Master Plan

Figure 6-4
Middle Housing Restrictions in Residential Zoning Areas

July 2023

22-3398

Table 6-2 | Estimated Households, Population, and Jobs within New Wastewater Catchments

Year	Households	Population	Jobs
2020	3,204	8,106	5,877
2045	3,926	9,933	9,212

6.1.2 Verified Households Using Septic Tanks

Within the existing wastewater catchments and portions of the UGB there are approximately 219 verified households that are not connected to the City's wastewater collection system, and instead are serviced by septic tanks. The City has a current practice in line with Oregon Administrative Rule (OAR) 340-071-0160 for connecting to the City's wastewater collection system unannexed dwellings or other establishments within the UGB currently serviced by septic systems. For planning purposes, the WWMP considers that the entirety of the UGB currently serviced by septic systems will be connected to the wastewater collection system within the planning horizon. To provide a conservative estimate of future wastewater conveyance within the existing wastewater collection system, it has been assumed that 100% of these verified septic tanks will be decommissioned and that all the associated households will be connected into the City's wastewater collection system by 2045.

To understand which sections of the collection system will be impacted by the connection of households with verified septic tanks, each verified septic tank was manually assigned to an existing wastewater MH based on proximity, topography, and known future development plans. A map of the verified septic tanks can be found in **Figure 6-2**.

6.1.3 Impacts from Oregon House Bill 2001

The Oregon State Legislature (State) passed House Bill 2001 in 2019, which expands the ability of property owners to construct middle housing in areas with residential zoning that allows single-unit dwellings. Middle housing includes:

- Duplexes
- Triplexes
- Fourplexes
- Cottage clusters
- Townhomes

With the passage of HB 2001, cities in Oregon with a population greater than 25,000, including the City of Springfield, were required to allow middle housing in residential zones which permitted single-unit homes by June 30, 2022. For the purposes of the WWMP update, this land use analysis was based on City of Springfield Zoning. The areas zoned R-1 were used to estimate the HB 2001 impacts. A map of the existing Zoning that is used to help predict future conditions and a breakdown of the percent area of each zoning district within the Springfield UGB can be found in **Figure 6-3** and **Table 6-3**, respectively.

Table 6-3 | Existing City Zoning in Springfield UGB

Rank	Plan Designation	Area (acres)
1	R-1 (Low Density Residential)	7,197
2	Public Land and Open Space	2,026
3	Heavy Industrial	1,375
4	Light Medium Industrial	844
5	Community Commercial	778
6	R-2 (Medium Density Residential)	770
7	Quarry and Mine Operations	385
8	Agriculture – Urban Holding Area	335
9	Campus Industrial	305
10	Mixed Use Commercial	243
11	R-3 (High Density Residential)	157

Historically, the City had some limitations on allowing middle housing types in areas that are currently zoned R-1. With the amendments to the Springfield Development Code to explicitly allow middle housing, there will be a gradual increase in middle housing in the R-1 zoning district, resulting in a greater population density in these areas than had been previously projected[4]. As increases in population density are correlated to increases in wastewater flows, it is expected that HB 2001 will subsequently lead to increased wastewater flow per parcel or lot in R-1 neighborhoods.

During the period between the passage of HB 2001 and the June 30, 2022 deadline for its implementation by large cities, the State allowed for cities to either adopt a Middle Housing Model Code produced by the State or to produce their own code that meets the minimum requirements of HB 2001. The updated Springfield Development Code that conforms with the requirements outlined by HB 2001 was adopted by the Springfield City Council on May 16, 2022, and co-adopted by the Lane County Board of County Commissioners on June 7, 2022.

However, some restrictions on housing density for R-1 areas still exist. For example, a minimum lot size must be met to construct certain types of middle housing, and market-rate multi-unit housing is generally not permitted. In addition, R-1 areas that are within the Hillside Development Overlay District (characterized by a slope that exceeds 15% or is above 650 feet of elevation) will limit the densities allowed. Some existing subdivisions have covenants prohibiting middle housing. Taken together, such areas make up approximately 16% of the total R-1 area within the UGB and have been excluded from any analysis involving the impact from HB 2001. **Figure 6-4** shows the R-1 areas within the City limits and the UGB where middle housing is now permitted with the passage of HB 2001 and the updated Springfield Development Code, as well as the areas within an R-1 area where middle housing is not anticipated to result in exceeding previously allowed densities.

To estimate the impact of HB 2001 on the wastewater system, the City decided to include a 3% growth in population density for the R-1 areas within the City limits and the UGB where middle housing is permitted. Taking into account increased densities in R-1 zoned areas and properties on septic systems helps to identify capacity limitations within specific wastewater catchment areas. It also results in the City planning

[4] HB 2001 middle housing impacts were not considered in the 2045 household projections for the TAZ analysis.

for more residents than what the Population Research Center forecasts for 2045. Instead of planning for 76,604[5] people, the City is planning its wastewater system to accommodate 83,657 people.

This higher number closely aligns with the population forecast on which Springfield's housing need is based. When undertaking the Residential Land and Housing Needs Analysis, adopted in 2011, the Population Research Center's forecast population for Springfield in 2030 was 81,608. Thus, the Wastewater Master Plan is consistent with the 2030 Comprehensive Plan projected growth estimates.

6.2 Future Condition Analysis Scenario

To provide a comprehensive analysis of the wastewater flow projections within the City's wastewater conveyance system, four conditions were used to build the future condition scenario for the City's WWMP. The four conditions modeled as one scenario are listed below:

- Impacts of development and redevelopment based on projected population and employment growth within the existing wastewater system.
- Impacts of development and redevelopment based on projected population and employment growth outside of the exiting wastewater system but within the UGB and an estimation of I&I in these areas.
- Impact to the City wastewater system based on the connection of verified septic tanks within existing wastewater catchments and within the UGB.
- Impacts from the assumed 3% growth in population density in allowed R-1 zoning areas due to HB 2001.

[5] The Population Research Center's 2021 forecast for the Springfield UGB in 2045 is 76,604. LCOG used a prior forecast of 76,660 for 2045 when creating the Regional Transportation Plan model.

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CHAPTER 7

Wastewater Flow Projections

This chapter summarizes the results of the wastewater loading analysis and forecasts future wastewater flow. The forecasts consider existing customers, future customers, and higher densification due to HB 2001. The flow projections developed for this WWMP are based on flow factors derived from flow monitoring data and the City's land use database.

7.1 Wastewater Flow Components

7.1.1 Dry Weather Flow

The DWF are comprised of base wastewater flow (contribution from users) and non-rainfall related groundwater infiltration (GWI). The City has an on-going flow monitoring program which collects measured flow data and the corresponding rainfall. During dry weather, the flow monitoring measurements show that for most of the system, GWI is negligible in the City's service area. Therefore, the hydraulic model was set up using the base wastewater flow only.

The base wastewater flow component was estimated using the measured flow data collected during the monitoring program. A dry weather average daily flow as well as average flow pattern was calculated for each meter and applied to the contributing wastewater catchment.

The future DWF was calculated based on a ratio of current equivalent population to the projected equivalent population for the 20-year planning horizon. The equivalent populations for each planning horizon was calculated from the TAZ data as described in **Section 6.1.1**.

- An equivalent population for each of the existing wastewater catchments was calculated using the current condition TAZ data.
- The average dry weather daily flow was divided by the 2020 equivalent population to determine a unit flow factor.
- An equivalent population for each of the existing and future wastewater catchments was calculated using the 20-year planning horizon TAZ data.
- The 20-year planning horizon equivalent population was multiplied by the unit flow factor to calculate the 20-year planning horizon average dry weather daily flow.
- The current average flow pattern for each existing wastewater catchment was used for future flow pattern in the existing wastewater catchments.
- An estimate of 100 gallons per day per equivalent population was used for calculating future flow in the new wastewater catchments.
- The average of all the flow patterns was calculated and applied as the future flow pattern for the new wastewater catchments.

7.1.2 Wet Weather Flow

The wet weather component of the wastewater flow is generated by storm events. To meet the required hydraulic criteria, the system must be able to collect and convey the peak wet weather flow contribution generated by the winter 5-year, 24-hour duration storm event.

While the City's system is intended to convey wastewater flows only and is working to reduce I&I, precipitation does enter the system in a number of ways, such as MH lids, cracks in pipes and illicit stormwater connections; this requires the system to be sized to convey some wet weather flows.

The hydraulic modeling conducted for this WWMP evaluated two different wet weather responses based on historical flow monitoring at various locations in the system. The hydrologic and hydraulic model was calibrated and validated to measured flow data for the following storm events:

- January 15 – 29, 2019
- October 16 – 27, 2017
- November 12 – 22, 2017
- April 1 – 14, 2018

The model hydrologic parameters used in the model calibration and validation were used for the existing condition and future condition wet weather flow predictions. This means the rainfall applied to the system in the calibration period behaves the same in the existing and future conditions.

7.1.3 Total Peak Wastewater Flow

Total peak wastewater flow is calculated by combining the maximum day DWF with the wet weather flow derived from a modeled design storm with the peak of the storm occurring at the same time as the peak of the dry weather component. The flow conditions also used a Hot Start (discussed in **Section 5.4**) that applies base flow, DWF, and RDII, based on the January 2019 measured rainfall event and subsequent sanitary wastewater collection system flow response. The Hot Start uses the results from the end of the January 2019 storm event to set the groundwater elevation, I&I flow, DWF, and water levels in the collection system.

By modeling peak wastewater flow in this manner rather than relying directly on peak flow data from field measurements, the collection system model can simulate severe, but potentially real, operating conditions. The capacity of the collection system is then evaluated under those worst-case conditions. **Figure 7-1** depicts typical sources of I&I and **Figure 7-2** shows a generic schematic of the wastewater flow components.

Figure 7-1 | Typical Sources of Infiltration and Inflow

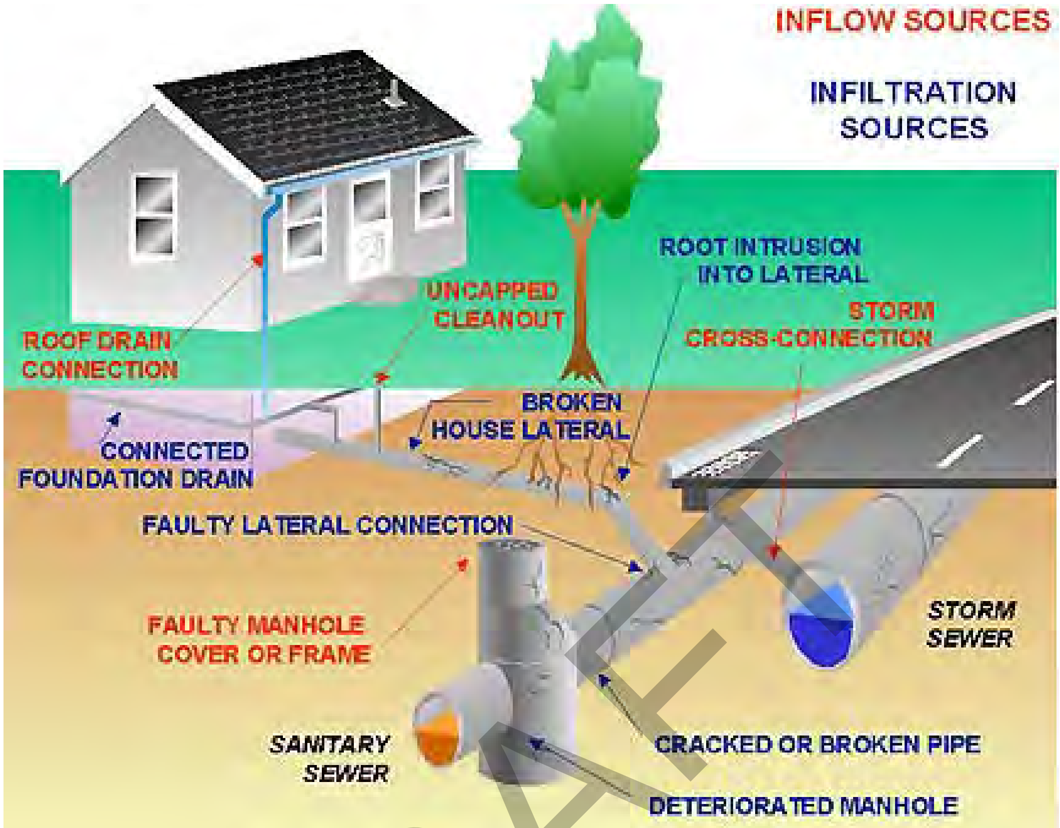
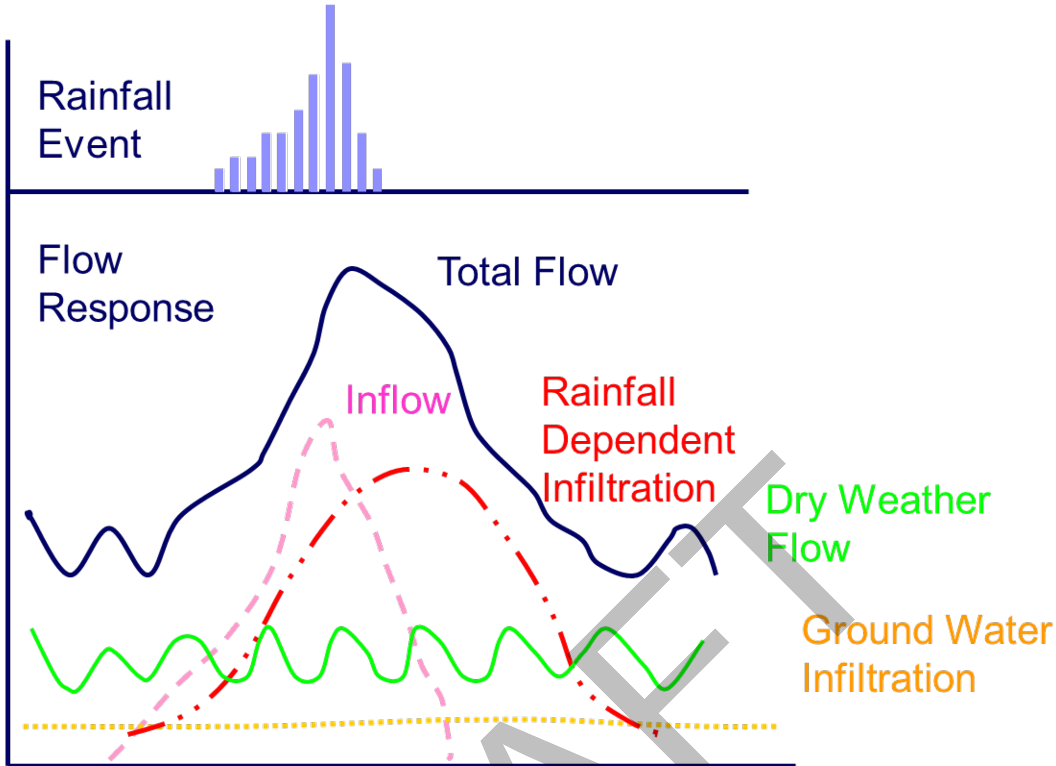


Image courtesy of King County, WA. Used with permission.

Figure 7-2 | Schematic of Wastewater Flow Components



CHAPTER 8

Collection System Evaluation

8.1 Planning Scenarios

This chapter summarizes the methodology and results of the wastewater collection system analysis. The existing wastewater system was evaluated for existing and future conditions both during DWF and wet weather flow to identify capacity restrictions. The following planning horizons were used:

- Existing Condition – Year 2020
- Future Condition – Year 2045

8.2 Model Development

A collection system capacity analysis was performed using MIKE+ modeling software. This analysis focused on the primary wastewater mains, i.e., the skeleton model (**Figure 4-2**). The analysis of the collection system consisted of verifying that piping and pump stations have capacity to carry flows for the existing (2020) and future (2045) design periods. The goal of the analysis was to identify any areas where wastewater surcharging has potential to occur during the estimated peak hour 5-year, 24-hour rain event for the design periods. The design storm used in the model is discussed in **Section 5.4**. The future 2045 planning horizon is discussed in **Chapter 6**, and 2045 flow rates were generated by applying unit flow factors discussed in **Sections 6.1.1.2** and **7.1.1**.

Existing flow and piping information, including pipe size, material and inverts were obtained from the prior hydraulic model (see **Chapter 4**) provided by the City. MH rim and invert elevations were also included in the model.

8.3 Collection System Capacity Analysis

The wastewater system analysis includes pipeline, pump station and force main capacity evaluations. This section describes the criteria used in the evaluation and the results of the analysis under existing and future conditions.

8.3.1 Deficiency Definition

Guidelines for pipeline and pump station design criteria are outlined in **Chapter 5**. The following was used to determine if a pipe or pump station is undersized:

8.3.1.1 Pipelines

Problem areas in the gravity collection piping were identified by using the water surface level in the piping compared to the pipe diameter, or d/D ratio. Where flows exceed a d/D of 0.75, the piping was identified for further analysis to determine the cause. The maximum flow (q) versus capacity of the piping (Q) was also analyzed to determine if the piping is capacity limited or if backwater effect[6] is occurring from a

[6] Rise in water surface elevation caused by an obstruction or constriction downstream

downstream condition causing the high d/D. If the q/Q is greater than 0.75 then the pipe was identified as capacity limited.

8.3.1.2 Pump Stations

Pump stations that exceed the firm capacity (largest pump out of service) were identified as a deficient. In addition, velocities for the pump station force mains were evaluated to determine whether they exceeded a maximum value of 8 fps[7].

8.3.2 Existing Condition Deficiencies

8.3.2.1 Mid-Springfield Basin

A 910-foot section of 10-inch gravity piping located along Olympic Street from MH 20977 to 20969 is capacity limited based on existing peak flows and will require an upgrade.

8.3.2.2 Gateway Basin

A 610-foot section of 10-inch gravity piping is backing up due to a connection to a 42-inch diameter trunk without a drop connection[8]. City staff indicated there may be a suspected stormwater cross-connection in the area that may be causing issues, as well.

The existing peak flows modeled at the Deadmond Ferry Pump Station is 1.4 million gallons per day (MGD), which exceeds the 1.2 MGD firm capacity of the pump station.

8.3.2.3 Glenwood Basin

The Nugget Way Pump Station was modeled with existing peak flows at 1.2 MGD, which exceeds the 0.9 MGD firm capacity of the pump station. The pump station was identified as deficient in the 2008 WWMP.

The Glenwood Pump Station was modeled with existing peak flows at 6.2 MGD, which exceeds the 5 MGD firm capacity of the pump station. The pump station was identified as deficient in the 2008 WWMP; however, this pump station is owned by the MWMC and will not be included as a capital improvement project in this WWMP.

8.3.2.4 North Springfield Basin

A 1,900-foot section of 10-inch gravity pipeline located along Marcola Road near Kingsford Manufacturing is identified as capacity limited and will require an upgrade from MH 21059 to 21063.

A 1,100-foot section of 12-inch gravity pipeline located north of the OR 126 interchange at Mohawk Boulevard is identified as capacity limited and will require an upgrade from MH 21610 to 21618. This deficiency was also identified in the 2008 WWMP. Southeast of the interchange another capacity-limited pipe about 650 feet long was identified from MH 21523 to 21526.

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[7] As recommended by United States Environmental Protection Agency and Oregon Department of Environmental Quality Pump Station Standards

[8] A drop connection manhole is one that is positioned where a sudden drop in the elevation of pipelines occurs. The incoming pipe is higher than the outgoing pipe.

8.3.3 Future Condition Deficiencies

8.3.3.1 South Springfield Basin

Approximately 800 feet of 12-inch polyvinyl chloride (PVC) gravity pipeline along South 2nd Street, south of OR 126, from MH 665196 to 665216 will need to be upgraded to meet future peak flows.

8.3.3.2 Thurston Basin

A 5,180-foot section of 12-to-18-inch gravity pipeline located along OR 126 between 60th Place and South 71st Street from MH 24304 to 25041 is identified as capacity limited based on future peak flows and will require an upgrade. This deficiency was identified in the 2008 WWMP.

8.3.3.3 Gateway Basin

Approximately 920 feet of 15-inch gravity pipeline along Gateway Street from MH 22309 to 23277 will need to be upgraded to meet future peak flows.

8.4 Additional Modeling

Based on input from City staff, there are three areas that will require additional modeling and investigation.

8.4.1 Downtown Basin

The City has received complaints regarding several properties on West D Street having service laterals crossing private property to West C Street. City staff indicated that there are known issues in the area, and the piping is not well defined between Kelly Boulevard, Pioneer Parkway West, E Street, and C Street. The area will need to be investigated further and the model updated to determine if a pipeline on West D Street is the best option.

8.4.2 Mid-Springfield Basin

The area from G Street to D Street and 20th Street to 28th Street is not well defined in the wastewater collection system hydraulic model. The drainage basin for the 21st Street Pump Station (at E Street and 21st Street) serves as an overflow for a 15-inch mainline during storm events and needs to be investigated and updated in the model.

8.4.3 Gateway Basin

The pipe inlet to the Harlow Pump Station has some backwater issues due to the pump station operation in the model. Also, an 8-inch pipe (Pipe No. 22949_26230) on Don Street, located north of Lochaven Avenue, is shown in the model connected between an 18-inch pipe and a 48-inch pipe. These areas need to be investigated further, and the model would be updated to accurately reflect the system.

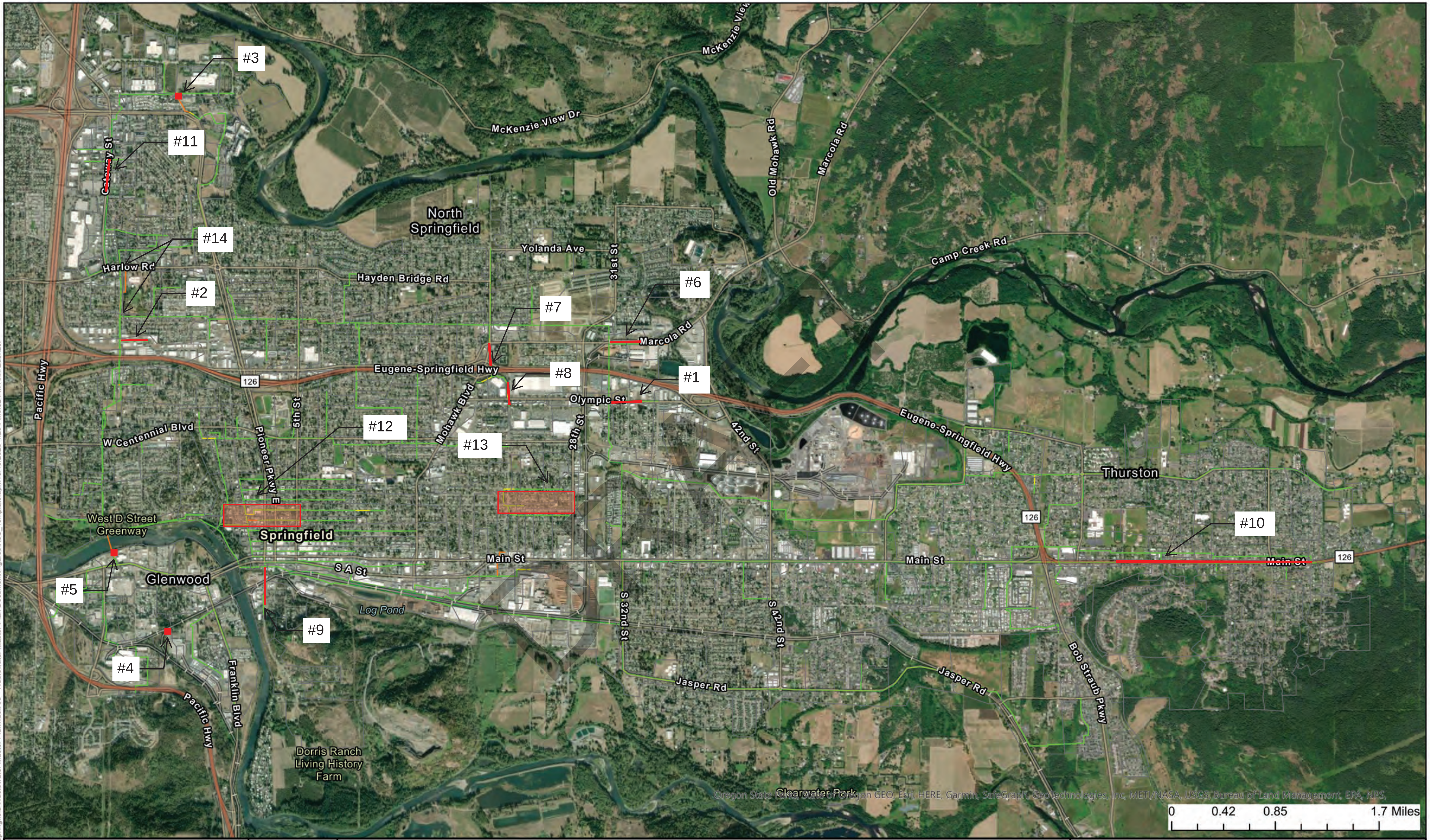
8.5 Summary of Deficiencies

Table 8-1 summarizes the capacity limited areas identified in the model. The corresponding capital improvement program (CIP) number is listed to help with tracking in **Chapter 10** – Capital Improvement Projects, which discusses the CIPs. **Figure 8-1** shows the locations based on the deficiency identification (ID) number.

Table 8-1 | Wastewater Collection System Deficiencies

Deficiency ID	CIP	Type	Dia. (in)	Length (ft)	Description	Existing	Year 2045
1	Mid-Springfield #3	Gravity Main	10	910	Gravity pipeline along Olympic Street from MH 20977 to 20969.	Yes	Yes
2	Gateway #4	Gravity Main	10	610	Drop connection needed for tie-in with 42-inch dia. piping at Node 26217 at Shelley Street and Don Street Suspected cross-connection in this area causing capacity issues.	Yes	Yes
3	Deadmond Ferry	Pump Station	-	-	Deadmond Ferry Pump Station	Yes	Yes
4	Nugget Way	Pump Station	-	-	Nugget Way Pump Station	Yes	Yes
5	N/A	Pump Station	-	-	Glenwood Pump Station[a]	Yes	Yes
6	North Springfield #2	Gravity Main	10	1900	Gravity pipeline along Marcola Road by Kingsford Manufacturing from MH 21059 to 21063.	Yes	Yes
7	North Springfield #1b	Gravity Main	12	1100	Gravity pipeline north of interchange at OR 126 and Mohawk Boulevard from MH 21610 to 21618.	Yes	Yes
8	North Springfield #1a	Gravity Main	10	650	Gravity pipeline in shopping center area to the southeast of interchange at OR 126 and Mohawk Boulevard from MH 21523 to 21526.	Yes	Yes
9	South Springfield #1	Gravity Main	12	800	Gravity pipeline along S 2nd Street south of OR 126 from MH 665196 to 665216.	No	Yes
10	Thurston #1	Gravity Main	12-18	5180	Gravity pipeline along OR 126 between 60th Place and S 71st Street from MH 24304 to 25041.	No	Yes
11	Gateway #2	Gravity Main	15	920	Gravity pipeline along Gateway Street from MH 22309 to 23277.	No	Yes
12	Downtown #4	Additional modeling/ planning.	-	-	Properties on W D Street have service laterals crossing private property to W C Street. Additional investigation and model update for wastewater basin between Kelly Boulevard & Pioneer Parkway W and E Street & C Street	Yes	N/A
13	Mid-Springfield and 21st PS	Additional modeling/ planning.	-	-	Additional investigation and model update for wastewater basin from G Street to D Street and 20th Street to 28th Street. Focus on drainage basin for pump station at E Street and 21st Street	Yes	N/A
14	Gateway #1	Additional modeling/ planning.	-	-	Additional investigation and model update for Harlow Road PS influent pipe and 8-inch dia. pipe section (Pipe No. 22949_26230) on Don Street located north of Lochaven Avenue.	Yes	N/A

[a] Regional facility owned by MWMC.



City of Springfield, OR
Wastewater Master Plan

Figure 8-1
Sewer Collection System Deficiencies Map

8.6 2008 Wastewater Master Plan for Springfield

The 2008 WWMP identified deficiencies in the collection system and possible future extensions. The 2008 WWMP provided recommendations for improvements to the existing collection system and for future extensions as summarized in **Table 8-2** below.

Table 8-2 | Summary of Recommended Wastewater Collection System Improvements from CH2M Hill 2008 Master Plan

CH2M Project ID	Timeline	Status	Type	Description	Comments
1	Existing	Done	Gravity Trunk Upgrade	Add new parallel 24-inch line from East Springfield Interceptor (near 10th and T Street) to MH 665372 on Centennial Blvd east of 13th.	
2	Existing	Not done	Gravity Main Upgrade	Upgrade gravity line from 12-inch to 21-inch east of 7th Street from MH 21459 to 21468	Current model does not show any issues.
3	Existing	Not done	Gravity Main Upgrade	Upgrade gravity line from 12-inch to 18-inch north of OR 126 interchange with Mohawk Blvd.	Identified as a project in this Plan (North Springfield #1a).
4	Existing	Not done	Gravity Main Upgrade	Upgrade gravity line from 10-inch to 12-inch north of J St from MH 21482 to 21402. Crosses Mohawk Blvd.	Current model does not show any issues.
5	Existing	Not done	Gravity Main Upgrade	Upgrade gravity line from 15-inch to 24-inch located north of E Street from 14th to 19th. Also, north on 14th to MH north of Parker Street From MH 21232 to 21494.	Pipeline is currently not in model. Identified as an area for additional modeling and investigation in this Plan (Mid Springfield 1&2).
6	Existing	Not done	Gravity Main Upgrade	Upgrade gravity line from 10-inch to 15-inch located in parking lot of logging yard and A Street from MH 20949 to 22126.	This was a project (Mid Springfield 4) but was moved to a watchlist since d/D was 0.78 for future flows.
7	Existing	Not done	-	Valve and weir adjustment in flow vault on S 32nd and Main Street reconfigured to prevent flow from going north. Divert all flow south.	Operations &Maintenance
8	Existing	Not done	Gravity Main Upgrade	Upgrade gravity main from 10-inch to 15-inch located on S 41st Street between MH 21626 and 21354.	Current model does not show any issues.
9	Existing	Not done	System Upgrade. New bypass	New 15-inch wet weather bypass from main at Thurston and 58th Street south on 58th to Main Street, then along Main Street to the west crossing Bob Straub Hwy ending at S 54th Street.	Current model does not show any issues on the Thurston Rd main that would require a bypass.
10	Existing	Not done	Gravity Main Upgrade	Upgrade pipeline from 15-/18-inch to 24-inch on Main Street from S 59th Street to 66th Street	Identified as part of a project in this Plan (Thurston #1).

CH2M Project ID	Timeline	Status	Type	Description	Comments
11	Existing	Not done	Gravity Main Upgrade	Upgrade pipeline from 12-inch to 15-inch north of Main Street from 66th Street to 68th Street (MH 24359 to 24624).	Current model does not show any issues.
12	Existing	Not done	Gravity Main Upgrade	Upgrade pipeline from 10-inch to 12-inch north of Main Street at the east end of A Street (MH 25458 to 24010).	Current model does not show any issues.
Rehab for I&I Reduction	Existing	Part of CMOM program.	Rehab	All rehab in Basin SN 22 (see figure). Will complete existing rehab work listed in the 2001 Wet Weather Flow Management Plan (WWFMP).	2001 WWFMP was phased out in Jan 2010 and has been replaced with CMOM program.
Nugget Way PS[a]	Existing	Not done	Pump Station Upgrade	Upgrade pump station from 0.9 MGD (640 gpm) firm capacity to 1.3 MGD (910 gpm).	Identified as a project in this Plan.
Hayden Lo PS	Existing	Not done	Pump Station Upgrade	Upgrade pump station from 0.55 MGD (380 gpm) firm capacity to 0.71 MGD (490 gpm).	Pump station information sheet lists firm capacity at 0.42 MGD.
River Glen PS	Existing	Not done	Pump Station Upgrade	Upgrade pump station from 0.55 MGD (380 gpm) firm capacity to 0.96 MGD (660 gpm).	Pump station information sheet lists firm capacity at 0.7 MGD.
13	Future	Not done	Gravity Main Upgrade	Upgrade pipeline from 12-inch to 18-inch on Main Street from S 66th Street to 70th Street	Identified as part of a project in this Plan (Thurston #1).
14	Future	Not done	Gravity Main Upgrade	Upgrade pipeline from 10-inch to 12-inch north of Main Street at the east end of A Street (MH 24010 to 24091)	Current model does not show any issues.
Rehab for I&I Reduction	Future	Part of CMOM program.	Rehab	22.6k ft in SN19, 7k feet in SN48, 1.5k feet in SN49. This plus reduction due to pipe improvements completes the future rehab listed in the 2001 WWFMP.	2001 WWFMP was phased out in Jan 2010 and has been replaced with CMOM program.
Harbor Drive	Future	Not done	System Extension	Service requirements: 1) new Harbor Drive PS equipped with 2 pumps each with 145 gpm capacity. 2) 134 ft of 5-inch to extend existing 5-inch dry pipe force main 3) 7684 ft of 8-inch pipe to service entire neighborhood.	High potential for part of future service area. Identified as a project for this Plan.
Jasper Road	Future	Partially done	System Extension	Extends system along Jasper Road to allow for the decommissioning of Lucerne Meadows and Golden Terrace PSs. Service requirements: 1) 2581 ft of 10- inch pipe, 2) 3395 ft of 12-inch pipe, and 3) 17016 feet of 21-inch pipe.	Two phases completed (Approx 9200'). Third phase scheduled to be constructed in 2024. Phase 3 consists of installing 5,280 fee of 18 to 24 inch diameter pipeline along Jasper Road to the south side of Bob Straub Parkway near Brand S Rd.

CH2M Project ID	Timeline	Status	Type	Description	Comments
Franklin Blvd	Future	Done	System Extension	Extends the system from the existing 30-inch south along Franklin Boulevard Service requirements: 1) 2411 ft of 8-inch pipe, and 2) 3868 ft of 15-inch pipe.	Approx. 4,100 feet of 18-inch completed. Ends near UGB.
Thurston Rd	Future	Not done	System Extension	Extends the system from the existing 15-inch east along Thurston Road. Service requirements are 3882 ft of 8-inch pipe.	Low potential to occur during planning period.
McKenzie Hwy	Future	Not done	System Extension	Extends the system from the existing 21-inch east along McKenzie Highway. Service requirements: 1) 1924 ft of 10-inch pipe, and 2) 1983 ft of 12-inch pipe.	Low potential to occur during planning period.
Vera Area	Future	Not done	System Extension	Services the development east of the new Vera pump station. Service requirements: 1924 ft of 10- inch pipe and 1983 ft of 12-inch pipe	High potential for part of future service area. Identified as a project for this Plan.
Peace Health/ River-bend PS	Future	Not done	System Extension	Pump station designed as part of the PeaceHealth/Riverbend Campus Development.	High potential for part of future service area. Identified as a project for this Plan.

[a] Project was not completed. However, an I&I issue found at an upstream MH was identified and resolved. Since then, the O&M staff have continued maintenance and monitoring at this site and have no concern. The site will continue to be monitored as future growth is the biggest driver for this recommendation.

8.7 Other Collection System Improvements

The City has completed or is in the process of completing a number of wastewater projects that are not listed in the 2008 WWMP. Many of these projects were related to completion of I&I elimination projects identified in the 2001 Wet Weather Flow Management Plan, others are sewer extension projects that are part of life cycle maintenance or expansion into unserved areas within the UGB. A summary of the projects is listed in **Table 8-3** below.

Table 8-3 | Summary of City of Springfield Wastewater Projects Completed or Near Completed

City Project No.	City Project Title	Year Completed	Description
P21185	70th Street Wastewater Basin Rehabilitation	Design in progress	See **Figure 8-2**.
P21186	72nd Street Wastewater Basin Rehabilitation	Design in progress	See **Figure 8-2**.
P21181	S 37th Street, S 38th Street, Osage Street, and Janus Street Pipeline Extension	Under Construction	This project involves installing 2,650 feet of 8-inch wastewater line extensions in four locations to make service available to lots along S 37th Street, S 38th Street, Osage Street/S 40thPlace, and Janus Street. See **Figure 8-3**.
P21166	South 28th Street Wastewater Pipe Extension	2022	Project consisted of an extension of a 12-inch gravity wastewater pipeline along S 28th Street from F Street south to the city limits (1,360 ft).

City Project No.	City Project Title	Year Completed	Description
P21170	42nd Street to 48th Street Wastewater Pipe Rehabilitation	2022	This project involved 4450 feet of cured-in-place-pipe (CIPP) for a 27-inch concrete pipeline (Thurston trunk line) between 42nd and 48th Street starting near the intersection of E Street and 42nd Street.
P21171	Crest Lane Wastewater Pipe Extension	2020	No further information.
P21132	Wastewater Pipe Rehabilitation – C	2018	As part of the CMOM implementation, this project replaced 1,790 feet of 8-inch pipeline and 1,070 feet of 10-inch pipeline between 10th and 16th and D and E Streets.
P21133	Wastewater Pipe Rehabilitation – B	2018	As part of the CMOM implementation, this project replaced 2,660 feet of 10-inch pipeline between 10th and 16th and B and C Streets.
P21130	Wastewater Pipe Rehabilitation – A	2018	As part of the CMOM implementation, this project replaced 2,670 feet of 8-inch pipeline between 10th and 16th and A and B Streets.

Figure 8-2 | Map of 70th Street and 72nd Street Pipeline Rehabilitation

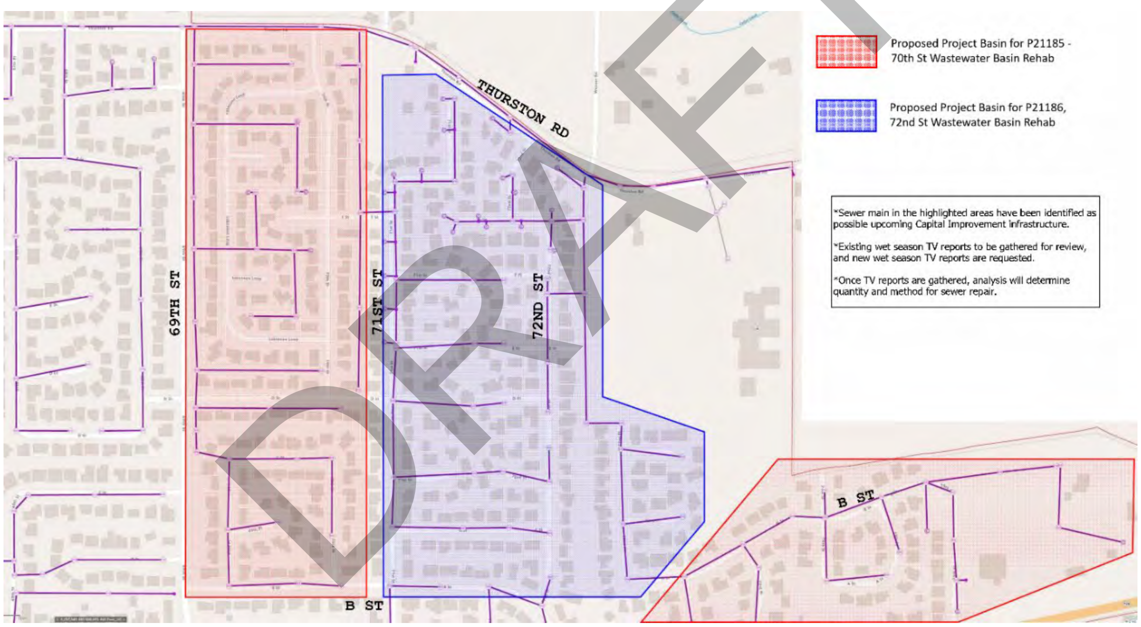


Figure 8-3 | Map S 37th Street, S 38th Street, Osage Street, and Janus Street Pipeline Extensions

CHAPTER 9

Recommended Improvements

This section of the WWMP discusses the recommended improvements for the City's wastewater collection system. These improvements address the collection system deficiencies from the model analysis discussed in **Chapter 8** for the existing (2020) and future (2045) peak flow conditions. In addition, projects identified in the 2008 Master Plan that have not yet been completed and are still a potential concern, are addressed. The projects are categorized as near term (0-5 years), intermediate term (6-10 years), and long term (11-20 years) timeframes based on the severity of the capacity restriction and input from City staff. New pipes have been sized to meet the 2045 peak design flows. The projects discussed below are listed in order of recommended priority and have been assigned an identifier for tracking. A summary and cost estimate of the projects is located in **Chapter 10**.

9.1 Near Term System Improvements (0-5 years)

9.1.1 South Springfield #1 Gravity Upgrade (Deficiency ID 9)

Within the past decade, the existing 8-inch main along S. 2nd Street was replaced and there is now a 12-inch collector. However, five sections of 12-inch **pipeline** along South 2nd Street have been identified as under capacity for future peak flows once the Harbor Drive pump station is built upstream of this pipe in 2025. Therefore, a new 15-inch pipeline 800 feet long will be required for the 2045 peak flows; however, an additional study should be done to size the upgrade for buildout conditions.

9.1.2 Mid-Springfield #3 Gravity Upgrade (Deficiency ID 1)

Three sections of 10-inch pipeline along Olympic Street have been identified as under capacity for existing and future condition peak flows. A new 12-inch pipe section 910 feet long will be required for the 2045 peak flows.

9.1.3 Gateway #4 Gravity Upgrade (Deficiency ID 2)

A new drop connection is required at the MH located at Shelley and Don Street (MH #26217) for the 10-inch pipeline to the east on Shelley Street. This pipeline connects to a 42-inch trunk at the same invert elevation and can back up from the trunk flows. The connection can be raised approximately 4-feet to an elevation of 431.0 feet, and the line regraded to MH# 22870 (610 feet) to maintain adequate slope for future peak flows. The rim of MH# 26217 is shown as 437.97 feet in the City's GIS system, which should allow enough cover at the new pipe elevation.

9.1.4 North Springfield #2 Gravity Upgrade (Deficiency ID 6)

Four sections of 10-inch pipeline along Marcola Road have been identified as under capacity for existing and future peak flows. A new 12-inch pipe section 1,900 feet long will be required for the 2045 peak flows. According to City staff the area is likely to be at full buildout already and not much additional future growth is expected to occur.

9.1.5 Mid-Springfield and 21st Street Pump Station Additional Study (Deficiency ID 13)

The 21st Street Pump Station was identified as a potential project based on the model. Due to the complexity of the piping in this area and the effort required to map it, the model is missing a section of wastewater main line between E and F Streets that contribute significant flow within this catchment area. The absence of these flows from the model creates inaccuracies thus a separate study and a model update should be performed from G Street to D Street and 20th Street to 28th Street. Once the model update is complete, the pump station can be more accurately evaluated.

9.2 Intermediate Term System Improvements (6-10 years)

9.2.1 Downtown #4 Additional Study (Deficiency ID 12)

Due to problems in the area, including service laterals crossing residential properties, City staff would like to further evaluate and map the piping between Kelly Boulevard & Pioneer Parkway W and E Street & C Street. under a separate study. Once the model update is complete, a more accurate evaluation can occur to extend piping to better serve the existing properties.

9.2.2 Gateway #1 Additional Study (Deficiency ID 14)

The model shows the inlet piping to the Harlow Pump Station backing up from the pump station operating levels in the wetwell[9]. Also, a 10-foot section of 8-inch of piping between MH#'s 22949 and 26230 appears to be surcharging, but the configuration is questionable as it is shown as a connector between two large trunk pipelines. Further analysis should be conducted in these two areas and the model updated accordingly.

9.2.3 North Springfield #1b Gravity Upgrade (Deficiency ID 8)

Two sections of 10-inch pipeline located behind a shopping center southeast of the interchange at OR 126 and Mohawk Boulevard. have been identified as under capacity for existing and future condition peak flows. A new 12-inch pipe section 650 feet long will be required for the 2045 peak flows.

9.2.4 Harbor Drive Extension

A wastewater pipeline extension, including a pump station, was identified in the 2008 Master Plan to serve a future area located near Harbor Drive in the southwestern part of the UGB. The Harbor Drive Pump Station is programmed in the current CIP, and funding to begin planning and design is expected to be included in the Fiscal Year (FY) 2025-26 Capital Budget with construction anticipated to follow in FY 2026-26. The pump station will be located at the north end of Harbor Drive near Dorris Street. This project includes a 134-foot connection to an existing dry 5-inch force main. The existing force main discharges to MH # 24898 on S 2nd Street. The project also includes 7,684 feet of 8-inch gravity pipe to help serve the area as development progresses.

[9] Separate basin that temporarily holds the wastewater located adjacent to the pump room

9.3 Long-Term System Improvements (11-20 years)

9.3.1 Thurston #1 Gravity Upgrade (Deficiency ID 10)

Fifteen sections of 12 to 18-inch pipeline located along OR 126 have been identified as under capacity for future peak flows. A new 15-inch pipe section 2,230 feet long, 18-inch section 2,150 feet long, and 21-inch section 800 feet long will be required for the 2045 peak flows. This project was also identified in two instances (Project ID No. 10 and 13) as a project in the 2008 Master Plan. According to City staff, construction could be difficult along the highway due to traffic volume. An alternative may be to upgrade the wastewater main along 'A' Street (parallel to the north) and divert flows to that line, but additional analysis would be required.

9.3.2 North Springfield #1a Gravity Upgrade (Deficiency ID 7)

Two sections of 12-inch pipeline located along Mohawk Boulevard. have been identified as under capacity for existing and future condition peak flows. A new 15-inch pipe section 1,110 feet long will be required for the 2045 peak flows. This project was also identified as a project in the 2008 WWMP (Project ID No. 3).

9.3.3 Gateway #2 Gravity Upgrade (Deficiency ID 11)

Four sections of 15-inch pipeline located along Gateway Street. have been identified as under capacity for future peak flows. A new 18-inch pipe section 920 feet long will be required for the 2045 peak flows.

9.3.4 North Springfield Trunk Extension

A pipeline extension was identified in the 2008 Master Plan to serve a future area including a number of existing houses located along Hayden Bridge Rd. in the north part of the UGB. This extension would connect to the Vera Street Pump Station. This project includes approximately 7,500 feet of 12-inch gravity pipe and 2,080 feet of 8-inch pipeline to help serve the area. This extension was originally identified in the 2008 Master Plan (Vera Area) and is still considered a potential project for this planning period.

9.4 Near Term Pump Station Improvements (0-5 years)

9.4.1 Deadmond Ferry Pump Station

The Deadmond Ferry Pump Station will require a firm capacity of 1,050 gallons per minute (gpm) in order to meet the peak flows for the existing and future conditions. The existing firm capacity of the pump station is 830 gpm. This project is considered a higher priority since City staff anticipate near term future growth in this area.

9.4.2 Nugget Way Pump Station

The Nugget Way Pump Station will require a firm capacity of 850 gpm in order to meet the peak flows for the existing and future conditions. The existing firm capacity of the pump station is 600 gpm. Growth is expected in the area. The rate of growth and flow impact should be monitored with flow monitoring.

9.5 Intermediate Term Pump Station Improvements (6-10 years)

9.5.1 River Glen Pump Station

The River Glen Pump Station was identified as a project in the 2008 WWMP. This pump station is not in the City's current model, so an updated capacity evaluation was not conducted. A model update should be done to determine whether this upgrade is still valid. Based on the prior plan, this pump station will require a firm capacity of 660 gpm in order to meet the peak flows modeled at that time. The existing firm capacity of the pump station is 490 gpm.

9.5.2 Hayden Lo Pump Station

The Hayden Lo Pump Station was identified as a project in the 2008 WWMP. This pump station is not in the City's current model, so an updated capacity evaluation was not conducted. A model update should be done to determine whether this upgrade is still required. Based on the prior plan, this pump station will require a firm capacity of 490 gpm in order to meet the peak flows modeled at that time. The existing firm capacity of the pump station is 290 gpm.

9.6 Long Term Pump Station Improvements (11-20 years)

9.6.1 PeaceHealth Pump Station Service Extension

The PeaceHealth Pump Station service extension was identified as a project in the 2008 WWMP. This extension would serve a future area located at the east end of Deadmond Ferry Road within the UGB as part of the PeaceHealth Riverbend campus development. Calculating flow from the potential contributing area estimates the required firm capacity for the pump station to be 240 gpm resulting in approximately 700 feet of 4-inch force main.

9.6.2 North Gateway Pump Station Service Extension

This extension will serve a future area located in the northwest part of the UGB north of International Way and bounded by I-5 and the McKenzie River. Calculating flow from the potential contributing area estimates the required firm capacity for the pump station to be 480 gpm resulting in a 6-inch force main approximately 1,700 feet long. The future force main could be connected to the 8-inch gravity line located on Sports Way and could be routed along Royal Caribbean Way to the north.

9.6.3 28th Street Pump Station Service Extension

This extension will serve a large future service area located in the south part of the UGB at the south end of 28th Street. This area is bounded by the UGB and City limits to the north and south and S 18th Street and S 42nd Street to the east and west. The City recently constructed a 12-inch gravity main extension along 28th Street that is 1,360 feet long and connects to the existing gravity line on S F Street. The pump station would be located south of the bridge and connect to this line. Calculating flow from the potential contributing area estimates the required firm capacity for the pump station to be 780 gpm resulting in an 8-inch force main approximately 520 feet long.

CHAPTER 10

Capital Improvements Program

This section summarizes Springfield's CIP which consists of a list of recommended prioritized wastewater collection system projects and estimated costs in 2023 dollars.

The CIP is a result of the capacity analysis and project reviews described in **Chapter 8** and **Chapter 9**. Prior to implementation, each project should undergo standard engineering design phases to finalize improvement sizing and location.

10.1 Cost Estimate Development

Construction costs are estimated using a combination of engineering experience with similar past projects and indexes published by sources such as the Engineering News Record (ENR). If available, previous pipe alignments were used to estimate preliminary layouts and utilized when preparing construction costs estimates.

All project descriptions and cost estimates in this document represent a Class 5 budget estimate in 2023 dollars, as established by the American Association of Cost Engineers. This preliminary estimate class is used for conceptual screening and assumes project definition maturity level below two percent. The expected accuracy range is -20 to -50 percent on the low end, and +30 to +100 percent on the high end, meaning the actual cost should fall in the range of 20 percent below the estimate to 100 percent above the estimate.

The cost estimates are consistent with the definition of OAR 660-011-0005(2) and OAR 660-011-035 which define "rough cost estimates" for facility plans as "approximate costs expressed in current-year dollars." These estimates are intended to "provide an estimate of the fiscal requirements to support the land use designation" and "for use by the facility provider in reviewing the provider's existing funding mechanisms." They are intended to be used as guidance in establishing funding requirements based on information available at the time of the estimate. The CIP cost estimates should be reevaluated periodically to account for changes due to inflation.

It is important to note that the CIP omits costs for routine maintenance. For budgeting purposes, it is assumed that a new pump station will be required for the pump station upgrades, since a facility evaluation was not conducted as part of this Plan. However, these projects could cost substantially less if only the pumps need to be replaced or modified.

10.1.1 Contingencies

Contingencies are a prudent inclusion in planning cost estimates to account for unforeseen circumstances that may increase costs. For the purposes of this planning document and preliminary cost estimates, a contingency amount equal to 30% of the estimated construction cost and engineering, legal and administrative costs is used. This works out to be about 45% of the construction cost.

10.1.2 Engineering

Engineering costs include preliminary design, surveying, design, construction management, and inspection services provided by a consulting engineering firm. Engineering cost estimates generally range from approximately 25% of the estimated construction costs for small projects to 15% of construction costs for larger projects. For the planning purposes in this Plan, an average engineering cost equal to 20% of estimated construction cost is used.

10.1.3 Legal and Administrative

Legal and administrative costs include such items as legal counsel regarding contracts and contract documents, costs related to obtaining and recording easements and permits, costs of grant and/or loan administration, additional city administration expenses occurring during a project, and other miscellaneous legal and administrative costs. A cost equal to 5% of the estimated construction cost is used for the estimates in this Plan.

10.1.4 Contractor Markup

Contractor markup costs include the contractor's markup for labor and materials for construction projects. A cost equal to 25% of the estimated construction cost is used for the estimates in this Plan.

10.2 Capital Improvements Projects

Costs estimates for the projects described in **Chapter 9** are provided in **Table 10-1** and **Table 10-2** as well as **Figure 10-1** on the following pages.

Table 10-1 | Springfield Capital Improvements Program - Piping

# on Map	CIP	Type	Exist. Dia (in)/ Capacity (gpm)	Proposed Dia (in)/ Capacity (gpm)	Length (ft)	Description	Comments	Priority	Timeline	Modeling/ Planning	Construction Cost	50% Engineering, Admin, Contractor Markup	30% Contingency	Total Cost
1	South Springfield #1	Capacity for future flows. Study/Additional modeling.	12	15	800	Upgrade PVC gravity sewer along S 2nd St south of SR 126 from MH 665196 to 665216.	High priority. Pump station is planned to be built in the near future and development will follow, though no large subdivisions are expected to occur. A study/model under buildout conditions should be conducted before designing.	Near Term	0-5yr	$ 50,000	$ 500,000	$ 250,000	$ 225,000	$ 1,025,000
2	Mid-Springfield #3	Capacity for existing and future flows.	10	12	910	Upgrade PVC gravity sewer along Olympic St. from MH 20977 to 20969.	High priority since existing d/D is greater than 0.8 and relatively low impact construction.	Near Term	0-5yr	-	$ 490,000	$ 245,000	$ 221,000	$ 956,000
3	Gateway #4	Backwater from tie-in with larger pipe.	10	10	610	Install new drop connection MH at Node 26217 at Shelley St. and Don St. Regrade upstream piping on Shelley St. to MH 22870.	Suspected cross-connection in this area causing capacity issues. Drop connection needed for tie-in with 42-inch diameter piping.	Near Term	0-5yr	-	$ 318,000	$ 159,000	$ 143,000	$ 620,000
4	North Springfield #2	Capacity for existing and future flows.	10	12	1900	Upgrade PVC gravity sewer along Marcola Rd. by Kingsford Manufacturing from MH 21059 to 21063.	Area likely to be at full buildout already.	Near Term	0-5yr	-	$ 1,029,000	$ 515,000	$ 463,000	$ 2,007,000
5	Mid-Springfield and 21st Street PS	Study/Additional modeling.	-	-	-	Additional investigation and model update for sewer basin from G St. to D St. and 20th St. to 28th St. Pump station at E St. and 21st St.	The model drainage basin for pump station needs refinement and 15-inch sewer main needs to be added to model.	Near Term	0-5yr	$ 75,000	-	-	-	$ 75,000[a]
6	Downtown #4	Study/Additional modeling.	-	-	-	Additional investigation and model update for sewer basin between Kelly Blvd. & Pioneer Parkway W and E St. & C St.	New sewerline on W D Street may be required. Service laterals crossing private property. There are a lot of problems in the area and the piping is not well mapped out requiring further investigation.	Intermediate Term	6-10 yr	$ 75,000	-	-	-	$ 75,000[a]
7	Gateway #1	Study/Additional modeling.	-	-	-	Additional investigation and model update for Harlow Rd. PS inlet pipe and 8" dia. pipe section (Pipe No. 22949_26230) on Don St. located north of Lochaven Ave.	Inlet to Harlow PS backing up due to PS wetwell operation. Also an 8" pipe connected between an 18" pipe and a 48" pipe on Don Street needs to be investigated further.	Intermediate Term	6-10 yr	$ 50,000	-	-	-	$ 50,000[a]
8	North Springfield #1b	Capacity for existing and future flows.	10	12	650	Upgrade PVC gravity sewer behind shopping center area to the southeast of interchange at SR 126 and Mohawk Blvd. from MH 21523 to 21526.	Peak flows are nearing capacity of piping for existing and future conditions.	Intermediate Term	6-10 yr	-	$ 360,000	$ 180,000	$ 162,000	$ 702,000
9	Harbor Drive	Future Service Extension		8 (gravity)/ 5 (force main)	7818	Service requirements: 1) new "Harbor Drive" PS equipped with 2 pumps each with 145 gpm capacity. 2) 134 ft of 5-inch to extend existing "dry pipe" force main 3) 7684 ft of 8-inch pipe to service entire neighborhood.	Most cost effective solution makes use of the existing "dry pipe' force main in place north of the neighborhood.	Intermediate Term	6-10 yr	-	$ 3,949,000	$ 1,975,000	$ 1,777,000	$ 7,701,000

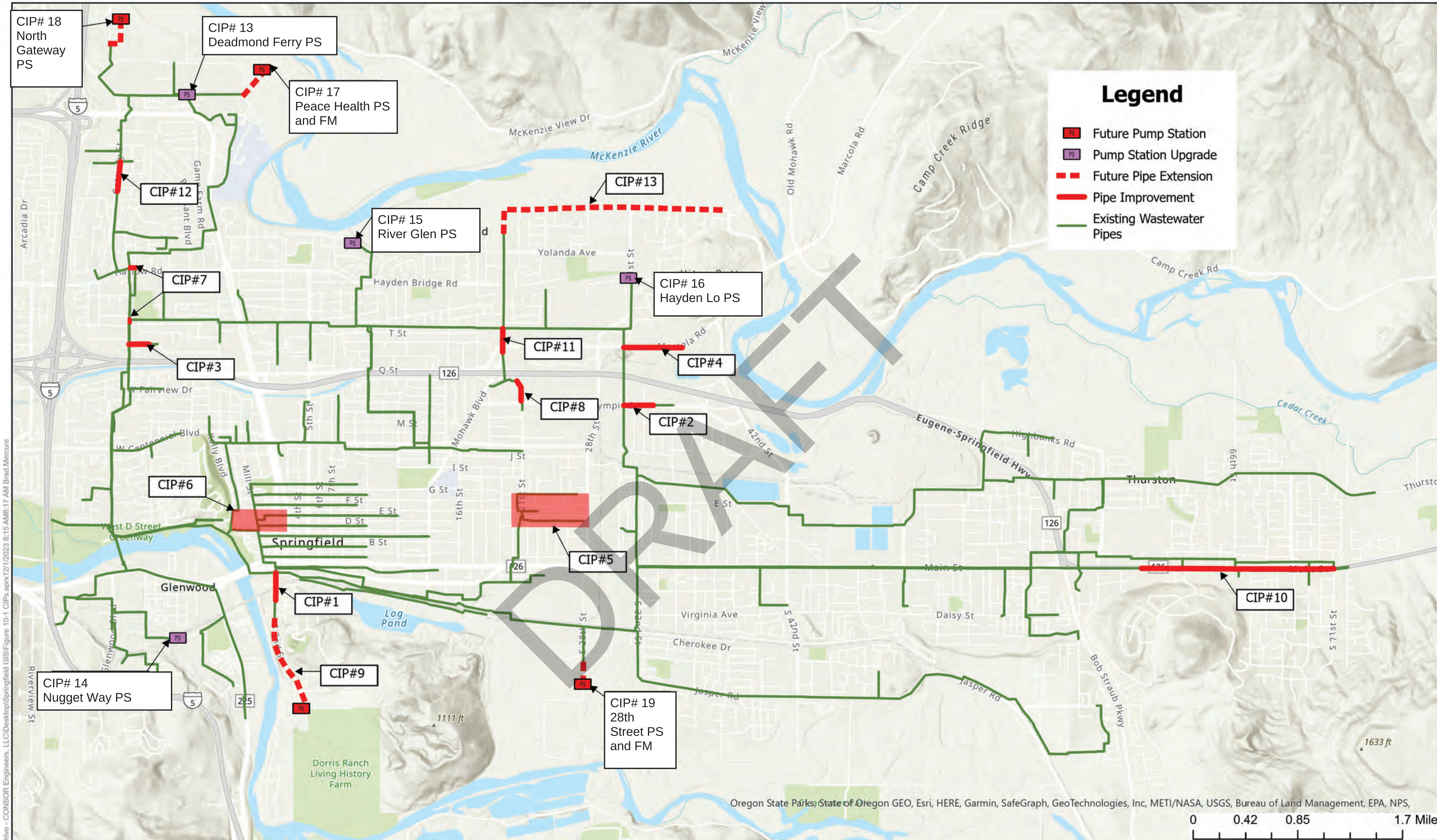
# on Map	CIP	Type	Exist. Dia (in)/ Capacity (gpm)	Proposed Dia (in)/ Capacity (gpm)	Length (ft)	Description	Comments	Priority	Timeline	Modeling/ Planning	Construction Cost	50% Engineering, Admin, Contractor Markup	30% Contingency	Total Cost
10	Thurston #1	Capacity for future flows.	12-18	15-21	5180	Upgrade concrete pipe and PVC gravity pipe along SR 126 between 60th Pl and S 71st St. From MH 24304 to 25041.	Lower priority triggered by future growth. Monitor growth. Diversion to A Street sewer main (upgraded) should be considered first. Identified in prior sewer plan as needing to be upgraded for existing and future peak flows.	Long Term	11-20 yr	-	$ 3,225,000	$ 1,613,000	$ 1,451,000	$ 6,289,000
11	North Springfield #1a	Capacity for existing and future flows.	12	15	1110	Upgrade concrete gravity sewer north of interchange at SR 126 and Mohawk Boulevard from MH 21610 to 21618.	Peak flows are nearing capacity of piping for existing and future conditions. Identified in prior sewer plan as needing to be upgraded for existing peak flows.	Long Term	11-20 yr	-	$ 670,000	$ 335,000	$ 302,000	$ 1,307,000
12	Gateway #2	Capacity for future flows.	15	18	920	Upgrade concrete gravity sewer along Gateway Street from MH 22309 to 23277.	Peak flows are nearing capacity of piping for future conditions.	Long Term	11-20 yr	-	$ 606,000	$ 303,000	$ 273,000	$ 1,182,000
13	North Springfield Trunk (Vera Area)	Future Service Extension	-	8, 12	9583	Services the development east of the new Vera Pump Station along Hayden Bridge Road.		Long Term	11-20 yr	-	$ 5,144,000	$ 2,572,000	$ 2,315,000	$ 10,031,000
									Subtotal 0-5 yr	$ 125,000	$ 2,337,000			$ 4,683,000
									Subtotal 6-10 yr	$ 125,000	$ 4,309,000			$ 8,528,000
									Subtotal 11-20 yr	$ -	$ 9,645,000			$ 18,809,000
									Total	$ 250,000	$ 16,291,000		$ 32,020,000	$ 32,020,000

[a] Total Cost is unknown until a solution is found during the additional modeling study is completed.

Table 10-2 | Springfield Capital Improvements Program – Pump Stations[a]

# on Map	CIP	Type	Peak Exisitng Flow (gpm)	Peak Future Flow (gpm)	Existing Firm Capacity (gpm) [b]	Proposed Firm Capacity (gpm)	Description	Comments	Priority	Timeline	Construction Cost	50% Engineering, Admin, Contractor Markup	30% Contingency	Total Cost
13	Deadmond Ferry PS	Pump Station Upgrade for existing and future flows.	997	1046	833	1050	Located east of Game Farm Road and Maple Island Road. Upgrade existing pumps.	Near future growth is expected in the area. Cost reflects pump station replacement but may be less if only pumps need to be replaced or modified. Flow monitoring suggested prior to preliminary design.	Near Term	0-5yr	$ 2,782,000	$ 1,391,000	$1,252,000	$ 5,425,000
14	Nugget Way PS	Pump Station Upgrade for existing and future flows.	853	853	597	850	Located at E 19th Avenue and Nugget Way. Upgrade existing pumps.	Near future growth is expected in the area. Cost reflects pump station replacement but may be less if only pumps need to be replaced or modified. Flow monitoring suggested prior to preliminary design.	Near Term	0-5yr	$ 2,318,000	$ 1,159,000	$1,043,000	$ 4,520,000
15	River Glen PS	Pump Station Upgrade for existing and future flows.	Not in model	Not in Model	490	660	Located northwest of intersecton of McKenzie Crest Drive and Royal del Lane Upgrade existing pumps.	Identified in prior sewer plan. Was not in current City model. A flow study/model should be conducted before designing. Cost reflects pump station replacement, but may be less if only pumps need to be replaced or modified.	Intermediate Term	6-10 yr	$ 1,854,000	$ 927,000	$ 834,000	$ 3,615,000
16	Hayden Lo PS	Pump Station Upgrade for existing and future flows.	Not in model	Not in Model	290	490	Located northwest of intersecton of W Street and 31st Street Upgrade existing pumps.	Identified in prior sewer plan. Was not in current City model. A flow study/model should be conducted before designing. Cost reflects pump station replacement, but may be less if only pumps need to be replaced or modified.	Intermediate Term	6-10 yr	$ 1,623,000	$ 812,000	$ 731,000	$ 3,166,000
17	Peace Health PS and Force main	Pump Station for future extension.	Not in model	240	NA	240	Future pump station located in the North Gateway area west of McKenzie River.	Identified in prior sewer plan. To serve PeaceHealth and Riverbend Campus development.	Long Term	11-20 yr	$ 2,076,000	$ 1,038,000	$ 934,000	$ 4,048,000
18	North Gateway PS and Force main	Pump Station for future extension.	Not in model	480	NA	480	Future pump station(s) located and 1,700 feet of 6" force main in the North Gateway area.		Long Term	11-20 yr	$ 2,236,000	$ 1,118,000	$1,006,000	$ 4,360,000
19	28th Street PS and Force main	Pump Station for future extension.	Not in model	780	NA	780	Future pump station(s) located at the south end of 28th Street.		Long Term	11-20 yr	$ 1,098,000	$ 549,000	$ 494,000	$ 2,141,000
										Subtotal 0-5 yr	$ 5,100,000			$ 9,945,000
										Subtotal 6-10 yr	$ 3,477,000			$ 6,781,000
										Subtotal 11-20 yr	$ 5,410,000			$ 10,549,000
										Total	$ 13,987,000			$ 27,275,000

[a] The COE has reviewed and approved the projects listed in **Table 10-2**. Please see **Section 11.2.4** for description of the inter-governmental agreement between Eugen and Springfield for pump station maintenance.
[b] From Eugene/Springfield Pump Station Information Spreadsheet



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City of Springfield, OR
Wastewater Master Plan

Figure 10-1
Capital Improvement Program
Piping and Pump Station

November 2023

22-3398

CHAPTER 11

CMOM Program

11.1 Introduction and Background

This chapter assesses the Capacity, Management, Operations, and Maintenance (CMOM) program for the City's wastewater collection system and recommends policy and procedure updates to support effective preservation, replacement, and rehabilitation of the City's wastewater collection network. The assessment is based on a review of existing City policies and procedures, comparison to the CMOM practices of similarly sized utilities, general industry best practices, and pertinent state and federal regulatory requirements.

The CMOM is an industry-accepted approach applied by agencies around the country to adaptively manage their wastewater collection infrastructure. In May 2014, the MWMC adopted a regional CMOM Framework Document and directed its partner agencies to develop local CMOM programs to address the ongoing effort to reduce I&I in both the public and private wastewater collection systems with a proactive and continuous approach. In 2015, Development and Public Works staff drafted a CMOM implementation plan (see Appendix E) using the findings from a 2014 gap analysis, EPA guidance documents, and MWMC's regional framework document. Springfield's CMOM program goals include improved wastewater infrastructure performance, protection of the regional wastewater treatment system against excessive wet weather flows and associated operational costs, efficient infrastructure planning for future development, a defensible regulatory-compliant strategy, and improved protection of the public and environment from exposure to wastewater overflow and backups. City staff informed Council of the draft CMOM plan in a July 2015 Communication Packet Memo.

11.2 Existing CMOM Program

11.2.1 Capacity Assessment

The City has 15 portable flow monitors to record flows in areas of the collection system and its collection system model. Currently, the City does not have rain gauges within the service area, but staff is working to install a new rain gauge on one of the City's fire stations. There is no formal flow monitoring program at this time, and currently the flow monitors are used to assess I&I in sewer sub-basins and rehabilitation work.

A collection system model is used to assess capacity issues and evaluate impacts from future developments and updates in the wastewater collection system. The City periodically updates its WWMP to identify collection system issues and plan for long term growth.

11.2.2 Operations and Maintenance

11.2.2.1 Inspections and Testing

The City has two closed caption television (CCTV) trucks to inspect piping for both the wastewater and stormwater collection systems. Pipes are inspected according to National Association of Sewer Service Companies (NAASCO) standards. Currently, the City videos the entire collection system every three to five years, basin by basin, and notes the pipe condition in GIS. MHs are inspected routinely and inspection forms are updated in the GIS field mapping. Smoke and dye testing is done on an as-needed basis to help identify cross-connections with the stormwater system.

11.2.2.2 Data Management

The City maintains a map and data for the collection system in GIS including piping, MHs, areas requiring more frequent cleaning, pipe condition, and customer calls. The City has asset management software that can also track inspections, cleaning and maintenance schedules/work orders, repairs/rehabilitation, and emergency responses.

11.2.2.3 Cleaning

The City has a hydro-jetter to clean collection system piping basin by basin. Some of the piping must be cleaned two to three times a year and are marked as "problem areas" in GIS. The City cleans approximately 80% of the collection system per year with the whole system cleaned once every 1-1/2 to 2 years. The City has two combination Vactor trucks used for hydro-jetting and clearing blockages in the stormwater collection system. These trucks can be used, if necessary, for cleaning lines in the wastewater collection system.

Root removal is done with the hydro-jetter, and a root saw attachment for larger roots. The City uses chemicals for root removal on lines smaller than 8-inch diameter. Problem areas are tracked by the City for more frequent root removal.

11.2.2.4 Hydrogen Sulfide

Hydrogen sulfide corrosion has not been a major issue with the collection system and therefore is not addressed in Springfield's CMOM program.

11.2.2.5 Pump Stations

Springfield's pump stations have been maintained by the COE's Public Works department since 1982 as outlined in an IGA between the two cities, see **Appendix F**. As stated in the IGA Item #10, Eugene shall be consulted in the planning, construction, review and inspection of new pump stations. While Springfield has the responsibility to approve design plans for the pump stations and ensure proper construction, the COE shall provide recommended specifications for the design. The COE currently operates and maintains 48 pump stations, including 16 of Springfield's pump stations.

The COE currently has three teams of two pump technicians performing inspections, operations and maintenance, and emergency response for the pump stations. All of the pump stations are inspected once every two weeks. Regardless of the lift station's configuration, the inspections include the time the pumps were on, amps consumed, and the wet well levels. Each individual pump station has an inspection checklist that the technicians use to record the inspection results. Because each pump station has unique features, there are not a set of standard operating procedures (SOPs) that apply to all of the pump stations; each pump station has its own SOPs that are contained in a binder along with all of the equipment manufacturer operations and maintenance (O&M) information. Records for all the inspections are kept with each station's O&M binder and in Eugene's Wastewater Division's maintenance management system program.

11.2.3 Current Rehabilitation and Replacement Practices

Currently, the City maintains a piping database that tracks pipe age. Flow monitoring is being used to evaluate I&I and rehabilitation work in micro-basins with 8-inch and smaller piping. There currently is no target for pipe replacement based on actual need.

11.2.4 Industrial Pretreatment and BMP Program

The City's Environmental Services Division maintains the Industrial Pretreatment Program and the Best Management Practices (BMPs) Program. There are approximately 18 permitted industrial dischargers, 210 Food Service Facilities, 31 Dental Facilities, and 3 Brewers, Wine Makers, or Distillers discharging to the collection system that require pretreatment.

11.2.5 Staffing

The Development and Public Works Department's Operations Division is responsible for maintaining the wastewater collection system. The City currently has nine full-time employees (FTEs) for collection system maintenance with eight field staff. Staff are trained through an apprenticeship program. Currently, there is not a fully trained repair crew for the collection system.

The COE budgets for one FTE for maintaining and operating Springfield's pump stations. There are a total of 10 FTEs for both pump stations and collection system maintenance.

11.2.6 Design and Construction Standards

Springfield's Engineering Design Standards and Procedures Manual (EDSPM), Chapter 2 covers design standards and considerations for the wastewater collection system and pump stations. The standards provide guidance and requirements for the following:

- Per capita flow rates for new construction;
- Design standards for piping and MHs;
- Service laterals;
- Piping location;
- Rehabilitation and repairs;
- Pump station design;
- Pump station reliability; and
- Force main design and testing.

In addition, the City has Standard Drawings including MH and pipe connection details.

As per EDSPM 2.02.2 Sewer Study, the City does require a hydraulic capacity study to be completed and submitted to the City when the collection system is extended to serve a development generating flow above 5,000 gallons per day or exceeding ten percent of the total flow in the downstream study. However, there are currently no standards for determining collection system capacity requirements for future development. As such, it is recommended that the City amend Springfield Development Code 4.3.105 and/or the EDSPM to establish collection system capacity standards based on the water level (d) versus the pipe diameter (D):

- d/D > 0.75 for existing piping
- d/D = 0.5 for new piping design flows

In 2022, Springfield adopted the Oregon Standard Specifications for Construction as the construction standards for the City. The specifications cover standard material, construction and testing procedures for new sewer gravity piping installations.

11.2.7 Sanitary Sewer Overflow Response Plan

Springfield has a separate Overflow Emergency Response Plan (OERP) that is not included in their CMOM plan. However, the CMOM plan does address how staff are notified of unplanned or emergency maintenance. A crew lad by a Wastewater Supervisor, with a Level 4 Wastewater certification, is sent out immediately to assess the source of the overflow, correct/repair the cause, and provide clean-up. The Development and Public Works Department is notified of the overflow so that reporting to appropriate state agencies occurs. The COE is responsible for responses to SSOs at pump stations.

The COE does have an emergency response plan for pump station overflows. One of the three pumps station crews from Eugene Public Works is on-call to respond 24 hours a day, 365 days per year. A call-out list is used to notify crews of an emergency after normal business hours. Each pump station has an O&M binder with a sheet that details generator capabilities, pump-around options, and a list of equipment needed to perform emergency procedures in case of pump station failure. Management staff at the WPCF also have copies of these sheets so that the appropriate resources can be allocated during an emergency. Each pump station has an emergency pump, or port for pump around, in case of pump failure.

11.2.8 Financial Management

The annual costs associated with the management of the wastewater collection system are discussed in **Chapter 12**.

11.3 Comparison to other Cities

Springfield's CMOM program was compared to two other municipalities. These cities, their population, miles of piping, and other comparators from Census data are listed in **Table 11-1**:

Table 11-1 | Comparison of Cities

Item	Springfield, OR	Urbana, IL	Hampton, VA
Population Served	69,000	40,000	146,000
Miles of Pipe	250	103	460
Median Household Income 2017-2021 (in 2021 dollars)	$54,503	$37,701	$59,380
Per Capita Income 2017-2021 (in 2021 dollars)	$26,784	$26,403	$32,831
Population per Square Mile 2020	3,903.5	3,240.6	2,665.1
Land Area Square Miles 2020	15.85	11.83	51.46

Similar to Springfield, both cities are part of a regional sanitary sewer district, which provides service for treatment and interceptors. The date for the Urbana CMOM program is 2010, and Hampton's is 2015. Each element of the CMOM programs is discussed below.

11.3.1 Capacity Assessment

Like Springfield, the two cities maintain a collection system model for capacity assessments and planning. Models are updated with flow monitoring information as collection system changes occur. Hampton's

CMOM program indicates it has a flow monitoring program and four temporary flow meters, which is less than Springfield; however, the utility has 108 pump stations in which most have flow meters. In addition, Hampton performs modeling analysis in conjunction with the model from the regional sewer district. Urbana's CMOM program did not specify any flow monitoring details.

11.3.2 Operations and Maintenance

11.3.2.1 Inspections and Testing

Both municipalities maintain a schedule of CCTV and MH inspections. CCTV operators are trained and certified in NASSCO's Pipeline Assessment and Certification Program (PACP®). Hampton has a dedicated CCTV truck and wash truck for long term preventive maintenance and condition assessment activities while also cleaning 100% of the piping in each flow area of the collection system. **Table 11-2** summarizes the time to inspect the entire collection system for each city.

Table 11-2 | Inspection Schedules

	Springfield	Urbana	Hampton
Whole System CCTV Inspection	3-5 yr	20 yr	6 yr
Whole System MH Inspections	5-7 yr	40 yr	5 yr

Both cities appear to have a more formal MH inspection program with forms, mapping and certifications. Smoke and dye testing are done on an as needed basis to identify I&I sources like Springfield.

11.3.2.2 Data Management

Both cities use GIS for mapping and record keeping of rehabilitation, repairs, inspections, complaints, backups and overflows. In addition, each municipality uses asset management programs for managing work orders and maintenance schedules for the collection system.

11.3.2.3 Pump Stations

Like Springfield, Urbana has its pump stations operated and maintained by another agency. Therefore, their CMOM program does not cover pump stations. The City of Hampton has a pump station section that covers maintaining their pump stations. In general, their pump station preventive maintenance is done on a monthly basis with general care and cleaning done in between. Force main air valves and aerial crossings are inspected annually. Similar to COE, they have both an electrician and a mechanic on-call should an emergency occur.

11.3.2.4 Cleaning

Comparable to Springfield, both cities have collection system cleaning on a systemic basis where they track and target the entire collection system over a period of time. In addition, each city has sections that require more frequent cleaning because of root and grease problems. Both cities use a jetter and root cutter to clean the piping and clear heavy roots. Urbana does not use chemicals for root control, whereas Hampton contracts with a vendor to provide chemical root control. Springfield also contracts with a vendor to provide chemical root control. Both cities use chemical or biological treatment to help with cleaning grease in the collection system. **Table 11-3** shows a comparison of the cities' cleaning frequency.

Table 11-3 | Cleaning Schedules

	Springfield	Urbana	Hampton
Whole System Cleaning	1.5-2 yr	10 yr	6 yr
Frequent Cleaning LF (% of System Annually)	3%	NP	6%

11.3.3 Repair, Replacement, and Rehabilitation

The repair, replacement and rehabilitation of piping for the cities varies year to year. Each city has implemented contracts in the past to annually rehabilitate a certain amount of piping with cured-in-place piping (CIPP) over a period of time. The City of Hampton also has two in-house construction crews and has contracted with companies to provide supplemental emergency repairs.

Hampton's sewer system is aged with areas that are 70 years old. Approximately 72 percent of the system is approaching or has exceeded 50 years in age, and about 75% of the sewer pipelines are constructed of vitrified clay pipe. The extent of rehabilitation needs for the City of Hampton is 1,100,000 feet of gravity sewer and 6,000 feet of force main or about 46 percent of the system. Hampton has conducted scoring and ranking of pipe segments to be replaced to prioritize and identify immediate versus long-term needs. **Table 11-4** lists the comparison of pipe repairs/replacement based on city goals and past repair programs.

Table 11-4 | Repair Replacement Goals

	Springfield	Urbana	Hampton
Repair/Replacement of Piping (% of system annually)	No annual target	1.4%	1.2%
Extent of Repair/Replacement Needs (% of system)	Not Provided	Not Provided	46%

11.3.4 FOG and Industrial Pre-Treatment

Both cities' CMOM programs refer to codes or ordinances for fat, oils, and grease (FOG) requirements that address restaurants primarily. Urbana indicated that they are working with their sanitary sewer district on a FOG program. Hampton has a FOG program managed by a FOG coordinator. Unlike Springfield, both cities do not appear to have an industrial pre-treatment program; rather, it is handled by the sanitary district.

11.3.5 Staffing and Equipment

Compared to Springfield, Urbana and Hampton have more staff to manage their collection systems. Urbana has six FTEs for the sanitary sewer system with four additional staff and two seasonal staff for both sewer and stormwater collection systems. Hampton has 69 FTEs for their collection system. They are divided into four sections: management section (engineering and planning), pump station section, I&I section (collection system maintenance and rehabilitation) and construction section (constructs new sewer).

Both cities have vacuum trucks and CCTV trucks for maintenance and inspection of the collection system. They also have equipment for excavation. Compared to Springfield, the two cities have more equipment for repairs and cleaning. **Table 11-5** summarizes the staffing and equipment for the cities.

Table 11-5 | Staffing and Major Equipment

	Springfield	Urbana	Hampton
Staffing (Full time employees)	10	8[a]	69
Population Served /Staff	6,900	5,000	2,116
Vacuum Trucks	2	2	5
Miles of Pipe/Vacuum Truck	125	52	92
CCTV Trucks	2	1	3
Miles of Pipe/CCTV Truck	125	103	153
Backhoe/Excavator	2[b]	1	7
Dump Truck	4[b]	1	7

[a] FTEs to maintain pump stations not included.
[b] This equipment is City owned and not used only for wastewater.

11.3.6 Design Standards and Testing

Urbana has construction and testing standards for new sewer construction provided by the sanitary district but does not appear to have any design standards. Hampton has adopted standards from their regional planning district and has its own design and construction standards which include standard drawings and design flows for new developments. Each city has an inspector for new construction.

11.3.7 Emergency Response

Both cities address procedures for emergency response related to the collection system. These include guidance, communication, notification procedures, incident reporting, recording, investigation and further evaluation. Like Springfield, Hampton has a separate SSO response plan from its CMOM plan. All three cities have set goals for response times to overflows, blockages, or other complaints. Each city also outlines staffing after hours to respond to an emergency.

11.3.8 Summary Table

The City's CMOM plan is fairly comparable to that of the other cities in this analysis. It is noted that at this time, Springfield does not have a target for replacing or rehabilitating piping. The City cleans their entire system on a more frequent basis than the other cities despite having fewer vacuum trucks for the size of the system. Springfield can use other City-owned excavation equipment for repairs or construction. Finally, the City has fewer staff for the collection system compared to the other cities. **Table 11-6** provides a summary comparison of the CMOM plans.

Table 11-6 | CMOM Comparison Summary

CMOM Information	Springfield	Urbana	Hampton
Population Served	69,000	40,000	146,000
Miles of Pipe	250	103	460
Number of Pump Stations	16	NP	103
Flow Model	Yes	Yes	Yes
Flow Monitoring	Yes	NP	Yes
Whole System CCTV Inspection	3-5 yr	20 yr	6 yr
Whole System MH Inspections	5-7 yr	40 yr	5 yr

CMOM Information	Springfield	Urbana	Hampton
GIS Mapping and Record Keeping	Yes	Yes	Yes
Asset Management Program	Yes	Yes	Yes
Pump Station and Force Main O&M	By other	By other	Yes
Whole System Cleaning	1.5-2 yr	10 yr	6 yr
Repair/Replacement of Piping (% of system annually)	No target	1.4%	1.2%
Extent of Repair/Replacement Needs (% of system)	NP	NP	46%
Fats, oils and Grease Program	Yes	Yes	Yes
Industrial Pre-treatment Program	Yes	By other	By other
Staffing (Full time employees)	10	8	69
Population/Staff	6,900	5,000	2,116
Vacuum Trucks	2	2	5
Miles of Pipe/Vacuum Truck	125	52	92
CCTV Trucks	2	1	3
Miles of Pipe/CCTV Truck	125	103	153
Backhoe/Excavator	2	1	7
Dump Truck	4	1	7
Construction and Testing Standards	Yes	Yes	Yes
Design Standards[1]	Yes	No	Yes
Emergency Response Plan	Yes	Yes	Yes

NP = not provided

[1] Recommendation is to update the City's design standards

11.4 CMOM Program Policy and Procedure Updates

It is recommended that the City finalize their CMOM Program document which was drafted in 2015. The document will need to be updated to incorporate current relevant information and incorporate the following recommendations as part of the document. The recommendations are listed generally in increasing priority.

11.4.1 Formal Flow Monitoring Program

The City has used their flow monitors to calibrate their sewer collection model and assess I&I in micro-basins based on input from the Operations Division. It is recommended that the City adopt a formal flow monitoring program to assist with capacity assessments. Permanent monitors should be placed in each of the major sewer basins to track flows and help ensure the model is up-to-date. Areas where flow data is missing or lacking should be prioritized, including the Glenwood area. The City should continue to assess I&I in micro-basins to target areas for rehabilitation. Data should also be collected from areas where growth is expected to occur to have background flow levels and help determine the available capacity of the collection system in that area. The City already has the flow monitoring equipment, so the costs should be minimal to adopt a program.

11.4.2 Design and Construction Standards

11.4.2.1 Reference to Codes and Programs

The City's sewer design standards should include a reference to the plumbing code for private laterals or side sewers. It also should include references to the City's Industrial Pre-treatment and BMP programs.

11.4.2.2 Design Standards

It is recommended that the City amend Springfield Development Code 4.3.105 and/or the EDSPM to establish collection system capacity standards based on the water level (d) versus the pipe diameter (D):

- d/D > 0.75 for existing piping
- d/D = 0.5 for new piping design flows

11.4.2.3 Design Flow Rates

The current Design Standards outline a methodology for determining flow rates for new developments based on a per capita unit rate and peaking factor. However, it is difficult to determine the ultimate or buildout flow rates for areas.

It is recommended the City use the future condition model discussed in **Section 5.4.** The future condition model includes land use and resulting sewer flow projections for the planning period and the "Stormy" 2035 5-year, 24-hour design storm. The future condition model also uses the rainfall dependent I&I predictions and the system capacity of the January 2019 storm event. I&I rates for new construction can be based on a gallons per acre basis. Typically, 1,000-2,500 gpad is used for new development and planning purposes (the City uses 2,000 gpad currently).

It is recommended that the City review the impacts of HB2001 on land use, densification, and increase in sewer flows on a more frequent basis, i.e., every 5 years.

11.4.2.4 Pump Stations

It is recommended that the City's Design Standards for pump stations include a reference to the requirements from the DEQ in OAR 340, Division 52, and the DEQ publication "Oregon Standards for Design and Construction of Wastewater Pump Stations".

The IGA between Springfield and COE was signed in August of 2000. It is recommended that the document be reviewed and updated as needed.

11.4.3 Staffing

The City's collection system has 10 FTEs comprised mainly of field staff, including one FTE from the COE for pump station maintenance. The City is operating with fewer staff per miles of pipe to maintain wastewater collection than comparable cities. The need for additional staff will grow as the system expands, wastewater flows increase, and as the system ages. Conservatively, it is anticipated that the City and MWMC will face additional mandates as the NDPES permit is renewed in future years.

Based on the staffing review above, the City requires more staff to adequately implement the defined operations and maintenance programs. The recommended number of staff for a city the size of Springfield based on EPA guidance for CMOMs is about 16 FTEs dedicated to the wastewater program. The following staffing recommendations are for the City to consider:

- To implement the Cleaning and Inspection Program with two vacuum trucks and two CCTV trucks operating daily for the wastewater and stormwater collection systems per the City's goal, the City would require two additional FTEs.

- Staffing evaluation related to a construction/repair crew is based on the City's preference for providing more pipe repair/replacement capability. If the City is going to implement an ongoing pipe repair/replacement program, it would require four FTEs with dedicated equipment to perform this work compared to contracting it out.

Staff retention is an issue for many sewer utilities, including Springfield. Keeping institutional knowledge in-house is also a challenge. It is recommended that Springfield develop an employee retention plan to reduce turnover and training. It is also recommended that the City develop standard operating procedures for various tasks associated with collection system maintenance to help with training and knowledge retention.

11.4.4 Equipment

Springfield's two CCTV trucks and camera equipment are obsolete and need to be replaced. It is recommended that the City purchase two new CCTV trucks with the latest technology. The new trucks will help ensure that the City's inspection program can continue with opportunities for more efficient data management with newer technology.

11.4.5 Inspections and Cleaning

Springfield's cleaning and CCTV inspection schedules are equivalent to or better than comparable cities. The current regular cleaning cycle appears adequate, along with the identification of problem areas/pipes that need more frequent cleaning. The CCTV inspection cycle for the entire collection system appears adequate, as well. The City does inspect MHs regularly, but it is recommended that a more formal MH inspection program be outlined in the CMOM plan with a check sheet, mapping, and a regular cycle to inspect the whole system. This implementation would have minimal costs since the City already does MH inspections, but they just need to formalize it in their CMOM document.

11.4.6 Modeling

Springfield's collection system model was brought into the latest software and minor network issues were fixed as part of this sewer plan (see **Appendix B** and **Appendix C**). Since Springfield's collection system is interconnected with Eugene's and the MWMC's, it is recommended that the City's model analysis be done is conjunction with any regional models that are available. This coordination will help ensure that any downstream impacts from changes in Springfield's collection system are identified.

11.4.7 Pipe Rehabilitation/Replacement

As the collection system ages, the structural and operational condition of the sewer system will decline as the number and type of defects in the system increase. If unattended, the severity and number of defects will increase along with an increased potential of sewer failures. Sewer failure is defined as an inability of the sewer to convey the design flow and is manifested by hydraulic and/or structural failures. Hydraulic failures can result from inadequate hydraulic capacity in the sewer, which can result from a reduction in pipe cross-sectional area due to accumulations of sediment, gravel, debris, roots, FOG, and structural failure.

Further, a major loss of hydraulic capacity can be the result of excessive rainfall dependent I&I or inappropriate planning for future growth that results in flows exceeding pipe capacity. Structural defects left unattended can lead to catastrophic failures, such as pipe collapses and SSOs. Structural failures may stem from common structural defects, such as cracks, fractures, holes, corrosion, and joint separations. Some cracked and broken sewers are the result of a condition called soil piping. Soil piping in this context is a loss of pipe bedding and backfill support due to small grain soil particles washing out of the supporting soils into the sewer as a result of infiltration at sewer cracks and separated joints. If these conditions are not addressed, sewers can fail, resulting in sinkholes, basement backups, and SSOs. Both hydraulic and structural failures can have a significant negative impact on the community and the environment.

A rehabilitation program focuses on structural condition of the collection system. This program extends the useful life of the collection system and minimizes capacity impacts by repairing or replacing infrastructure before structural failure. Rehabilitation can involve installing a PVC liner within existing piping to maintain the pipe integrity. Extending the useful life of assets minimizes annualized capital costs, since the cost of rehabilitation is typically less than half the cost of pipe replacement, and expected life rehabilitation can be greater than one half the life of a new pipe. Rehabilitation is even more economical when compared with the cost of repairing a failed sewer.

The rehabilitation program should consider the useful life of the piping. The useful life can vary depending on conditions of the wastewater and soils, but generally the useful life of collection system piping is considered to be between 80-100 years for older materials (non-plastic). Old sewer lines installed prior to around 1960 used cement and tar joints and are prone to failure. Rubber gaskets started to be used in the 60’s, and main lines were installed using gasketed PVC pipe starting in the mid-70’s.

Springfield’s pipe inventory database shows the earliest collection system piping was installed in 1945. The database also has the piping material listed for each pipe. Most of the gravity piping in the system is either plastic or concrete. This analysis will only consider the replacement and rehabilitation of concrete piping as the earliest PVC would be considered for replacement or rehabilitation would be the in the 2070’s or 2080’s. From the pipe inventory, it was determined that the transition from concrete to mainly PVC piping was 1982. Total concrete piping installed between 1945-1982 is approximately 713,000 linear feet or about 54% of the collection system. Figure 11-1 shows the collection system piping by age, and Table 11-7 has a breakdown of the concrete piping by year.

Table 11-7 | Concrete Pipe Footage By Year Installed

Install Date	Feet
No Date	15,942
1/1/1945	8,204
1/1/1946	1,472
1/1/1948	76,747
1/1/1954	1,142
1/1/1955	484
1/1/1960	1,388
1/1/1961	82,366
1/1/1962	11,256
1/1/1963	27,822
1/1/1964	4,319
1/1/1965	101,050
1/1/1966	16,314
1/1/1967	22,815
1/1/1968	12,141
1/1/1969	11,840
1/1/1970	25,779
1/1/1971	17,042
1/1/1972	17,857
1/1/1973	17,581
1/1/1974	30,321
1/1/1975	27,983
1/1/1976	25,795
1/1/1977	60,673
1/1/1978	44,578
1/1/1979	11,554
1/1/1980	16,374
1/1/1981	10,673
1/1/1982	5,805
Total	713,168

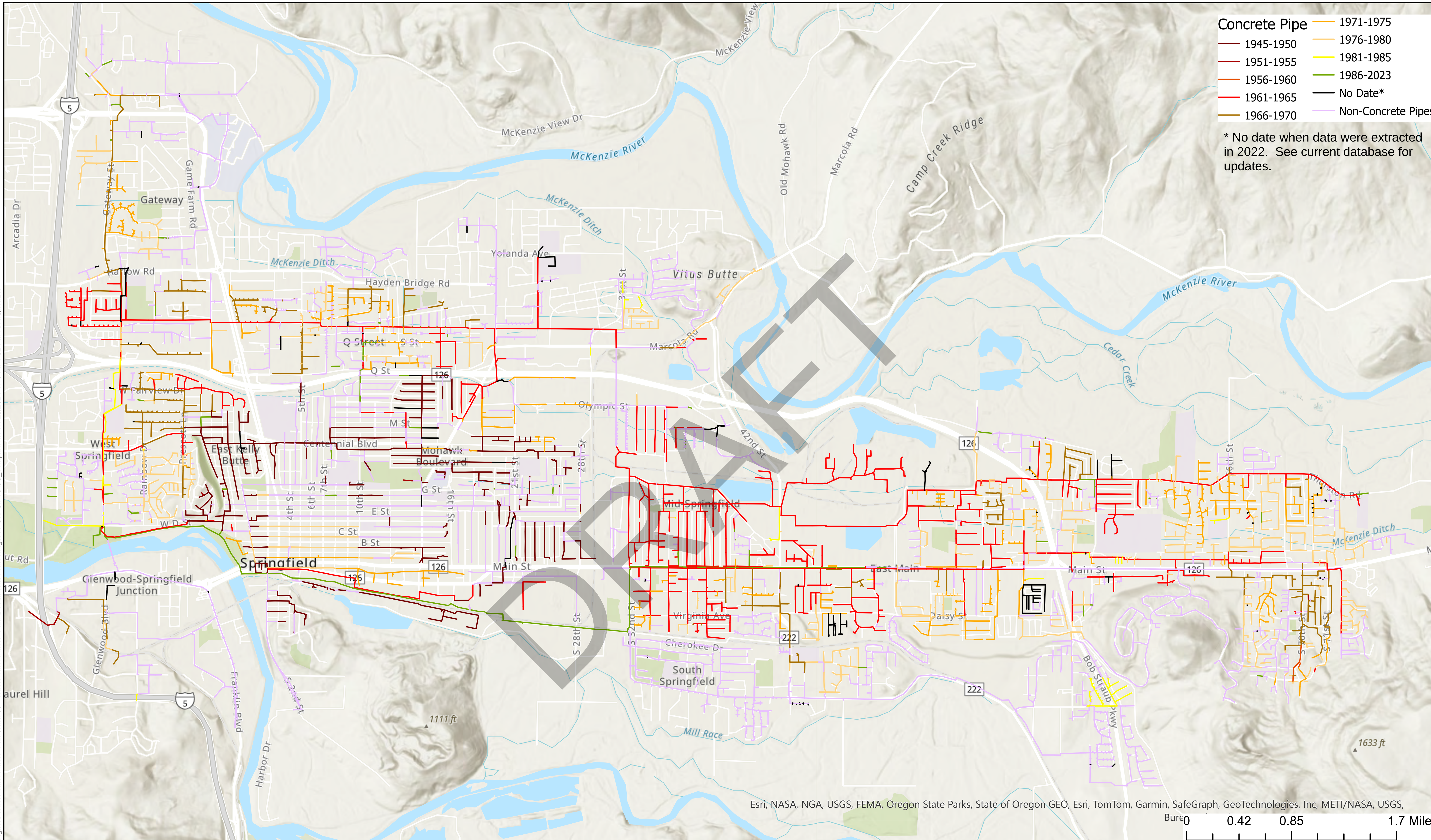

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Figure 11.1
Collection System Piping by Age

Priority for replacement/rehabilitation is piping that was installed between 1945 and 1965 and is labeled as a problem line in GIS. Approximately 4,781 feet of 6- to 10-inch piping is under this category and would be in the one-to-five-year time frame for replacement/rehabilitation. **Figure 11-2** shows the location of the piping, and **Table 11-8** provides information on the piping. For detailed views of the locations see Figure **11-2a** through **Figure 11-2d**.

Table 11-8 | Priority Pipe Replacement

OBJECTID	Basin	Location	Problem Area	Material	Install Year	Length (Ft)
1243	19	19TH & D	Yes	Conc.	1948	265
5840	19	19TH & D	Yes	Conc.	1948	300
2388	25	10TH & F	Yes	Conc.	1948	393
6645	48	28TH & MAIN	Yes	Conc.	1948	305
6334	39	S 4TH & QUARRY RD.	Yes	Conc.	1948	176
1370	46	40TH & MAIN	Yes	Conc.	1961	448
1807	15	FAIRVIEW & RAINBOW	Yes	Conc.	1961	12
3278	8	17TH & MOHAWK	Yes	Conc.	1965	179
115	8	17TH & OLYMPIC	Yes	Conc.	1965	249
3893	8	17TH & OLYMPIC	Yes	Conc.	1965	254
3722	8	18TH & MOHAWK	Yes	Conc.	1965	146
6258	8	18TH & OLYMPIC	Yes	Conc.	1965	266
6717	8	18TH & OLYMPIC	Yes	Conc.	1965	84
1818	46	40TH & MAIN	Yes	Conc.	1965	360
853	45	43RD & MAIN	Yes	Conc.	1965	164
3424	45	43RD & MAIN	Yes	Conc.	1965	50
4498	45	43RD & MAIN	Yes	Conc.	1965	226
6874	45	N 42ND & MAIN	Yes	Conc.	1965	90
3975	46	S 41ST & MAIN	Yes	Conc.	1965	448
2995	23	MILL & CENTENNIAL	Yes	Conc.	No Date	300
3732	23	MILL & CENTENNIAL	Yes	Conc.	No Date	66
					Total:	**4781**

For the rehabilitation and replacement schedule, once the concrete piping becomes 80 years old, the replacement of that piping should start and occur over a 20-year period, so that when the piping has reached the 100-year mark, it has all been replaced or rehabilitated. **Table 11-9** shows the amount of piping that needs to be replaced by year from 2025 until 2081 and the estimated annual cost for replacement. Concrete piping with no date was assumed to start replacement in 2025.

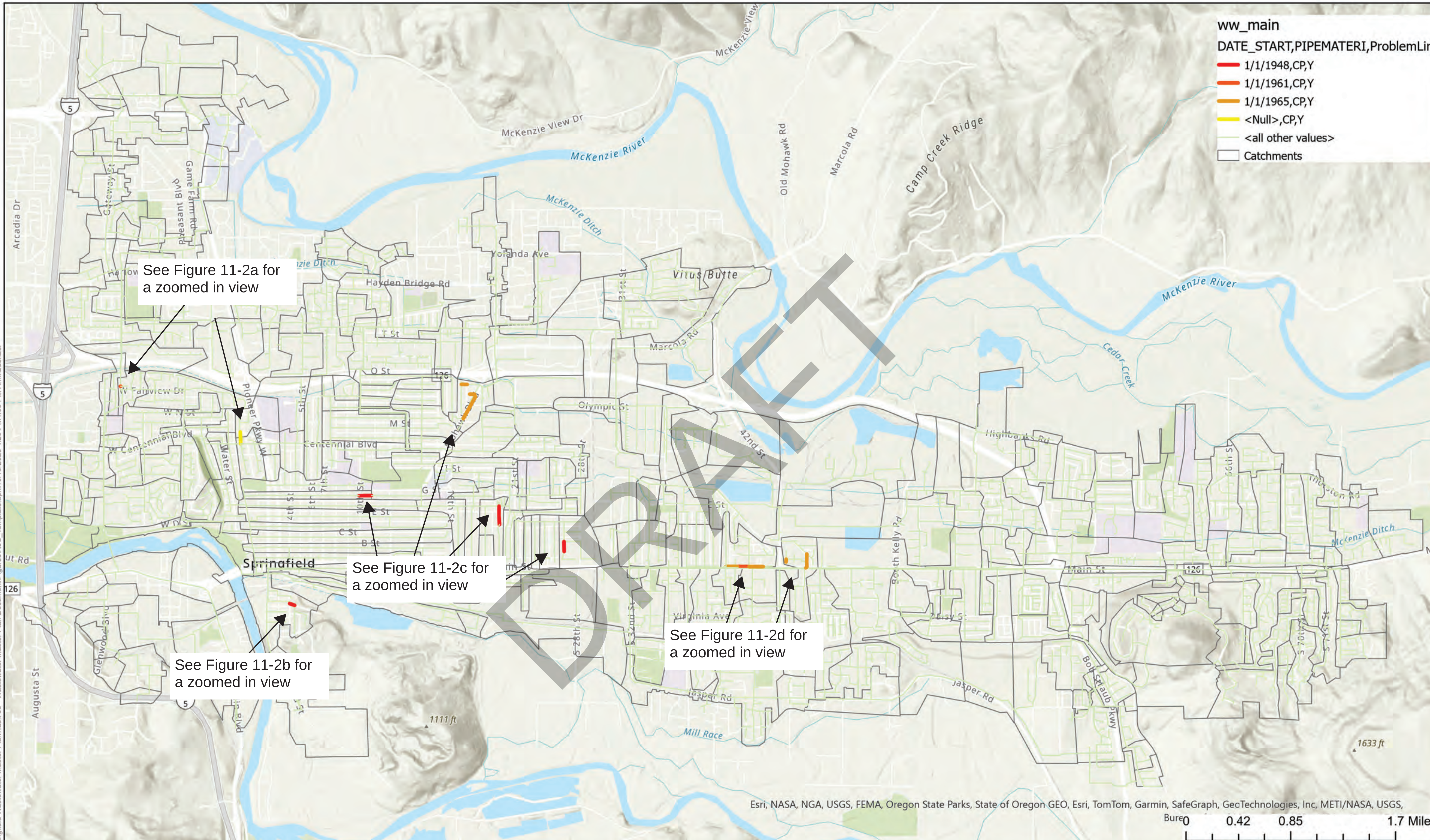

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Figure 11-2
Collection System Problem Areas and Pipe Age

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Figure 11-2a
Collection System Problem Areas and Pipe Age

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Figure 11-2b
Collection System Problem Areas and Pipe Age

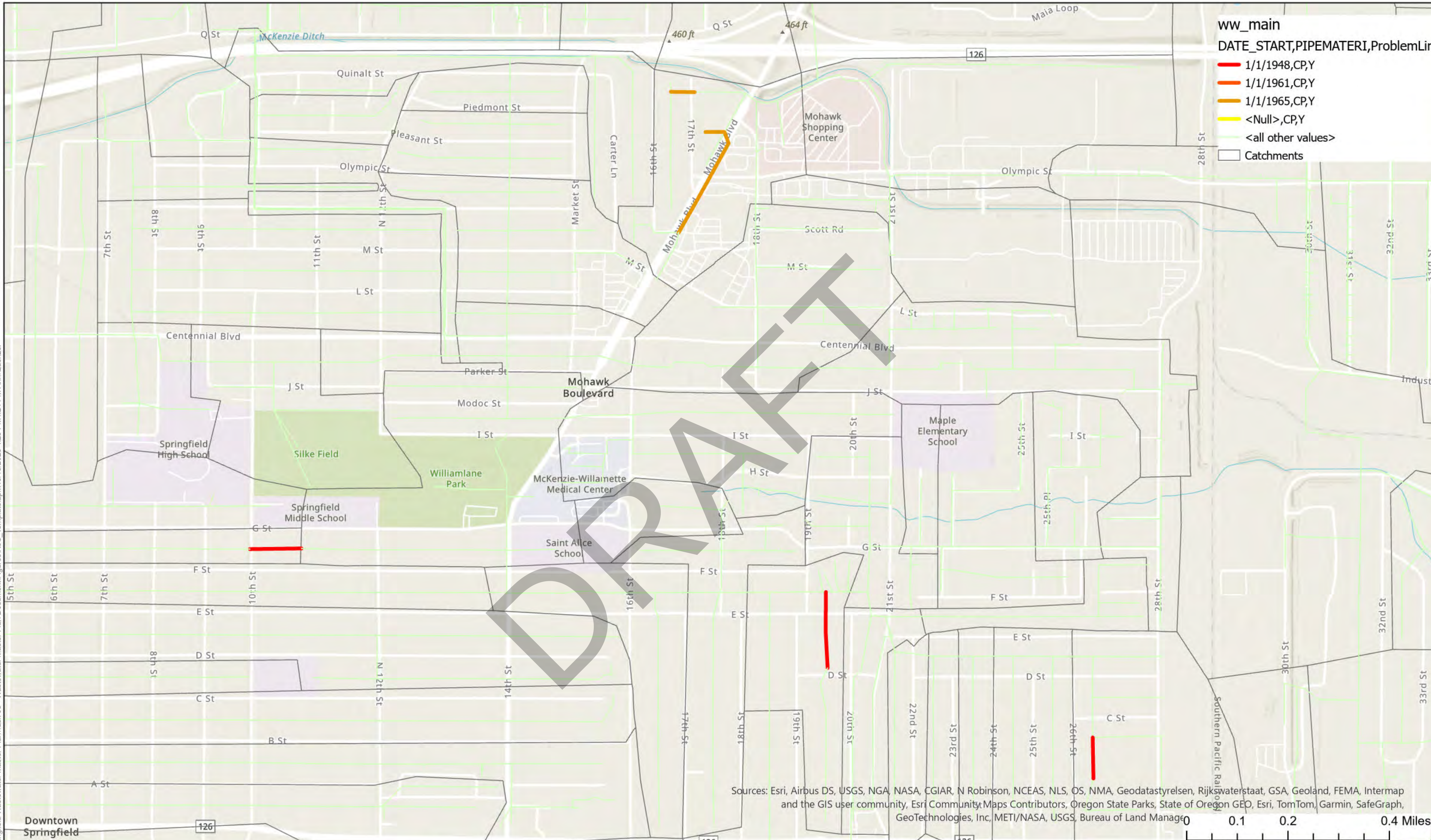

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Figure 11-2c
Collection System Problem Areas and Pipe Age

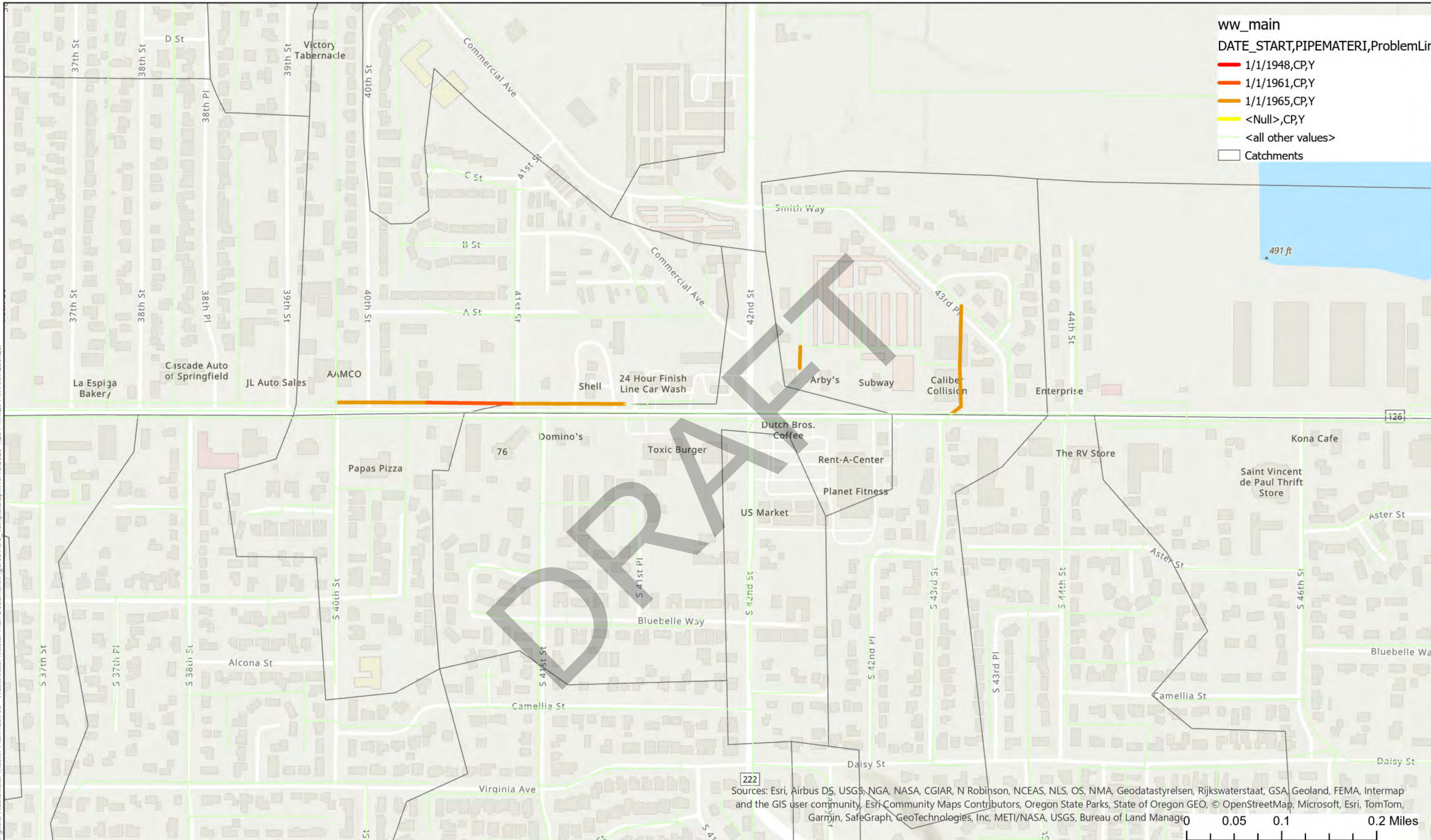

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Figure 11-2d
Collection System Problem Areas and Pipe Age

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Table 11-9 | Yearly Concrete Pipe Replacement Footage and Cost Estimate

Year	Total Ft/ Year	Replace Cost/ LF	Construction Cost	50% Engineer, Admin, Contractor Markup	30% Contingency	Total Cost
2025	2,090	$498	$1,040,000	$520,000	$468,000	$2,028,000
2026	3,047	$498	$1,517,000	$759,000	$683,000	$2,959,000
2027	3,047	$498	$1,517,000	$759,000	$683,000	$2,959,000
2028	5,118	$498	$2,548,000	$1,274,000	$1,147,000	$4,969,000
2029	5,118	$498	$2,548,000	$1,274,000	$1,147,000	$4,969,000
2030	5,118	$498	$2,548,000	$1,274,000	$1,147,000	$4,969,000
2031	5,118	$498	$2,548,000	$1,274,000	$1,147,000	$4,969,000
2032	5,118	$498	$2,548,000	$1,274,000	$1,147,000	$4,969,000
2033	5,118	$498	$2,548,000	$1,274,000	$1,147,000	$4,969,000
2034	5,175	$498	$2,576,000	$1,288,000	$1,159,000	$5,023,000
2035	5,200	$498	$2,588,000	$1,294,000	$1,165,000	$5,047,000
2036	5,200	$498	$2,588,000	$1,294,000	$1,165,000	$5,047,000
2037	5,200	$498	$2,588,000	$1,294,000	$1,165,000	$5,047,000
2038	5,200	$498	$2,588,000	$1,294,000	$1,165,000	$5,047,000
2039	5,200	$498	$2,588,000	$1,294,000	$1,165,000	$5,047,000
2040	5,269	$498	$2,623,000	$1,312,000	$1,181,000	$5,116,000
2041	9,387	$498	$4,673,000	$2,337,000	$2,103,000	$9,113,000
2042	9,950	$498	$4,953,000	$2,477,000	$2,229,000	$9,659,000
2043	11,341	$498	$5,645,000	$2,823,000	$2,540,000	$11,008,000
2044	11,557	$498	$5,753,000	$2,877,000	$2,589,000	$11,219,000
2045	15,402	$498	$7,666,000	$3,833,000	$3,450,000	$14,949,000
2046	16,144	$498	$8,036,000	$4,018,000	$3,616,000	$15,670,000
2047	17,285	$498	$8,604,000	$4,302,000	$3,872,000	$16,778,000
2048	14,055	$498	$6,996,000	$3,498,000	$3,148,000	$13,642,000
2049	14,647	$498	$7,290,000	$3,645,000	$3,281,000	$14,216,000
2050	15,936	$498	$7,932,000	$3,966,000	$3,569,000	$15,467,000
2051	16,788	$498	$8,356,000	$4,178,000	$3,760,000	$16,294,000
2052	17,681	$498	$8,801,000	$4,401,000	$3,961,000	$17,163,000
2053	18,560	$498	$9,238,000	$4,619,000	$4,157,000	$18,014,000
2054	20,019	$498	$9,964,000	$4,982,000	$4,484,000	$19,430,000
2055	21,394	$498	$10,649,000	$5,325,000	$4,792,000	$20,766,000
2056	22,683	$498	$11,291,000	$5,646,000	$5,081,000	$22,018,000
2057	25,717	$498	$12,801,000	$6,401,000	$5,761,000	$24,963,000
2058	27,946	$498	$13,910,000	$6,955,000	$6,260,000	$27,125,000
2059	28,524	$498	$14,198,000	$7,099,000	$6,389,000	$27,686,000
2060	29,273	$498	$14,571,000	$7,286,000	$6,557,000	$28,414,000
2061	25,688	$498	$12,786,000	$6,393,000	$5,754,000	$24,933,000
2062	25,416	$498	$12,651,000	$6,326,000	$5,693,000	$24,670,000
2063	24,025	$498	$11,958,000	$5,979,000	$5,381,000	$23,318,000

Year	Total Ft/ Year	Replace Cost/ LF	Construction Cost	50% Engineer, Admin, Contractor Markup	30% Contingency	Total Cost
2064	23,809	$498	$11,851,000	$5,926,000	$5,333,000	$23,110,000
2065	18,756	$498	$9,336,000	$4,668,000	$4,201,000	$18,205,000
2066	17,941	$498	$8,930,000	$4,465,000	$4,019,000	$17,414,000
2067	16,800	$498	$8,362,000	$4,181,000	$3,763,000	$16,306,000
2068	16,193	$498	$8,060,000	$4,030,000	$3,627,000	$15,717,000
2069	15,601	$498	$7,765,000	$3,883,000	$3,494,000	$15,142,000
2070	14,312	$498	$7,124,000	$3,562,000	$3,206,000	$13,892,000
2071	13,460	$498	$6,700,000	$3,350,000	$3,015,000	$13,065,000
2072	12,567	$498	$6,255,000	$3,128,000	$2,815,000	$12,198,000
2073	11,688	$498	$5,818,000	$2,909,000	$2,618,000	$11,345,000
2074	10,172	$498	$5,063,000	$2,532,000	$2,279,000	$9,874,000
2075	8,773	$498	$4,367,000	$2,184,000	$1,965,000	$8,516,000
2076	7,483	$498	$3,725,000	$1,863,000	$1,676,000	$7,264,000
2077	4,449	$498	$2,215,000	$1,108,000	$997,000	$4,320,000
2078	2,220	$498	$1,105,000	$553,000	$497,000	$2,155,000
2079	1,643	$498	$818,000	$409,000	$368,000	$1,595,000
2080	824	$498	$410,000	$205,000	$185,000	$800,000
2081	290	$498	$144,000	$72,000	$65,000	$281,000
Avg/yr	**12,487**		**$6,215,000**	**$3,108,000**	**$2,797,000**	**$12,120,000**

The average cost per year would be approximately $12.1 million, and the average linear feet replaced per year would 12,487 feet. The cost assumes full pipe replacement averaging 10-inch diameter and 10-foot depth. It also assumes MH replacement.

If the piping is rehabilitated, it would be less than half the cost using CIPP. At a unit cost of $195/ft for CIPP, the average annual cost would be $4.8 million. Some piping will need to be replaced and some would be candidates for CIPP which can be determined through further analysis of the piping. Therefore, the cost for rehabilitation and repair will fall between $4.8 million and $12.1 million annually on average.

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CHAPTER 12

Strategic Financial Plan

The WWMP identifies approximately $60 million in pump station and sewer line projects (in 2023 dollars) over the planning period. Additional improvements (estimated to be about $93 million) are for wastewater repair and local sewer extensions, and to address I&I and other issues identified through the City's CMOM program. To implement the capital and CMOM improvements, additional staffing and equipment will also be required over the planning period.

The WWMP includes a Strategic Financial Plan (SFP) to estimate future available funding sources for capital projects and to project potential changes to the City's local wastewater rates that may be needed to support WWMP recommendations and fund ongoing operations, maintenance, and capital replacement costs. The building blocks of the SFP include projections of available revenues (from existing rates and projected rate increases) and costs or "revenue requirements" that the City will incur during the 20-year planning period.

The SFP provides important information for decision-makers to help define expectations related to future capital financing needs and associated wastewater rate increases. Because circumstances and priorities change, these projections typically vary (at least marginally) from approved annual budgeting and rate-setting decisions. Prospective financial and rate planning will involve regularly updating revenue requirement projections in the context of changing economic and credit market conditions, more refined cash flows and cost estimates, and other factors. Accordingly, the SFP elements discussed are intended to serve as a benchmark and reference for the City's prospective budgeting, capital planning, and rate setting decisions. Future updating of the SFP is facilitated by a 20-year cash flow forecasting model that was developed to support this effort.

12.1 Wastewater System Revenue Requirements

The SFP includes projections of annual revenue requirements that the City will incur for the wastewater system during the 20-year planning period. The primary components of wastewater system revenue requirements are:

- O&M costs – Ongoing personnel, materials and internal and external services costs associated with wastewater system operation and routine facility maintenance.
- Capital expenditures – Funding for capital improvements in the form as annual "pay-as-you-go" (PAYGO) funding from current revenue sources and debt service expenses (principal and interest) on long-term debt used to finance prior investments and future capital improvements.
- Reserves – Annual contingencies and reserves needed to maintain system financial integrity and service reliability, and rate stability. Designated cash reserves benefit the system by strengthening credit quality (supporting more favorable borrowing terms) and the City's ability to address unforeseen emergencies.

Each component of revenue requirements is discussed below.

12.2 Operation and Maintenance Costs

The O&M costs include all costs associated with operating and maintaining the system, including personnel (salary and benefits) costs, materials and services costs, and internal service charges (the wastewater system's portion of shared City services). Wastewater operating costs are projected for the planning period based on the City's FY 2023-24 budget and the following annual escalation factors, reflecting past trends and current general economic conditions:

- Salaries & Wages for FY 2024-25 through FY 2026-27 = five percent to realign compensation with the current labor market, based on the City's recently completed compensation survey.
- Salaries & Wages after FY 2026-27 = four percent.
- Benefits = four percent.
- Materials and Services (including internal service charges) = 3.5 percent.

Table 12-1 shows FY 2023-24 budgeted O&M costs by major expense category and future projections (in five-year increments) based on the escalation factors noted above.

Table 12-1 | Projected O&M Cost Summary ($ Millions)

Category	Current Budget 2023-24	Projected (Fiscal Year)			
		2028-29	2033-34	2038-39	2043-44
Current Budget Levels					
Salary Expenses	$2.24	$2.79	$3.40	$4.13	$5.03
Benefits	0.70	0.85	1.03	1.25	1.53
Material & Services	1.40	1.66	1.97	2.34	2.78
Internal Service Charges	0.84	1.00	1.18	1.40	1.67
Subtotal	$5.17	$6.29	$7.58	$9.13	$11.00
Project Delivery & CMOM Program					
Salary Expenses	$0.00	$0.55	$0.66	$0.81	$0.98
Benefits	-	0.23	0.29	0.35	0.42
Material & Services	-	0.05	0.06	0.07	0.08
Subtotal	$0.00	$0.83	$1.01	$1.22	$1.49
Total O&M	**$5.17**	**$7.12**	**$8.59**	**$10.35**	**$12.48**

As indicated in **Section 11.3.5**, the City is operating with fewer wastewater collection system staff than other comparable cities. Furthermore, the need for additional staff will grow as the system expands, wastewater flows increase, and regulatory requirements continue to evolve. Therefore, the O&M forecast includes the following staff positions added within the FY 2024-25 to FY 2025-29 period, which are included in **Table 12-1** under "Project Delivery and CMOM Program":

- Two FTE positions to implement the collection system cleaning and inspection program with two vacuum trucks and two CCTV trucks operating daily.
- Four FTEs to serve as a construction/repair crew to provide ongoing pipe repair and replacement.

12.3 Capital Expenditures

12.3.1 Capital Improvement Projects

The 20-year CIP discussed in **Section 10.2** and the CMOM recommendations discussed in **Section 11.4** is summarized in **Table 12-2**. The total projected improvement costs are approximately $225 million, including an adjustment for inflation of 3.5 percent per year based on long-term (20-year) growth in construction costs, as calculated from 20-city average cost indices published by the ENR.

To estimate potential funding of the CIP from System Development Charges (SDCs),[10] each CIP project was reviewed by City staff to estimate the portion of project costs associated with expanding capacity for future growth versus replacing existing capacity or addressing existing deficiencies. **Table 12-2** shows these preliminary estimates as a percentage of each project's costs. Capacity-increasing project costs are eligible for funding through SDCs or other developer contributions. [11]

Table 12-2 | Capital Improvement Plan (Inflated $)

Category	Total Cost 20-Year[a]	Estimated Growth Share[b]
CMOM Planning & Implementation		
Wastewater Repair	$ 14,634,735	--
CMOM Planning & Implementation	110,730,093	--
Local Sewer Extensions	13,383,968	--
Harbor Drive Pump Station	1,035,000	--
Equipment	816,780	--
Subtotal	$ 140,600,577	
Master Plan Improvements		
Pipe Projects		
South Springfield #1	$ 1,178,348	100%
Mid-Springfield #3	1,108,718	15%
Gateway #4	687,405	15%
North Springfield #2	2,352,422	15%
Mid-Springfield and 21st Street PS	83,154	15%
Downtown #4	89,076	15%
Gateway #1	61,463	15%
North Springfield #1b	924,400	15%
Harbor Drive	9,710,502	100%
Thurston #1	9,099,067	50%
North Springfield #1a	2,039,943	50%
Gateway #2	1,876,747	50%
North Springfield Trunk (Vera Area)	18,214,036	100%
Pump Stations		
Deadmond Ferry PS	6,170,985	35%

[10] System Development Charges are one-time charges assessed on new development upon connection to the local wastewater system.

[11] Developers may be required to advance-fund infrastructure needed to extend service to their development. To the extent that facilities constructed directly by developers have capacity beyond the individual need of the development, the City may provide SDC credits for the over-sized portion or otherwise establish a mechanism for reimbursement directly by future developments.

Category	Total Cost 20-Year[a]	Estimated Growth Share[b]
Nugget Way PS	5,320,146	50%
River Glen PS	4,145,436	15%
Hayden Lo PS	4,442,105	15%
Peace Health PS and Force main[c]	6,116,806	100%
North Gateway PS and Force main[c]	7,057,508	100%
28th Street PS and Force main[3]	3,712,464	100%
Subtotal	$ 84,390,732	
Total	**$ 224,991,309**	

[a] Includes 3.5% annual inflation based on 20-year average growth in construction costs as calculated from data published by the ENR.

[b] Preliminary estimate of project costs that expand capacity for future growth, as estimated by the City. Capacity-increasing costs are eligible for funding through SDCs.

[c] Needed for future development, but likely funded directly by developers.

The phasing of the CIP is an important consideration in evaluating the use of a PAYGO funding strategy versus long-term debt financing. Under a PAYGO approach, the combined revenues from annual fees and charges (along with any available reserves) must be sufficient to meet the annual costs of the CIP, based on the desired phasing schedule. **Table 12-3** shows the projected CIP costs by major category in five-year increments, based on the City's project prioritization and estimated timing.[12] As shown in **Table 12-3**, the average annual CIP costs increase over the planning period from $2.75 million in FY 2023-23 to $14.02 million by the final five-year period ending FY 2043-44.

Table 12-3 | CIP Phasing by Category ($ Millions)

CIP Category	Budget FY2023-24	5 Yrs. End FY2028-29	5 Yrs. End FY2033-34	5 Yrs. End FY2038-39	5 Yrs. End FY2043-44	20-Year Total
City CIP						
Wastewater Repair	$ 0.50	$ 2.78	$ 3.30	$ 3.91	$ 4.65	$ 14.63
CMOM[a]	1.75	13.42	21.16	31.42	44.73	110.73
Equipment	-	0.82	-	-	-	0.82
Local Sewer Extensions	0.50	2.78	2.05	3.91	4.65	13.38
Subtotal	$ 2.75	$ 19.78	$ 26.50	$ 39.25	$ 54.03	$ 139.57
Master Plan						
Sewer Mains	$ -	$ 5.50	$ 13.52	$ 16.06	$ 12.35	$ 47.43
Pump Stations	-	12.53	8.59	13.17	3.71	38.00
Subtotal	$ -	$ 18.03	$ 22.11	$ 29.23	$ 16.06	$ 85.43
Total CIP	**$ 2.75**	**$ 37.81**	**$ 48.61**	**$ 68.49**	**$ 70.09**	**$ 224.99**
Average Annual Costs	$ 2.75	$ 7.56	$ 9.72	$ 13.70	$ 14.02	

[a] Includes 70th Street Basin Rehab in FY 2023-24

12.3.2 Existing Debt

In addition to capital expenditures related to the CIP, the wastewater revenue requirements for the planning period include existing debt service associated with the 2017 Sewer Revenue Refunding Bonds. Annual debt service on the bonds ranges from $1.0 million to $1.7 million through maturity in FY 2026-27.

[12] The SFP is based on planning level costs and construction schedules. Detailed spend down assumptions for individual projects will be further refined as part of CIP implementation and shorter-term capital and financial planning.

12.4 Reserve Targets

While specific reserve targets are a matter of local policy, the City's existing reserve structure and target reserves used for financial planning purposes are consistent with wastewater industry best practices and include the following:

- Operating reserve = 150 days of operating expenses, consistent with the lower end of the benchmark range of reserves for Aa-rated utilities, as reported by credit agencies.[13] Based on the current budget, the operating reserve is about $2.1 million, and will increase over the forecast period as O&M costs increase.
- Rate stabilization contingency = $2.0 million per year.
- Working capital reserves and contingencies consistent with the City's current budget (about $0.23 million combined). These reserves are included in annual requirements, but they are assumed to be unspent and therefore roll forward in each year to the following year's beginning fund balance.
- For purposes of programming capital reserve spending on CIP projects, a minimum reserve of $4 million is used in the forecast.

Table 12-4 summarizes the specific operating and capital reserves estimated for the current fiscal year. General reserves (operating and capital ending fund balances in excess of the target reserves listed in the table) area available for future capital operating and capital expenses.

Table 12-4 | Estimated Contingencies and Reserves (FY 2023-24)

Category	FY 2023-24 Estimated ($ Millions)
Operating	
Operating Reserve[a]	$2.12
Working Capital Reserve	0.08
Rate Stability Reserve	2.00
Contingency	0.15
General Operating Reserves	2.01
Subtotal Operating	**$ 6.36**
Capital	
Minimum Capital Reserve	$ 4.00
General Capital Reserve	4.61
SDC – Reimbursement	7.90
SDC – Improvement	3.10
Subtotal Capital	**$ 19.62**

[a] 150 days of operating expenses

[13] Source: *"US Municipal Utility Revenue Debt Methodology"*, Moody's Investors Service, April 13, 2022.

12.5 Preliminary CIP Funding Strategy

12.5.1 Funding Sources

A key element of the SFP is the preliminary capital funding strategy that identifies the projected annual sources of funds that may be used to implement the CIP based on estimated project costs and sequencing. For most wastewater agencies, grant funding opportunities are limited, so agencies must rely on local funding from system revenues (primarily user fees and SDCs) to fund capital expenditures. Furthermore, because wastewater systems generally require intermittent capital projects that are larger in scale than available current revenue funding, utilities often utilize longer-term debt to fund a portion of the CIP. Fixed rate financings in the form of loans made available through state and federal financing programs and revenue bonds issued through the municipal credit market are the most common debt instruments used to fund large-scale improvements on an "as-needed" basis.

Accordingly, the preliminary CIP funding strategy consists of a combination of PAYGO funding (from local wastewater rates, SDCs, and reserves) and long-term debt financing. Direct funding from private development is also anticipated for a portion of new pump station improvements needed to serve the needs of new developing areas. While the City will continue to explore grant funding opportunities, no specific grants have been identified for CIP projects.

It is important to note that future financial and CIP planning may give rise to re-evaluation of planned use of debt vs. current revenues to fund capital expenditures as CIP costs, cash flows and credit market conditions change over time.

12.5.2 Current Revenue Capital Funding Capacity

Forecasts of local revenues were developed to estimate the capacity of current rates and charges to fund a portion of the WWMP CIP.

12.5.3 Revenue Forecast

User rates are assessed on all wastewater system customers based on billable sewer volumes (which are determined for most customers based on winter average water use which is an indicator of sewage flow). SDC revenues are charges on developments when they connect to the system. Forecast revenue from user rates and SDCs reflect assumptions related to customer growth, water consumption trends, and future SDC inflationary increases.

The following key assumptions are used to forecast future revenue from existing rates and SDCs for purposes of evaluating current capital funding capacity:

- Customer growth will average 0.7 percent per year, reflecting growth in households in existing service areas, new catchment basins, and from septic conversions.[14]
- Consistent with recent trends, water use per account will continue to decrease, but the rate of decline will moderate slightly over the longer-term period. Average billed sewer volumes per account are projected to decline an average of 0.50 percent per year from the most recent FY 2022-23 estimates. This compares to an average annual reduction of 0.90 percent per year over

[14] From the "Future Land Use Analysis and Population Projections Technical Memorandum" (April 27, 2023), existing households are 30,516 in existing and new catchments and projected future householders are 36,250 in existing and new catchments.

the past 10 years. These reductions reflect the installation of more efficient plumbing fixtures and other water conservation measures by customers.

- SDC revenues (from both improvement and reimbursement components) are projected to average about $0.8 million in FY 2024-25 and will grow with inflation at 3.5 percent per year.[15]

Table 12-5 shows budgeted and forecast revenue from existing user rates and SDCs in five-year forecast increments. In FY 2023-24, revenue from existing rates is estimated to be about $8.1 million, based on the existing rate schedule (effective July 1, 2023) and the current billed volumes by customer class from the billing system. As the system grows, wastewater user fee revenue at existing rates is projected to be approximately $8.8 million by FY 2043-44, assuming modest customer growth and continued reductions in water use per account.

Table 12-5 | Projected Revenue for Capital from Current Rates and SDCs

Category	Current Budget 2023-24	Projected (Fiscal Year)			
		FY2028-29	FY2033-34	FY2038-39	FY2043-44
Operating Revenue					
User Rate Revenue (Existing Rates)	$8.10	$8.38	$8.51	$8.64	$8.78
Other Revenue[a]	$0.19	$0.22	$0.24	$0.27	$0.31
Subtotal Revenue	$8.29	$8.60	$8.75	$8.91	$9.09
Less Operating & Debt Requirements					
O&M	$5.17	$7.12	$8.59	$10.35	$12.48
Existing Debt Service	$1.71	$0.00	$0.00	$0.00	$0.00
Subtotal Requirements	$6.88	$7.12	$8.59	$10.35	$12.48
Projected Revenue Available for Capital					
Rate Revenue (Net of Operating & Debt Requirements)	*$1.41*	*$1.48*	*$0.16*	*-$1.44*	*-$3.40*
Plus SDC Revenue	*$1.35*	*$0.92*	*$1.09*	*$1.29*	*$1.54*
Total Revenue Available for Capital	**$2.76**	**$2.40**	**$1.25**	**-$0.15**[b]	**-$1.86**

[a] Includes revenue from engineering fees and interest income.
[b] SDC revenue used for modelling purposes but note that SDCs cannot fill capital gaps if for operating expenses.

12.5.4 Projected Funding Capacity

Monthly sewer rates are used to fund both system O&M and capital costs, while SDCs are restricted to funding capital improvement costs only. **Table 12-5** shows the amount of rate and other revenue available for capital improvements, after rate revenues are reduced by O&M costs (from **Table 12-1**) and annual debt service requirements associated with existing debt. As shown in **Table 12-5**, rate revenue available for capital averages about $1.5 million per year through FY 2028-29, as O&M cost increases are offset by the reduction in existing debt service, which is eliminated by FY 2028-29.

SDC revenue is projected to range from slightly under $1 million to just over $1.5 million per year during the planning period, down from recent years.[16] Revenue from improvement SDCs (which currently

[15] Under Oregon SDC law, utilities may adjust SDCs annually based on cost inflation as measured by a construction cost index (CCI). The long-term trend for the ENR CCI has been an increase of approximately 3.5 percent per year.
[16] Annual SDC revenues between FY 2020-21 and FY 2022-23 averaged about $1.7 million. Future annual SDC revenue is projected to moderate based on the assumed rate of growth over the long-term planning period (0.7 percent) compared to higher recent growth (1.1-1.2 percent).

represent about one-third of total SDC revenue) is restricted to capacity-increasing improvement costs in the CIP. **Table 12-2** provided a preliminary estimate of improvement fee eligibility for each project, as estimated by the City. Reimbursement SDC revenues may be spent on any capital related costs of the wastewater system that recapture or increase capacity, including wastewater repair and CMOM projects.

Total revenue for capital from existing rates and SDCs shown in **Table 12-5** is less than the average annual CIP costs shown in **Table 12-3**, both in the short and longer term, meaning that rate increases will be needed to build capital funding capacity (both for PAYGO and future debt service costs), and to adequately fund projected O&M costs.

In addition to the projected annual rate and SDC revenues, the City has existing cash reserves that may provide funding for a portion of the near-term CIP costs. As mentioned previously, cash reserves are needed to maintain the financial integrity of the system and to address unforeseen circumstances. Undesignated reserves may also be used to manage capital spending needed from rates. Rate increases may be smoothed (phased in) over the planning period to avoid short-term rate increase "spikes" under a PAYGO strategy and to defer the need for issuing additional debt. Based on the reserve targets provided in **Table 12-3**, the City has approximately $15 million in undesignated capital reserves (including $11 million in SDC balances) that may be used to fund capital projects during the planning period.

12.6 Projected CIP Cash Flow

The preliminary funding strategy for CIP was developed using a long-term SFP model. The model, in Microsoft Excel, is composed of a series of integrated spreadsheets specifically designed to represent wastewater system annual cash flows. The preliminary CIP cash flows and funding sources for the 20-year period are shown in **Table 12-6.**

Table 12-6 | Summary of Capital Cash Flows ($ Millions)

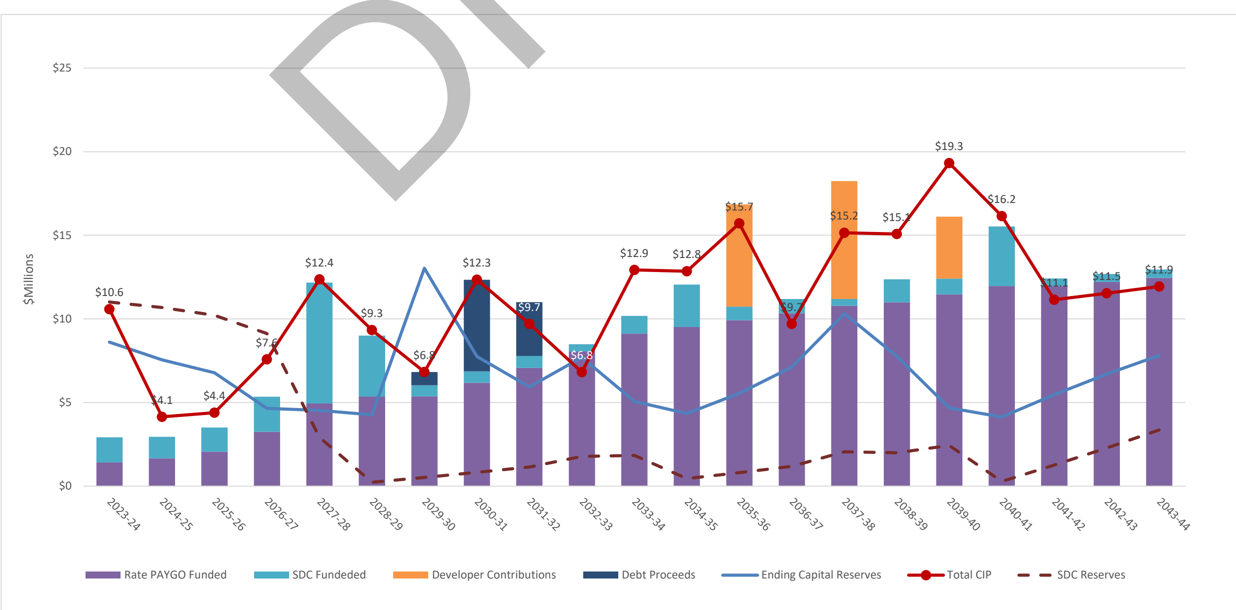
Fiscal Year	CIP Expenditures	Rates	Funding Sources				
			Capital Reserves	Debt Proceeds	SDC Revenue & Reserves	Developer Contributions	Total
2024-25	$4.14	$1.79	$1.06	-	$1.29	-	$4.14
2025-26	$4.39	$2.17	$0.78	-	$1.45	-	$4.39
2026-27	$7.58	$3.35	$2.13	-	$2.10	-	$7.58
2027-28	$12.36	$5.00	$0.12	-	$7.24	-	$12.36
2028-29	$9.33	$5.43	$0.26	-	$3.64	-	$9.33
2029-30	$6.82	$5.36	-	$0.80	$0.66	-	$6.82
2030-31	$12.34	$6.17	-	$5.48	$0.69	-	$12.34
2031-32	$9.70	$5.77	-	$3.22	$0.71	-	$9.70
2032-33	$6.81	$6.37	-	-	$0.44	-	$6.81
2033-34	$12.93	$9.23	$2.64	-	$1.06	-	$12.93
2034-35	$12.85	$9.59	$0.72	-	$2.54	-	$12.85
2035-36	$15.71	$8.78	-	-	$0.82	$6.12	$15.71
2036-37	$9.70	$8.85	-	-	$0.84	-	$9.70
2037-38	$15.15	$7.69	-	-	$0.40	$7.06	$15.15
2038-39	$15.08	$11.14	$2.55	-	$1.38	-	$15.08
2039-40	$19.32	$11.58	$3.08	-	$0.94	$3.71	$19.32

Fiscal Year	CIP Expenditures	Rates	Funding Sources				
			Capital Reserves	Debt Proceeds	SDC Revenue & Reserves	Developer Contributions	Total
2040-41	$16.15	$12.03	$0.55	-	$3.57	-	$16.15
2041-42	$11.14	$10.68	-	-	$0.46	-	$11.14
2042-43	$11.54	$11.05	-	-	$0.48	-	$11.54
2043-44	$11.94	$11.44	-	-	$0.50	-	$11.94
Total	**$224.99**	**$153.49**	**$13.90**	**$9.50**	**$31.22**	**$16.89**	**$224.99**

The projected annual CIP requirements generally increase over the planning period, reflecting steady increases in CMOM-related improvements and intermittent large trunk sewer and pump station projects (as shown in **Table 12-3**). The CIP funding strategy consists of a combination of PAYGO funding and long-term debt financing, where debt proceeds are used on a limited basis to address larger-scale improvements not covered by existing available reserves in the short-term or anticipated developer funding in the longer term.

Figure 12-1 shows the projected annual CIP costs and funding sources in the context of projected capital and SDC reserves. Initially, the projected CIP costs exceed the available funding from projected rates and SDCs (based on rate increases discussed in the following section), so capital reserves are used to fund a portion of project costs, resulting in a steady decline in capital and SDC reserves through FY 2028-29. Pay-as-you-go capital funding increases incrementally each year, with the goal of building a sustainable level of CIP funding capacity from rates to meet basic system repair and replacement (asset management) needs. The phasing in of larger amounts of PAYGO requires utilization of other available resources (undesignated capital and SDC reserves and debt and developer funding) in years where CIP costs exceed PAYGO funding capacity from projected rate increases. In other years, where CIP costs are below the funding capacity of revenue sources, the reserve levels increase and are then available for CIP project costs later in the plan.

Figure 12-1 | Projected CIP Cash Flow and Capital Reserves



As shown in **Table 12-6**, debt proceeds of $9.5 million are assumed to fund a portion of the CIP costs (Harbor Drive improvements) anticipated to begin in FY 2029-30. Without long-term financing, the requirements from rates during the FY 2029-30 through FY2033-34 CIP would exceed $45 million ($9 million per year), compared to about $3.4 million per year in the initial five-year period. The City may elect to issue a greater amount debt over the planning period or adjust other elements of the preliminary CIP funding strategy to further reduce revenue requirements from rates, as part of its future capital and financial planning.

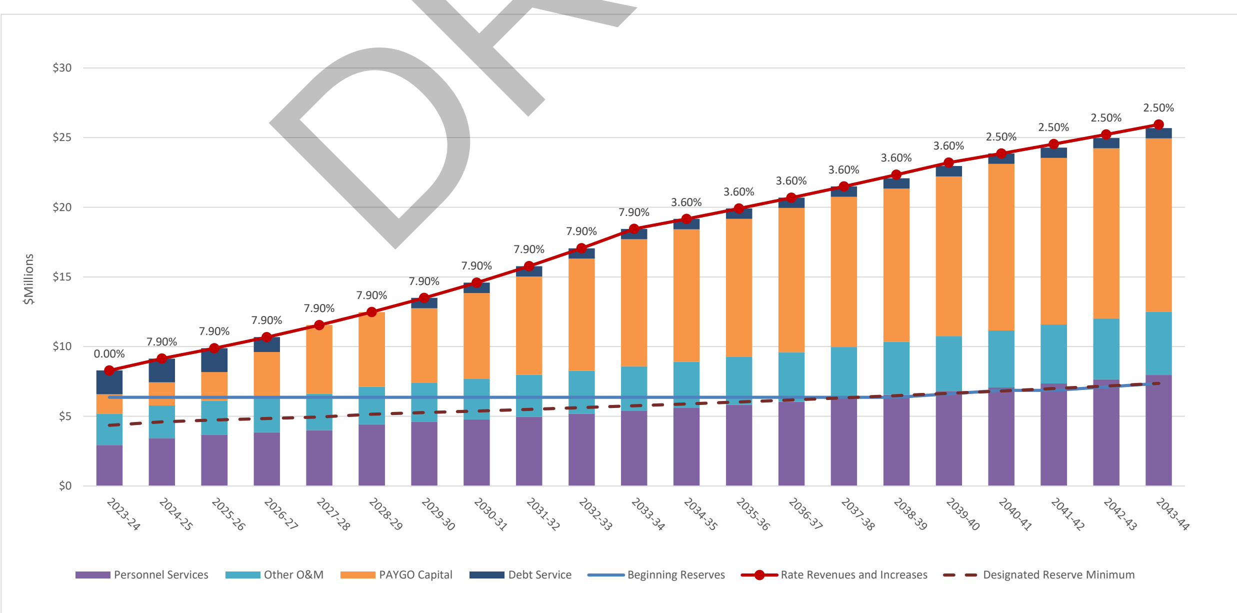
The CIP cash flow anticipates that many of the development-driven expansion projects will need to be constructed during the final 10 years of this WWMP (as shown in **Table 12-6** and **Figure 12-1**). The City anticipates some direct funding from private development for these projects that will reduce pressure on wastewater rates increases. However, should it be necessary for these projects to be constructed by the City prior to development activity, without additional capital reserves or private development contributions to offset rate revenue requirements, some combination of additional long-term debt financing and larger rate increases would likely be required to fully fund the CIP.

12.7 Summary of Projected Requirements and Rates

12.7.1 Projected Requirements and Rate Increases

The SFP forecasting model was developed as a tool to project system revenue requirements and determine needed wastewater rate adjustments to meet those requirements, in accordance with the capital funding strategy and financial reserve targets described previously. **Figure 12-2** shows the projections of O&M and rate-supported (i.e., PAYGO) capital expenditures and operating reserves over the planning period, and the annual rate revenues (and percent increases), projected to meet the planned expenditures and designated reserve targets. The growth in revenue requirements is attributed to ongoing increases in O&M expenses (both inflationary and additional staffing requirements), as well as PAYGO capital funding.

Figure 12-2 | Projected Wastewater Rate Revenues, Requirements, and Operating Cash Reserves*



*Excludes SDC revenue and capital-related reserves

As shown in **Figure 12-2**, a series of rate increases will be necessary to generate adequate revenues to support the CIP, and to fund ongoing operation and maintenance costs. Notably, because of the need to build revenue capacity to support the additional staffing associated with the CMOM program in the short-run and assuming a capital funding plan focused on building PAYGO capacity for asset management needs, the pace of rate increases is projected to be greatest in the first half of the planning period. During these years, system-wide rate increases are projected to exceed assumed general cost inflation (3.5 percent) and result in a more than doubling of the FY 2023-24 rates. As shown in **Figure 12-2**, projected annual rate increases are as follows:

- FY 2023-24 – No additional rate increase in the current year. The City had a two (2) percent increase at the beginning of the FY.
- FY 2024-25 through FY 2033-2034 = 7.9 percent.
- FY 2034-35 and beyond – inflationary increases in the range of 2.5 percent to 3.6 percent.

The projected rate adjustments are based on customer growth and water use trends, as well as the initial capital funding strategy. Future financial and CIP planning may give rise to re-evaluation of planned capital funding sources (e.g., use of debt versus current revenues) as CIP costs, cash flows and credit market conditions change over time. As noted previously, the City may elect to issue a greater amount debt over the planning period to further reduce revenue requirements from rates and projected rate increases in the shorter term.[17] The SFP is intended to provide a framework for the City to begin conversations around project phasing, funding sources and associated rate impacts.

12.8 Current and Projected Rates and Bills

Under the City's current local wastewater rate structure, customers are charged a uniform rate per unit of billed volume (determined by winter average water use for most customers). The current adopted rate and the projected future rates (based on the planning level rate increases) are shown in **Table 12-7.** A typical residential customer has an average billable volume of seven units;[18] thus, the current monthly bill (excluding the regional wastewater charges) is $27.23. In this SFP, typical monthly bill increases during the first 10 years of the planning period would average approximately $3 per month. During the second half of the plan, projected bill increases would average slightly over $2 per month.

Table 12-7 | Current and Projected Local Wastewater Rates and Typical Bills[a]

Fiscal Year	User Rate Per Unit[b]	% Change	Typical Res. Bill per Month[c]	Increase in Monthly Bill
2023-24	$3.89	--	$27.23	--
2024-25	$4.20	7.9%	$29.38	$2.15
2025-26	$4.53	7.9%	$31.70	$2.32
2026-27	$4.89	7.9%	$34.21	$2.51
2027-28	$5.27	7.9%	$36.91	$2.70
2028-29	$5.69	7.9%	$39.83	$2.92

[17] For example, shifting an additional $10-12 million of trunk sewer and pump station costs from PAYGO to debt funding in the first 10 years of the plan may reduce the projected annual rate increases through FY 2033-34 from 7.9 percent to approximately 7.0 percent. However, post FY 2033-34 annual rate increases would increase under that scenario, to build PAYGO funding capacity later in the plan and to pay for the additional debt service costs.

[18] As noted previously, billable wastewater volumes per account are projected to decline marginally over the planning period such that a typical residential customer's monthly volume is anticipated to be less than seven units; however, for purposes of projecting bill impacts in **Table 12-7**, a consistent monthly volume is used throughout the planning period,

Fiscal Year	User Rate Per Unit[b]	% Change	Typical Res. Bill per Month[c]	Increase in Monthly Bill
2029-30	$6.14	7.9%	$42.98	$3.15
2030-31	$6.63	7.9%	$46.38	$3.40
2031-32	$7.15	7.9%	$50.04	$3.66
2032-33	$7.71	7.9%	$53.99	$3.96
2033-34	$8.32	7.9%	$58.25	$4.26
2034-35	$8.62	3.6%	$60.35	$2.10
2035-36	$8.93	3.6%	$62.52	$2.17
2036-37	$9.25	3.6%	$64.78	$2.25
2037-38	$9.59	3.6%	$67.11	$2.33
2038-39	$9.93	3.6%	$69.52	$2.42
2039-40	$10.29	3.6%	$72.03	$2.51
2040-41	$10.55	2.5%	$73.83	$1.80
2041-42	$10.81	2.5%	$75.68	$1.85
2042-43	$11.08	2.5%	$77.57	$1.89
2043-44	$11.36	2.5%	$79.51	$1.94

a Excludes Regional (MWMC) wastewater rates
b Units = 748 gallons
c Based on 7 units

12.9 Operating Cash Flow Forecast

The projected operating cash flow forecast is provided in **Table 12-8**. Specifically, the table shows projected annual revenues, requirements, operating balances, and debt service coverage, based on the preliminary capital funding strategy and rate increases. As is the case with the City's current local wastewater debt, new debt included in the SFP assumes revenue obligations structured as level annual debt service, with a maturity of 20 years.[19] A revenue bond repays creditors from net revenues generated by the overall system.

For revenue bonds, the utility is required to set its rates and charges in a manner that generates the funds to repay bondholders from system revenues, pay O&M costs, and contribute to the replacement of system facilities. Debt service "coverage" is calculated as the ratio of net revenues (total system revenues less O&M expenses) to annual debt service. Typically, revenue bond covenants require the utility to charge rates that target coverage ratios between 1.20 and 1.50 times the annual debt service requirement. Given the limited debt included in the SFP, projected debt service coverage targets exceed these minimum industry benchmarks, as shown in **Table 12-8.**

[19] An interest rate of 4.5 percent was used for planning purposes.

Table 12-8 | Summary of Projected Revenues, Requirements, Debt Service Coverage and Operating Balance ($ Millions)

SFP Component	Projected Fiscal Year									
	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34
Revenues										
Wastewater User Fees	$8.94	$9.68	$10.47	$11.33	$12.26	$13.27	$14.36	$15.54	$16.82	$18.21
Other Revenue*	$0.20	$0.20	$0.21	$0.21	$0.22	$0.22	$0.23	$0.23	$0.23	$0.24
Total Revenues	$9.14	$9.88	$10.68	$11.54	$12.48	$13.49	$14.59	$15.77	$17.06	$18.44
Revenue Requirements										
Operation & Maintenance	$5.78	$6.11	$6.37	$6.61	$7.12	$7.39	$7.67	$7.97	$8.27	$8.59
Debt Service	$1.71	$1.71	$1.07	$0.00	$0.00	$0.74	$0.74	$0.74	$0.74	$0.74
PAYGO Capital	$1.66	$2.06	$3.25	$4.93	$5.36	$5.36	$6.17	$7.07	$8.05	$9.12
Total Revenue Requirements	$9.14	$9.88	$10.68	$11.54	$12.48	$13.49	$14.59	$15.77	$17.06	$18.44
Revenue Surplus/(Deficiency)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Debt Service Coverage										
Net Rev. Available for Debt Service[a]	$3.36	$3.77	$4.31	$4.93	$5.36	$6.10	$6.92	$7.81	$8.79	$9.86
Debt Service Coverage	1.97	2.20	4.05	na	na	8.23	9.33	10.53	11.85	13.30
Operating Balances										
Beginning Balance	$6.36	$6.36	$6.36	$6.36	$6.36	$6.36	$6.36	$6.36	$6.36	$6.36
Ending Balance[b]	$6.36	$6.36	$6.36	$6.36	$6.36	$6.36	$6.36	$6.36	$6.36	$6.36

* Sources of other revenue explained on next page.

SFP Component	Projected Fiscal Year									
	2034-35	2035-36	2036-37	2037-38	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44
Revenues										
Wastewater User Fees	$18.92	$19.66	$20.43	$21.23	$22.07	$22.93	$23.58	$24.24	$24.92	$25.62
Other Revenue	$0.24	$0.25	$0.25	$0.26	$0.27	$0.28	$0.29	$0.29	$0.30	$0.31
Total Revenues	$19.17	$19.91	$20.69	$21.49	$22.33	$23.21	$23.86	$24.53	$25.22	$25.93
Revenue Requirements										
Operation & Maintenance	$8.91	$9.25	$9.61	$9.97	$10.35	$10.75	$11.16	$11.58	$12.03	$12.48
Debt Service	$0.74	$0.74	$0.74	$0.74	$0.74	$0.74	$0.74	$0.74	$0.74	$0.74
PAYGO Capital	$9.51	$9.92	$10.34	$10.78	$10.99	$11.47	$11.96	$11.96	$12.21	$12.46
Total Revenue Requirements	$19.17	$19.91	$20.69	$21.49	$22.08	$22.96	$23.86	$24.28	$24.97	$25.68
Revenue Surplus/(Deficiency)	$0.00	$0.00	$0.00	$0.00	$0.25	$0.25	$0.00	$0.25	$0.25	$0.25
Debt Service Coverage										
Net Rev. Available for Debt Service[c]	$10.25	$10.66	$11.08	$11.52	$11.98	$12.46	$12.70	$12.95	$13.20	$13.45
Debt Service Coverage	13.83	14.38	14.95	15.54	16.16	16.81	17.14	17.47	17.80	18.14
Operating Balances										
Beginning Balance	$6.36	$6.36	$6.36	$6.36	$6.36	$6.61	$6.86	$6.86	$7.11	$7.36
Ending Balance[b]	$6.36	$6.36	$6.36	$6.36	$6.61	$6.86	$6.86	$7.11	$7.36	$7.61

[a] Total revenues less operation & maintenance costs.
[b] Beginning balance less revenue surplus/deficiency.
[c] Total revenues less operation & maintenance costs

12.10 Conclusions

The SFP is designed to provide a framework for the City to initiate conversations with stakeholders around CIP phasing, funding sources and associated rate impacts. The capital funding strategy contained herein relies on a combination of PAYGO funding from rates and SDCs, utilization of undesignated capital reserves, limited long-term debt financing, to address larger-scale improvements, and direct developer funding to pay for the estimated $225 million in capital projects over the next 20 years. While the City will continue to explore grant funding opportunities, no specific grants have been identified for CIP projects.

Annual rate increases, based on a largely PAYGO capital funding strategy, are initially projected at 7.9 percent per year for the first half of the SFP and are projected at inflationary levels in the second half of the plan. The SFP model developed as part of the WWMP process is structured to enable evaluation of CIP alternatives and different approaches to program financing as part of continued financial, capital planning, and rate-setting efforts. The model provides a framework to assess the financial implications of a variety of alternative capital funding scenarios that may include re-balancing of debt and equity financing, revised project scheduling, or debt structure revisions, while adhering to financial management targets (i.e., maintenance of reserve balances and debt service coverage levels).

The projected cash flows that comprise the SFP are based on available information on revenue, expenditures, customer accounts, and water use as of May 2023. There will usually be differences between assumed and actual conditions because events and circumstances frequently do not occur as expected, and those differences may be significant. Among the variables that could impact future rate increases are changes in customer growth, economic and other factors impacting water consumption patterns, cost escalation, and interest rates on long-term debt. Furthermore, any changes to CIP funding or other key assumptions would likely necessitate changes to the rate increases. Therefore, it is important that the City monitors the financial plan regularly and update projections as needed.

Sustainable capital funding may be advanced by long-term financing strategies that reflect system development, renewal, and replacement needs. In general, this occasions use of long-term debt obligations for major, intermittent investment/reinvestment needs and current revenue (i.e., PAYGO) funding from rates and SDCs for annual asset management and system expansion requirements.

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APPENDIX A

COMMUNITY ENGAGEMENT PLAN

Springfield Wastewater Master Plan

Community Engagement Plan

Reviewed by Springfield Committee for Citizen Involvement: April 19, 2022

I. Purpose of this Community Engagement Plan

This Community Engagement Plan will serve as a guide for outreach and community engagement activities for Springfield's Wastewater Master Plan Project. It describes activities that the City of Springfield will implement to ensure that interested and affected parties, together with the project team, have adequate opportunities to provide meaningful input and feedback to one another. The Community Engagement Plan is designed with the general public, development and engineering community, decision makers, and the project team in mind as the intended audience.

II. Introduction

Background

The City of Springfield operates a large and complex wastewater collection system, which includes 250 miles of wastewater pipe varying from 6 to 60 inches in diameter. This system of pipes and pumps conveys Springfield's wastewater to the Metropolitan Wastewater Management Commission's (MWMC) regional wastewater treatment plant in North Eugene, where all wastewater from the Eugene-Springfield area is treated prior to being returned to the Willamette River. Effective conveyance and treatment of wastewater is critical to the health and vitality of the Springfield community, surrounding water quality, and the local environment.

Guided by the City's Capacity, Management, Operations, and Maintenance (CMOM) Program, the City operates, maintains, inspects, and cleans its wastewater collection system. The CMOM Program helps to preserve and extend the life of wastewater infrastructure, as well as prevent overflows of wastewater into local parks, yards, streets, or waterways, known as sanitary sewer overflows or SSOs.

The City also uses a hydrologic and hydraulic model along with various inspection techniques to identify locations where maintenance holes and pipes can be repaired to reduce infiltration and inflow (I&I), groundwater and stormwater that enters the wastewater system and increases the flow being conveyed to the wastewater treatment plant. These tools have also helped the City identify downspouts, sump pumps, and area drains that are improperly connected to the wastewater system.

To provide an assessment of existing and future needs for Springfield's wastewater collection system and to develop cost-effective solutions for managing excessive wet weather wastewater flows, the City last updated its Wastewater Master Plan in 2008. All capital improvement projects identified in the 2008 plan have been constructed, so the Wastewater Master Plan is being updated again in 2022, in collaboration with contractor Murraysmith Inc.

Project Purpose & Outcomes

Project Purpose

The purpose of updating Springfield's Wastewater Master Plan is to identify needed improvements to the City's wastewater collection system for increased capacity for future 2042 planning year conditions.

Project Outcomes

With the purpose of the project in mind, the project will result in the following outcomes:

1. Analysis of the wastewater collection system's performance and response under different hydrologic and hydraulic conditions, using historical monitoring data
2. Development of a methodology to determine future condition land use, related to potential changes in housing density in portions of Springfield's service area, and to identify areas within the City where the wastewater collection system is available for increased capacity based on these potential changes
3. Assessment of existing system capacity and identification of deficiencies in current and future 2042 planning year conditions
4. Recommendation of improvements to the wastewater collection system to increase capacity and eliminate identified deficiencies in the current and future 2042 planning year conditions. This will include a comparison of expansion vs.

rehabilitation of the wastewater conveyance system in portions of the service area, as well as identification of needed infiltration and inflow repairs.

5. Establishment of a long-term funding plan that ensures adequate revenue to address the capital needs of the local wastewater collection system, with consideration for rate impacts
6. Delivery of a Wastewater Master Plan document to discuss the planning process, technical analysis, and potential improvements to the City of Springfield's wastewater collection system, for City Council review and adoption

III. Community Engagement

Community Engagement Goals

The project team is committed to sharing information and gathering input regarding the needs and issues of the broader community and key stakeholders related to this planning effort.

The Community Engagement goals are to:

- **Build awareness:** Share project information through multiple communication channels to reach the development and engineering sector and the broader Springfield community, building awareness of the City's efforts to update the Wastewater Master Plan along with the final product and recommendations for improvements.
- **Create space for dialogue:** Engage with project stakeholders and the broader Springfield community, to ensure they have opportunities to provide input at key project milestones.
- **Educate the community:** Foster understanding amongst community members on the key issues related to the strategic management of Springfield's wastewater collection system and the importance of design and planning infrastructure changes to address those concerns.
- **Support informed decision-making:** Ensure clear and transparent access to technical findings and community input.
- **Accountability:** Explain how input will influence the process and demonstrate how the project incorporates this input into the final Wastewater Master Plan.
- **Timely communication:** Communicate complete, accurate, understandable, and timely information to the community and partners through the development of an updated Wastewater Master Plan.
- **Agency collaboration:** Communicate actively with Springfield agency partners and other regional public partners, including the Metropolitan Wastewater Management Commission, to inform them on how the outcomes achieved through this project will help them fulfill their shared missions to serve the community.

- **Reliability and adaptability:** Use the Community Engagement Plan as the guiding document and resource for the project team when questions arise and/or the need to revisit strategies becomes apparent.

Engagement Process

Setting the Stage for Community Engagement

The Springfield Committee for Citizen Involvement's input on the Community Engagement Plan will provide foundational guidance to the project team on how to make sure they can work effectively with and meaningfully involve Springfield's community members throughout the project.

Decision-Making Groups

City Council: The Springfield City Council has the ultimate decision-making responsibility for the Wastewater Master Plan. The City Council must adopt the updated Wastewater Master Plan for it to be implemented. In addition to City Council work sessions and/or Communication Packet Memos during the development of the plan, City staff will facilitate a public hearing with the Springfield City Council for adoption of the draft Wastewater Master Plan.

Identified Stakeholders & Issues

The project team has identified the below listed stakeholders as potentially affected interests, who will likely be affected by the project either directly or indirectly, as well as those interests who think they will be affected or otherwise need to or want to be involved in the project. Also outlined below are the likely concerns of those potentially affected interests.

Potentially Affected Interests (below) & Issues (right):	Cost and impacts to rates	Planned capital improvements & construction disruption	Wastewater collection system quality and reliability for protection of public health and the environment	Infrastructure Design Standards	Community input and support
Springfield residents/local wastewater ratepayers	✓	✓	✓		
Development & engineering community		✓	✓	✓	

Springfield City Council	✓	✓	✓	✓	✓
MWMC Commission and regional wastewater staff	✓		✓	✓	✓

Key Messages

Using key messages throughout project communications is helpful to maintain consistent messaging about the project's goals and outcomes. These messages can appear on written communications, serve as talking points, and can adapt to include feedback and themes from various stages of the project.

What's the City of Springfield's role related to wastewater collection and why does it matter for community members?

- The City of Springfield is committed to strategically managing and maintaining its wastewater infrastructure, including 250 miles of wastewater pipes to meet our community's current and future needs.
- Springfield's pipes and pumps transport wastewater from around the city to the Metropolitan Wastewater Management Commission's (MWMC) regional wastewater treatment plant in North Eugene. The MWMC cleans water for the Eugene-Springfield area and then returns that cleaned water to the Willamette River.
- Wastewater collection is an essential community service. Effective management of the wastewater collection system is critical to the health and vitality of the Springfield community, surrounding water quality, and the local environment.

What is the City of Springfield currently doing to manage its wastewater collection system?

- The City of Springfield utilizes a Capacity, Management, Operations, and Maintenance or CMOM program to guide its work associated with the wastewater collection system, including operating, maintaining, inspecting, and cleaning it.
    - This includes proactive maintenance activities such as close circuit TV inspections of wastewater pipe using a camera, high velocity cleaning, and flow metering completed by Springfield's Operations Division of the Development & Public Works Department. Additionally, the team repairs leaking sections of wastewater pipes as needed.
    - Springfield is also guided by the MWMC's Regional CMOM Program Plan, as all the wastewater Springfield conveys ultimately ends up at the MWMC's treatment plant.

    - Springfield has an inter-governmental agreement with the City of Eugene Wastewater Division to maintain the pump stations within Springfield.
- Springfield maintains a hydraulic model in order to predict areas in the collection system where issues may occur. Larger scale improvements that are needed are added to the City's five-year Capital Improvement Program and capital budget, to ensure sufficient financial and human resources are allocated for maintenance of the wastewater collection system.

What does an updated Wastewater Master Plan entail and what is the desired outcome of the project?

- An update to Springfield's Wastewater Master Plan is important for identifying where improvements for increased capacity are needed and the best and most cost-effective way to meet those needs.
- The City's last update of its Wastewater Master Plan was completed in 2008, and all of the capital improvements identified in the plan have been completed. A 2022 update to the plan will recommend additional improvements to the City's wastewater collection system to increase capacity and eliminate identified deficiencies, in anticipation of future 2042 planning year conditions.

How will the development of a new Wastewater Master Plan affect local wastewater rates?

- As part of the Wastewater Master Plan, a long-term funding plan will be developed to identify options to ensure adequate revenue to address the capital needs of Springfield's wastewater collection system.
- This long-term funding plan will be developed with consideration for rate impacts to community members and businesses and with transparency to stakeholders. The community will have the opportunity to share their input related to any future rate impacts.

How can community members get involved?

- There will be opportunities at key project milestones for Springfield community members and project partners to review draft materials, ask questions, and provide input and feedback on the project.
- Recommendations from City staff and consultants for the management of Springfield's wastewater collection system will be based in scientific analysis using qualitative and quantitative data, and this information will be available to the community through the various communications channels listed below under Community Engagement Strategies.
- City staff welcome questions about the project. We are here to help you.

Community Engagement Strategies

The activities listed below highlight the project's specific communication strategies outside of any legal notices that may be required as part of the public hearing process.

Community Engagement Strategies			
Strategy	**Purpose**	**Timeline**	**Level of Engagement**
Project webpage: To include posting of current plan and draft plan updates, FAQs, key dates, and more	Provides project information in one location	Create webpage Spring 2022; updates as needed	Inform, gather feedback with any tools on the webpage
FAQs on project webpage	Share key messages, project information, answer common questions	Create initial FAQs by May 2022; updates as needed	Inform
Graphics	Share project information in a visual and easy-to-understand way; Use these graphics across multiple communications channels as needed	Summer & Fall 2022	Inform
Article(s) in MWMC and DPW external newsletters	Build awareness of the project through key messages, share updates	Ongoing/as needed	Inform
E-Updates to DPW general, Development Code, and Housing E-lists	Share periodic updates (topics, ways to stay involved, key dates)	Ongoing/as needed	Inform
Social media posts on City channels (Facebook, Instagram, and Twitter) and potentially sharing by MWMC	Build overall awareness and promote project activities and findings	Ongoing/as needed	Inform
Virtual open house and survey via StoryMap that is linked from the project webpage	Share infrastructure improvements identified for existing and future expanded system; gather feedback and answer questions	Anticipated November-December 2022, when improvement recommendations and the draft Strategic Financial Plan are received from consultant	Inform, gather feedback
News Releases	Share key messages, project information, and opportunities for community input and	As needed – 3 news releases anticipated: prior to virtual open	Inform, promote community feedback

	feedback with local media at key project milestones	house launch, prior to City Council's public hearing, and at the conclusion of the project when the Wastewater Master Plan has been finalized and adopted	
SUB Brochure	Include a short blurb in the wastewater and stormwater rates brochure, which is sent to SUB customers as a bill insert with their July bill, about the Wastewater Master Plan work. Link to the project webpage for more information.	Brochure goes to print on June 20; Included with July bills	Inform, promote community feedback
Direct Outreach	As the project progresses and specific improvements are recommended, consider opportunities for targeted outreach to affected/interested audiences, such as homebuilders, realtors, NGOs, etc.	Fall 2022	Inform, gather feedback
Analytics	Evaluate effectiveness of engagement formats	Ongoing	Analysis
Debrief meetings	After key project milestones	As needed	Analysis

Measures of Success

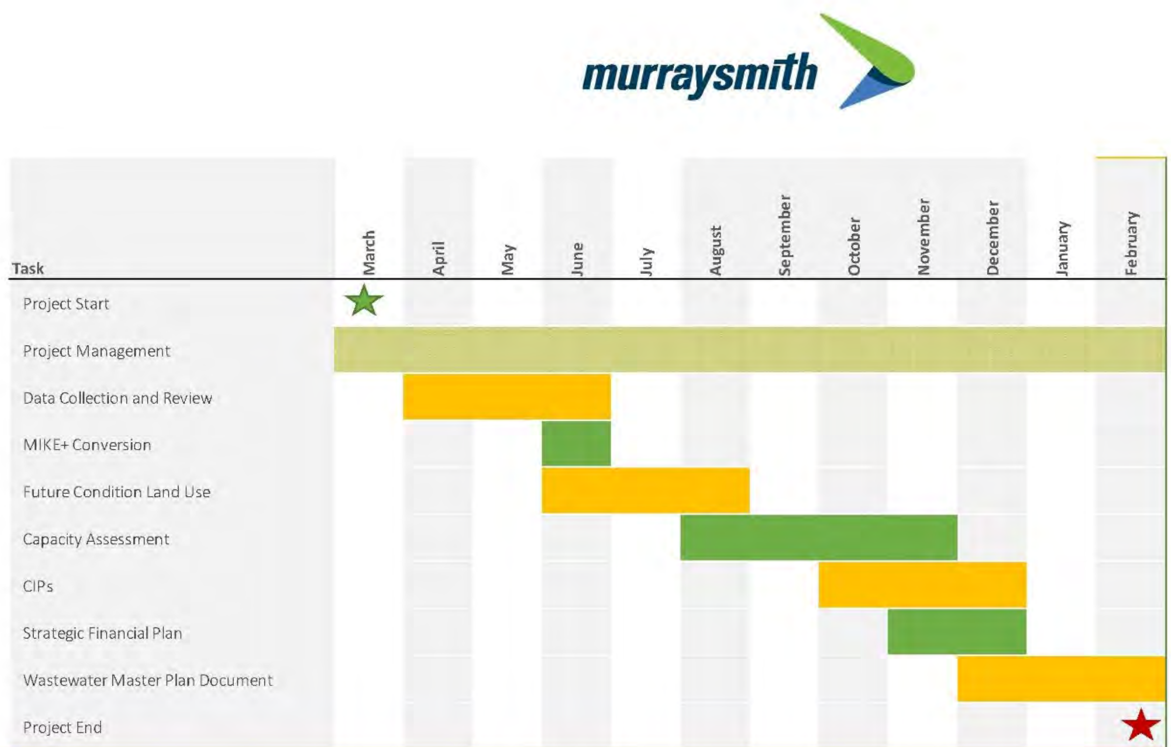
Measures of success will help determine the effectiveness of community engagement efforts. Measures are based on the established Community Engagement Goals specified on page 3. The City will evaluate the effectiveness of community engagement throughout and at the end of the project. The following factors can be used to assess the engagement efforts in addition to or in relation to the Community Engagement Goals:

- Number of participants attending meetings in person or virtually
- Number of responses received to the virtual open house and survey
- Number of website views during a specified time period
- Number of people who open e-updates and click through to links contained within those messages

- Number of people who open MWMC and DPW external newsletters containing project information and click through to links contained within those messages
- Number of people who view and interact with social media posts
- How project decisions are modified as a result of public input
- Level of acceptance of project outcomes

IV. Project Timeline

The City and contractor Murraysmith Inc. signed a contract for the project in February 2022. Below is a high-level project timeline that shows the project's intended phasing from March 2022 to February 2023. It represents the process and timeline for assessment of Springfield's existing wastewater infrastructure and the development of an updated Wastewater Master Plan.



consor

APPENDIX B
MIKE+ IMPORT TECHNICAL MEMORANDUM

Technical Memorandum

Date: May 27, 2022

Project: Springfield Wastewater Master Plan

To: Molly Markarian
Jeff Paschall, P.E.
City of Springfield, OR

From: Ann Quenzer, P.E.
Katie Husk, P.E.
Murraysmith

Re: MIKE URBAN conversion to MIKE+ software

Introduction

The City of Springfield, Oregon (City) is updating their Wastewater Master Plan to accommodate future growth and needed system improvements. The new plan will provide updates to meet the future 2042 planning year conditions.

Murraysmith has been hired to work collaboratively with the City to identify needed improvements and update the Plan to accommodate future needs. Part of this effort includes converting the City's calibrated existing conditions MIKE URBAN sewer model to the 2022 version of MIKE+ and reviewing for inconsistencies.

This memorandum is a summary of the MIKE URBAN (MU) to MIKE+ conversion, including the modeling methodologies and results from this exercise.

Existing System

The Springfield wastewater collection system is made up of a series of approximately 250 miles of sewer lines ranging from 6-inches to 60-inches in diameter along with numerous pump stations. Sewage is conveyed to a regional treatment plant owned by the Metropolitan Wastewater Management Commission (MWMC). The City operates, maintains, inspects, and cleans the collection system as part of the City's Capacity, Management, Operations, and Maintenance (CMOM) program.

Existing Model

The City has maintained a model of Springfield's existing sewer assets within the 2019 MIKE URBAN modeling software. The newer MIKE+ software from 2022 eliminates many of the bugs and errors that existed in the previous software version.

Methodology

The City provided the calibrated existing MU model of the City's sewer assets to Murraysmith, along with results from their model runs. The model was then reviewed and run by the Murraysmith staff in the MU software. In this initial run, the results were studied to identify any glaring anomalies or discrepancies between the results from the City and the results from the new model run. This included locations where links were not properly connected to nodes or elevations that were incongruous with the surrounding system.

The results existing model was then uploaded into the 2022 MIKE+ software where it was re-run. The new model was similarly inspected for anomalies.

The City also provided data from flow monitoring at several points in the system for the months of January 2019, April 2018, October 2017, and November 2017. The results from the two different software programs, along with the City-provided MU results, were compared along with the flow monitoring results at the locations of the flow monitors. These results were graphed in excel and compared to identify any discrepancies between them.

Findings

Catchments

There were five catchments that did not have a hydrologic model assigned to them: 24037_3; 24037_4; 24037_5; 24037_6; and 24037_7. To be consistent with the other catchments and the City's modeling specifications, the 'Kinematic Wave (B) + RDI' model was assigned to each of the catchments.

Network

When the model was imported into MIKE+, an error occurred stating there was a digitization error. Further investigation showed that Pipe '665295_22591' was digitized in a way such that it doubled back on itself. Pipe '665295_22591' was deleted and redrawn from the upstream to the downstream maintenance hole, making it a straight line. All assets are otherwise the same as the original pipe.

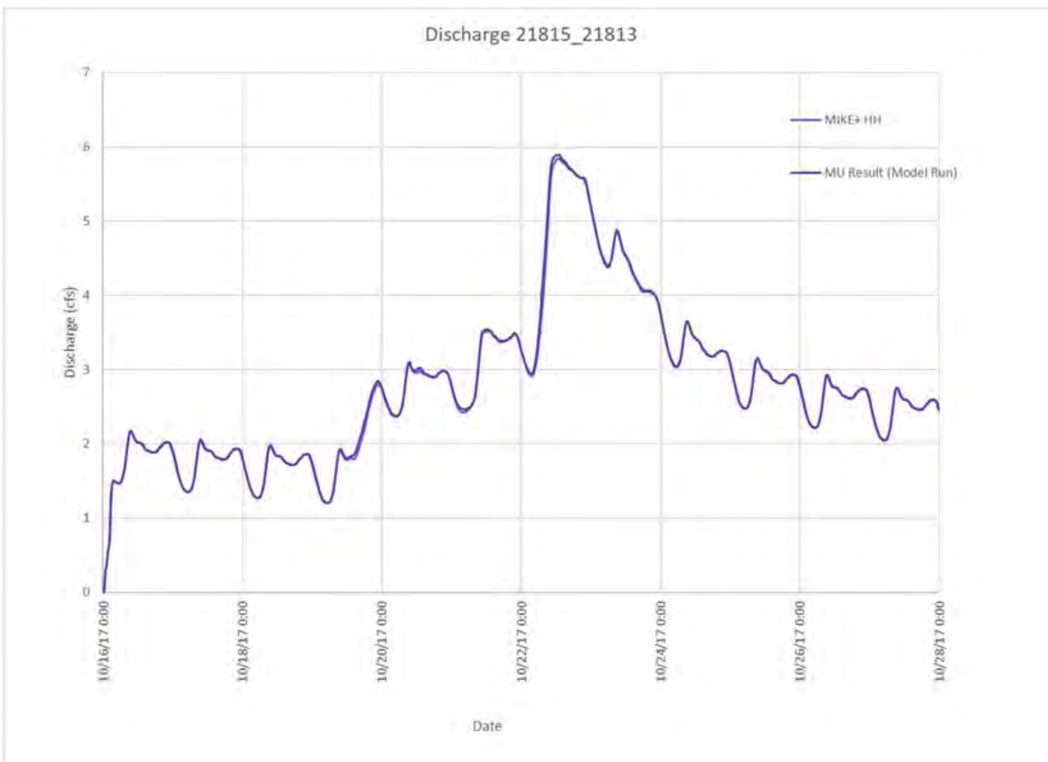
Model Results

The results from each of the modeling scenarios are included in Appendix A. These graphs include results from the flow monitors (Measured Flow), results from the converted MIKE+ model run (MIKE+ HH), the MIKE URBAN results provided by the City (MU Result (Springfield)), and the MIKE URBAN results from the City-provided MU model files (MU Result (Model Run)). Only results from April and October were plotted in order to simplify the study in accordance with the scope.

MIKE URBAN and MIKE+ Model Run Comparison

In all cases, the MIKE+ HH model results were similar if not identical to the MU Result (Model Run). This verifies the MIKE+ conversion is successful when importing the MIKE URBAN model files received from the City. An example of this comparison is shown in Figure 1 below.

Figure 1: MU Result (Model Run) Results Compared to MIKE+ HH Results

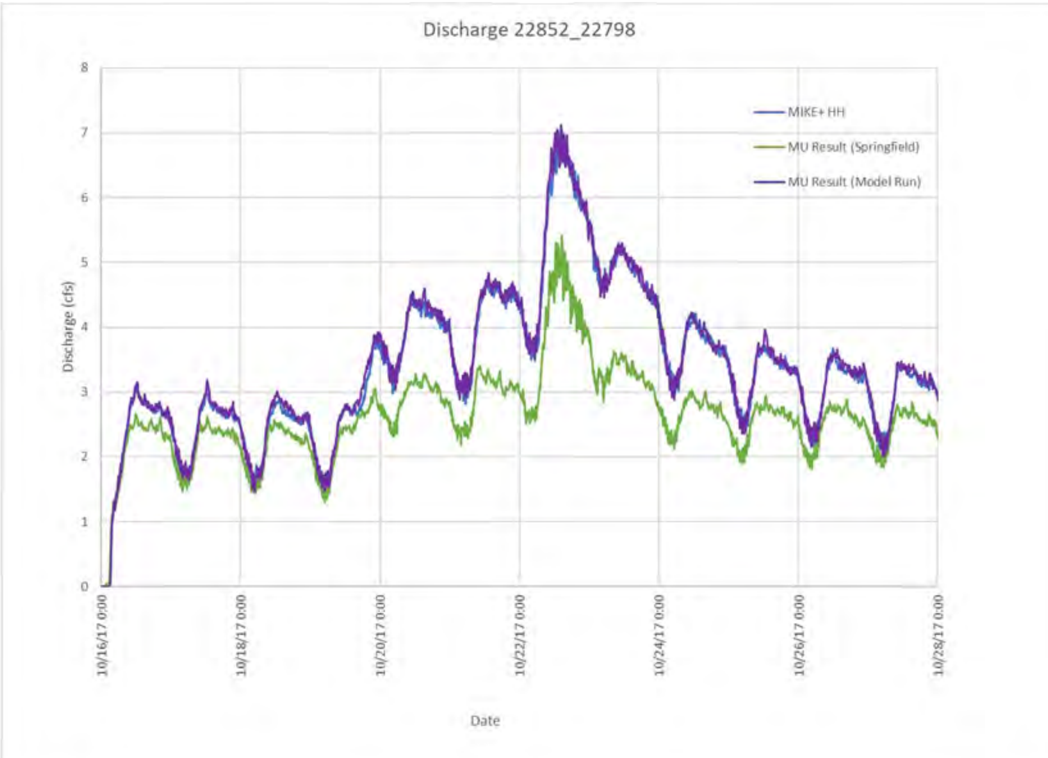


MIKE URBAN Model Result File Comparison

The MIKE URBAN result file from the City was compared to the MIKE URBAN result file created from the MIKE URBAN model files. In most cases, the model result files were similar, if not identical. However, there were three measurement locations in which the two MIKE URBAN result files differed: 22852_22798; 22851_22853; and 23341_27384. It is concluded that the MIKE URBAN model result files received from the City are created from a different set of model files than those that were received from the City.

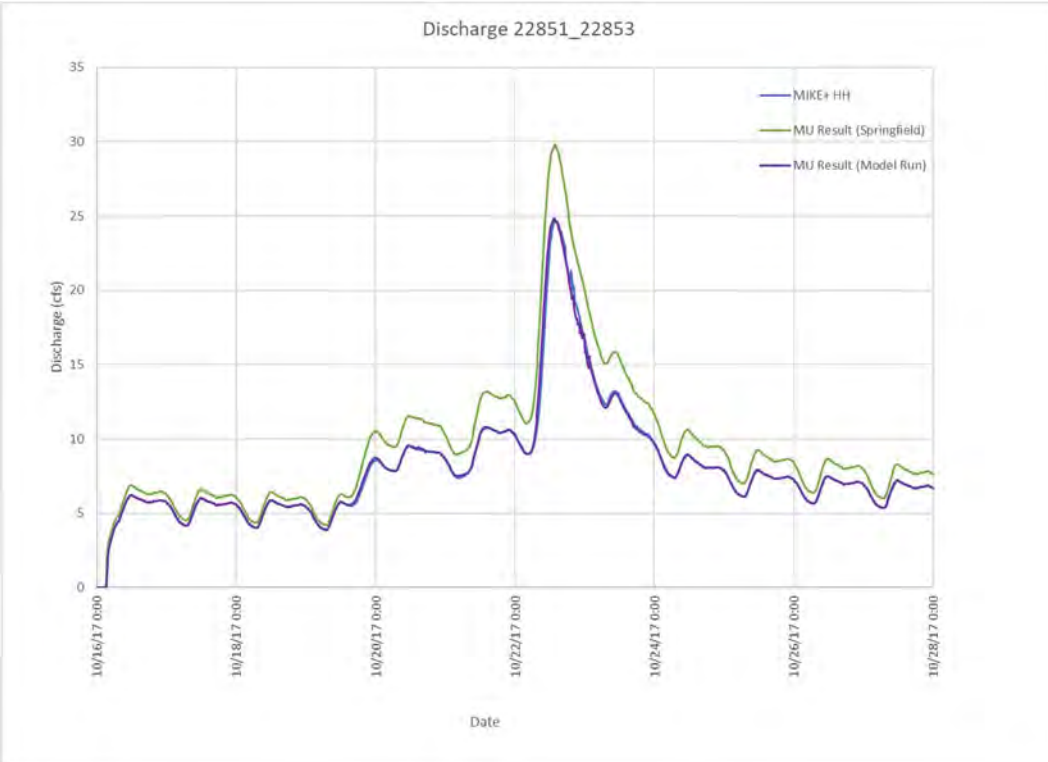
The measurement location 22852_22798 was identical during the April storm; however, during the October storm the result file from the City was lower than the result file from the MIKE URBAN model files. This is shown in Figure 2 below.

Figure 2: Measurement Station 22852_22798 (October Storm)



The measurement location 22851_22853 was also identical during the April storm; however, during the October storm the result file from the City was higher than the result file from the MIKE URBAN model files. This is shown in Figure 3 below.

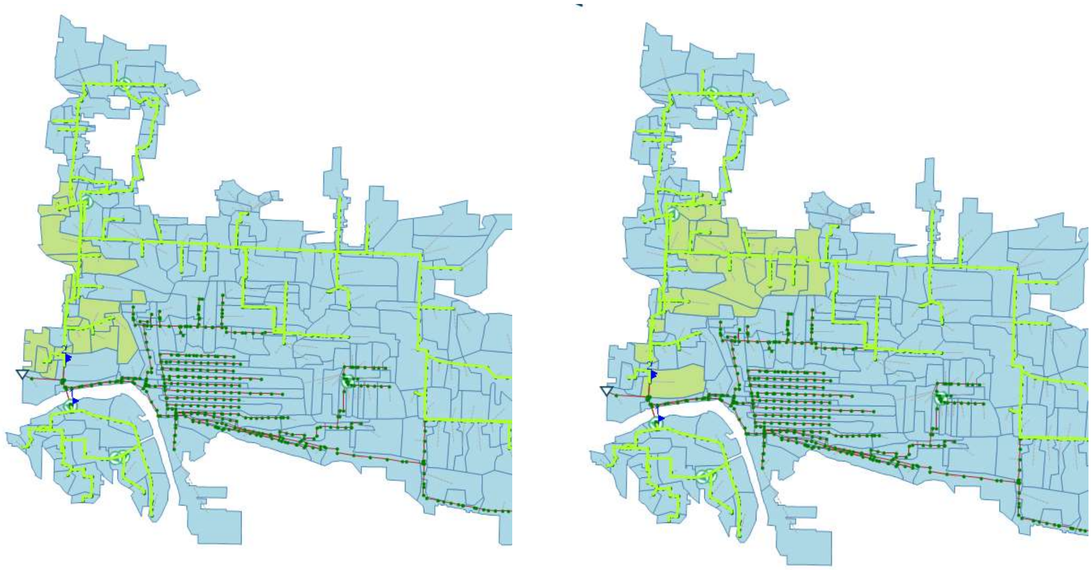
Figure 3: Measurement Station 22851_22853 (October Storm)



As shown in Figure 4, the basins contributing to the areas upstream of measurement stations 22852_22798 and 22851_22853 are adjacent to each other. Because of the locations of the measurement stations and the areas contributing to the flow, there are three potential causes for the discrepancies found between the MIKE URBAN results received from the City and the results produced from the MIKE URBAN model files received from the City.

The first potential cause could be due to how a diversion structure is represented in the two different models, resulting in a difference in catchment area assigned to the link that is being reviewed. It is also possible that different hydrologic parameters are assigned to the model catchments in the two MIKE URBAN models and are more pronounced during the higher rainfall event in October. Another discrepancy could be that the dry and wet weather flow inputs from the basins are assigned to different manholes in the two models.

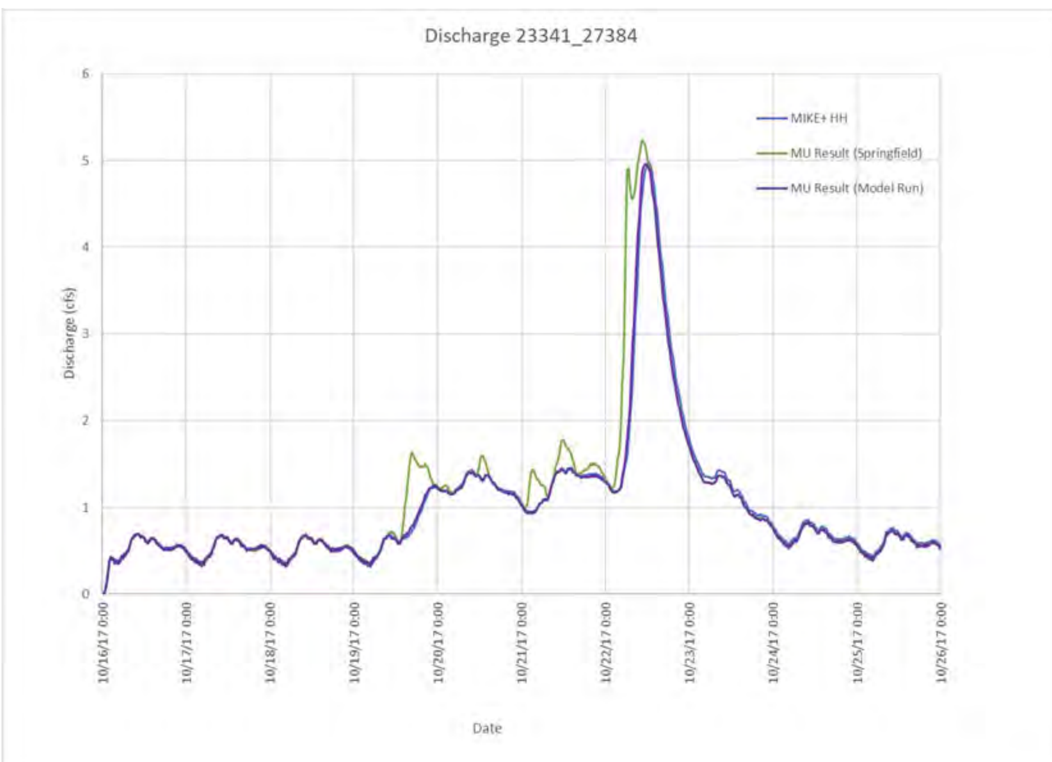
Figure 4: Location of Basins Contributing to Measurement Stations 22852_22798 and 22851_22853



During both the April storm and the October storm, the MIKE URBAN result file from the City was higher than the result file from the MIKE URBAN model files received from the City. A potential cause of this discrepancy could be due to different hydrologic parameters being assigned to the model catchments in the two MIKE URBAN models. The basins contributing to the measurement station 22341_27384 are shown in Figure 5, and a plot of the MIKE URBAN results versus the results from the MIKE URBAN model files are show in Figure 6.

Figure 5: Location of Basins Contributing to Measurement Station 23341_27384

Figure 6: Measurement Station 23341_27384 (October Storm)



Measured Flow Compared to Model Results

In many cases, the model results did not correlate well with the measured flow rates. These differences could indicate that further model calibration may be required. Alternatively, the discrepancies may be due model pump station settings versus actual pump station operations as shown in Figure 7.

Figure 7: Measurement Station 23210_23253 (October Storm)

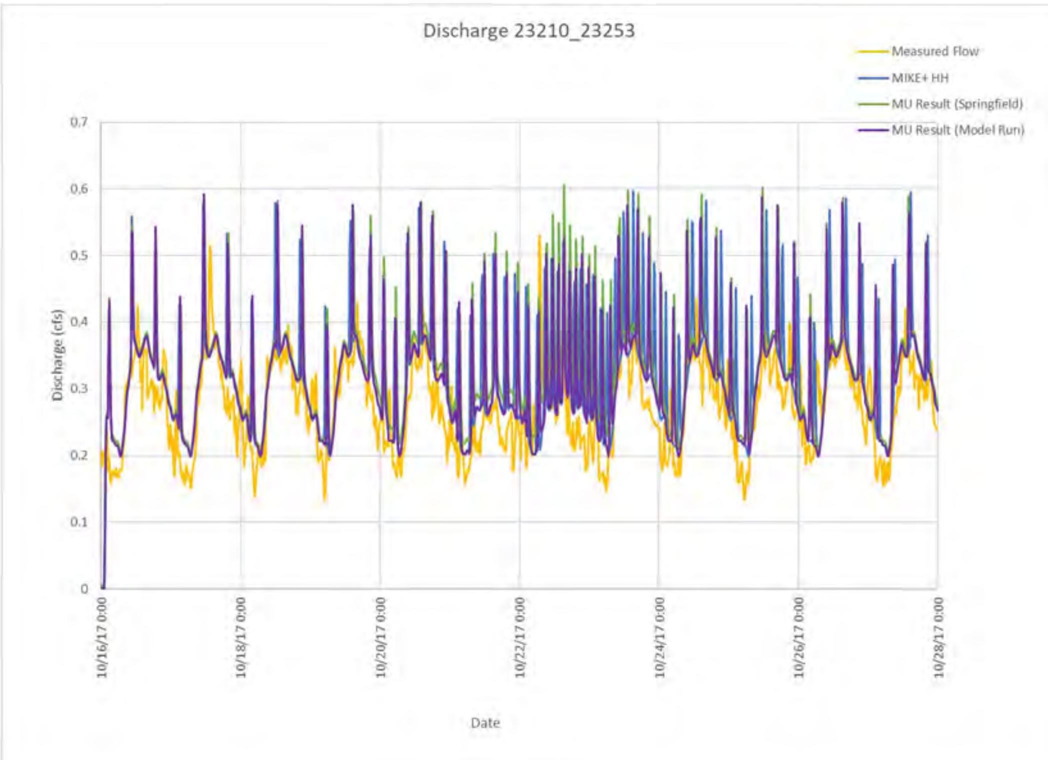
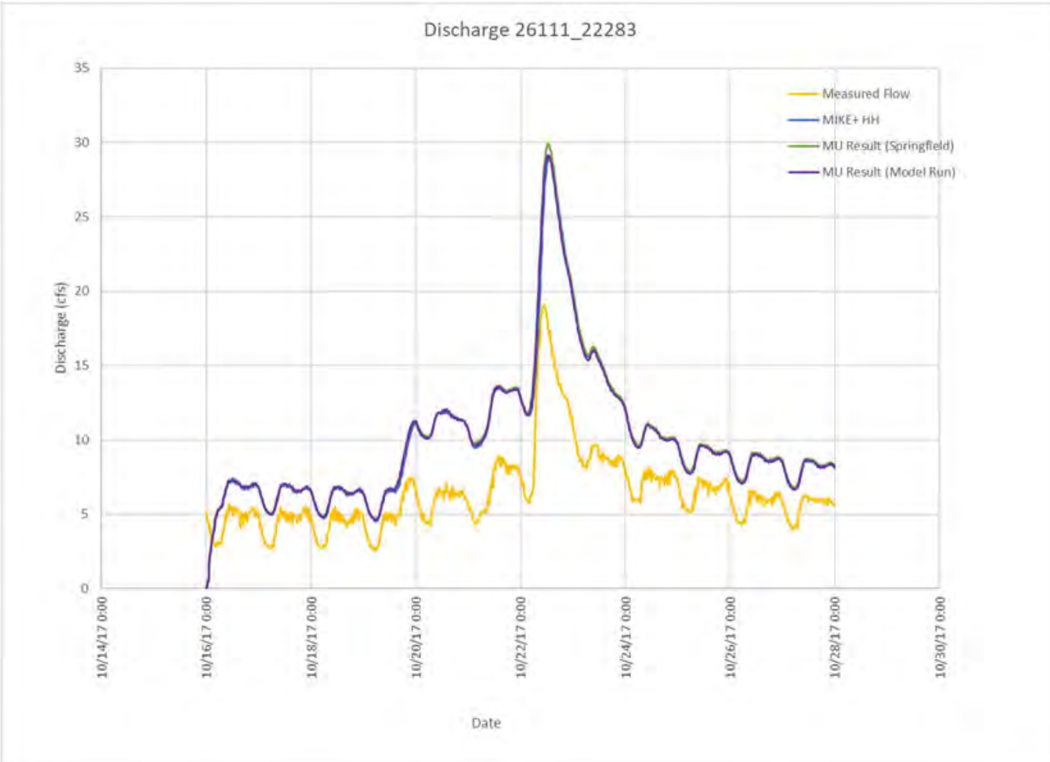


Figure 8: Measurement Station 26111_22283 (October Storm)



The April and October comparison graphs and information related to this comparison study may be found in Appendix A.

Conclusions and Recommendations

There are discrepancies between the MIKE URBAN results from Springfield and the results from the MIKE URBAN model files, meaning that there are potential differences between the model that was originally run by the City and the model that was provided to Murraysmith. The City has recommended using the MIKE URBAN model files and results from these files.

The April and October model runs for the MIKE URBAN model files from the City and the converted MIKE+ model consistently showed similar results with no major discrepancies. This correlation means that the conversion between MIKE URBAN and MIKE+ has been verified and the MIKE+ model can be used for the City of Springfield's Wastewater Master Plan.

murraysmith

Appendix A

Model Conversion – 23201_23207

Figure 1: Drainage Basin for 23201_23207

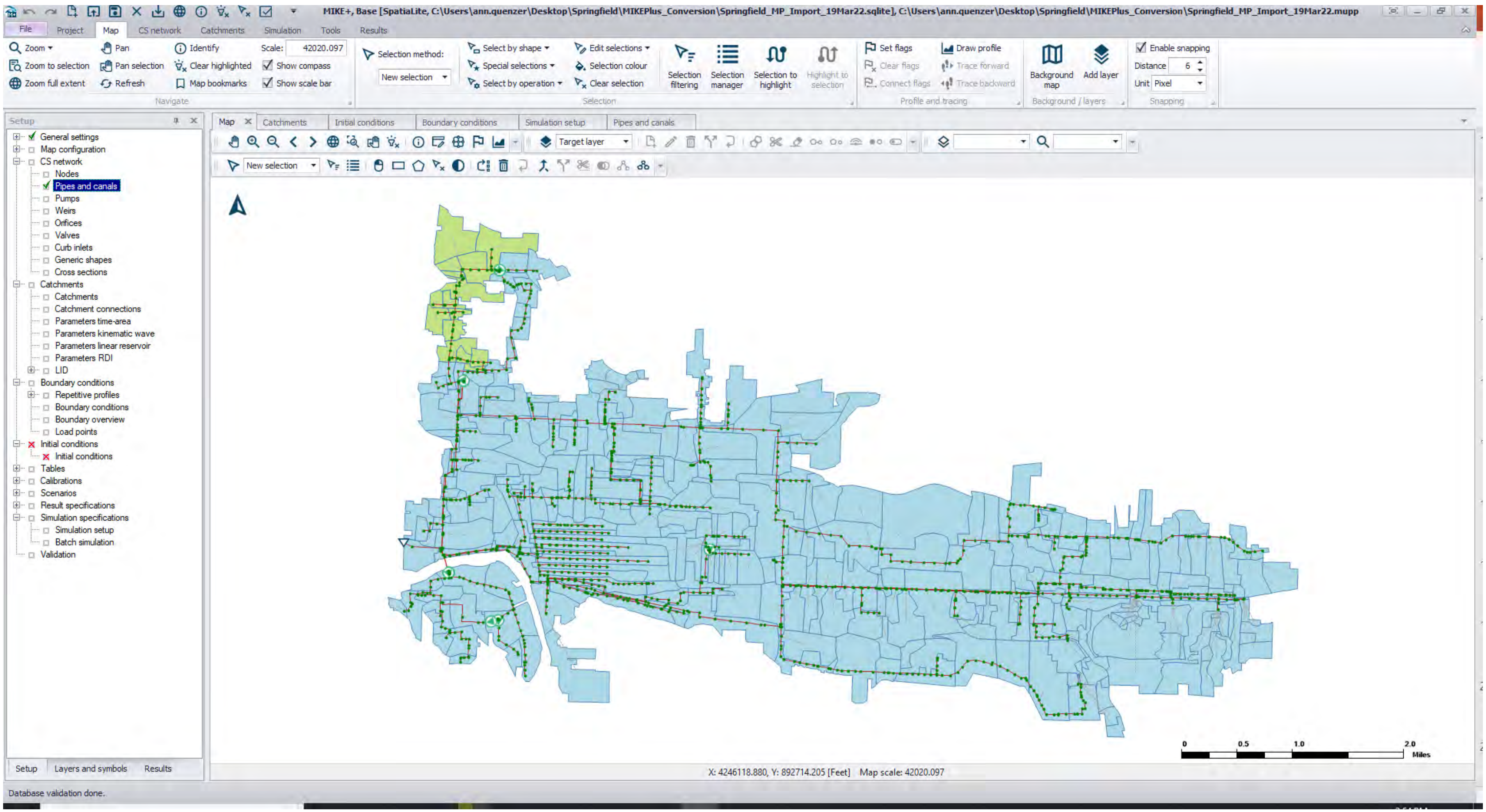
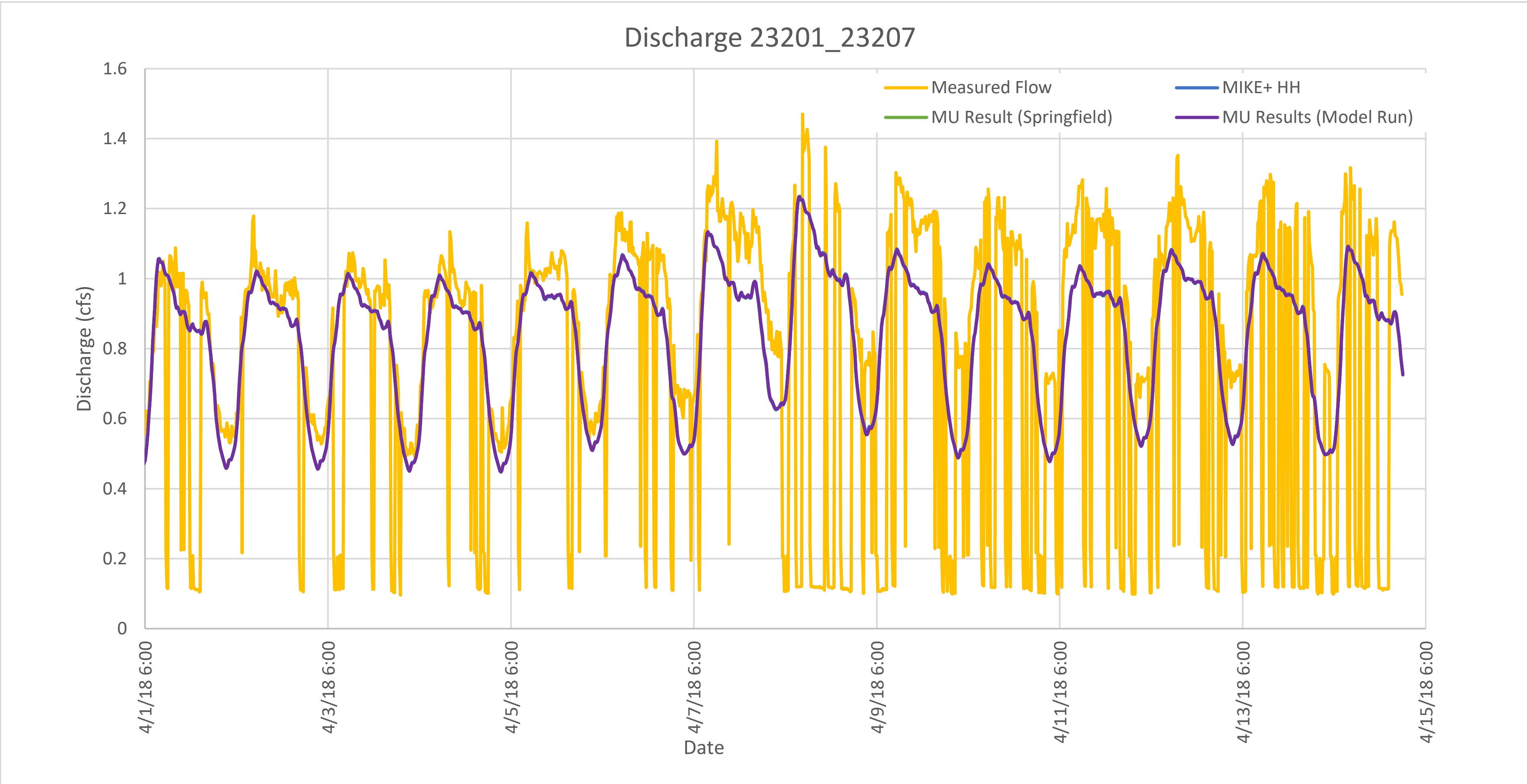


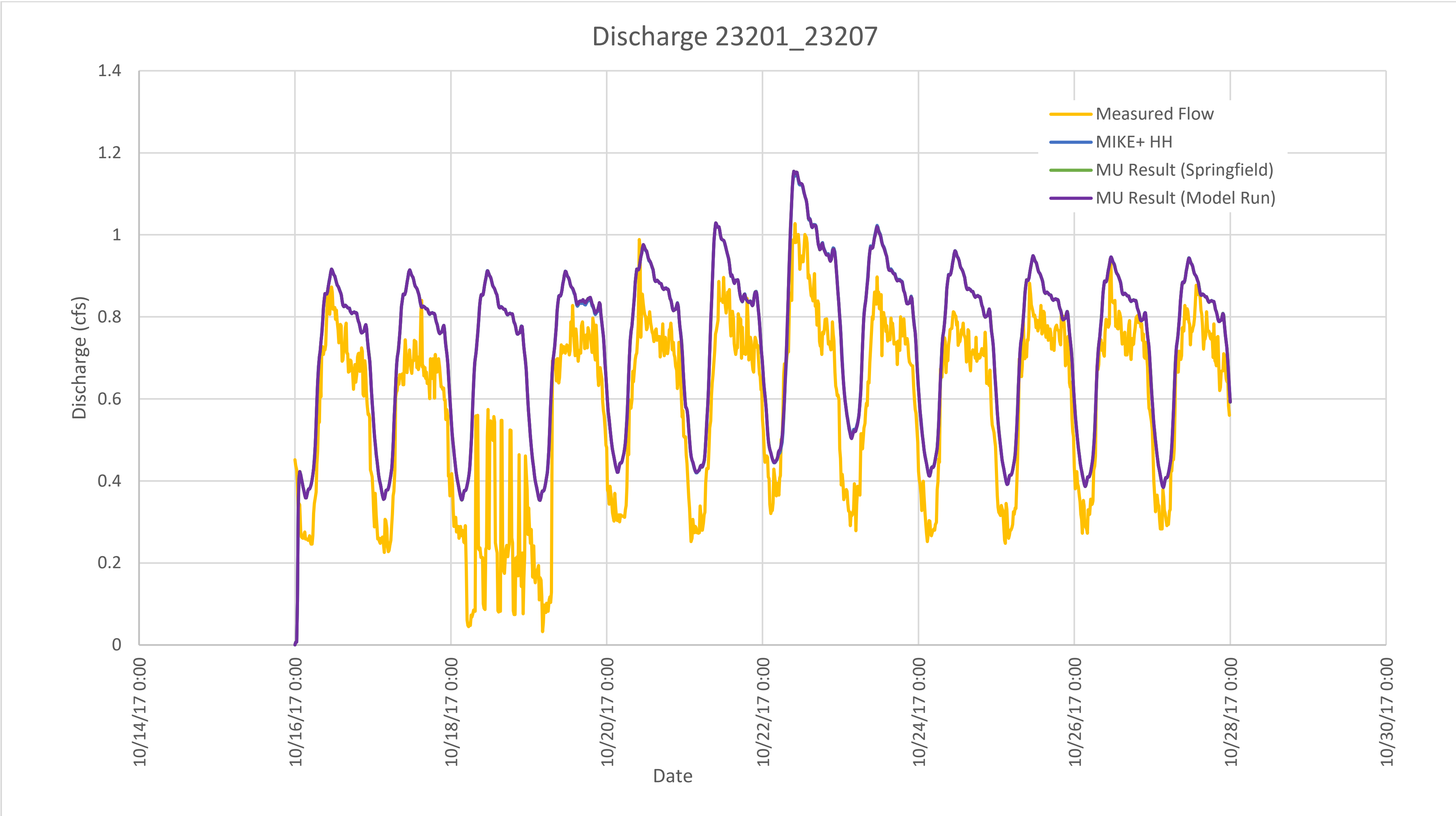
Figure 2: April Discharge for 23201_23207



Notes:

- The results from the April model show peak flow rates that are lower than the measured peak flow rates.
- Results from the three models are similar.

Figure 3: October Discharge for 23201_23207



Notes:

- The peak flows from the model results are higher than the peak measured flows.
- The trough on the modeled flows is higher than the trough for the measured flows, resulting in an overall increased volume.
- Results from the three models are similar.

Model Conversion – 23210_23253

Figure 4: Drainage Basin for 23201_23210_23253

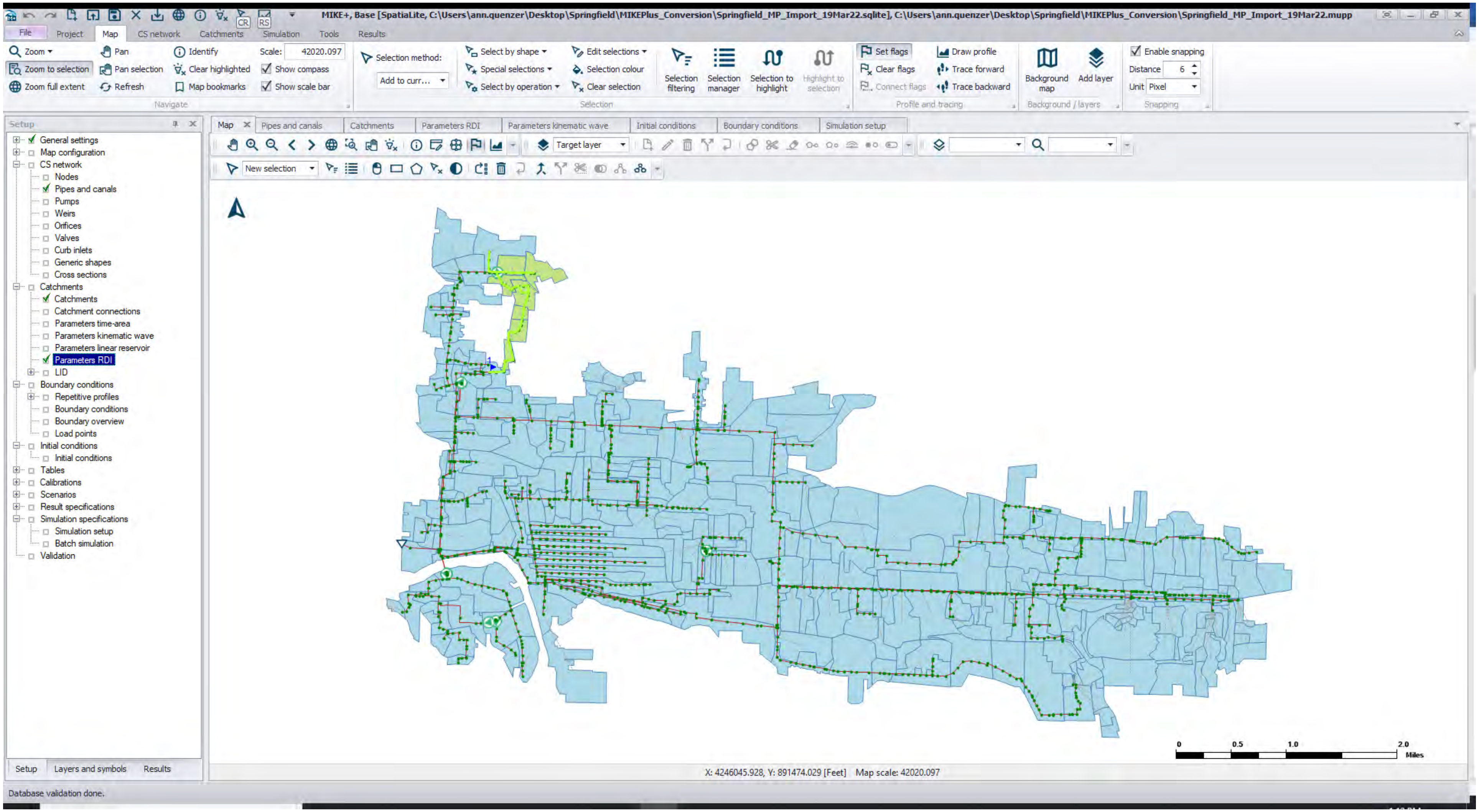
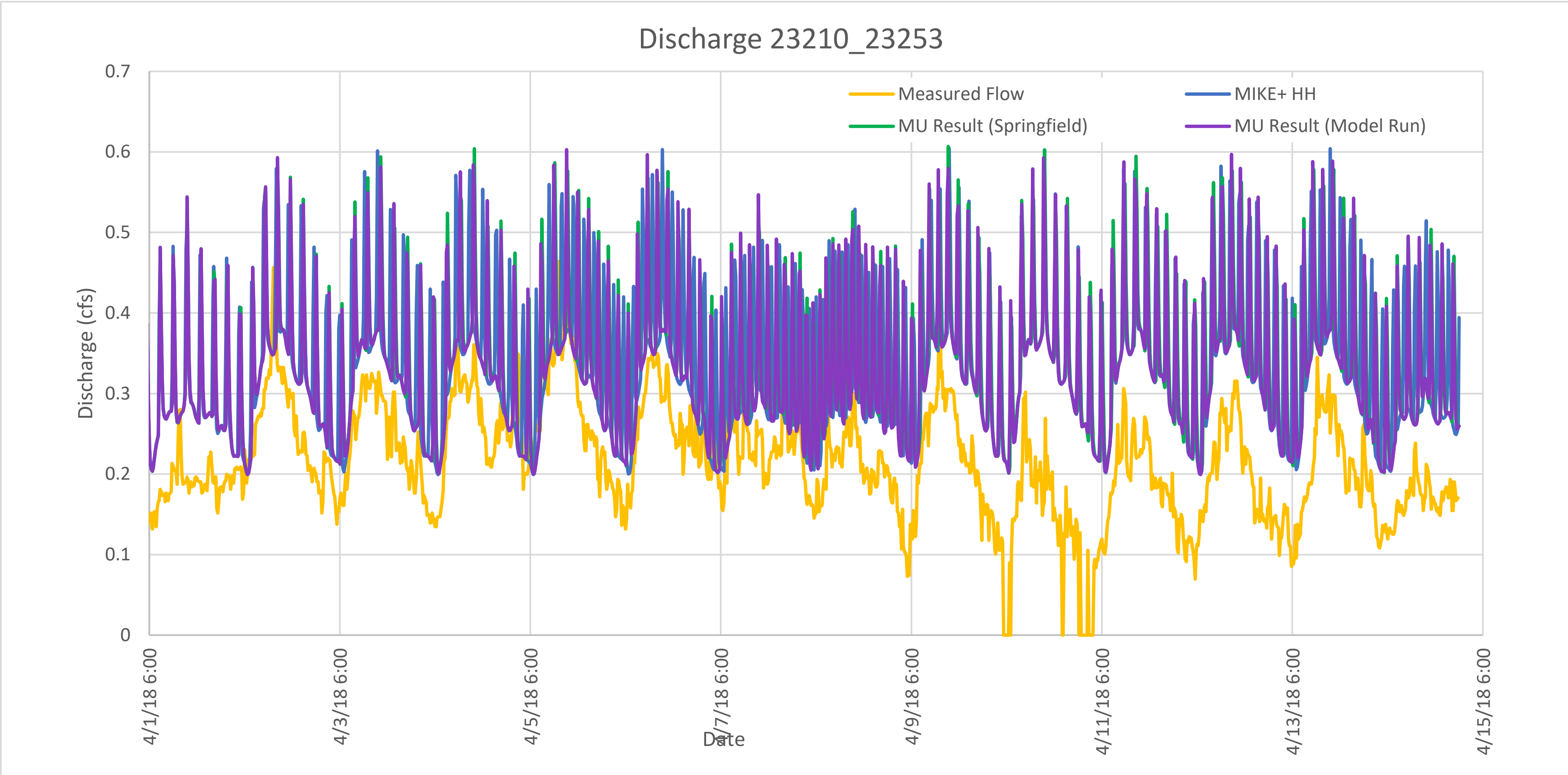


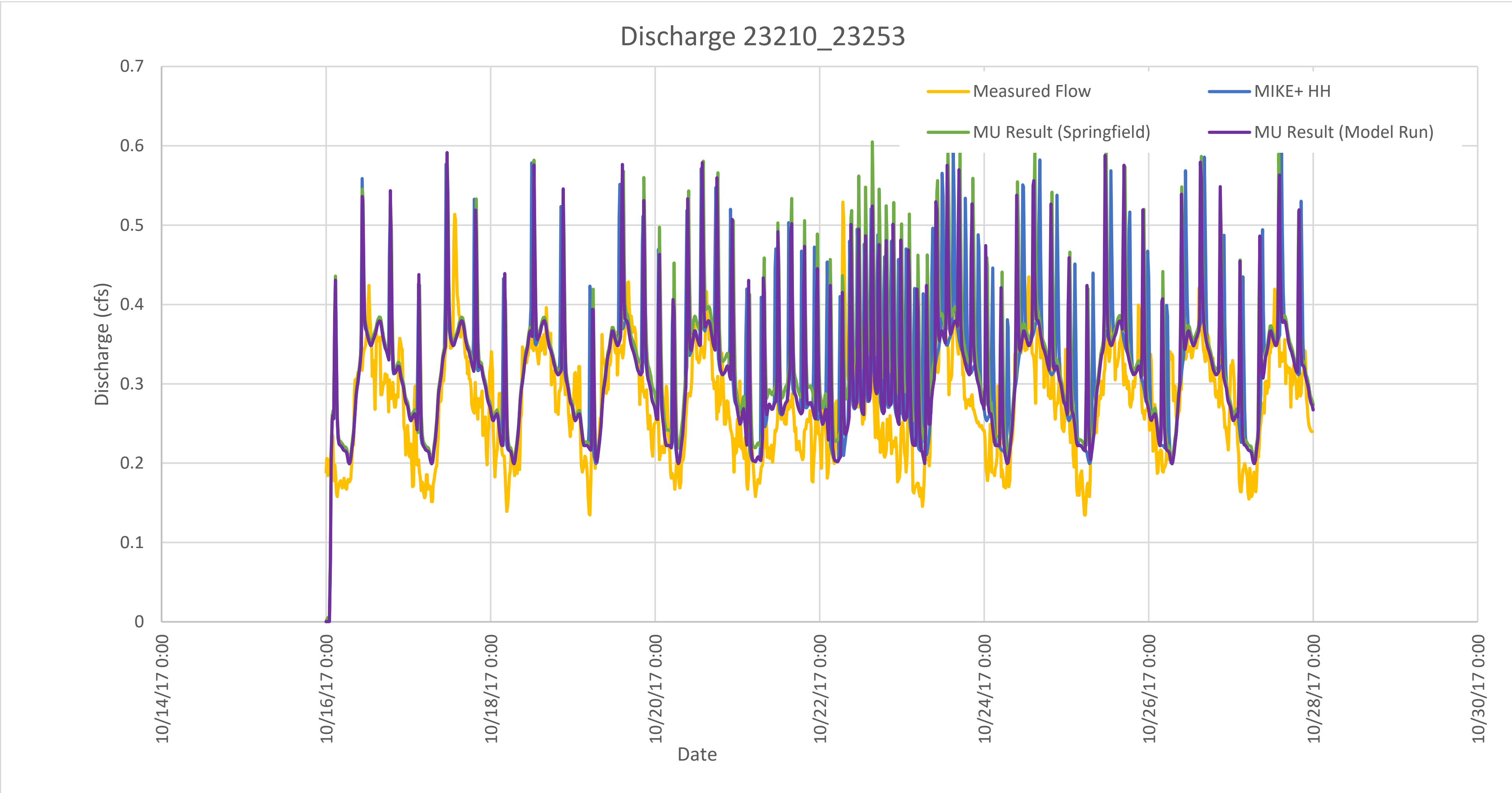
Figure 5: April Discharge for 23210_23253



Notes:

- The peak flows from the model results are higher than the peak measured flows.
- The measured flow is inconsistent throughout.
- The model results indicate there is significant influence from the adjacent pump station. The pump station settings may need to be adjusted in the model.

Figure 6: October Discharge for 23210_23253



Notes:

- The peak flows from the model results are higher than the peak measured flows.
- The measured flow is inconsistent throughout.
- The model results indicate there is significant influence from the adjacent pump station. The pump station settings may need to be adjusted in the model.

Model Conversion – 22852_22798

Figure 7: Drainage Basin for 22852_22798

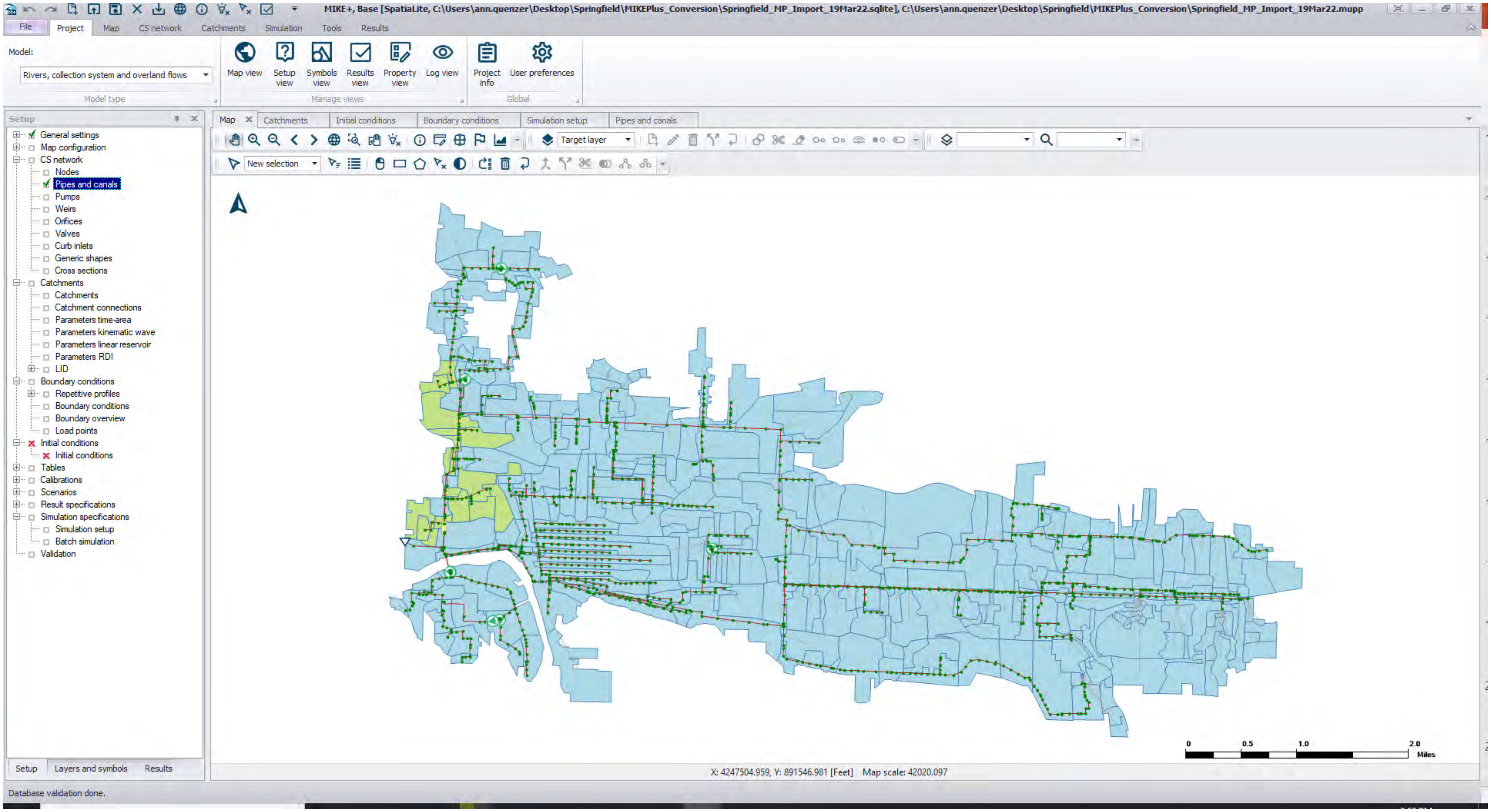
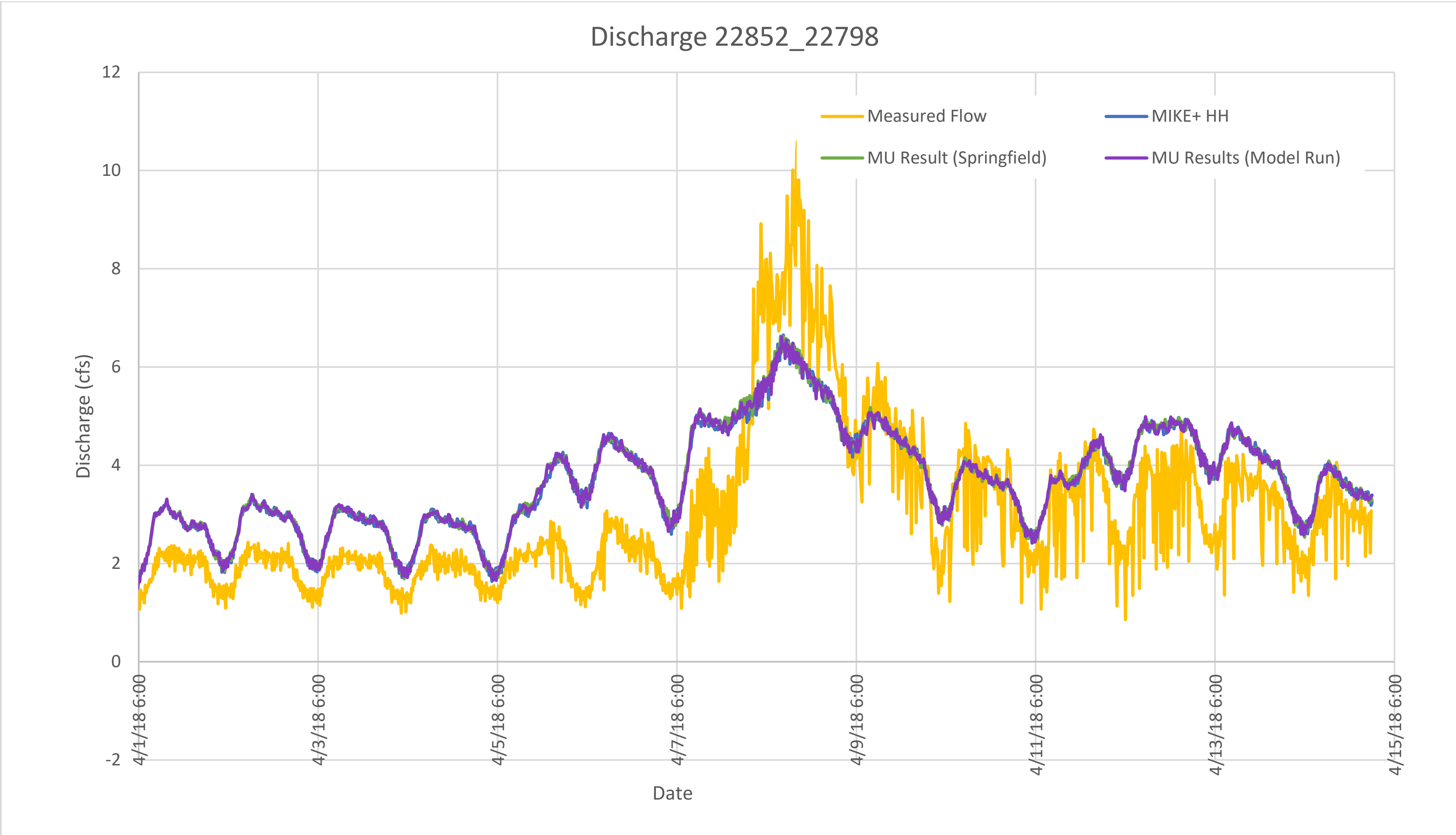


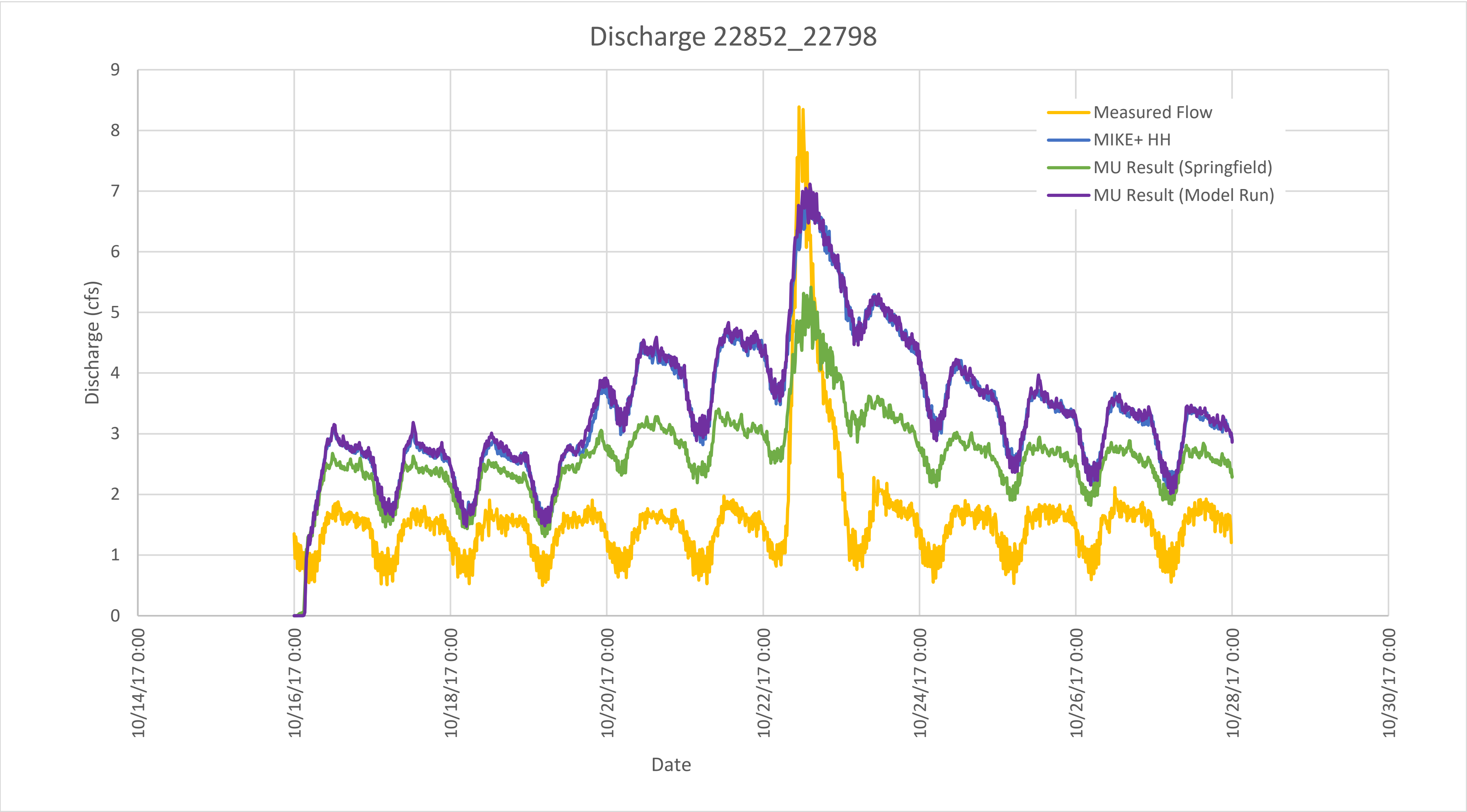
Figure 8: April Discharge for 22852_22798



Notes:

- The overall peak flow from the model results is lower than the peak measured flow.
- The rising limb for the modeled flow is higher than for the measured flow, resulting in a net volume increase.
- Results from the three models are similar.

Figure 9: October Discharge for 22852_22798



Notes:

- The overall peak flow from the model results is lower than the peak measured flow.
- Both the rising and receding limb are higher for the modeled flows than for the measured flows, resulting in an increased volume.
- The result file from Springfield lows consistently lower discharge rates than the results from all other model files.
- Results from the other two models are similar.

Model Conversion – 23802_23801

Figure 10: Drainage Basin for 23802_23801

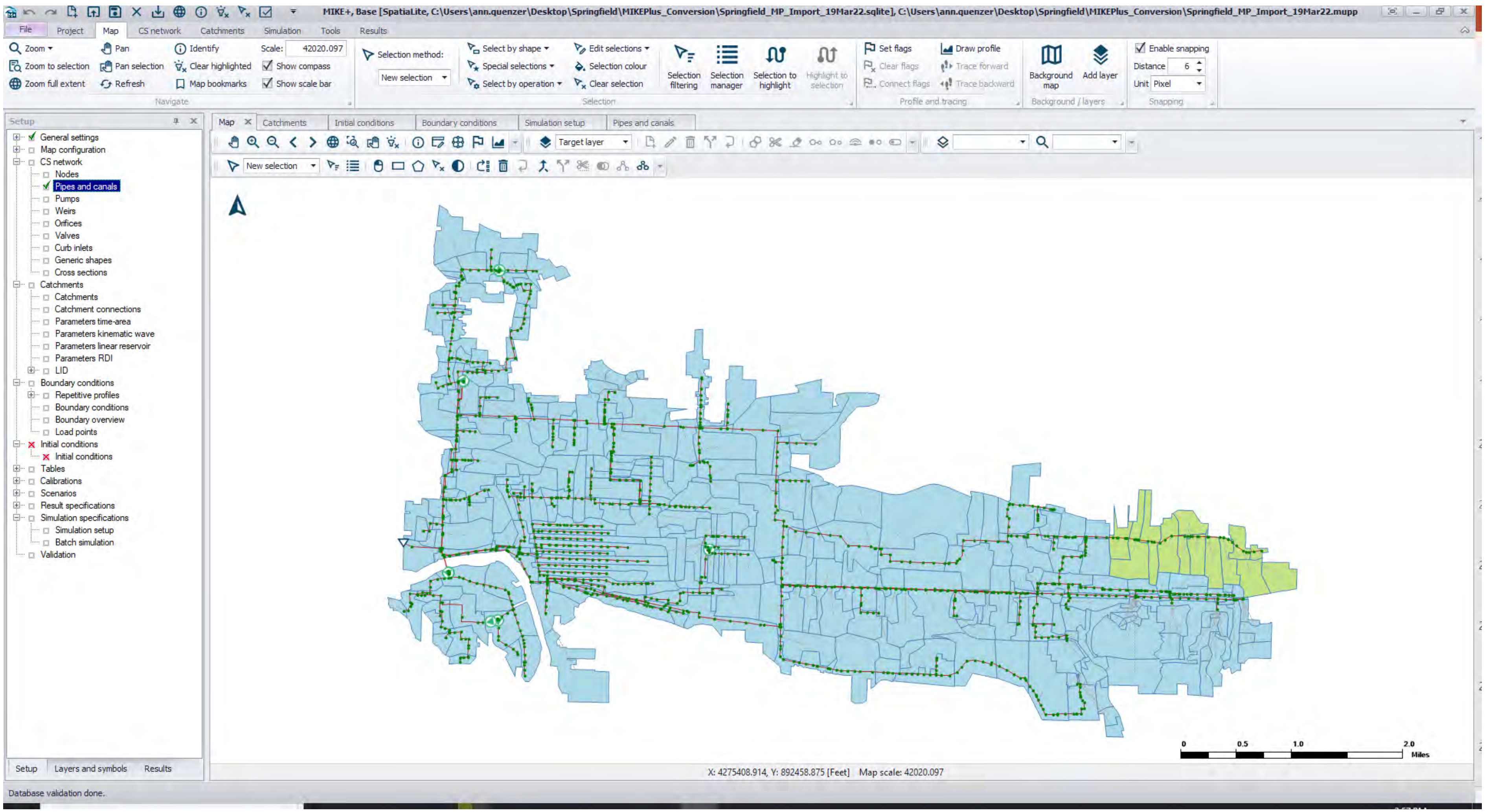
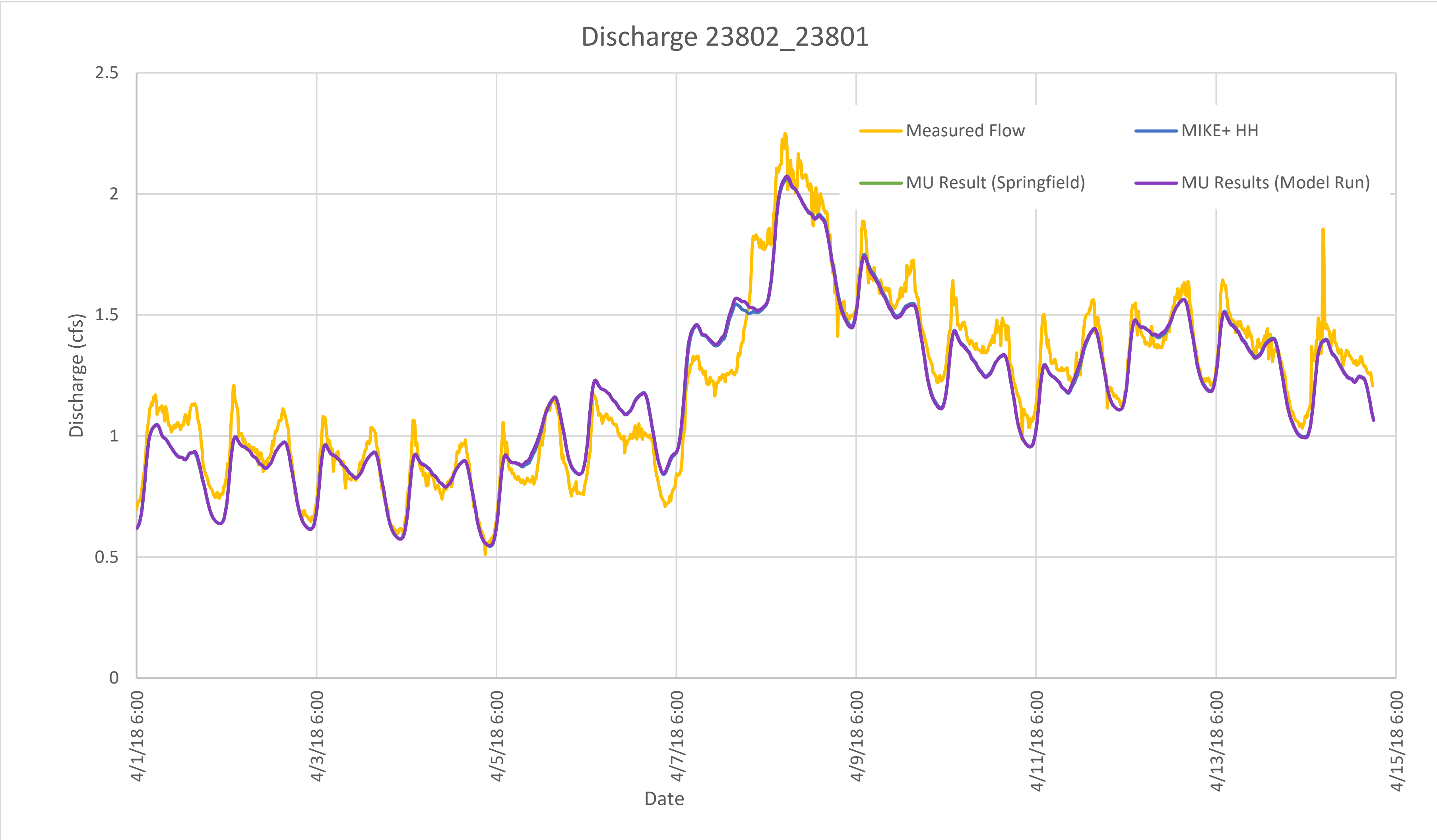


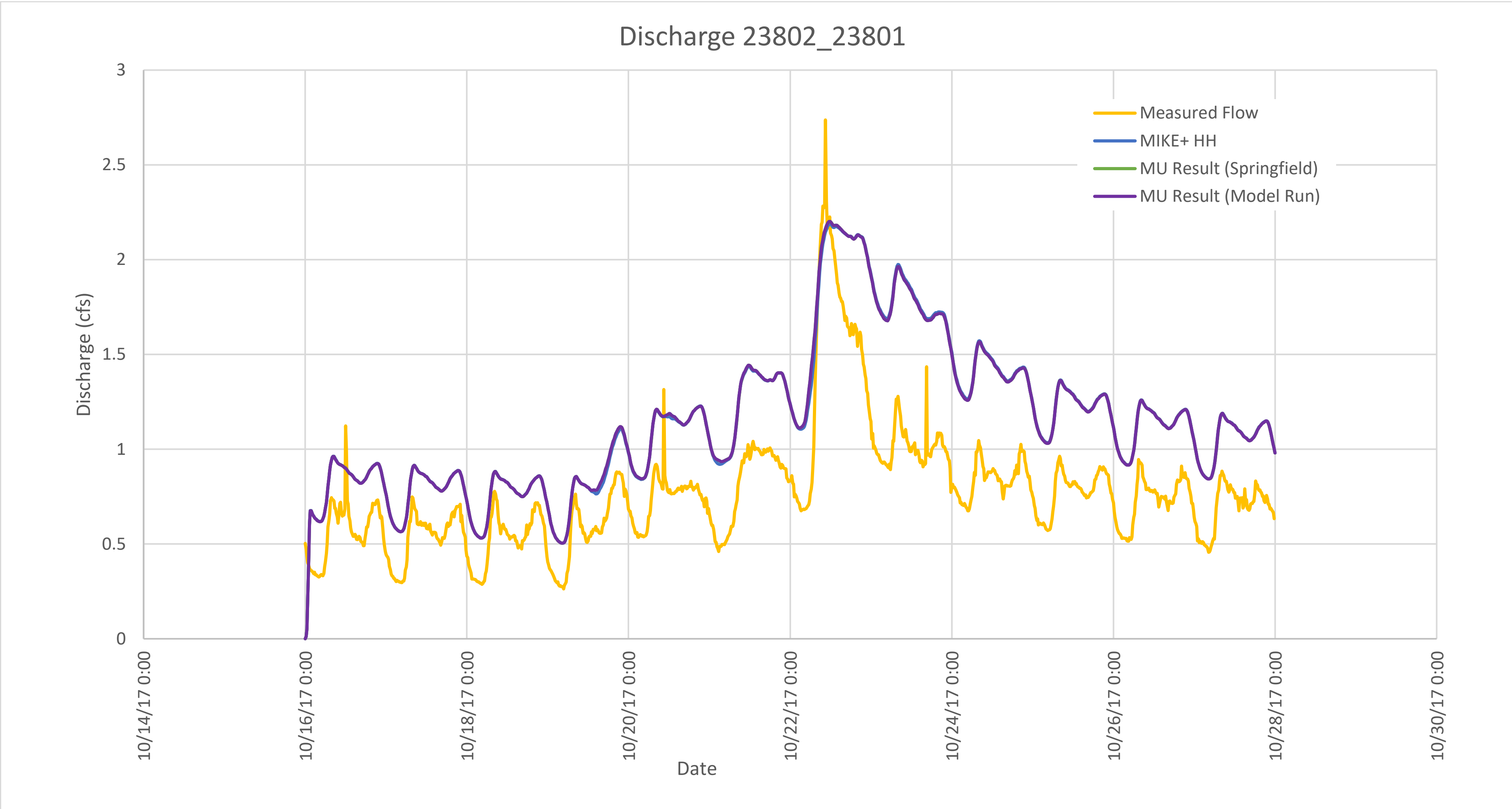
Figure 11: April Discharge for 23802_23801



Notes:

- The peak flows from the model results are lower than the peak measured flows.
- Results from the three models are similar.

Figure 12: October Discharge for 23802_23801



Notes:

- The peak flows from the model results are higher than the peak measured flows.
- The rising and receding limbs are higher for the modeled flows than for the measured flows, resulting in an increased volume.
- Results from the three models are similar.

Model Conversion – 21815_21813

Figure 13: Drainage Basin for 21815_21813

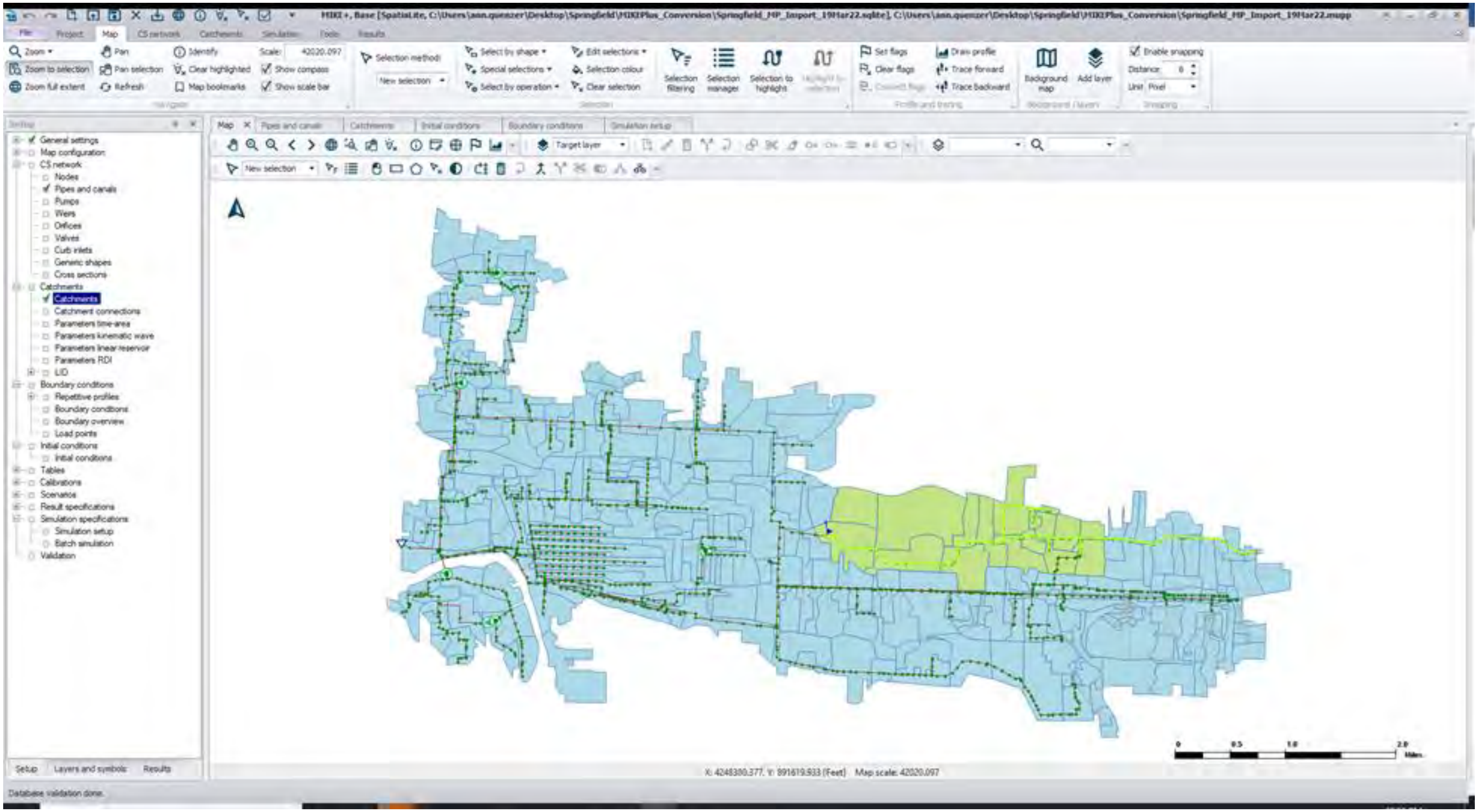
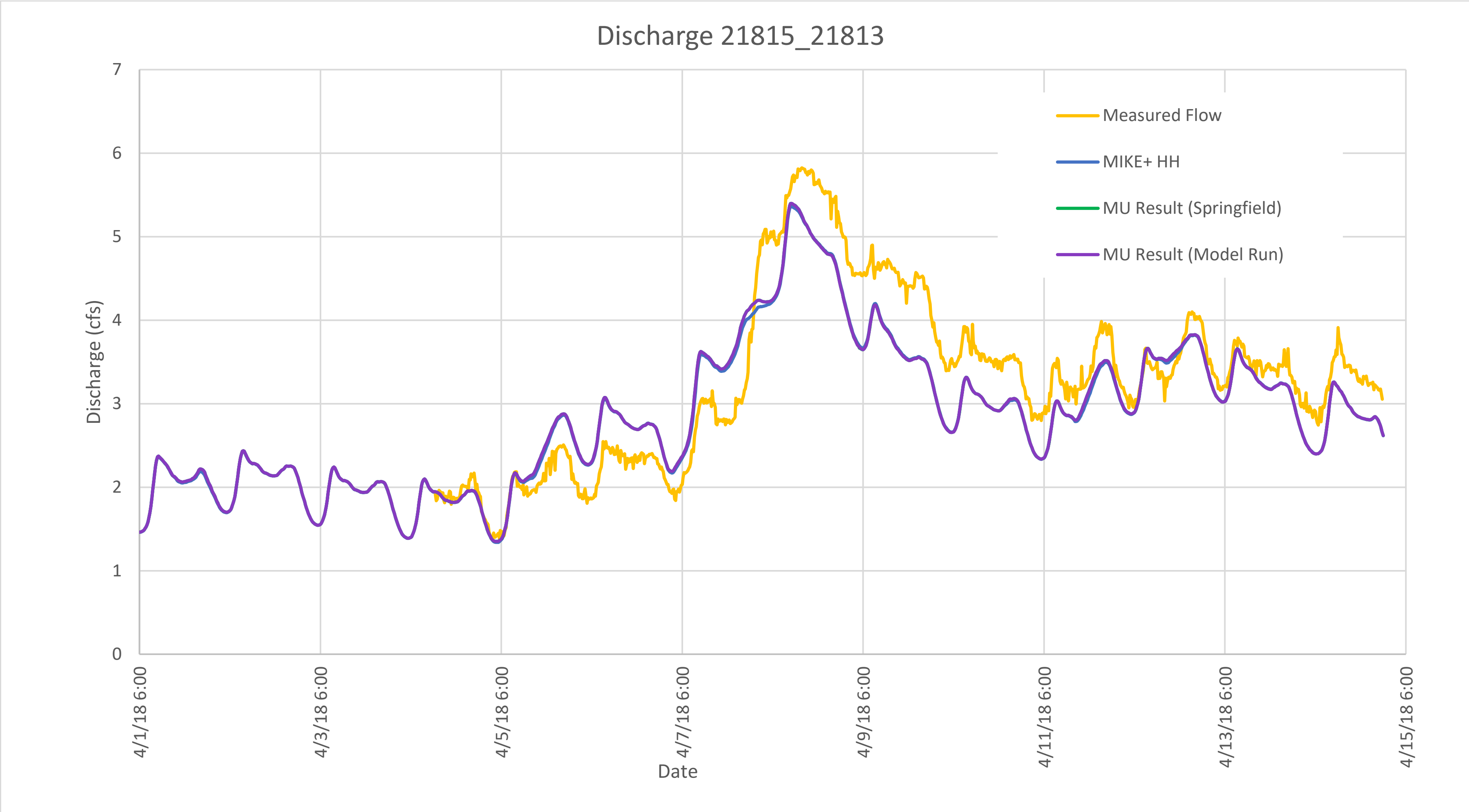


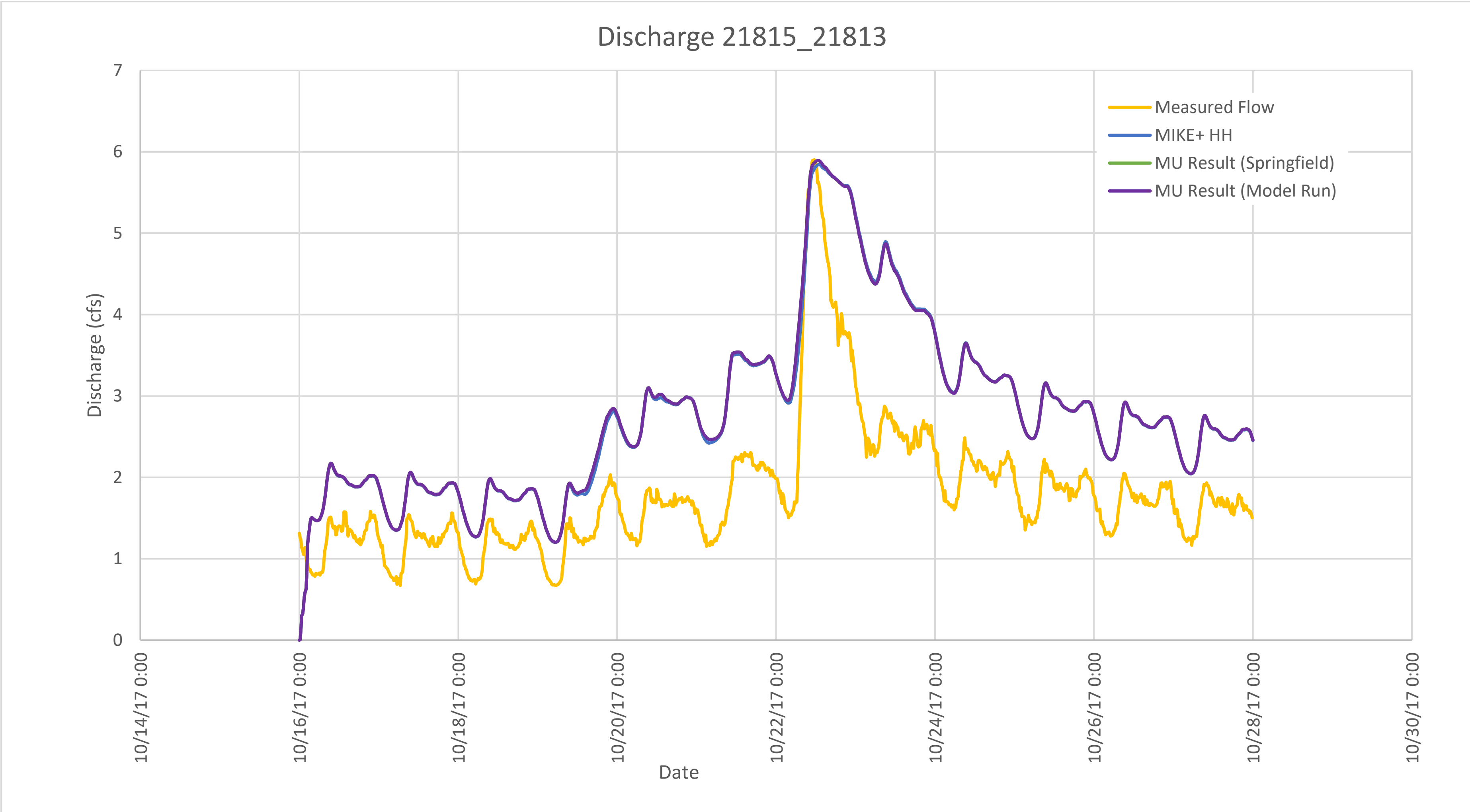
Figure 14: April Discharge for 21815_21813



Notes:

- The peak flows from the model results are lower than the peak measured flows.
- The receding limb is lower for the modeled flows than for the measured flows, resulting in a decreased volume.
- Results from the three models are similar.

Figure 15: October Discharge for 21815_21813



Notes:

- The peak flows from the model results are higher than the peak measured flows.
- The rising and receding limb for the modeled flows are higher than for the measured flows, resulting in an increased volume.
- Results from the three models are similar.

Model Conversion – 24230_24232

Figure 16: Drainage Basin for 24230_24232

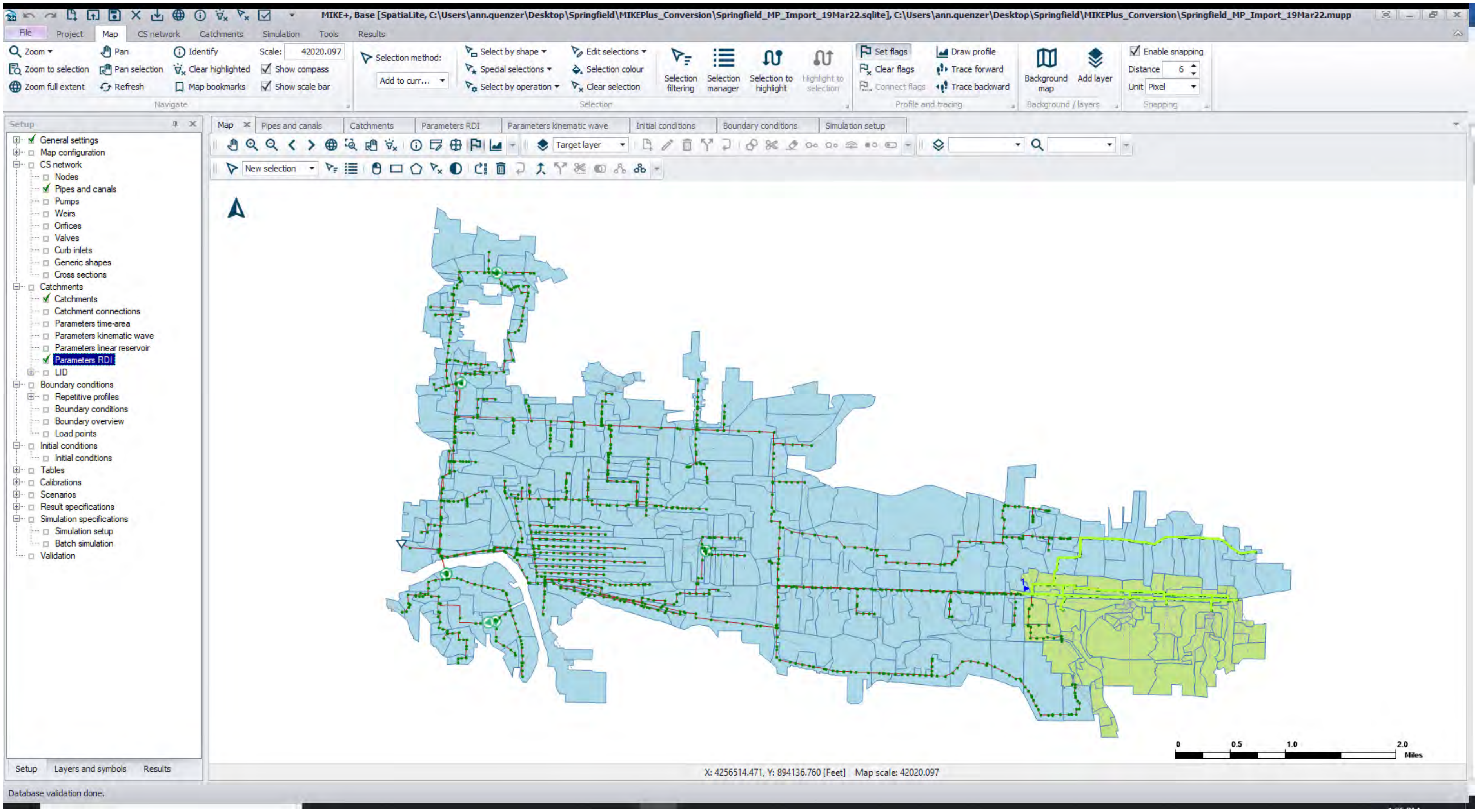
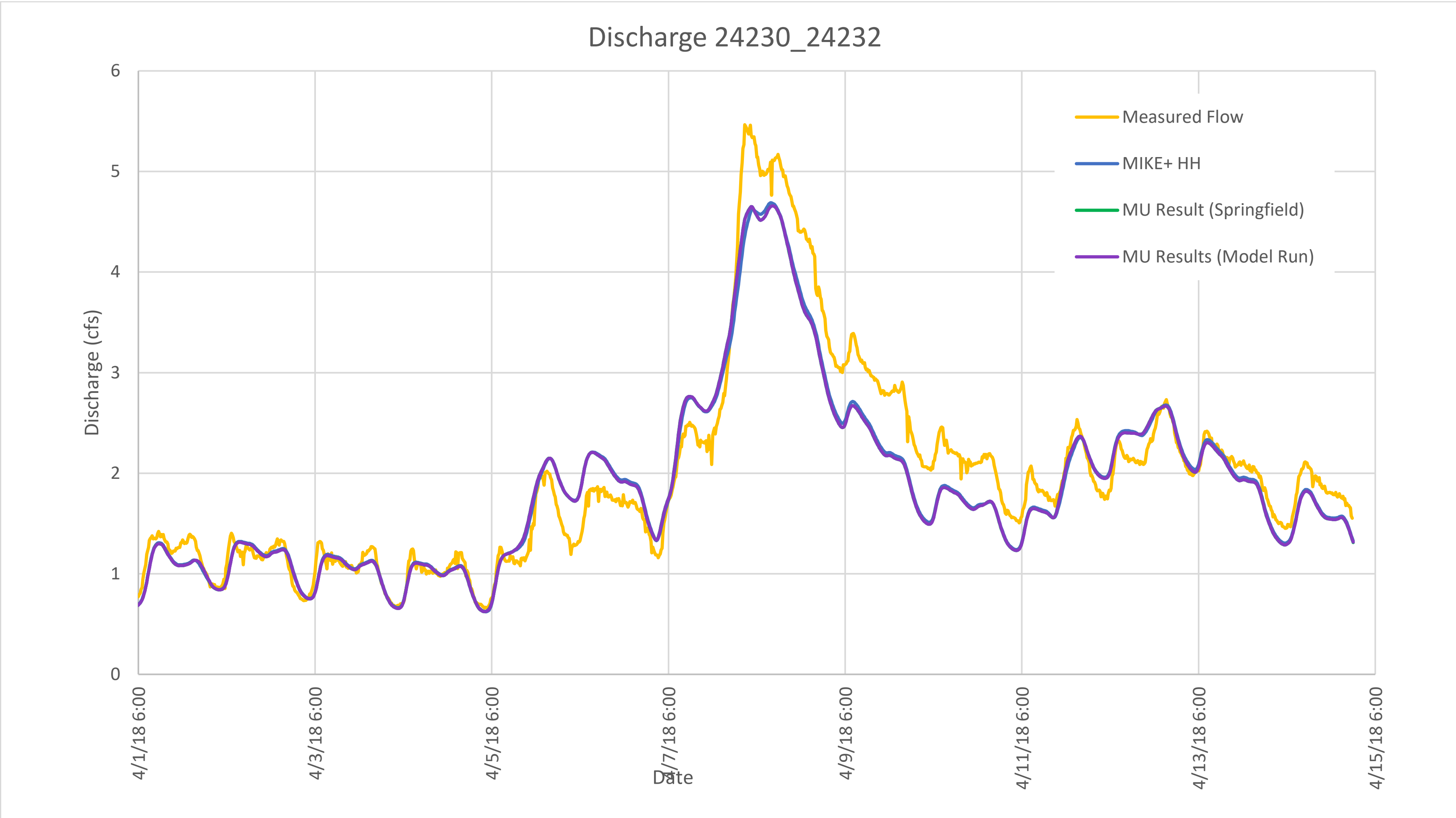


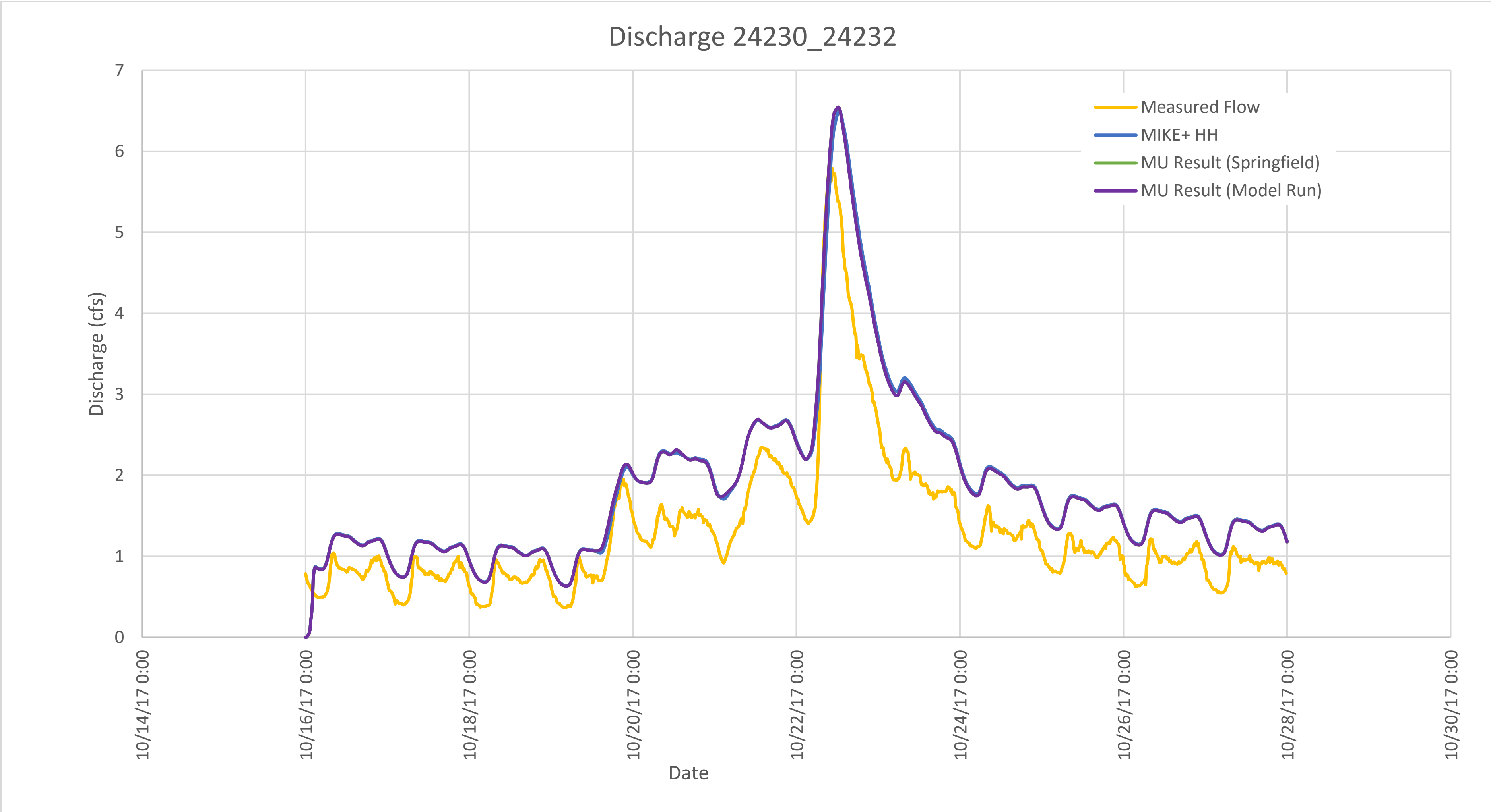
Figure 17: April Discharge for 24230_24232



Notes:

- The peak flows from the model results are lower than the peak measured flows.
- The receding limb for the modeled flows is lower than for the measured flows, resulting in a decreased volume.
- Results from the three models are similar.

Figure 18: October Discharge for 24230_24232



Notes:

- The peak flows from the model results are higher than the peak measured flows.
- The rising and receding limb for the modeled flows are higher than for the measured flows, resulting in an increased volume.
- Results from the three models are similar.

Model Conversion – 24507_24497

Figure 19: Drainage Basin for 24507_24497

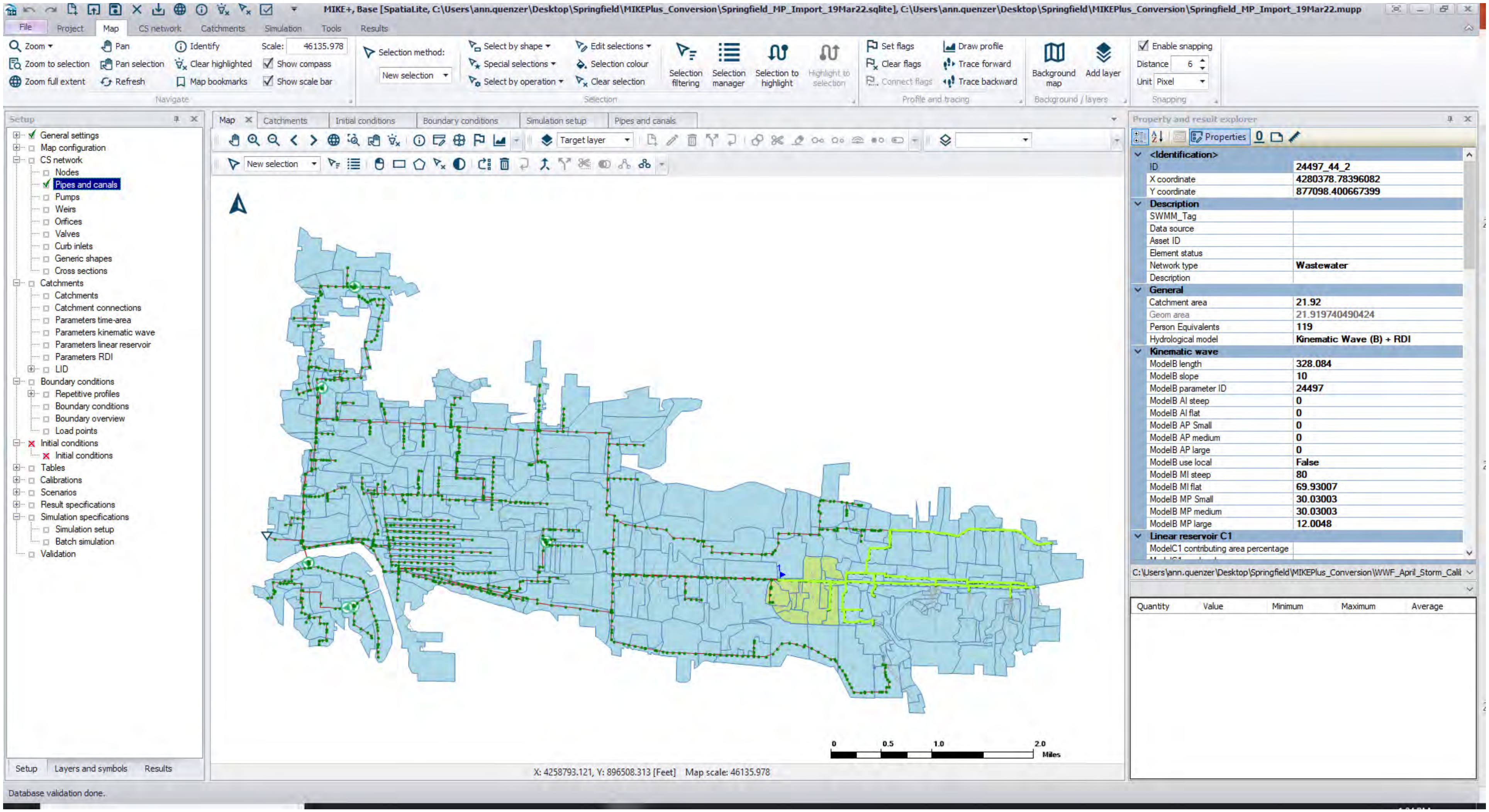
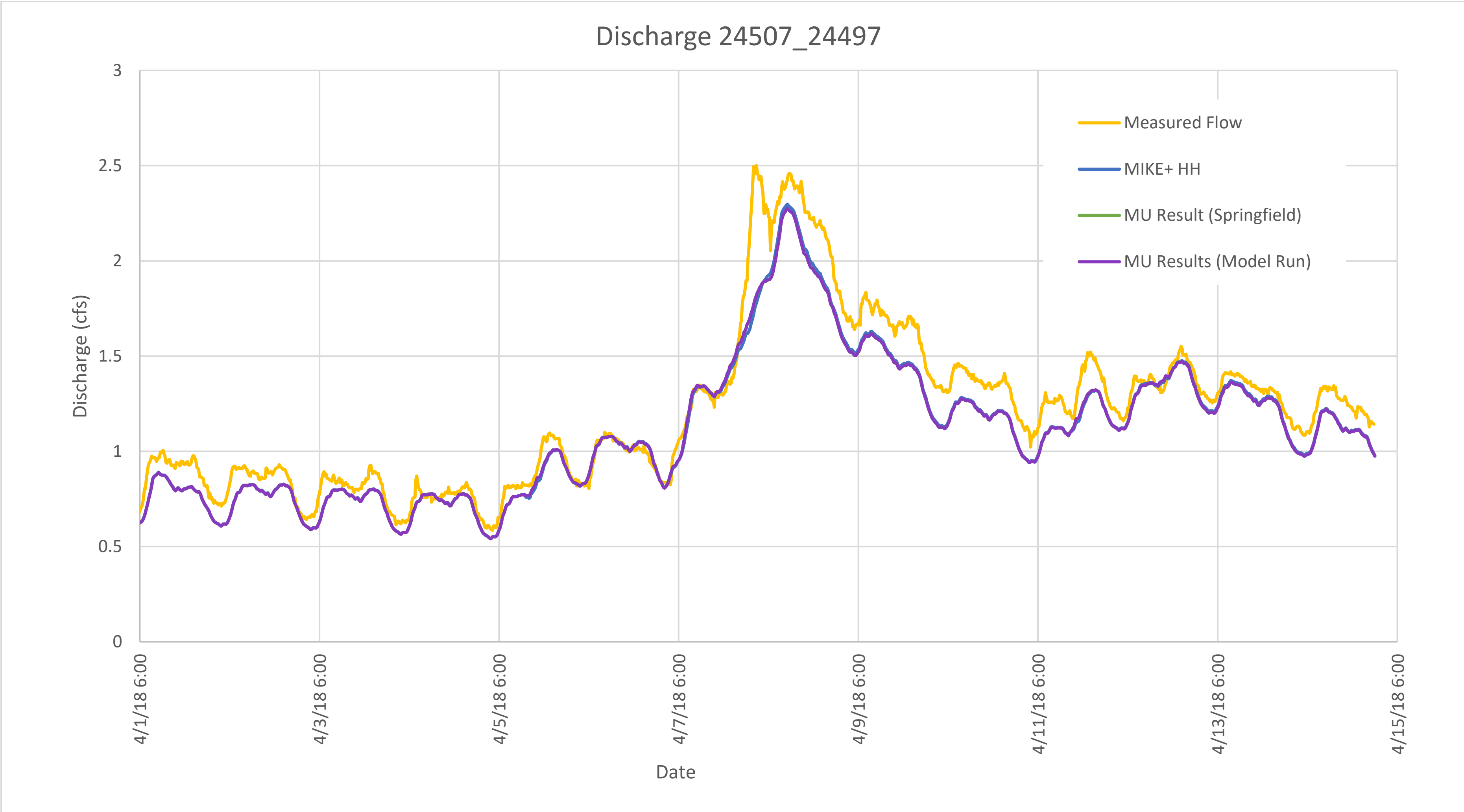


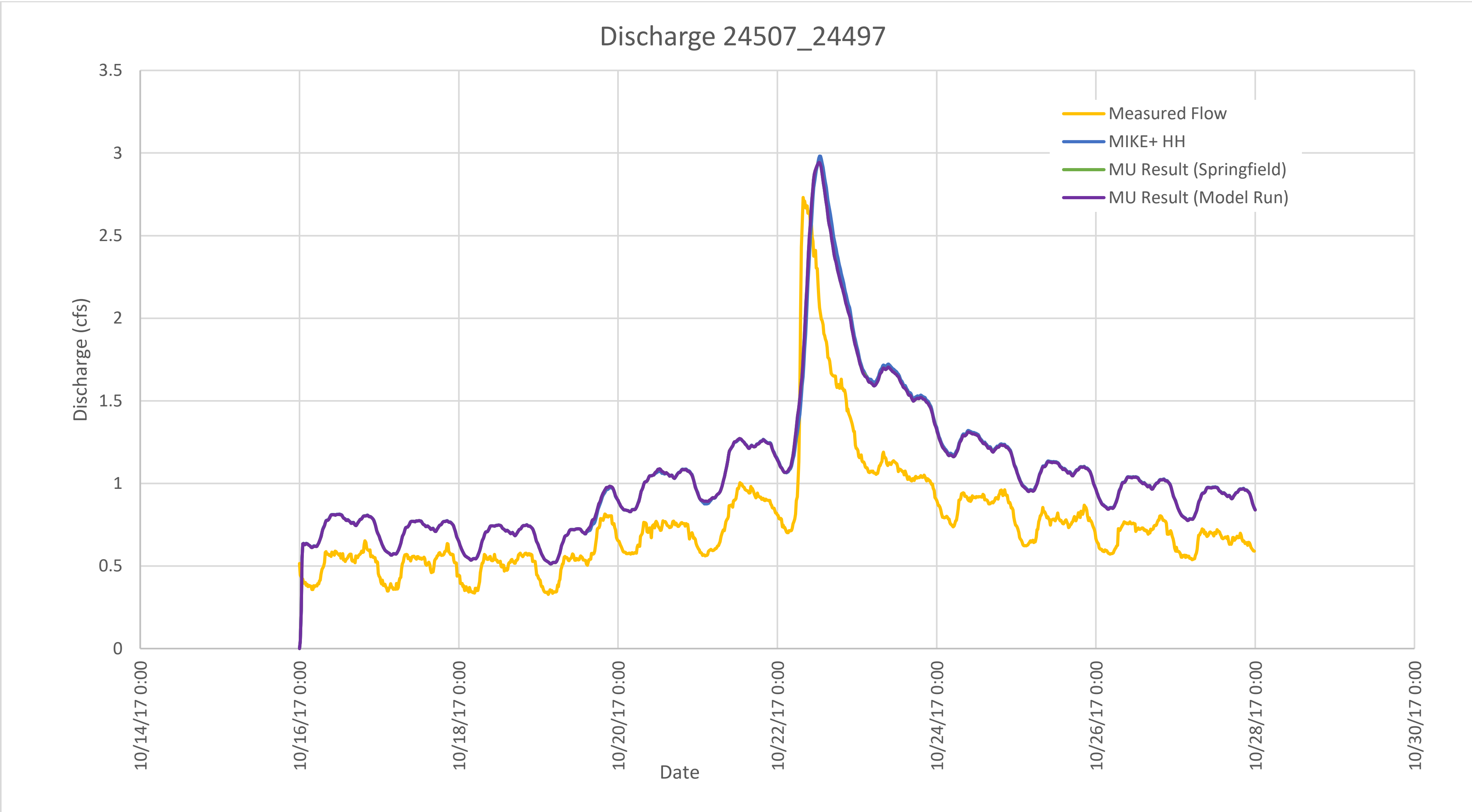
Figure 20: April Discharge for 24507_24497



Notes:

- The peak flows from the model results are lower than the peak measured flows.
- The receding limb for the modeled flows is lower than for the measured flows, resulting in a decreased volume.
- Results from the three models are similar.

Figure 21: October Discharge for 24507_24497



Notes:

- The peak flows from the model results are higher than the peak measured flows.
- The rising and receding limb for the modeled flows are higher than for the measured flows, resulting in an increased volume.
- Results from the three models are similar.

Model Conversion – 26111_22283

Figure 22: Drainage Basin for 26111_22283

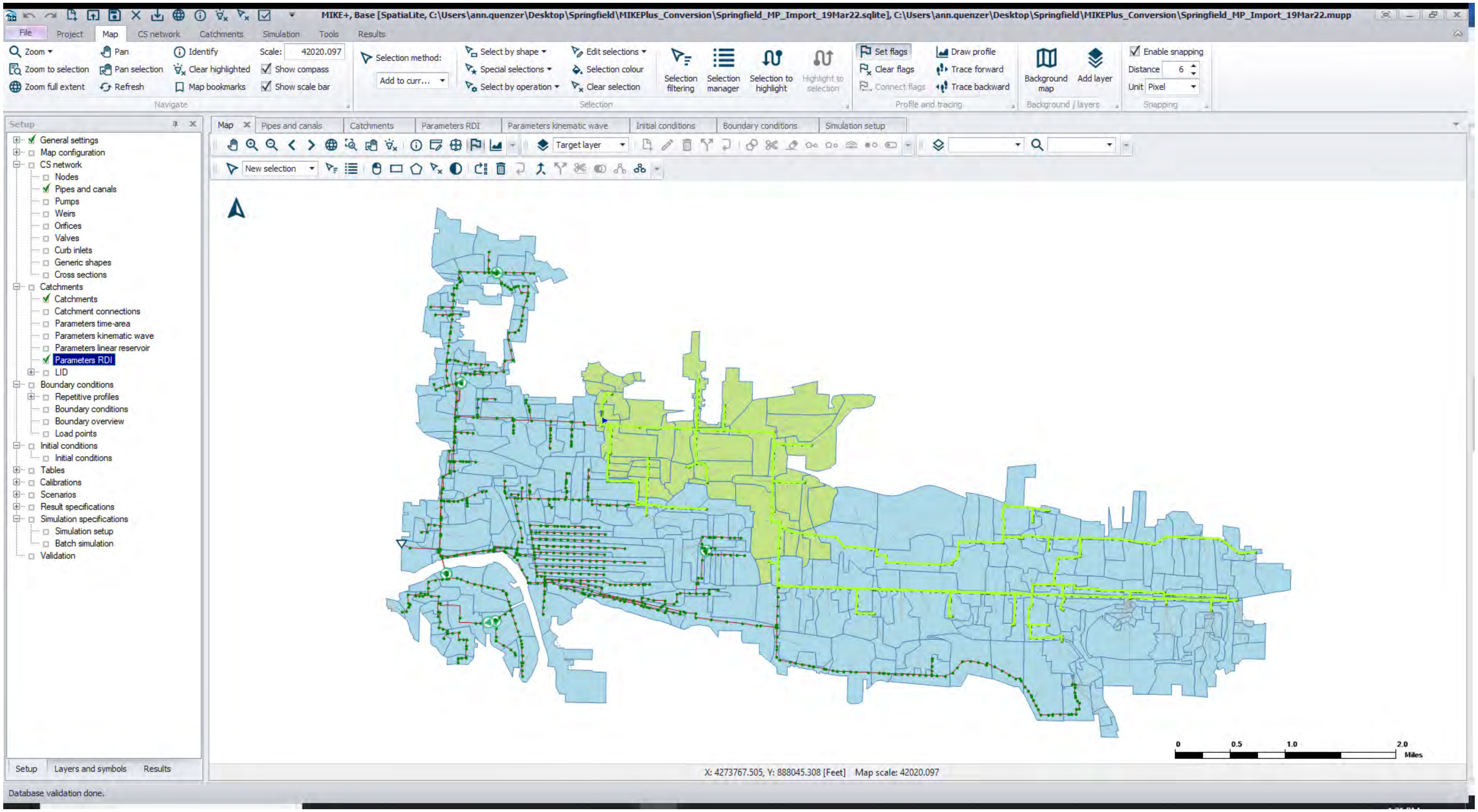
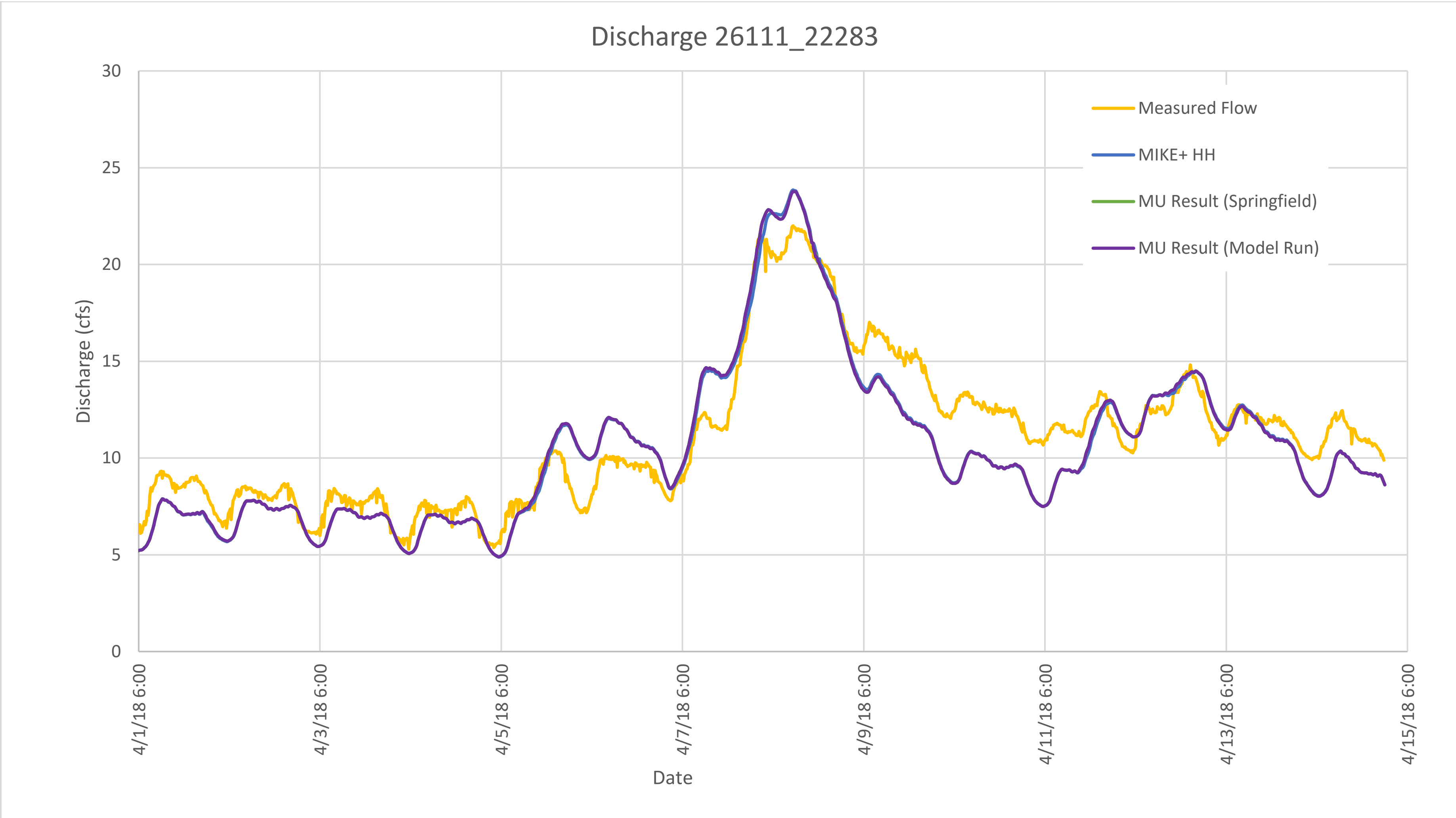


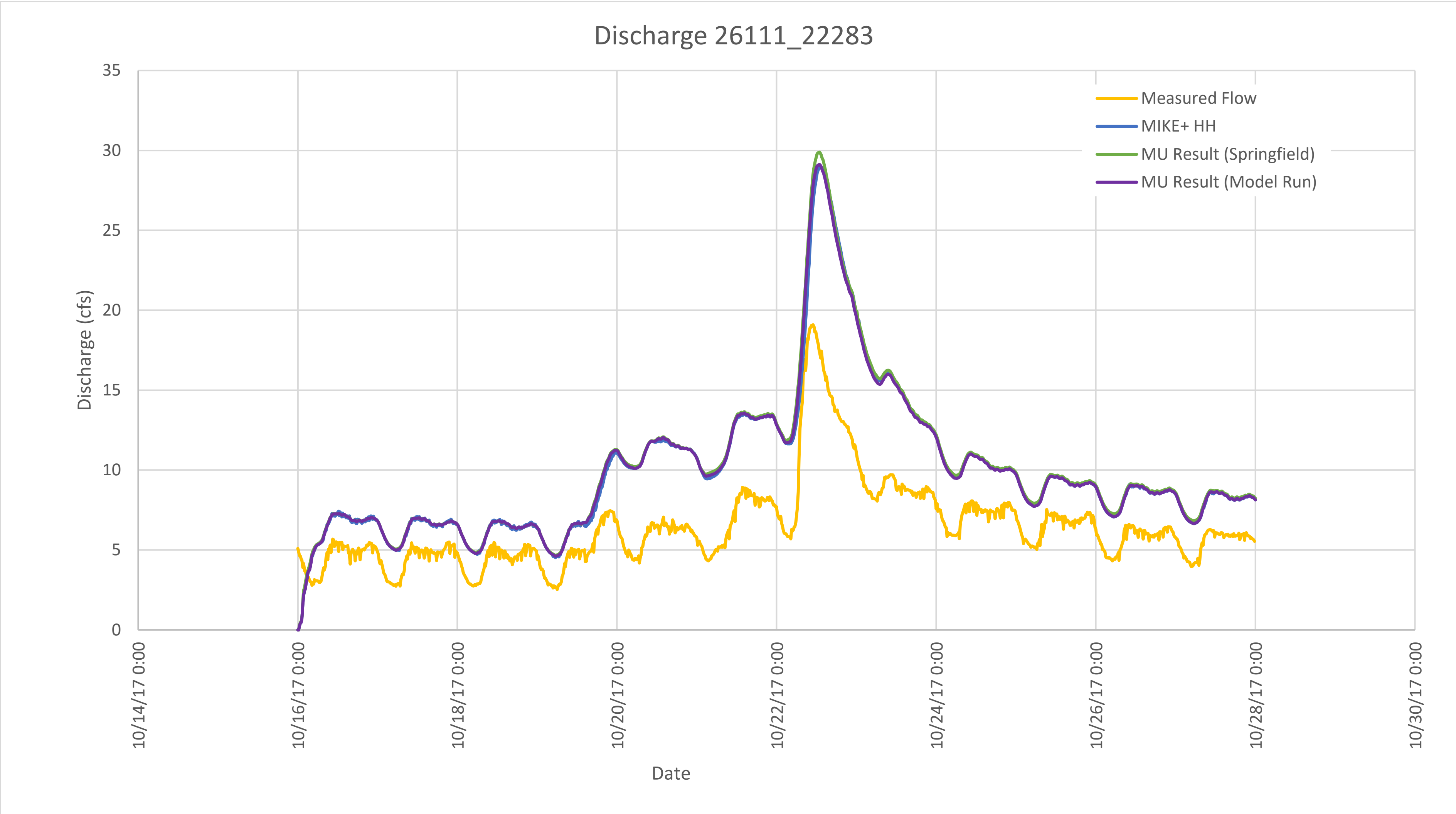
Figure 23: April Discharge for 26111_22283



Notes:

- The peak flows from the model results are higher than the peak measured flows.
- The receding limb for the modeled flows is lower than for the measured flows, resulting in a decreased volume.
- Results from the three models are similar.

Figure 24: October Discharge for 26111_22283



Notes:

- The peak flows from the model results are higher than the peak measured flows.
- The rising and receding limb for the modeled flows are higher than for the measured flows, resulting in an increased volume.
- Results from the three models are similar.

Model Conversion – 22851_22853

Figure 25: Drainage Basin for 22851_22853

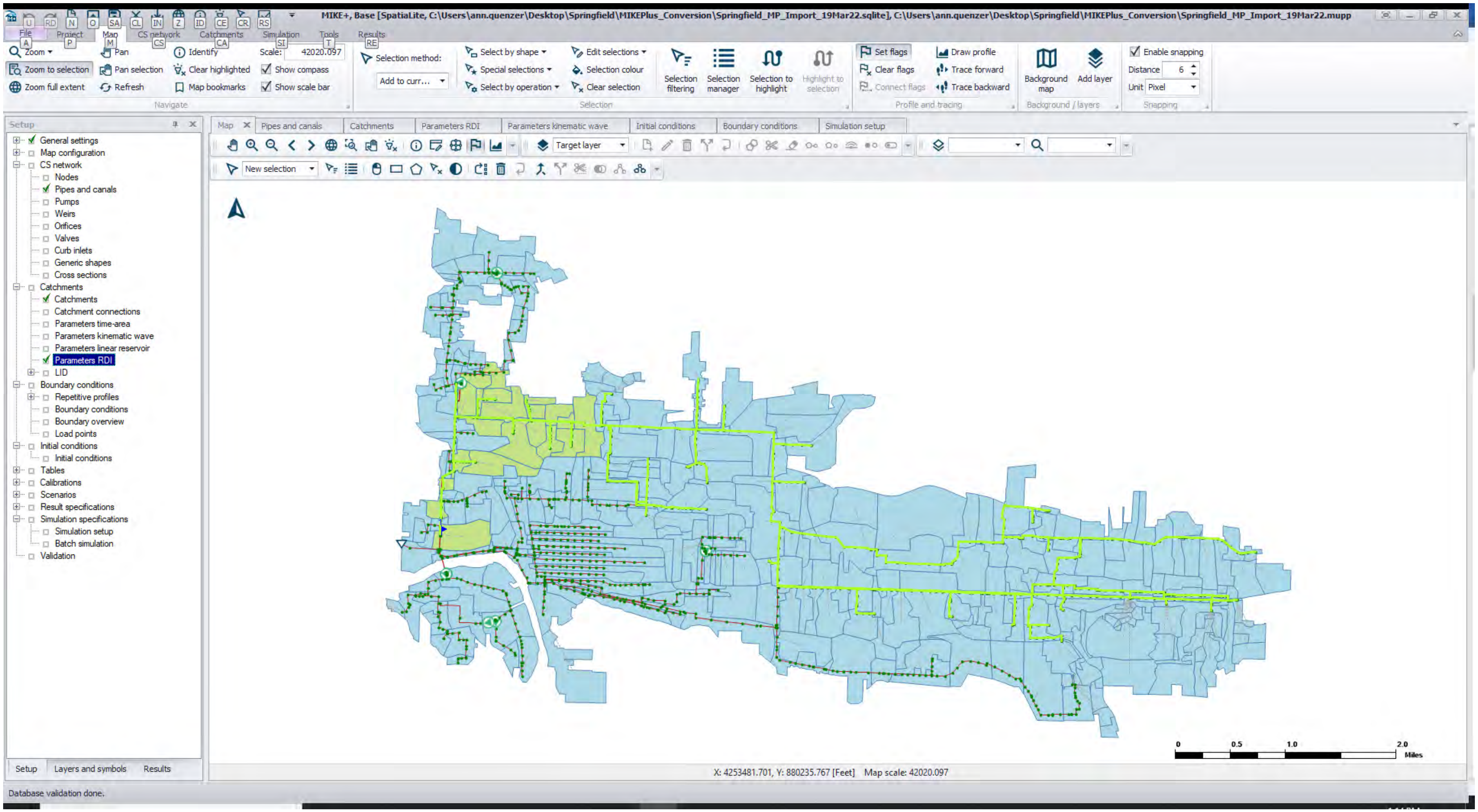
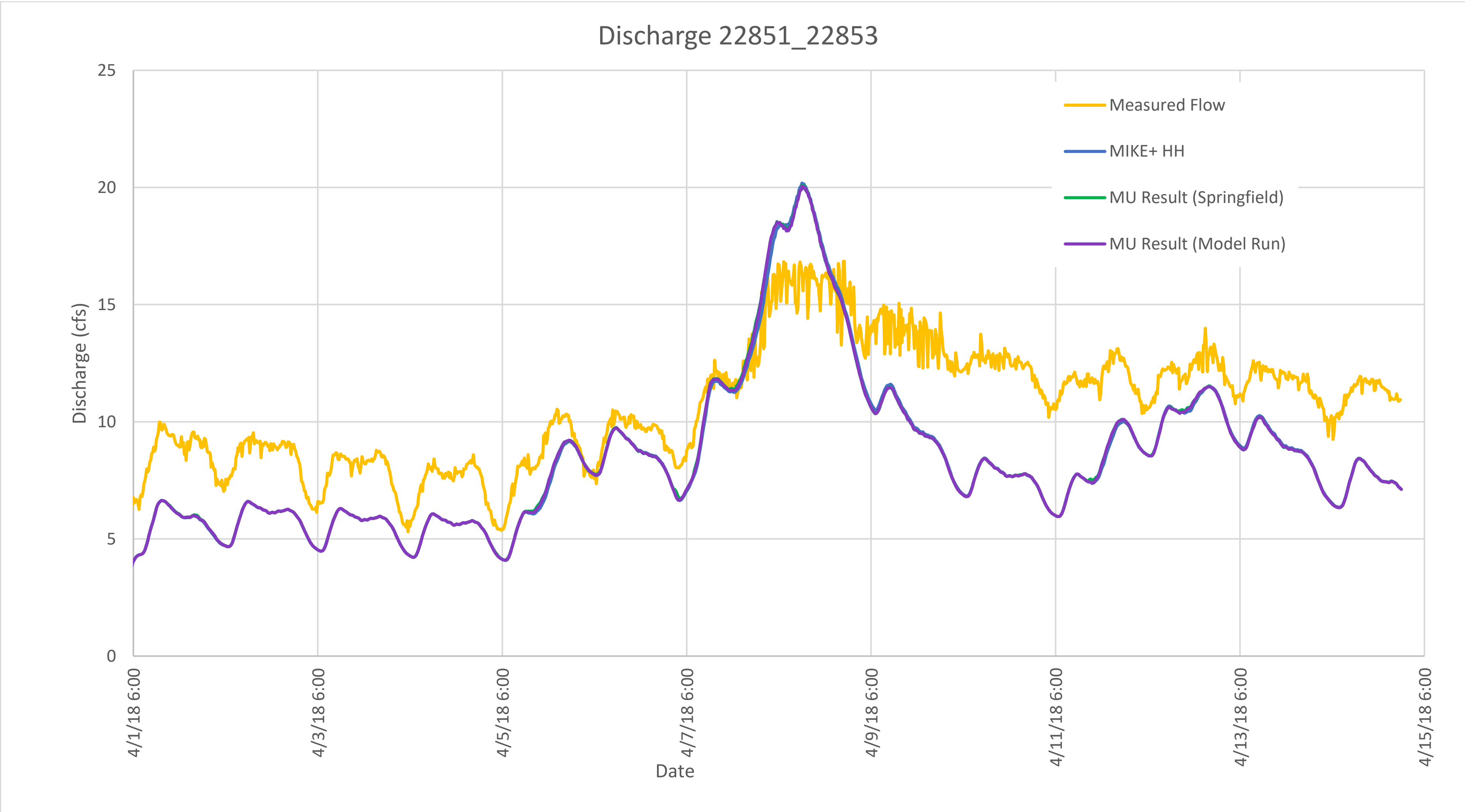


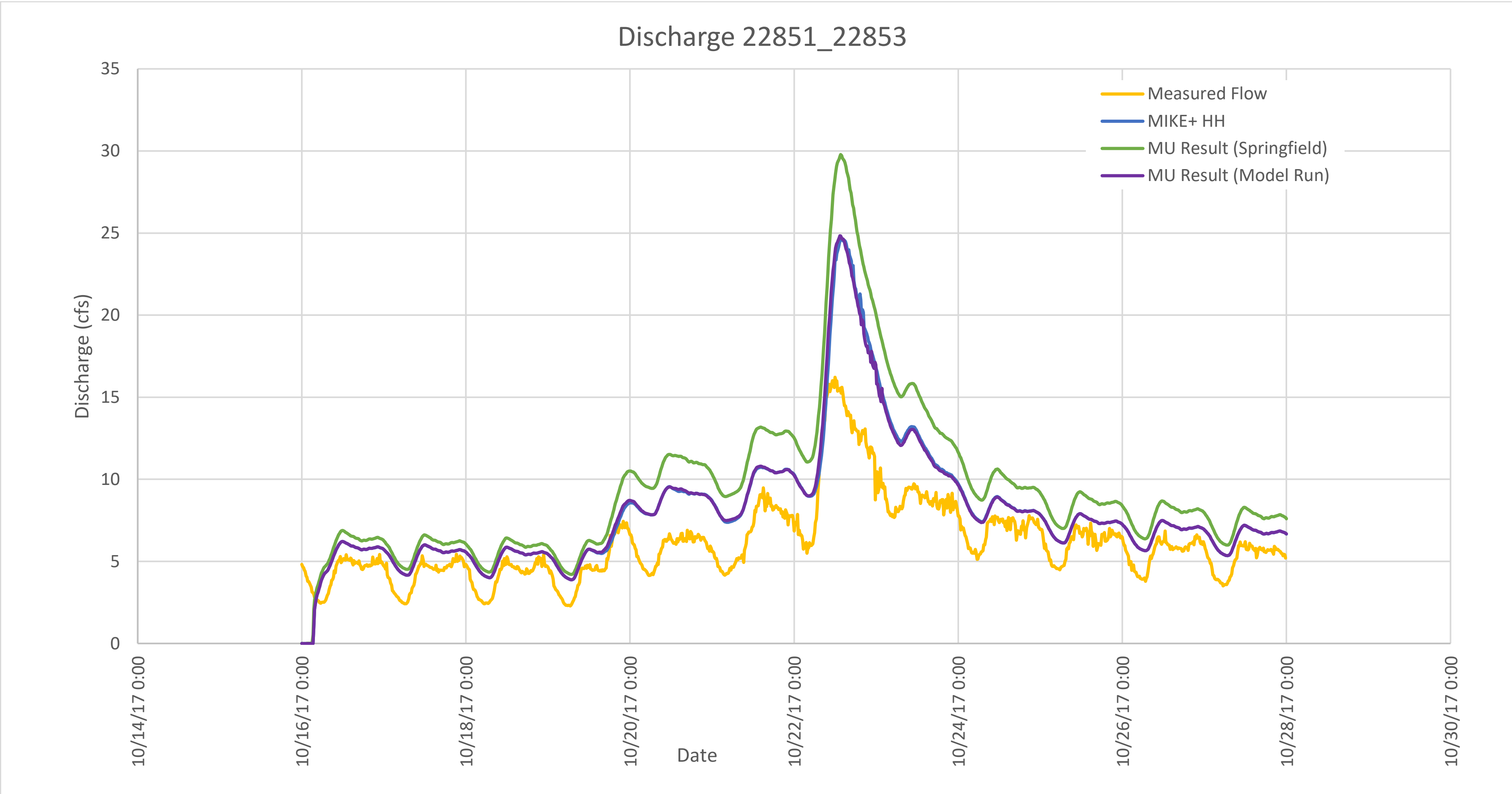
Figure 26: April Discharge for 22851_22853



Notes:

- The peak flows from the model results are higher than the peak measured flows.
- The receding limb for the modeled flows is lower than for the measured flows, resulting in a decreased volume.
- Results from the three models are similar.

Figure 27: October Discharge for 22851_22853



Notes:

- The peak flows from the model results are higher than the peak measured flows.
- The rising and receding limb for the modeled flows are higher than for the measured flows, resulting in an increased volume.
- The results provided by Springfield are higher than the other modeled results.
- Results from the other two models are similar.

Model Conversion – 22837_22781

Figure 28: Drainage Basin for 22837_22781

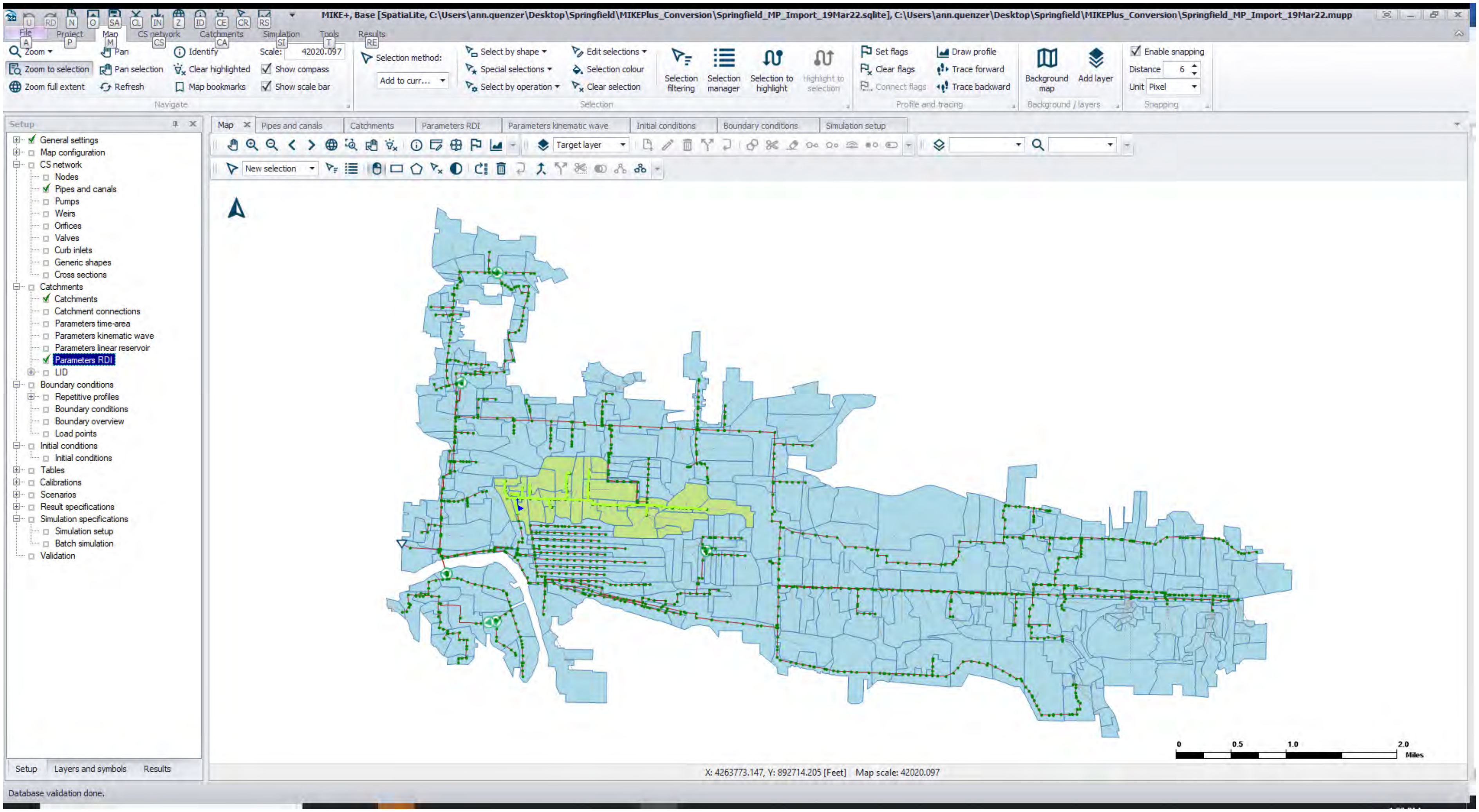
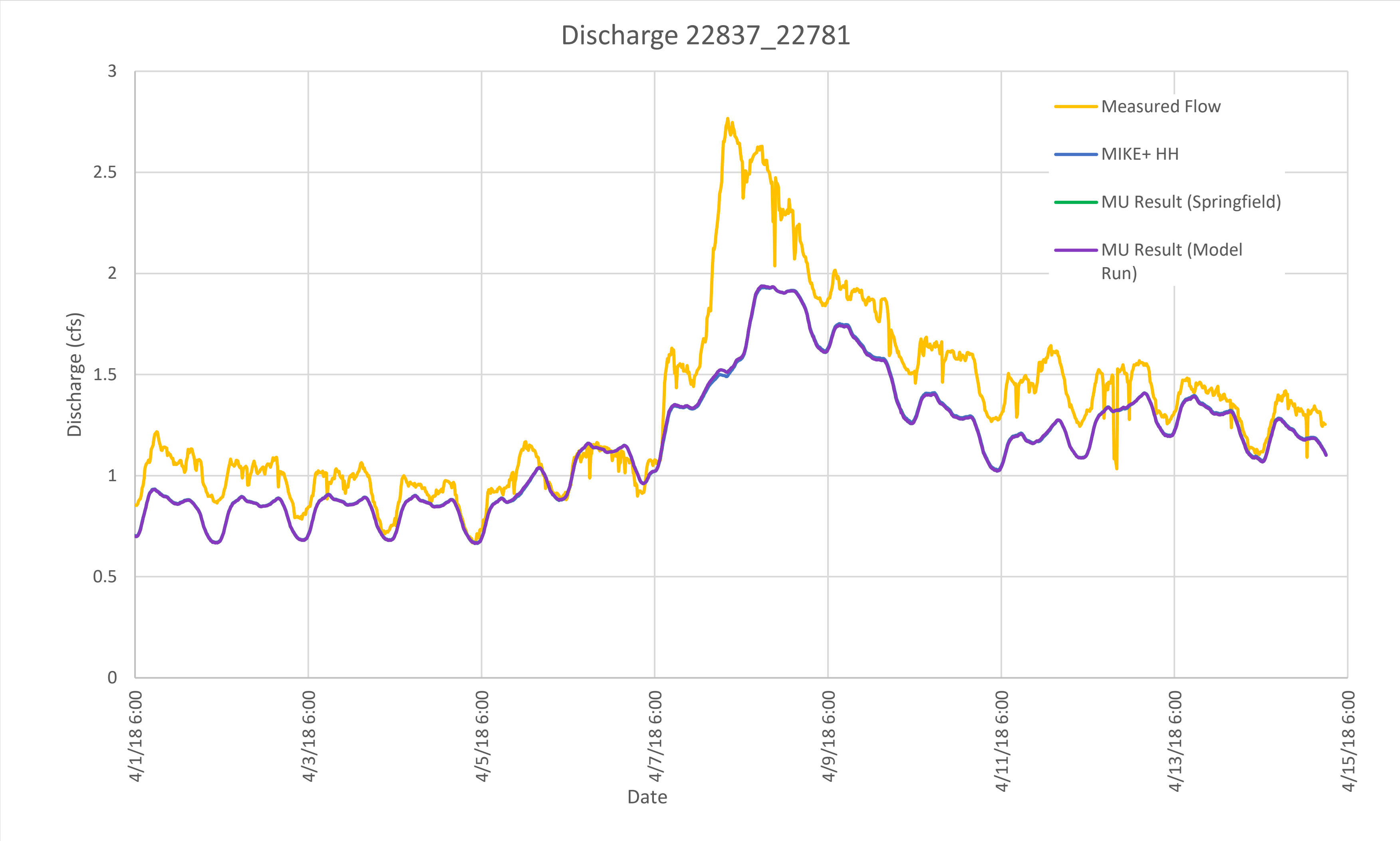


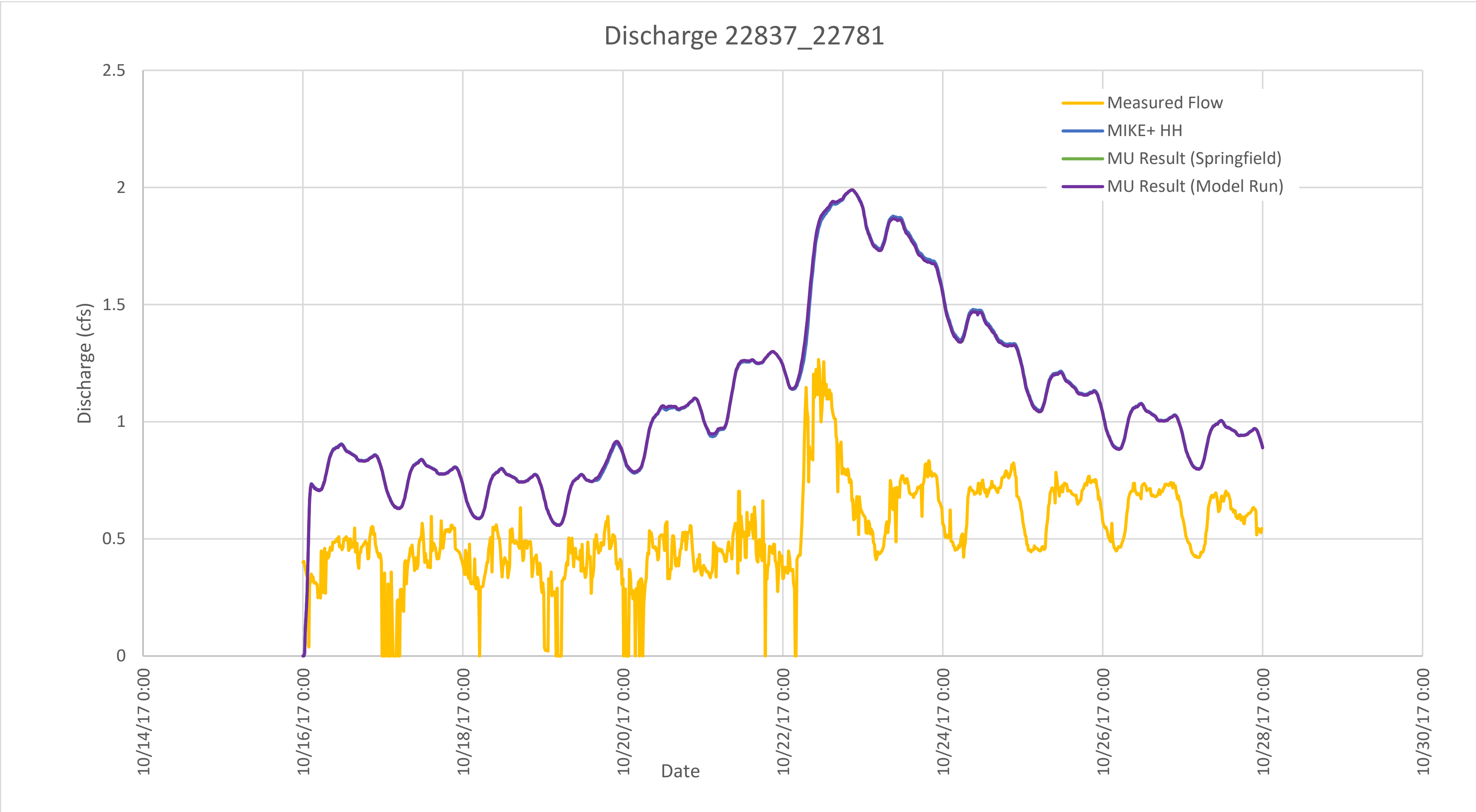
Figure 29: April Discharge for 22837_22781



Notes:

- The peak flows from the model results are lower than the peak measured flows.
- The receding limb for the modeled flows is lower than for the measured flows, resulting in a decreased volume.
- Results from the three models are similar.

Figure 30: October Discharge for 22837_22781



Notes:

- The peak flows from the model results are higher than the peak measured flows.
- The rising and receding limb for the modeled flows are higher than for the measured flows, resulting in an increased volume.
- Results from the three models are similar.

Model Conversion – 23341_27384

Figure 31: Drainage Basin for 23341_27384

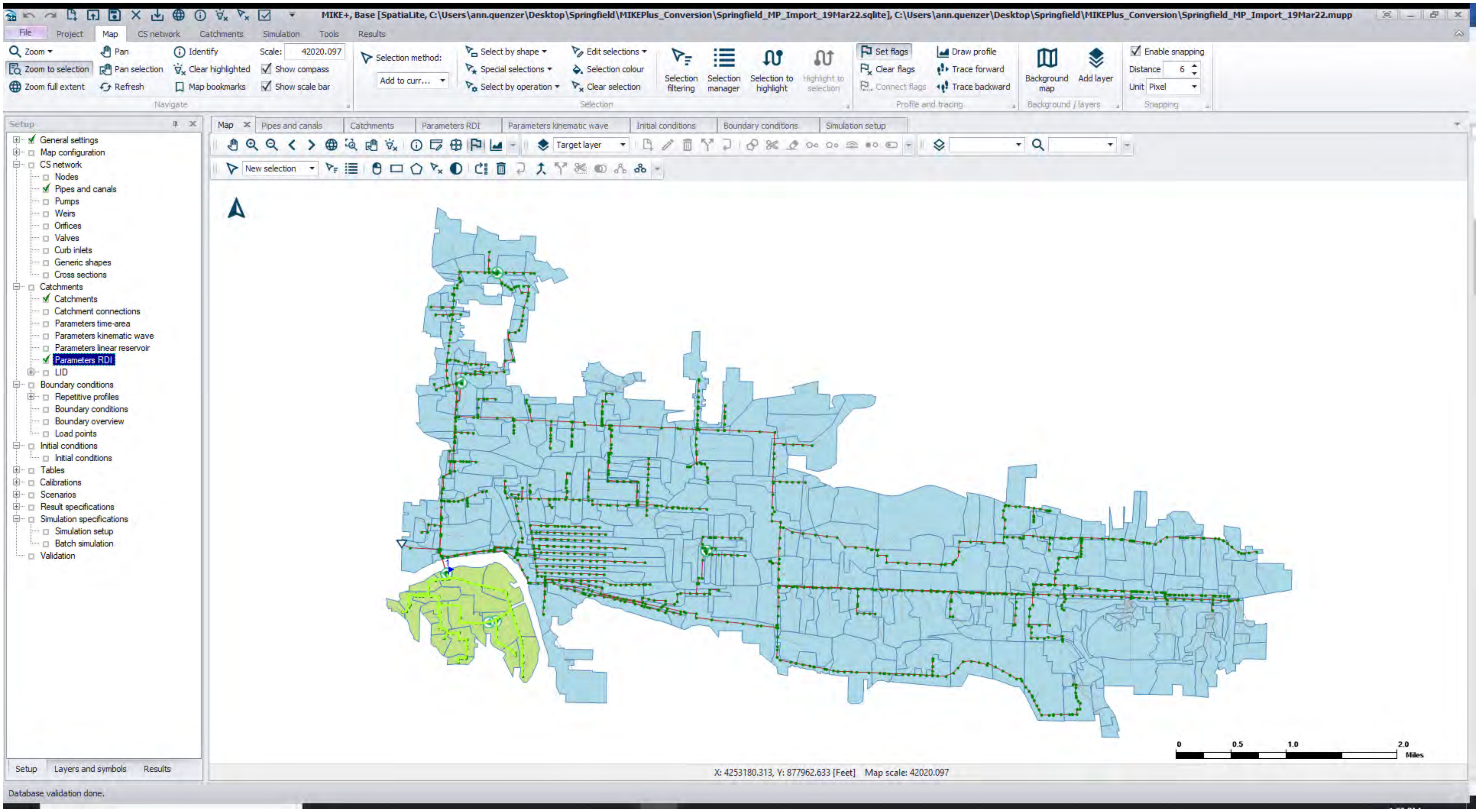
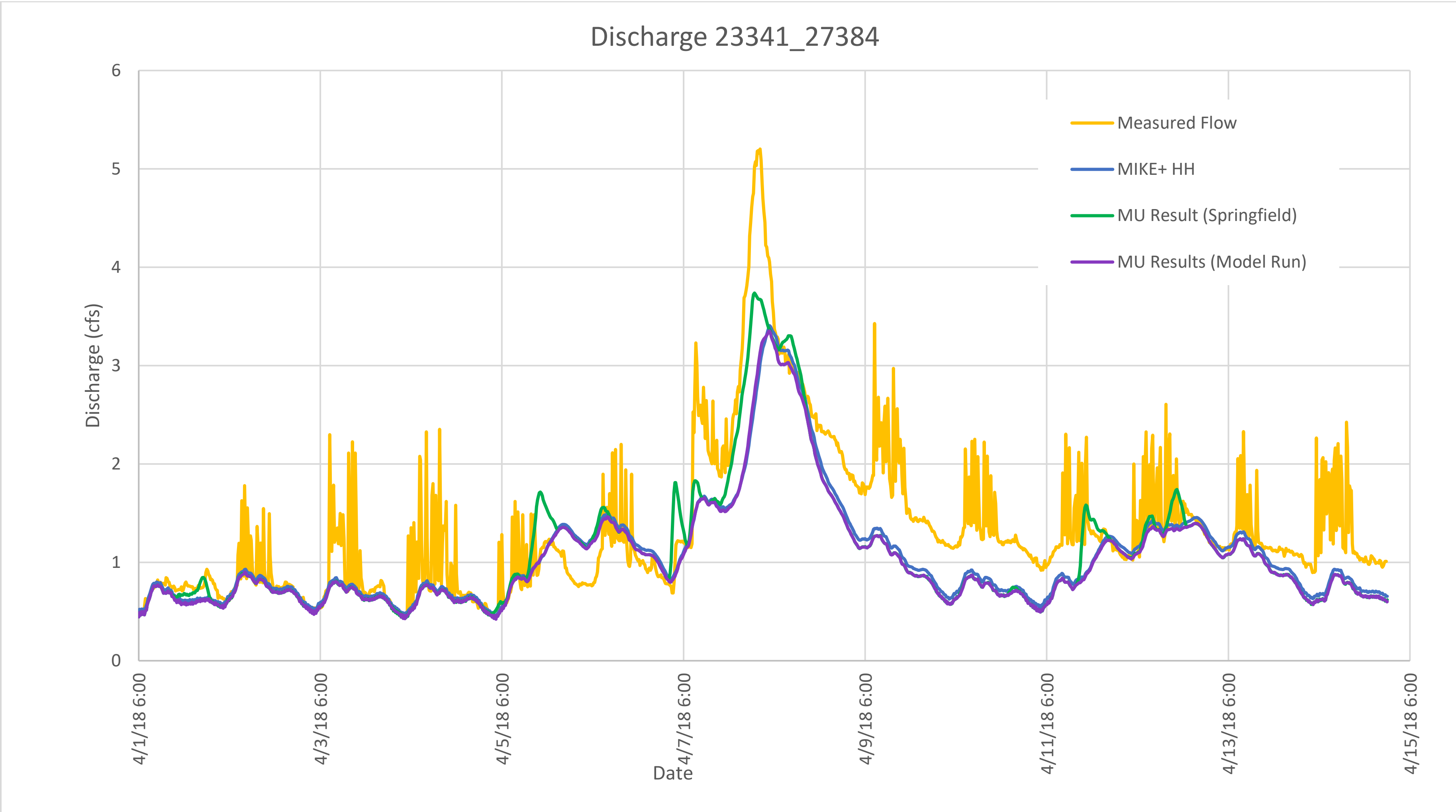


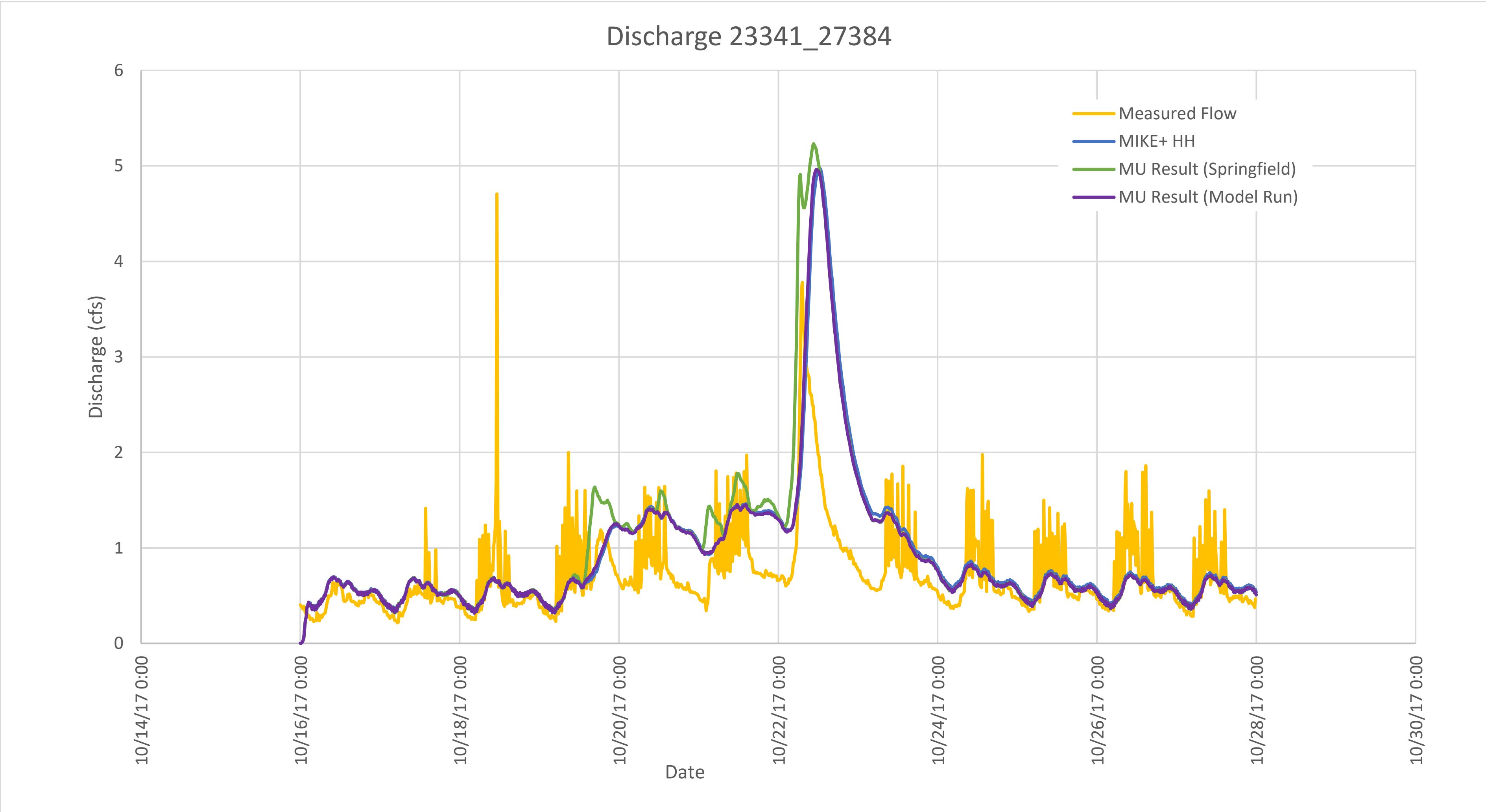
Figure 32: April Discharge for 23341_27384



Notes:

- The peak flows from the model results are lower than the peak measured flows.
- The receding limb for the modeled flows is lower than for the measured flows, resulting in a decreased volume.
- The result file provided from Springfield is higher than the other modeled results.

Figure 33: October Discharge for 23341_27384



Notes:

- The peak flows from the model results are higher than the peak measured flows.
- The rising and receding limb for the modeled flows are higher than for the measured flows, resulting in an increased volume.
- The result file provided from Springfield is higher than the other modeled results.

Model Conversion – 24040_24037

Figure 34: Drainage Basin for 24040_24037

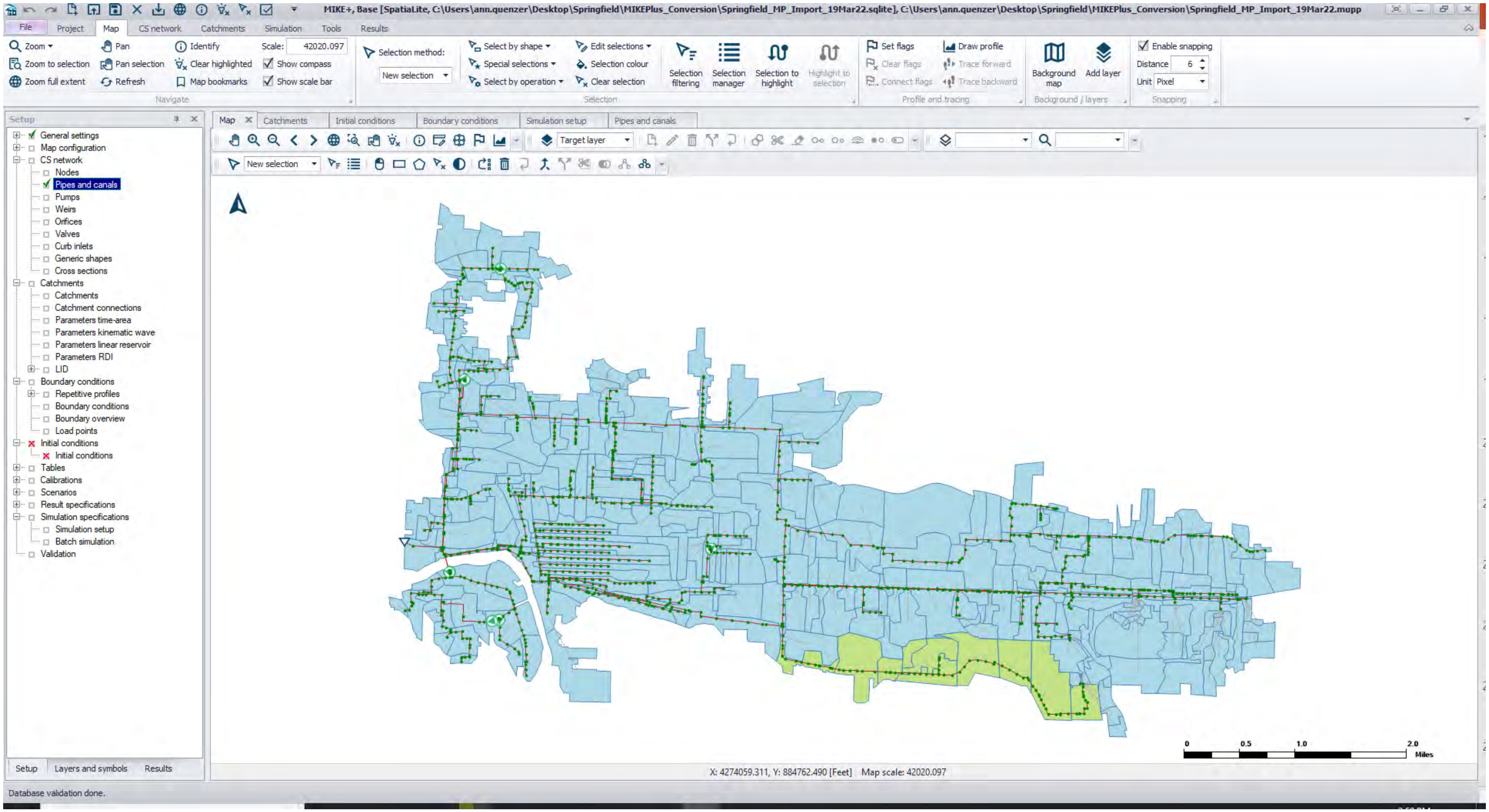
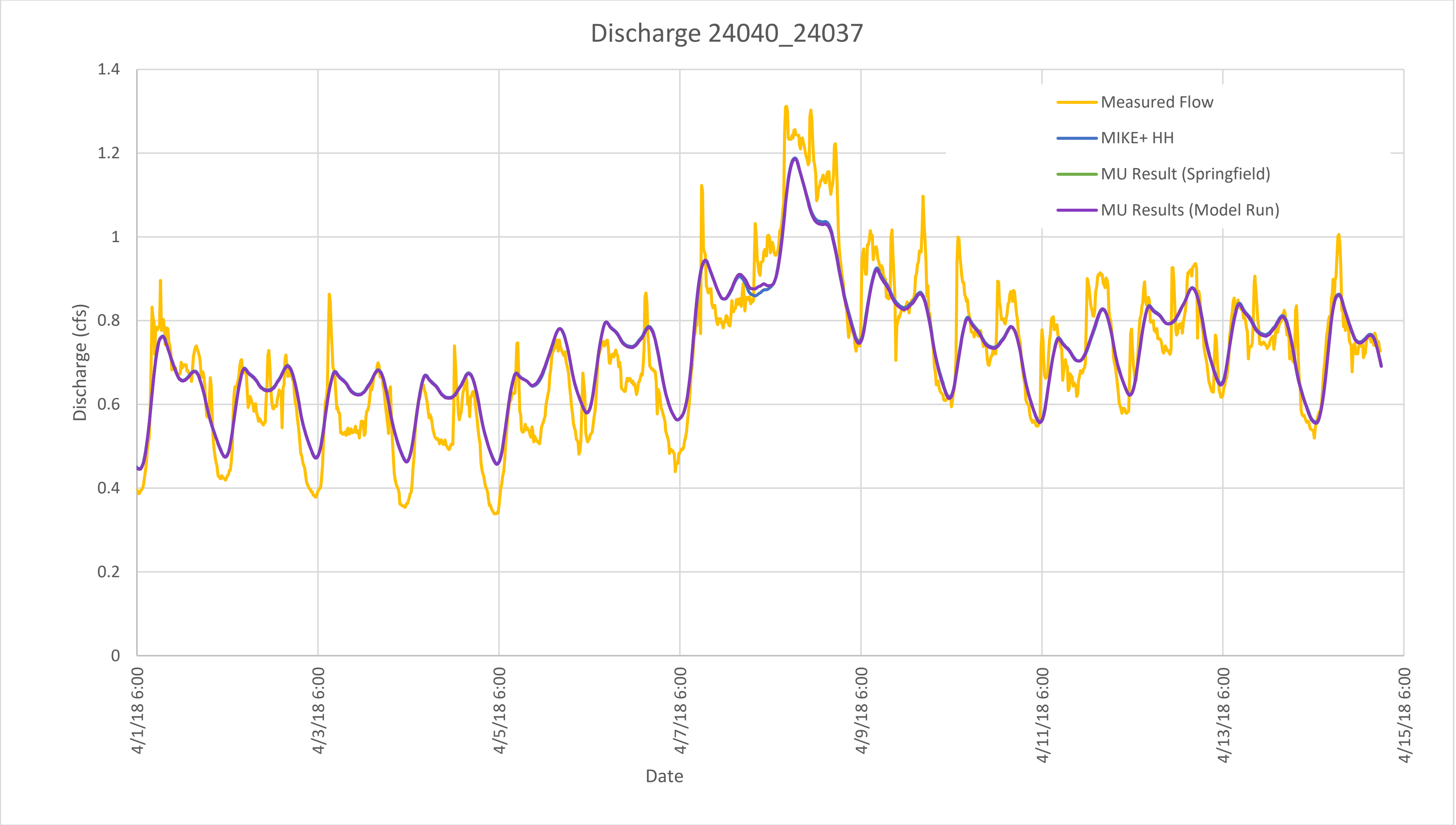


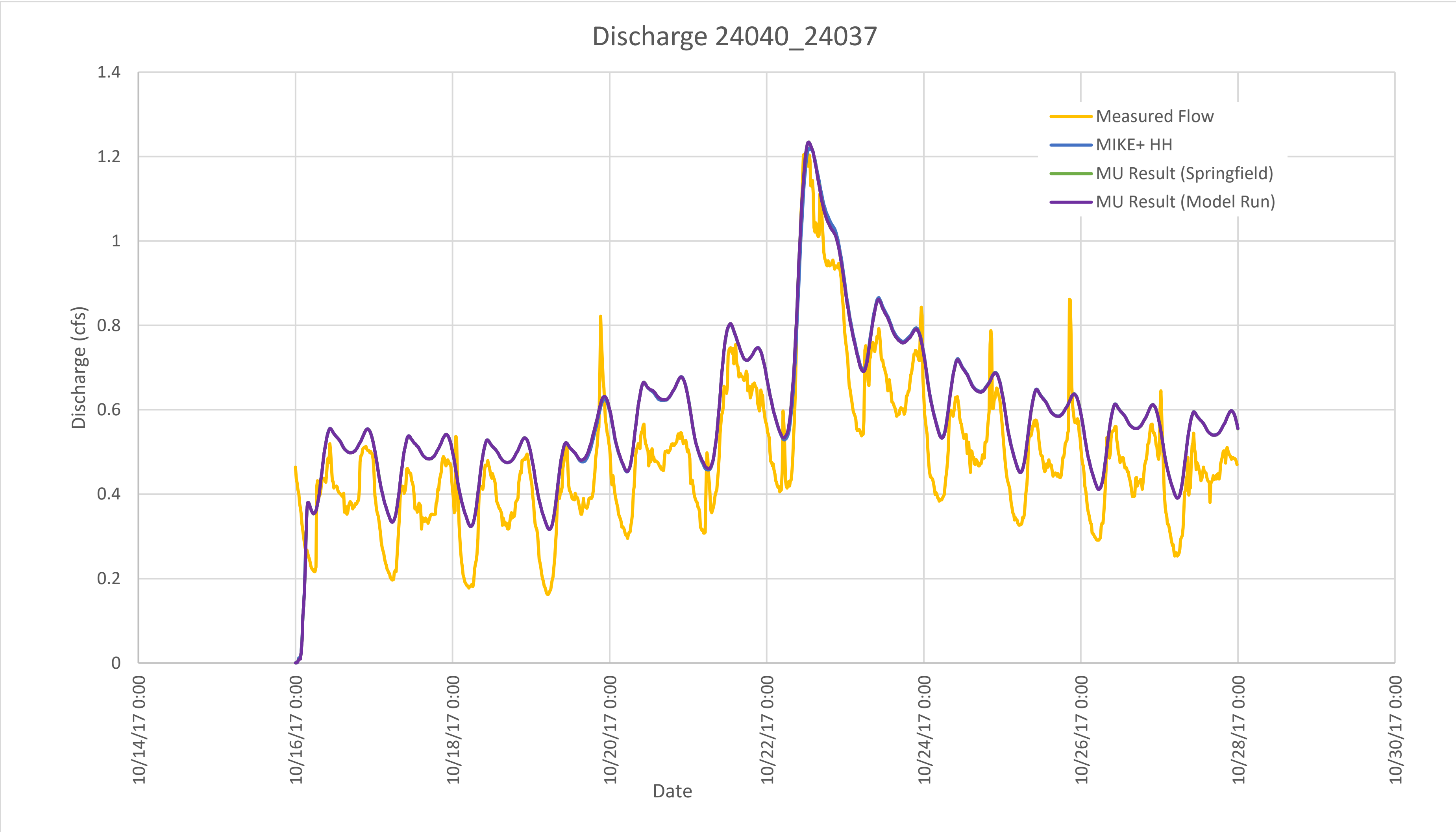
Figure 35: April Discharge for 24040_24037



Notes:

- The peak flows from the model results are lower than the peak measured flows.
- Results from the three models are similar.

Figure 36: October Discharge for 24040_24037



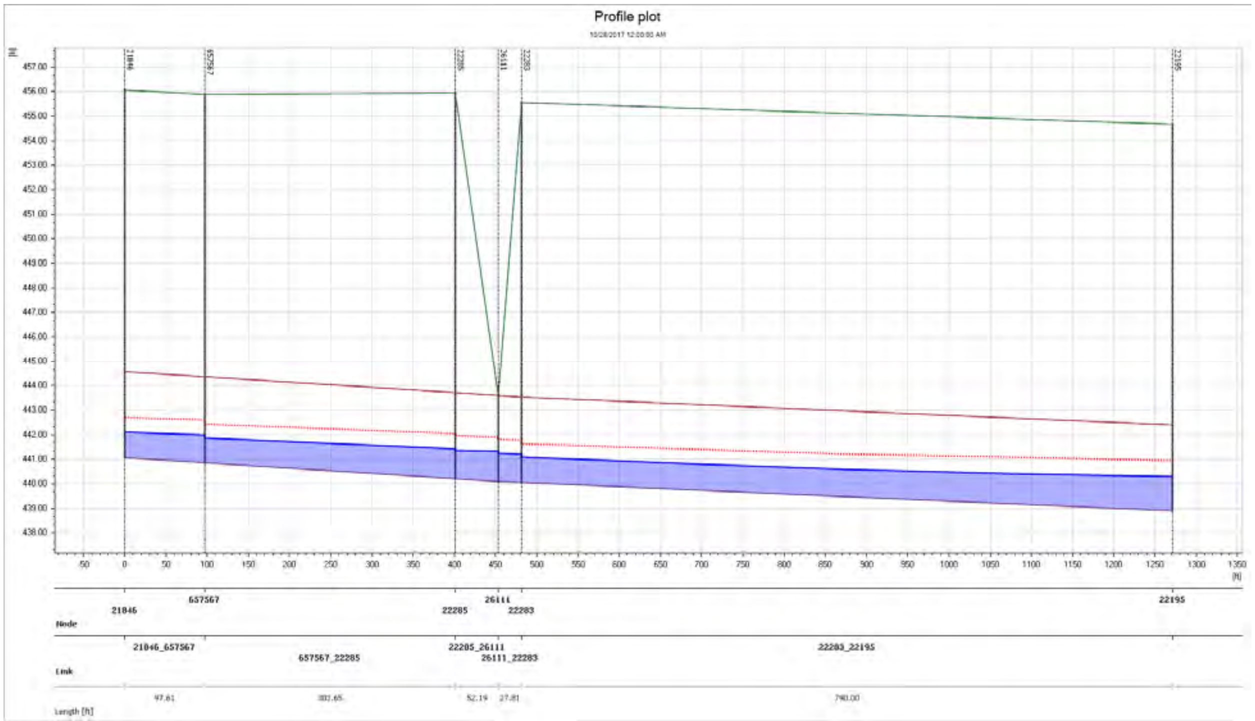
Notes:

- The peak flows from the model results are higher than the peak measured flows.
- The rising and receding limb for the modeled flows are higher than for the measured flows, resulting in an increased volume.
- Results from the three models are similar.

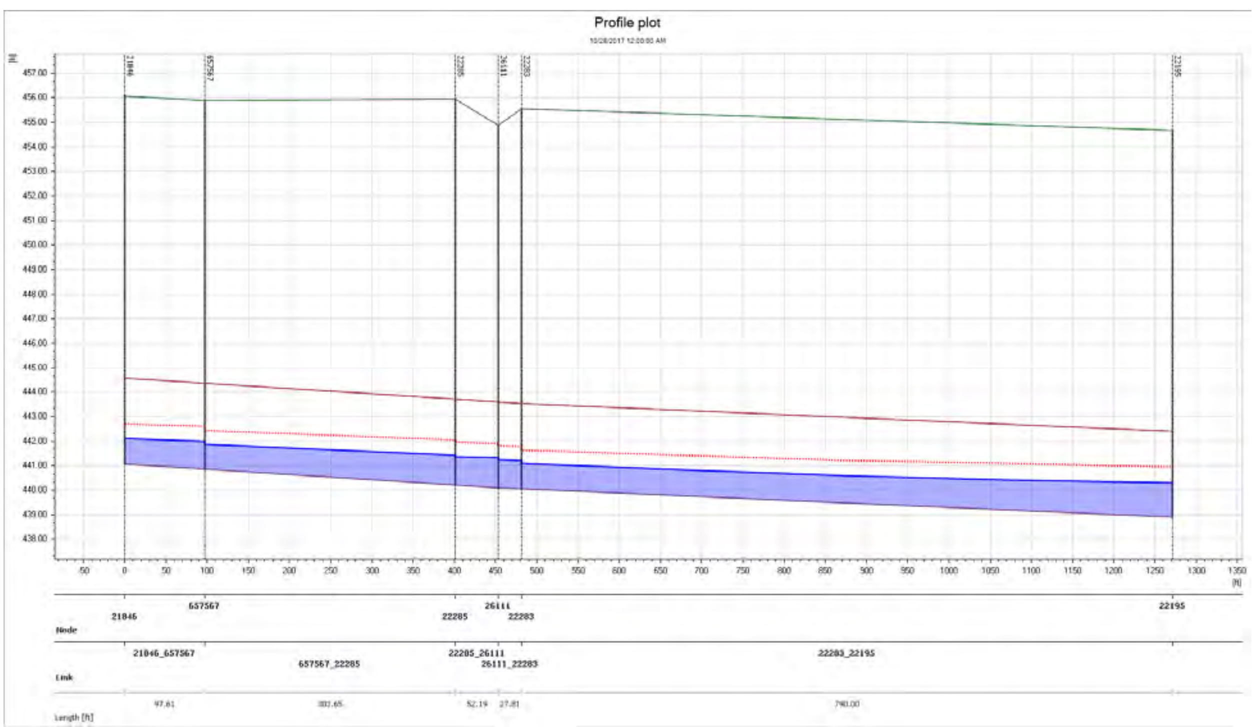
APPENDIX C
MODEL UPDATES

MH 26111

- Original Ground Elevation: 443.6 ft

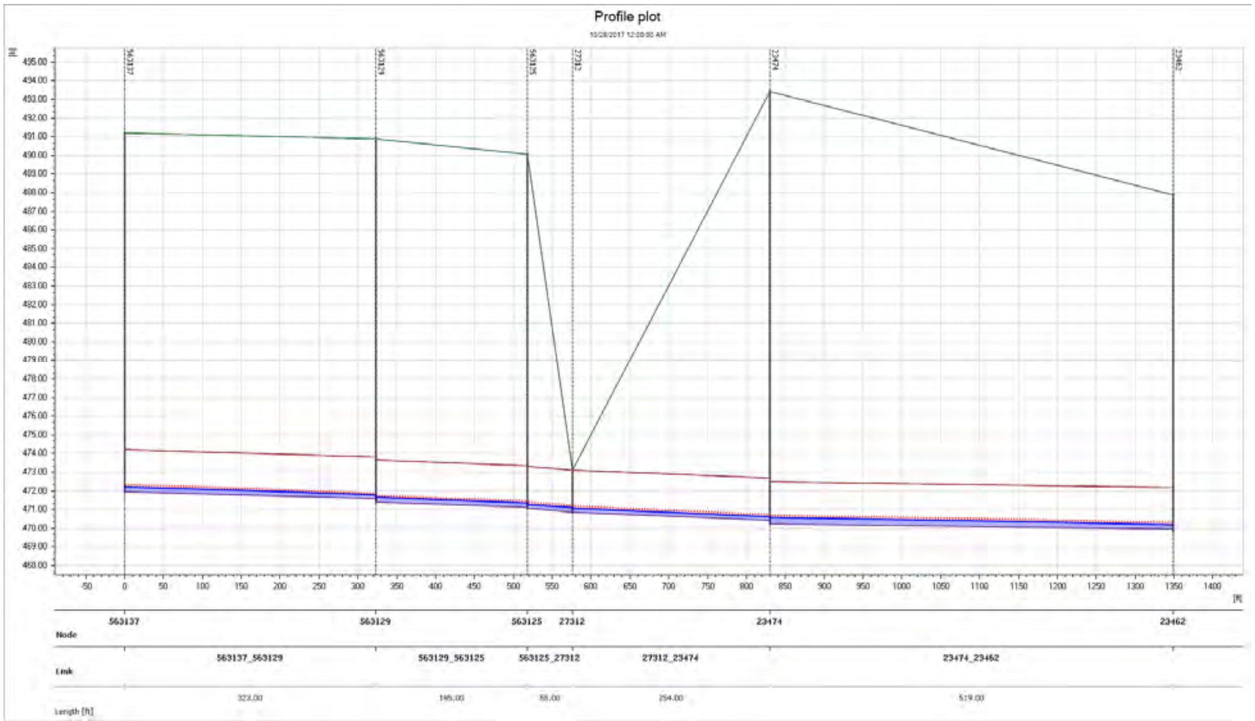


- Interpolated Ground Elevation: 454.8831 ft

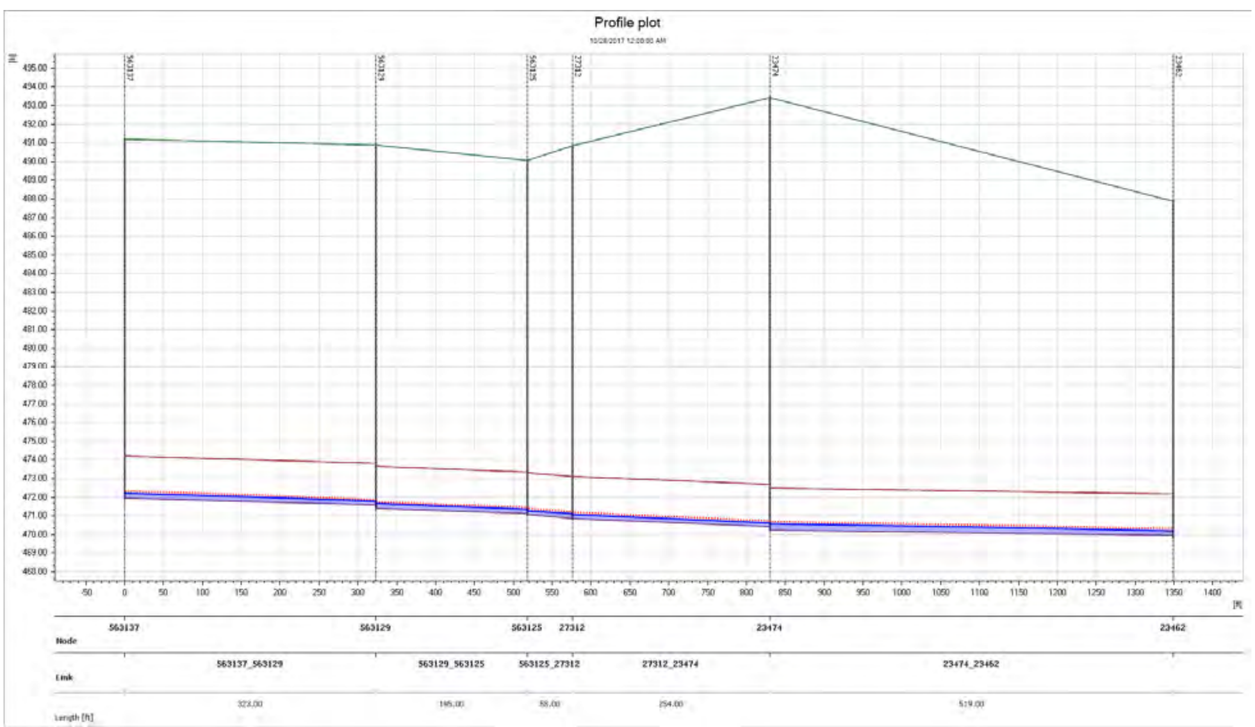


MH 27312

- Original Ground Elevation: 473.1 ft

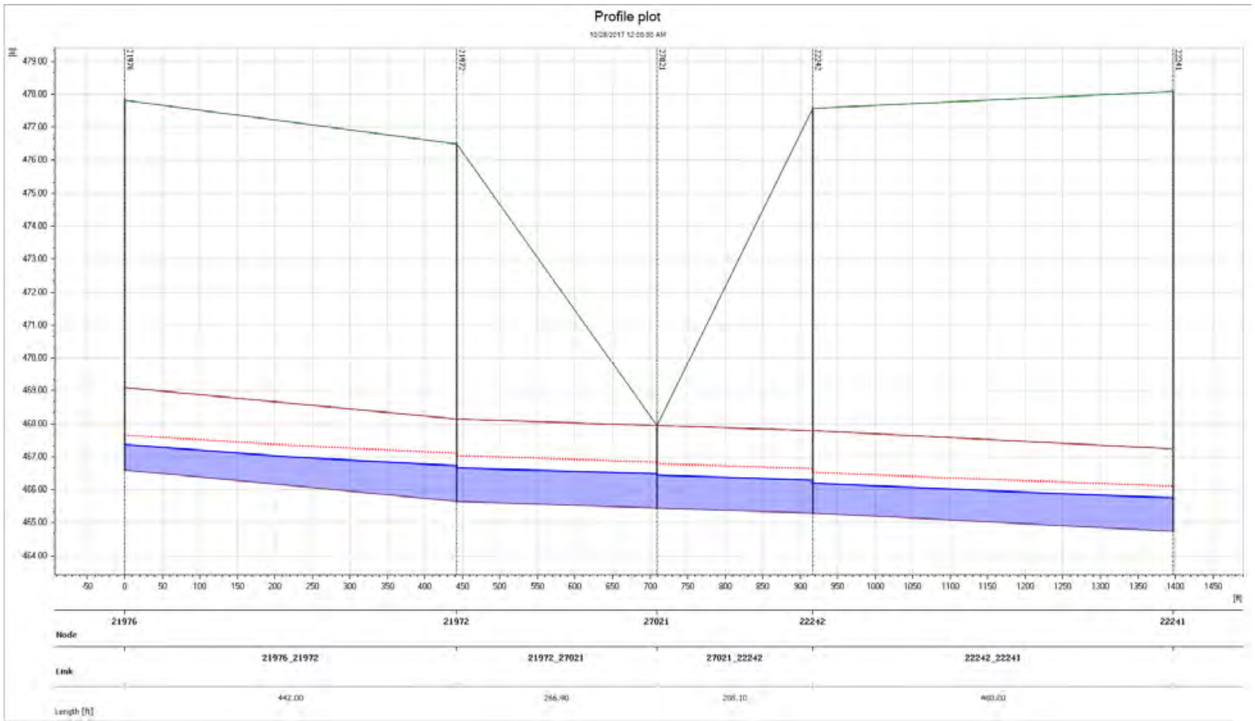


- Interpolated Ground Elevation: 490.87 ft

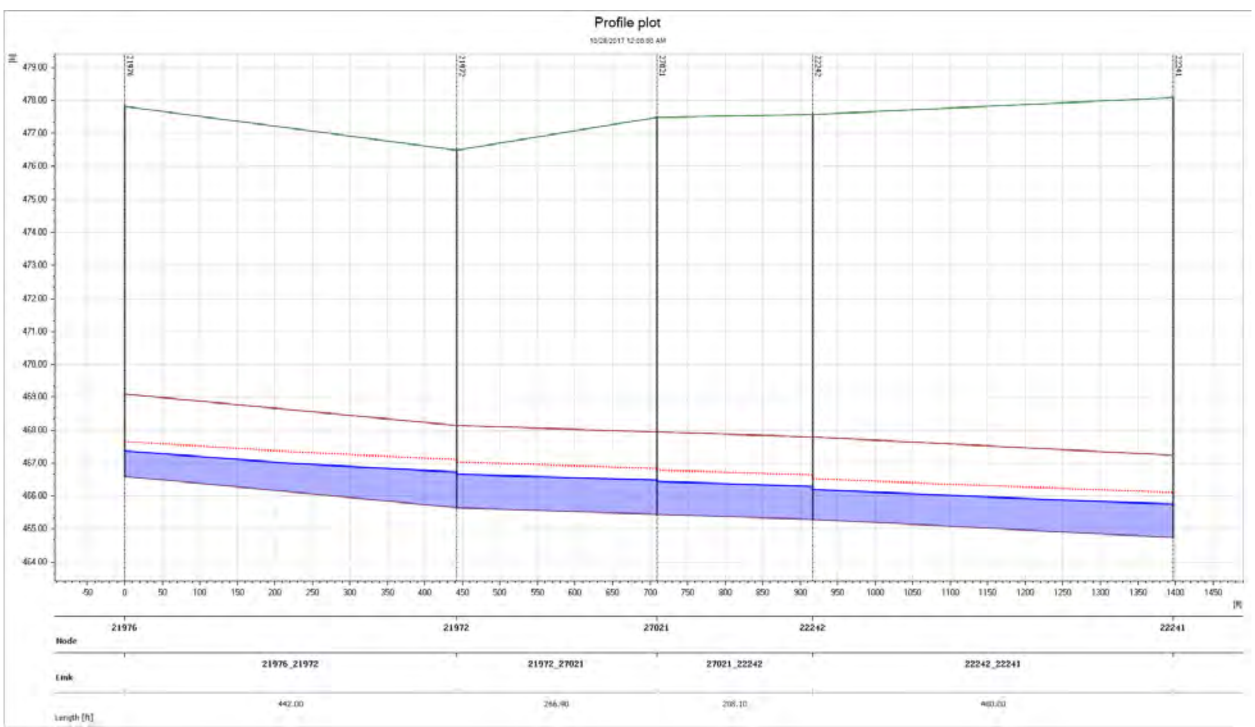


MH 27021

- Original Ground Elevation: 467.95 ft

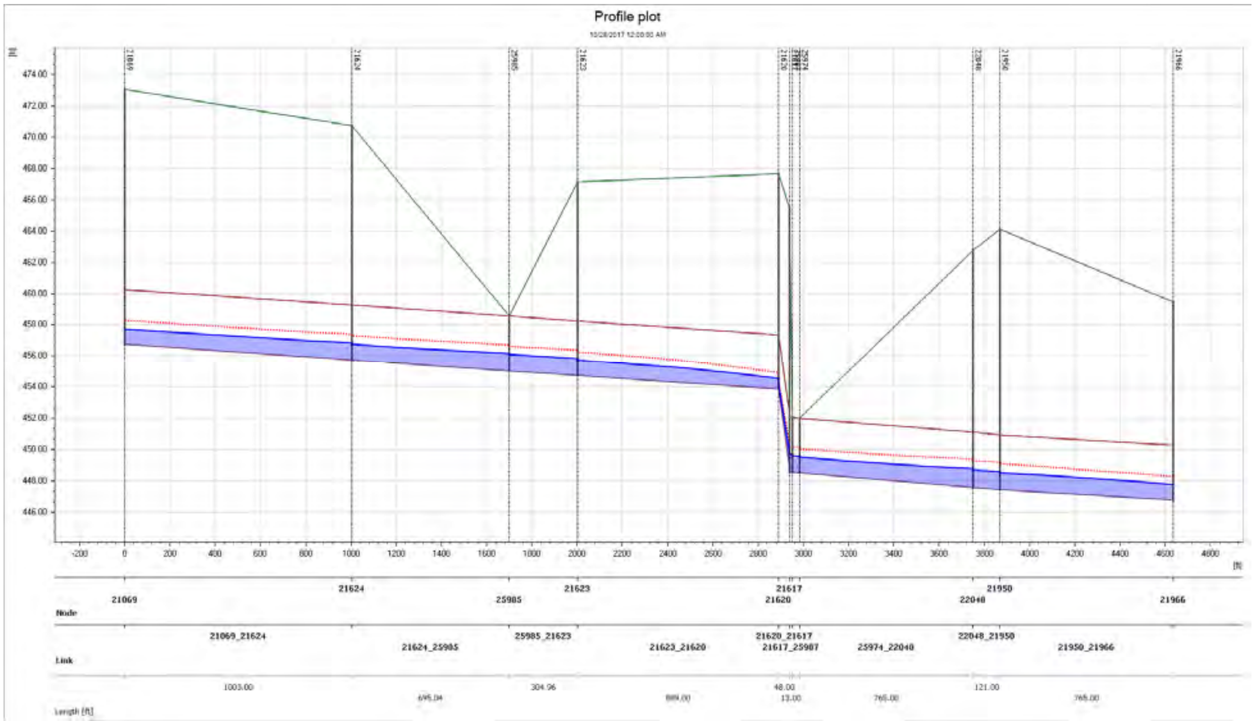


- Interpolated Ground Elevation: 477.5015 ft

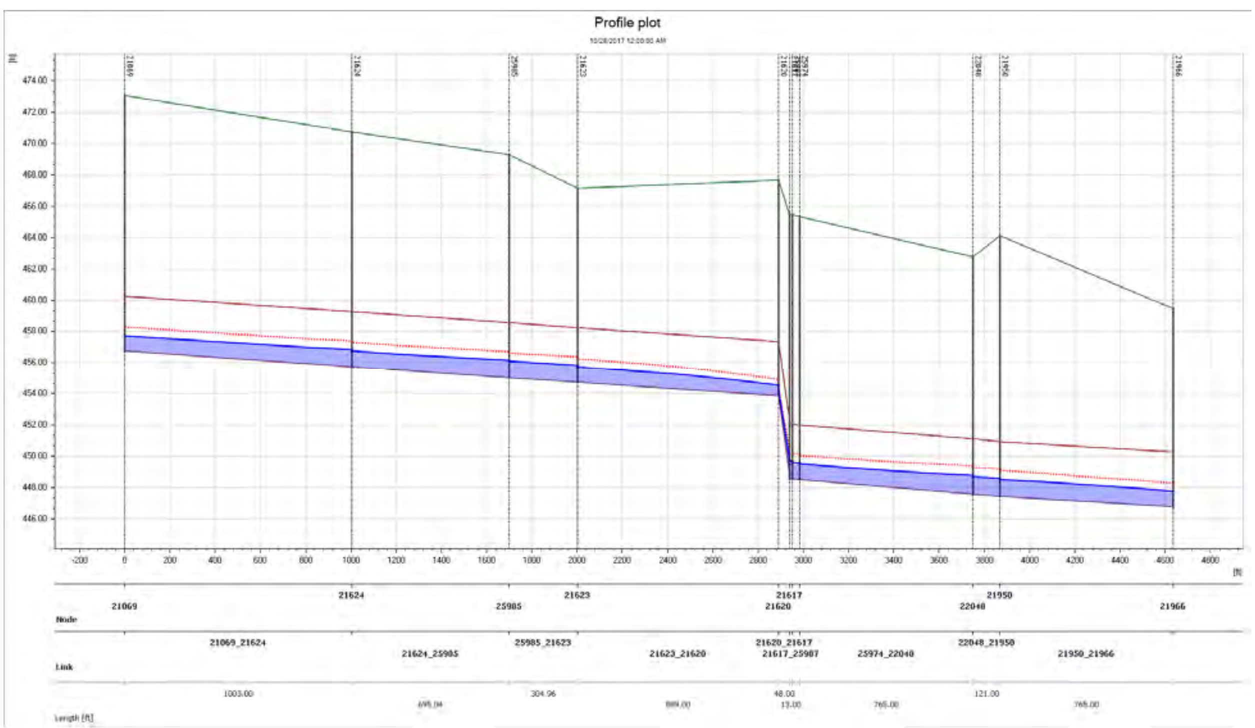


MH 25974

- ➢ Original Ground Elevation: 452 ft

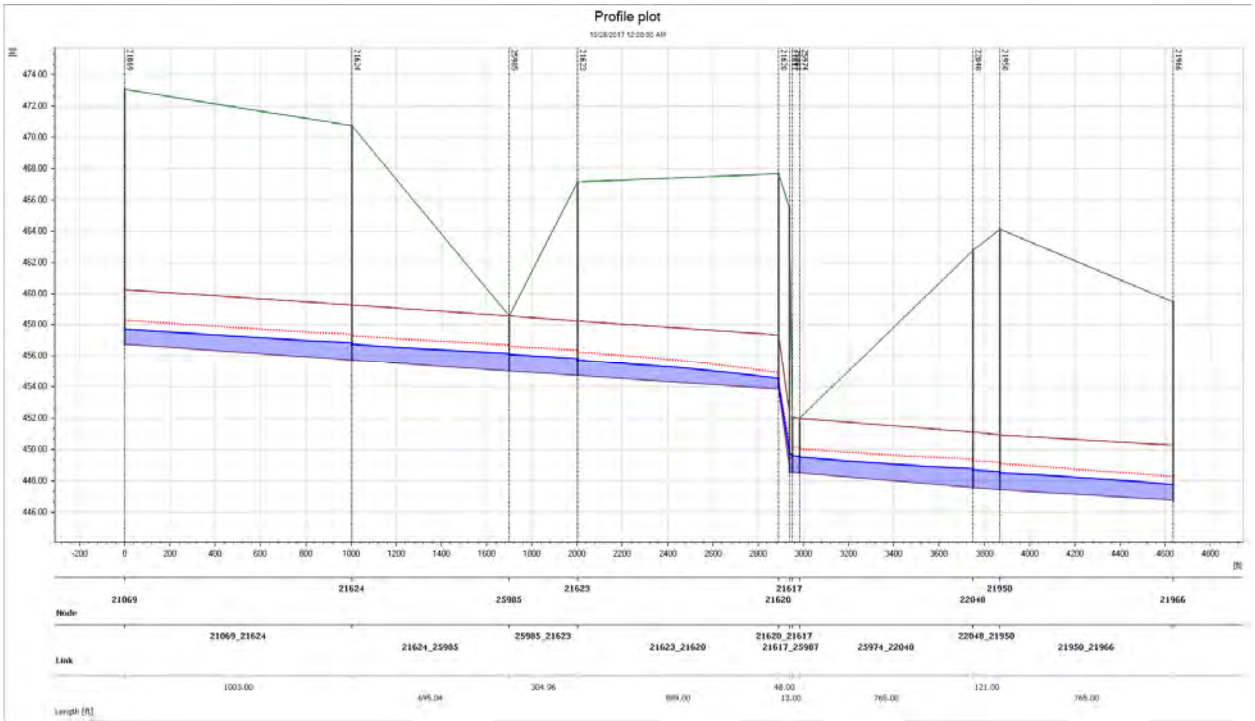


- ➢ Interpolated Ground Elevation: 465.34 ft

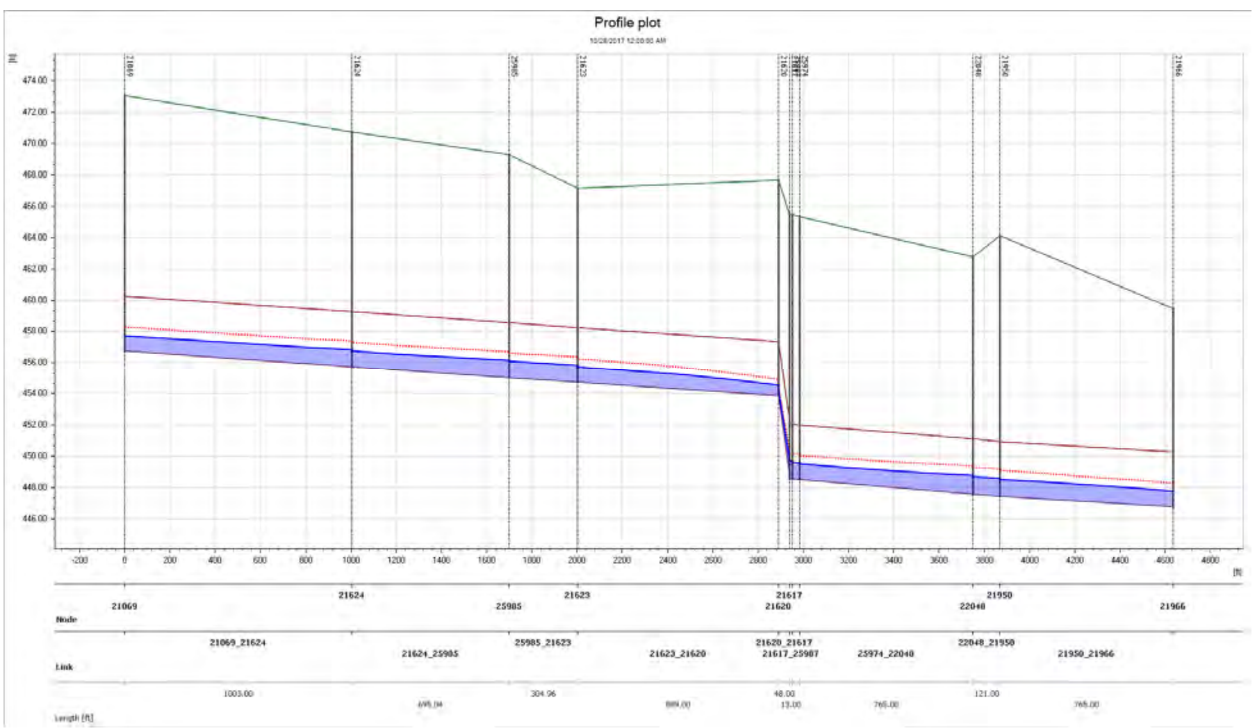


MH 25985

- Original Ground Elevation: 458.56 ft

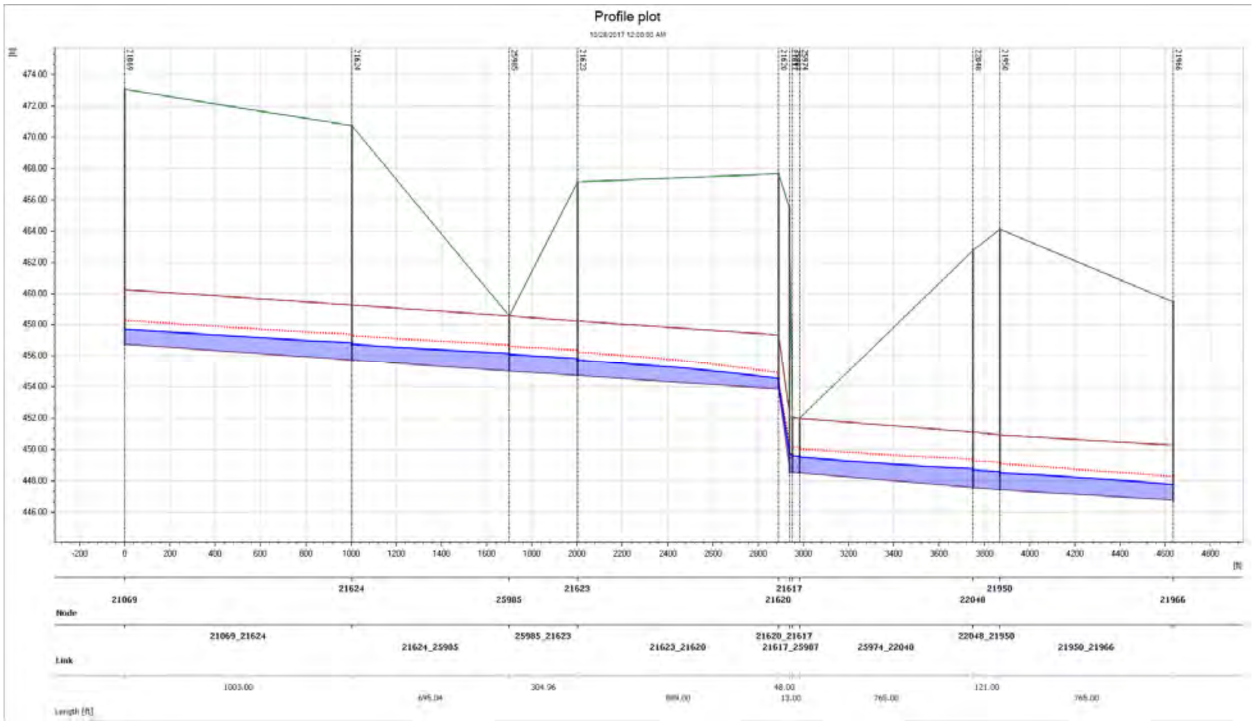


- Interpolated Ground Elevation: 469.31 ft

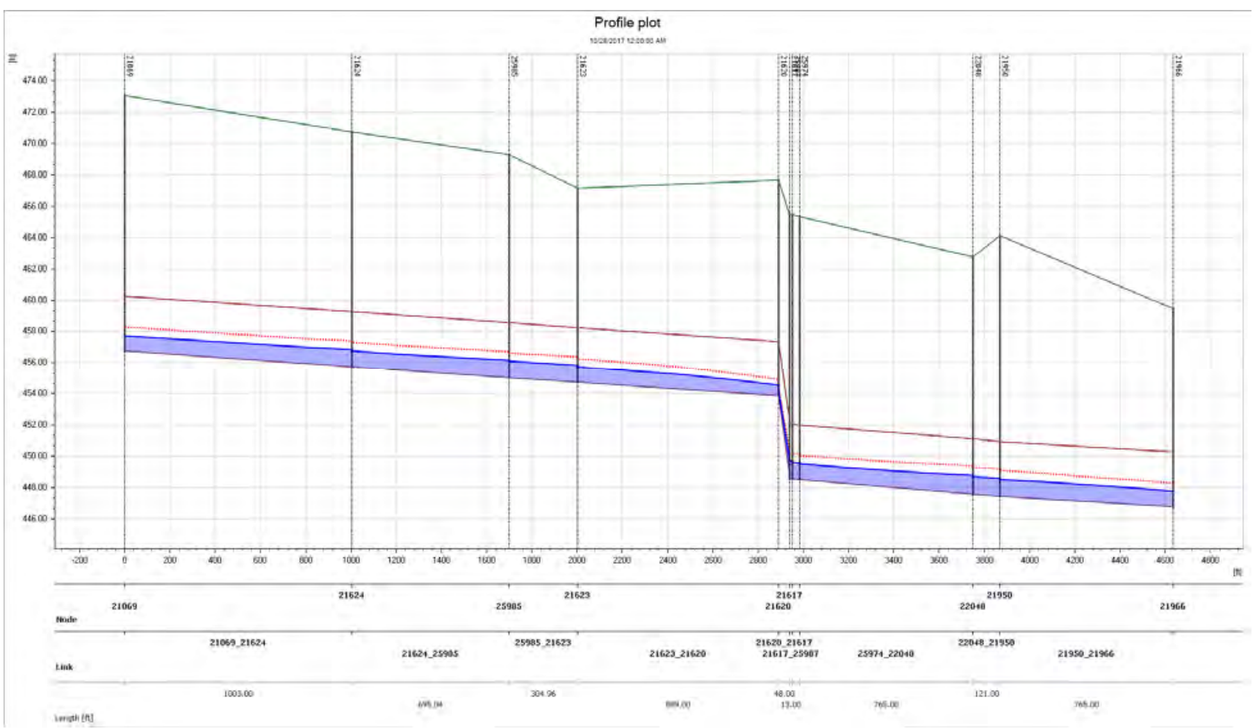


MH 25987

- Original Ground Elevation: 452.04 ft

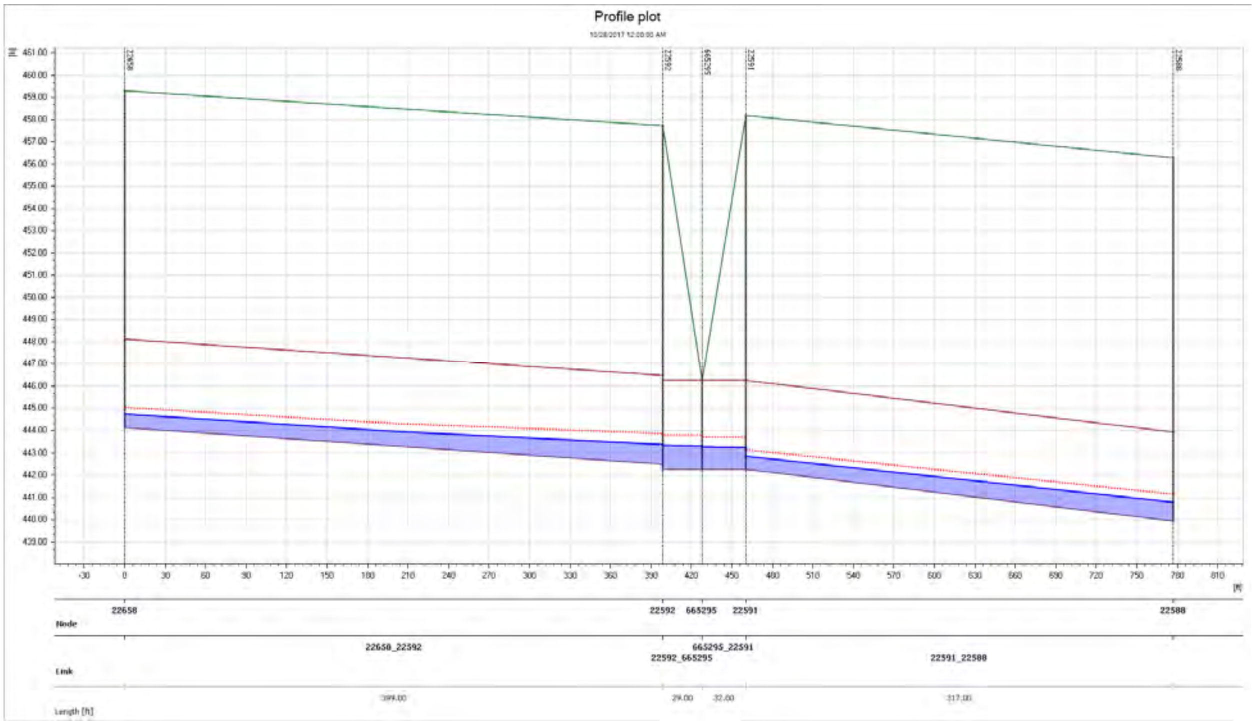


- Interpolated Ground Elevation: 465.46 ft

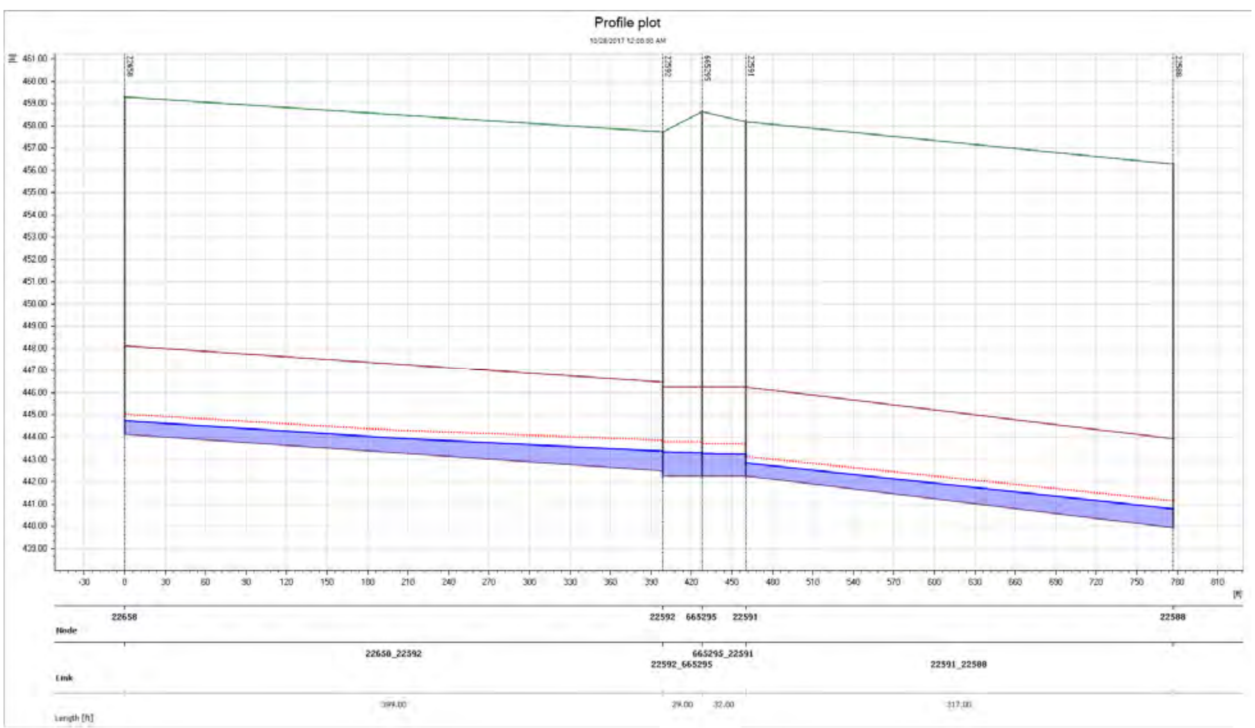


MH 665295

- Original Ground Elevation: 446.27 ft

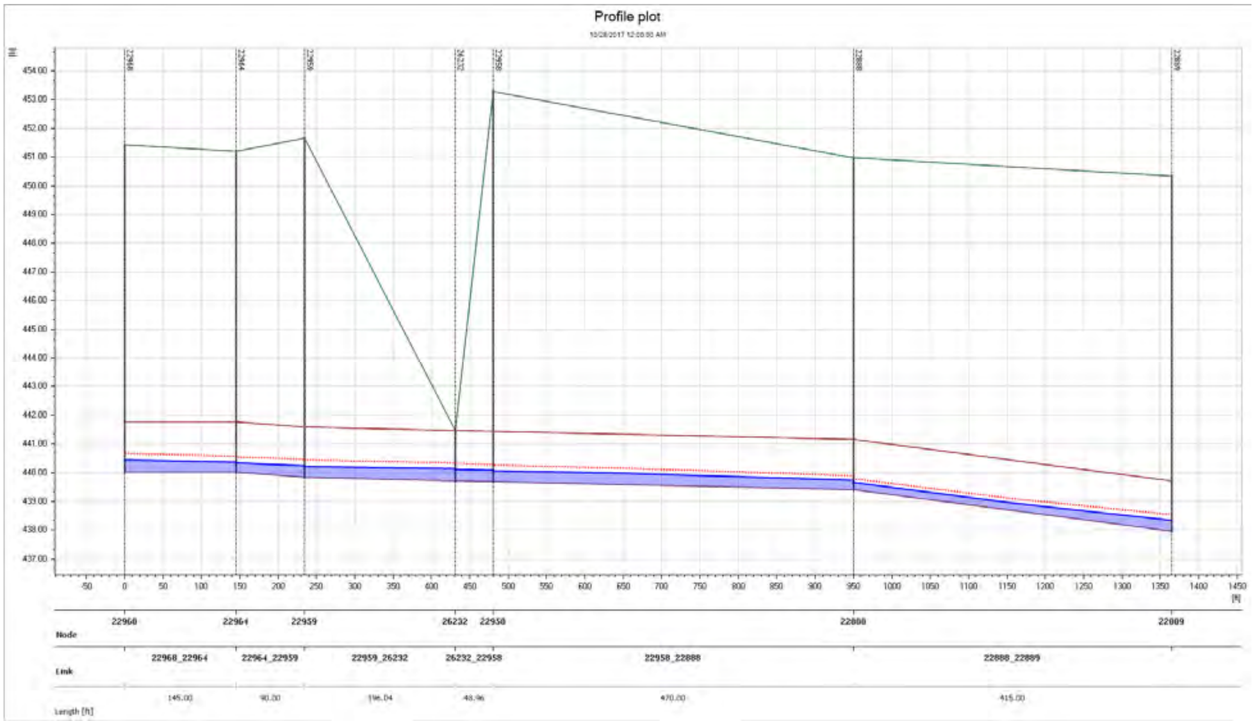


- Interpolated Ground Elevation: 458.6415 ft

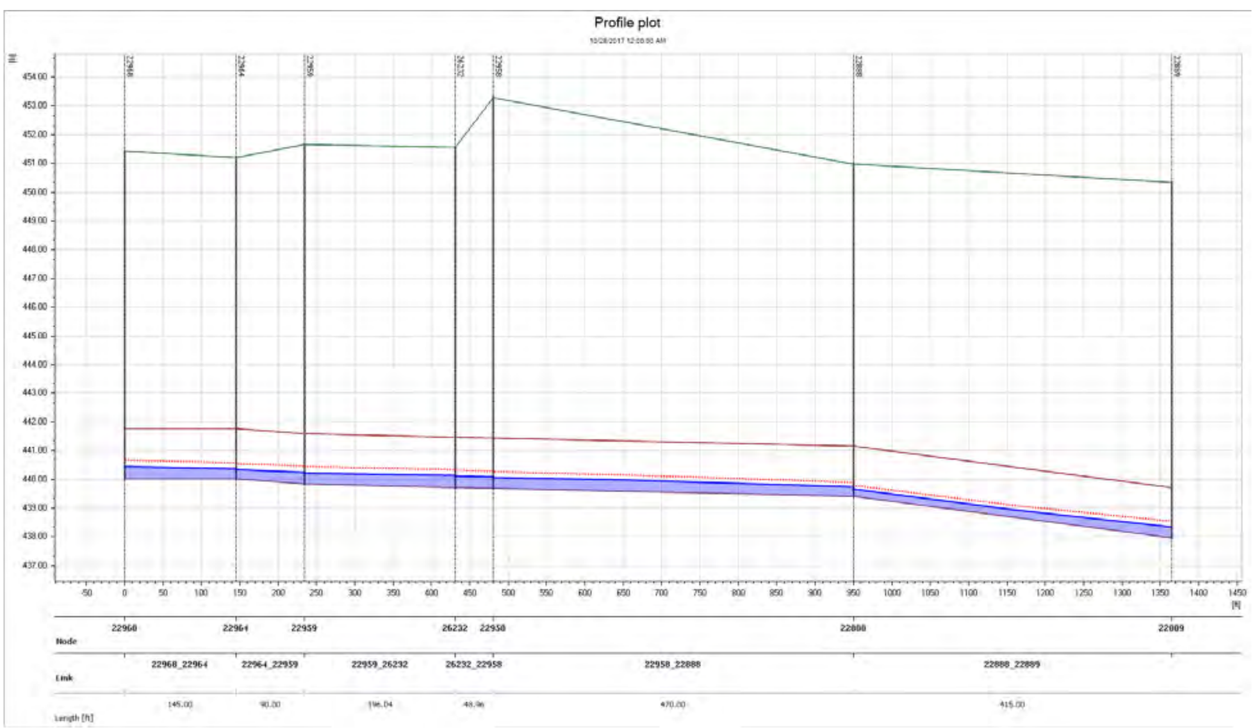


MH 26232

- Original Ground Elevation: 441.47 ft

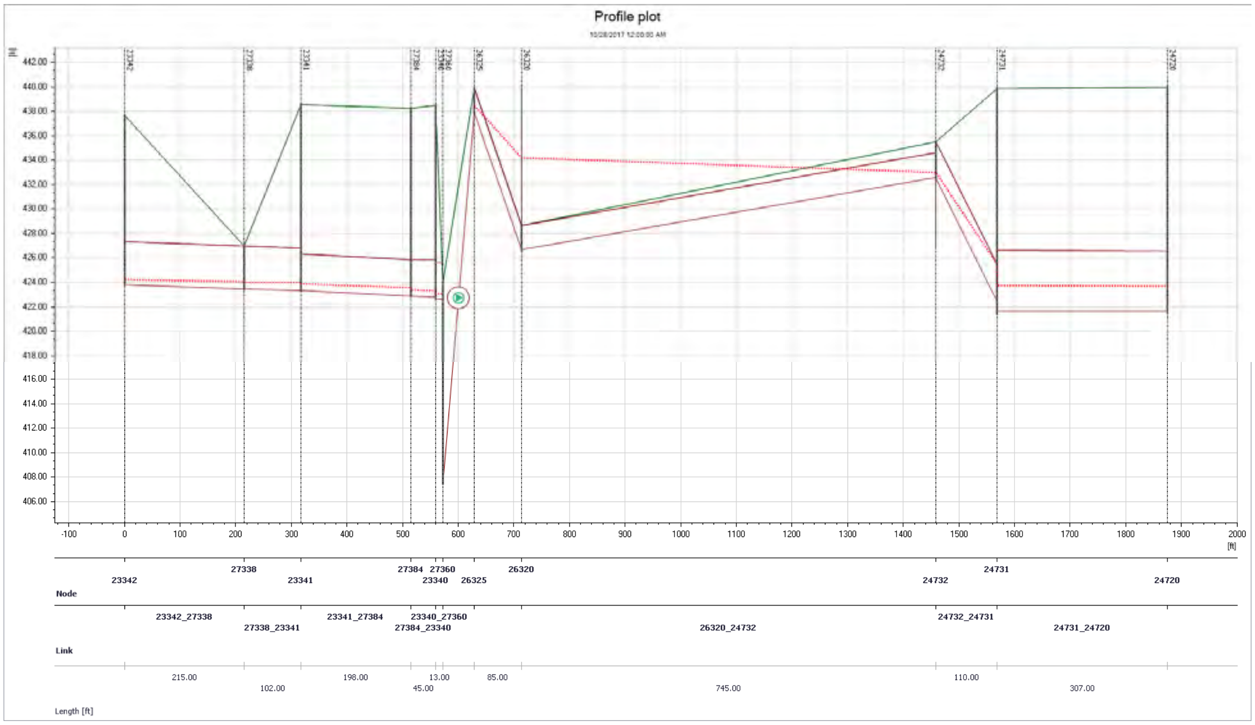


- Interpolated Ground Elevation: 451.5554 ft

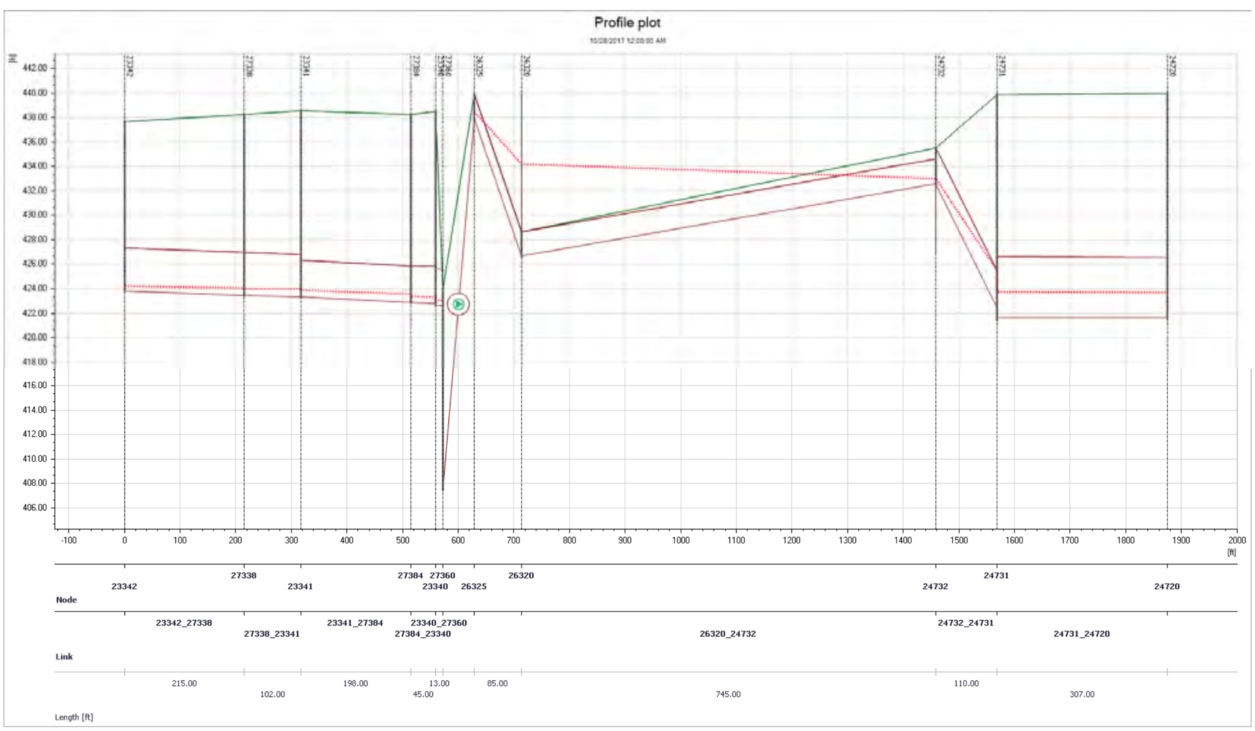


MH 27338

- Original Ground Elevation: 426.98 ft

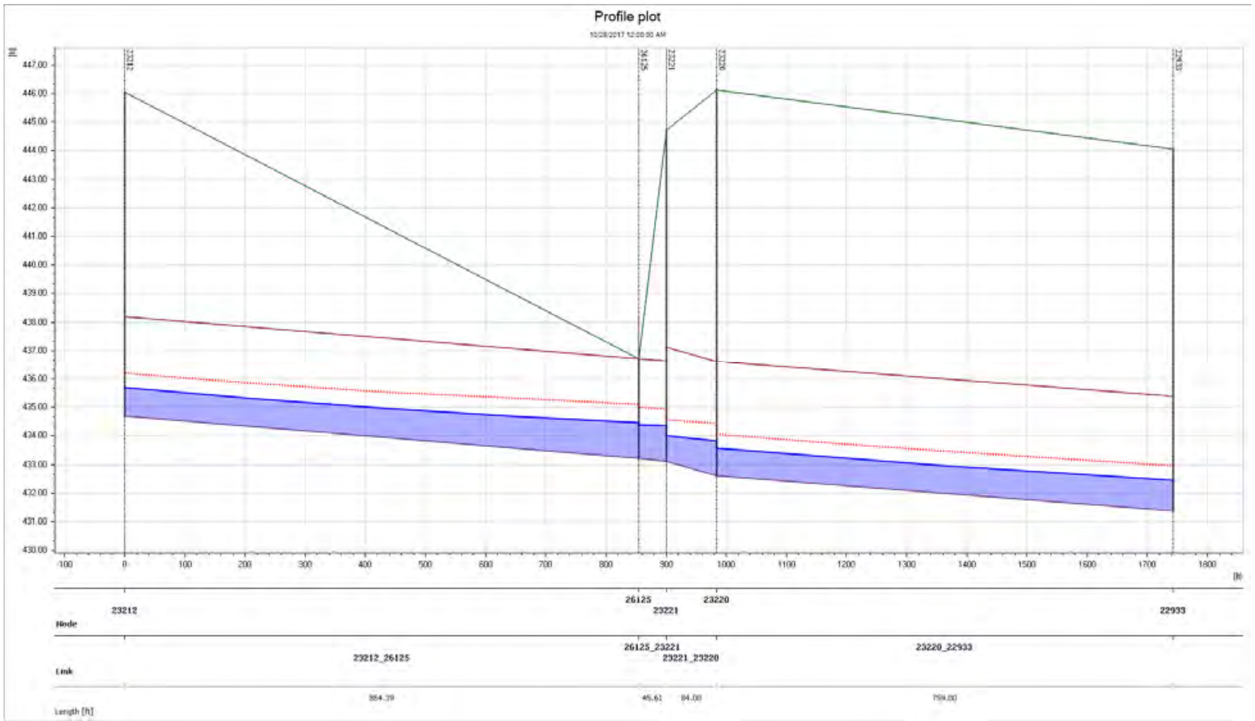


- Interpolated Ground Elevation: 438.2858 ft

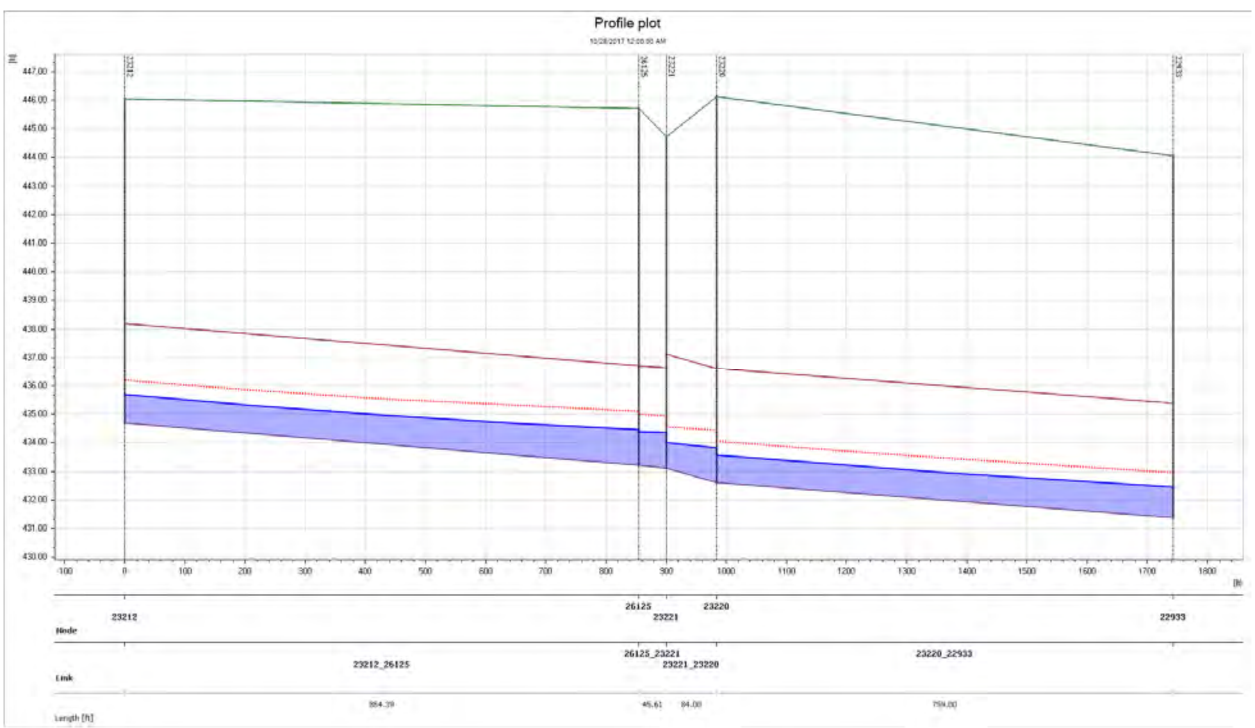


MH 26125

- Original Ground Elevation: 436.71 ft

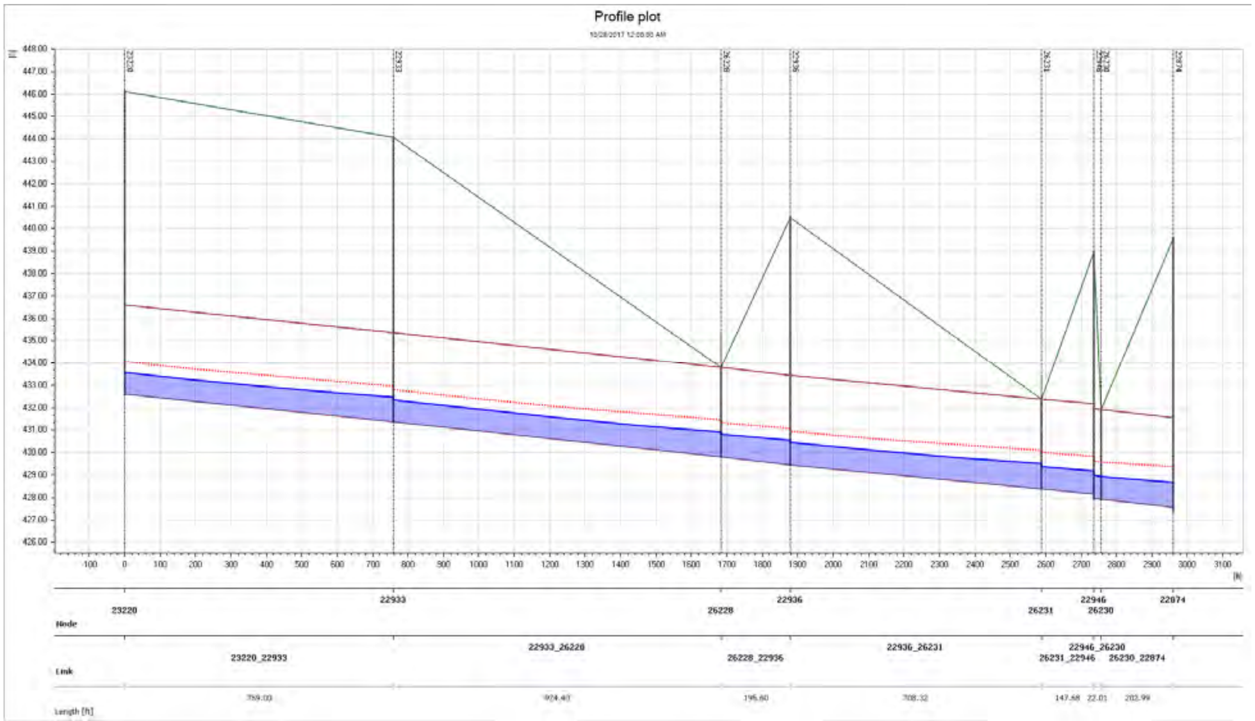


- Interpolated Ground Elevation: 445.7107 ft

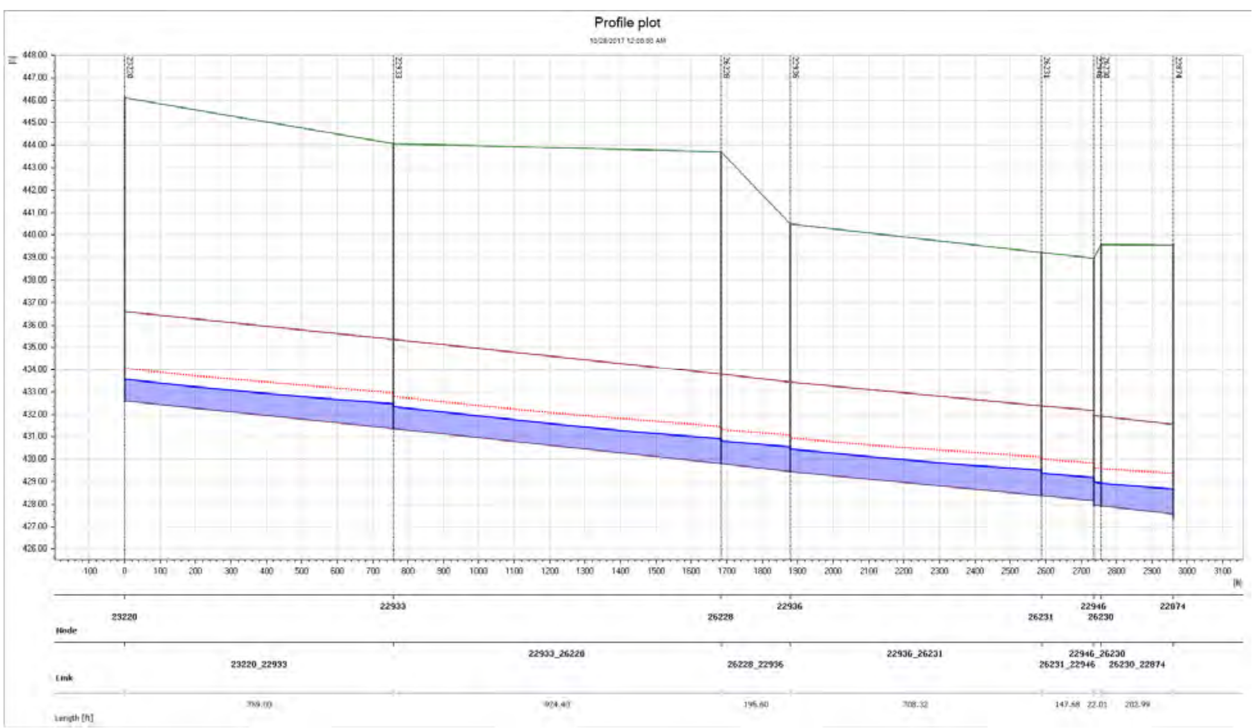


MH 26228

- Original Ground Elevation: 429.8 ft

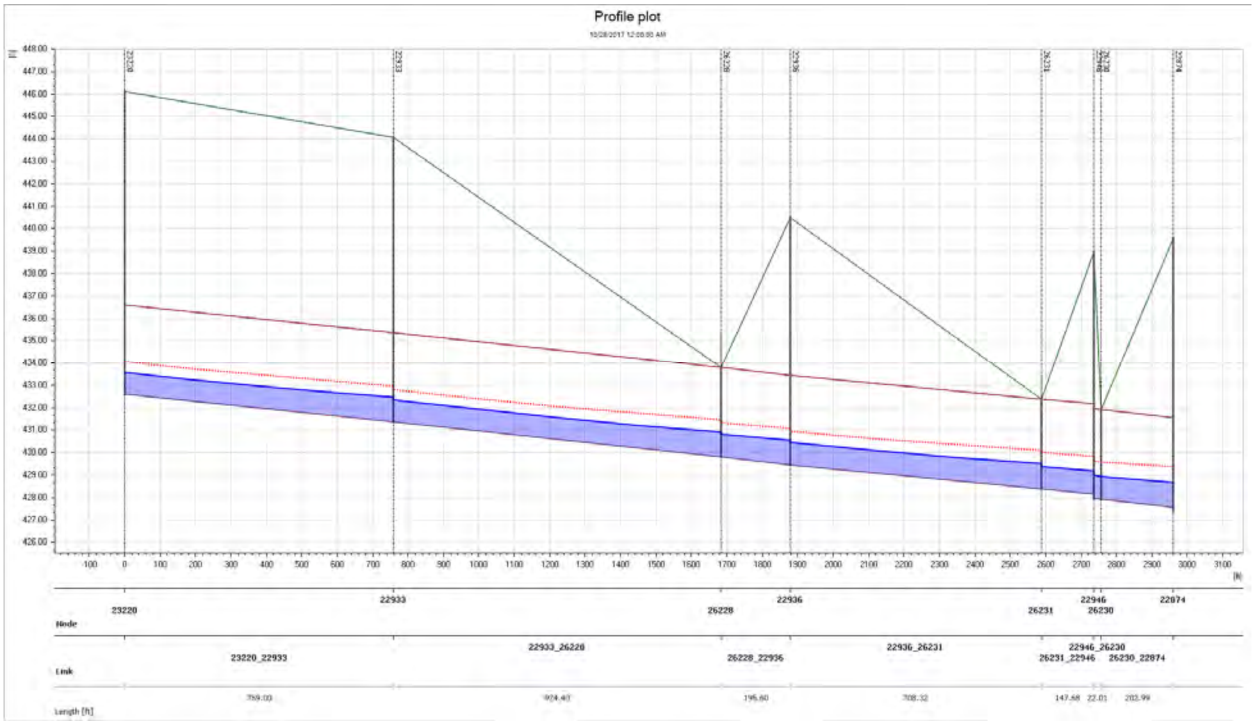


- Interpolated Ground Elevation: 443.7128 ft

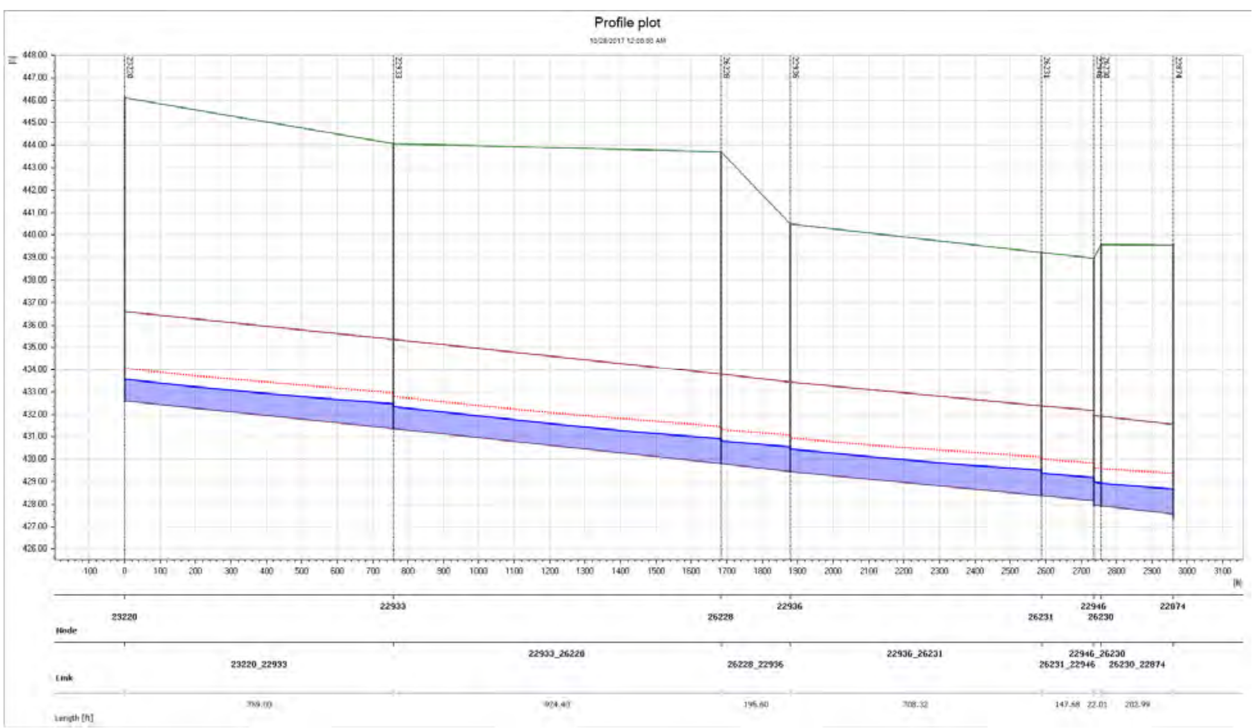


MH 26231

- Original Ground Elevation: 432.39 ft

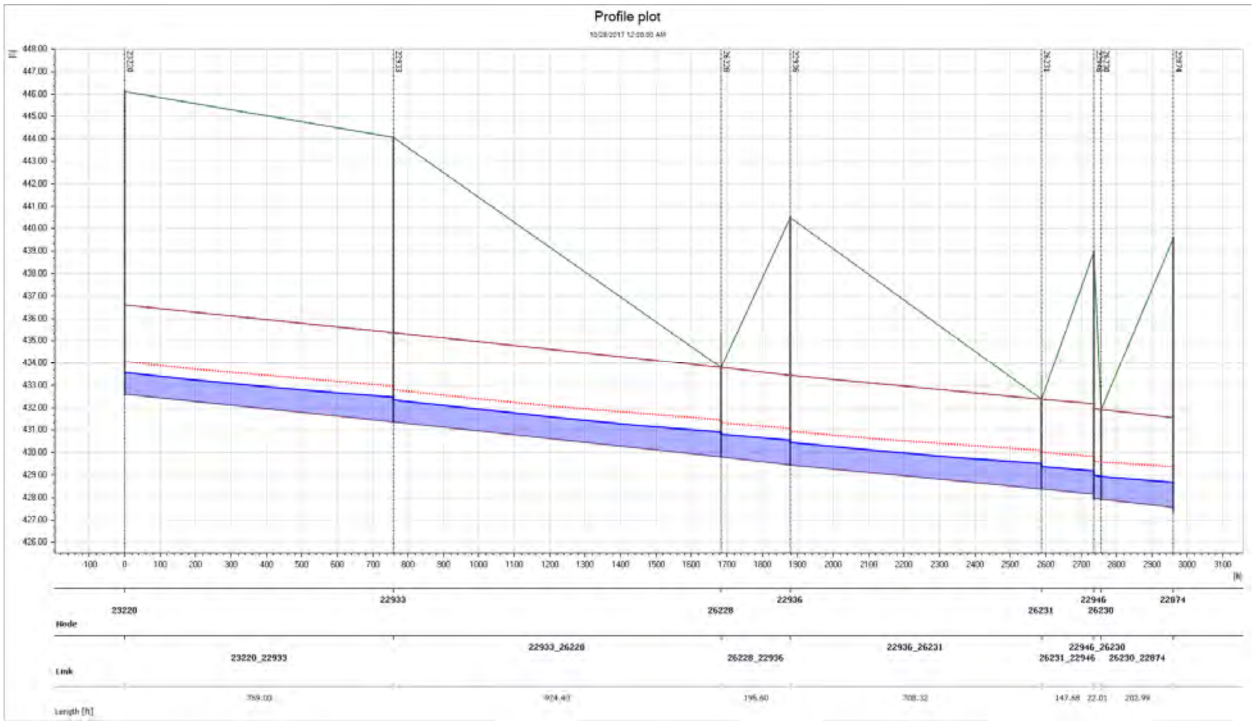


- Interpolated Ground Elevation: 439.2257 ft

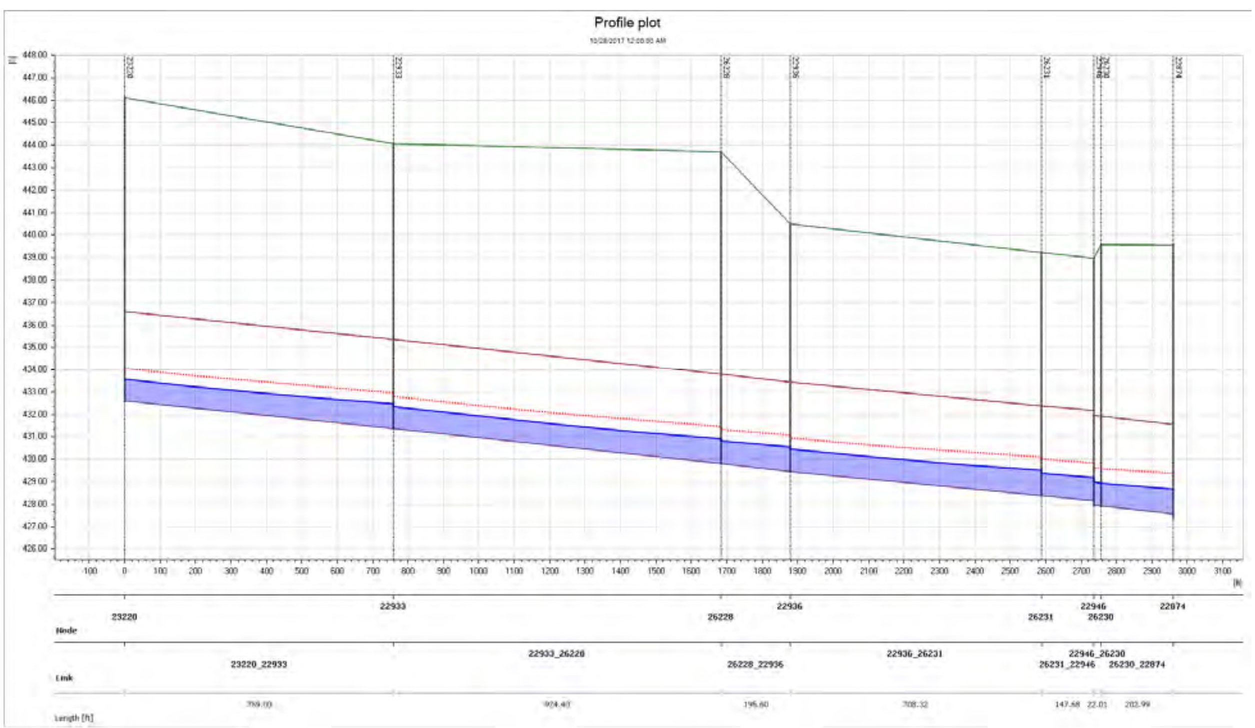


MH 26230

- ➢ Original Ground Elevation: 431.92 ft

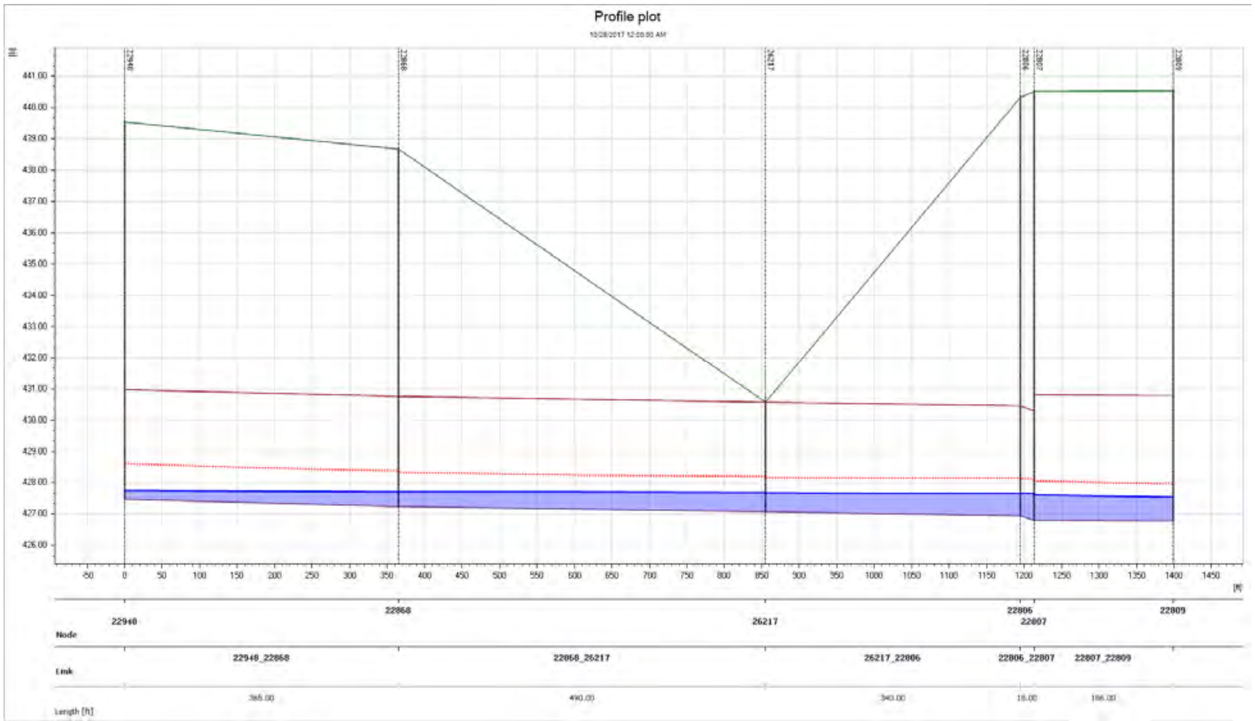


- ➢ Interpolated Ground Elevation: 439.5778 ft

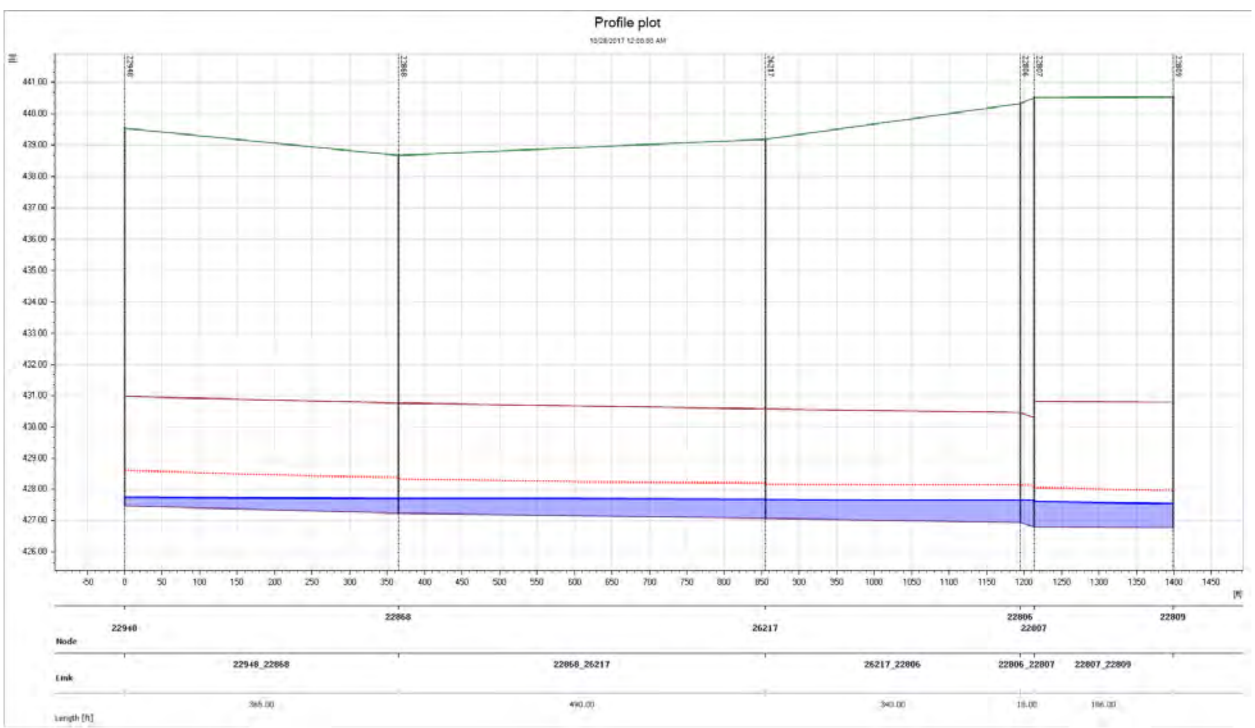


MH 26217

- Original Ground Elevation: 430.57 ft

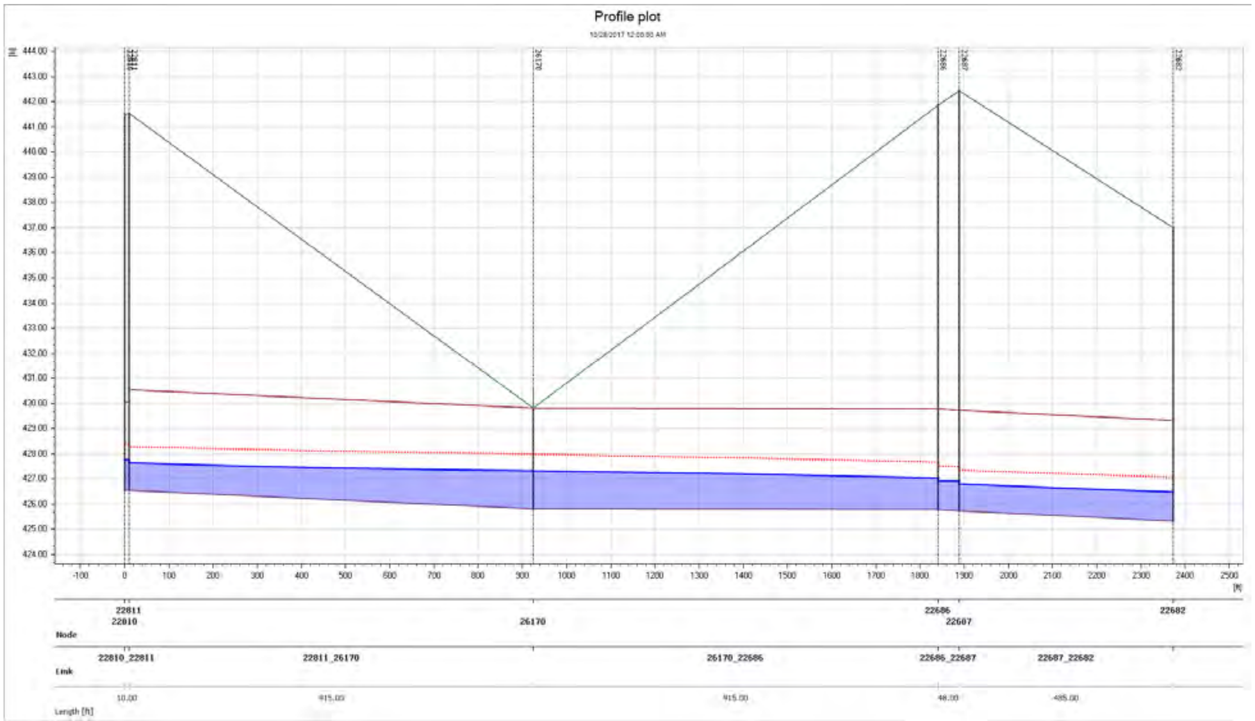


- Interpolated Ground Elevation: 439.1819 ft

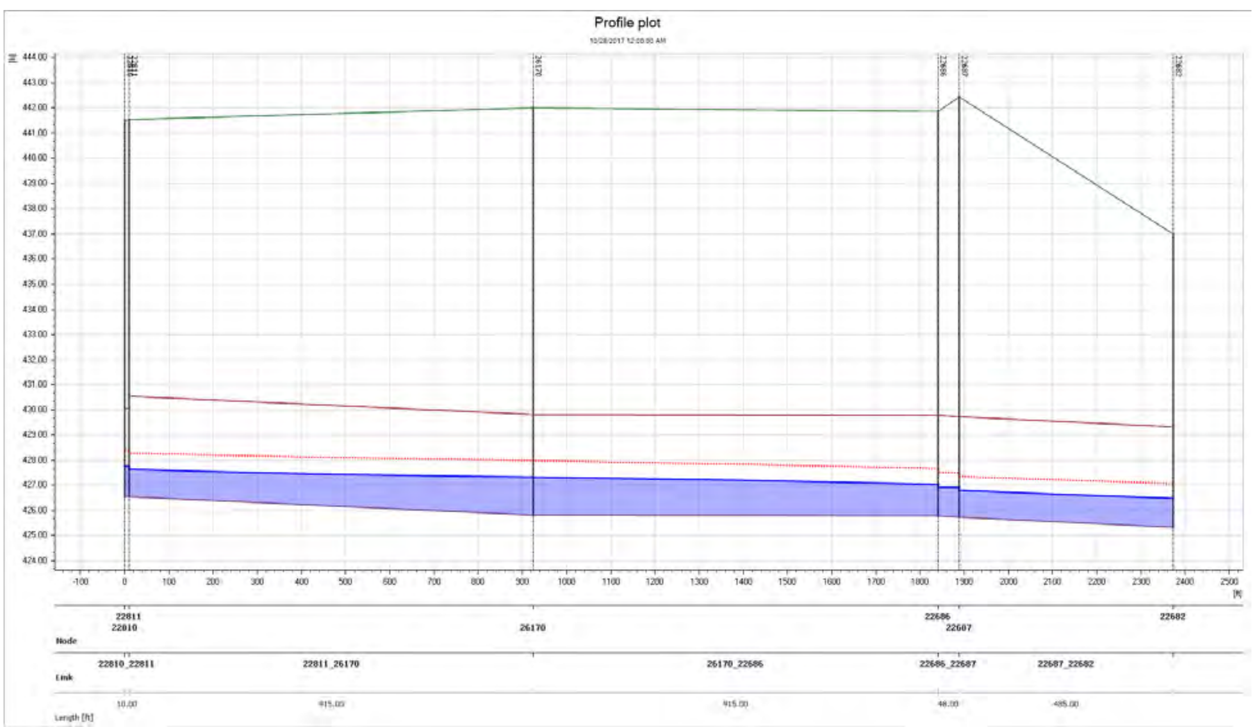


MH 26170

- Original Ground Elevation: 429.82 ft

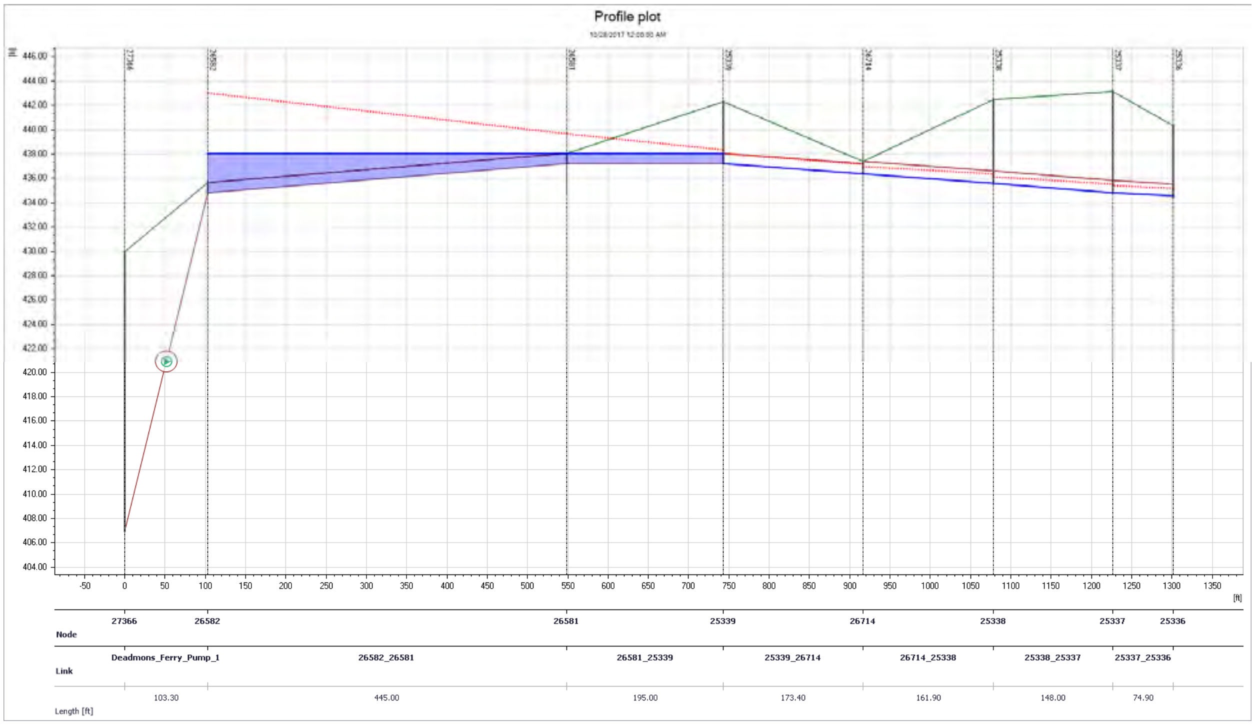


- Interpolated Ground Elevation: 441.9962 ft

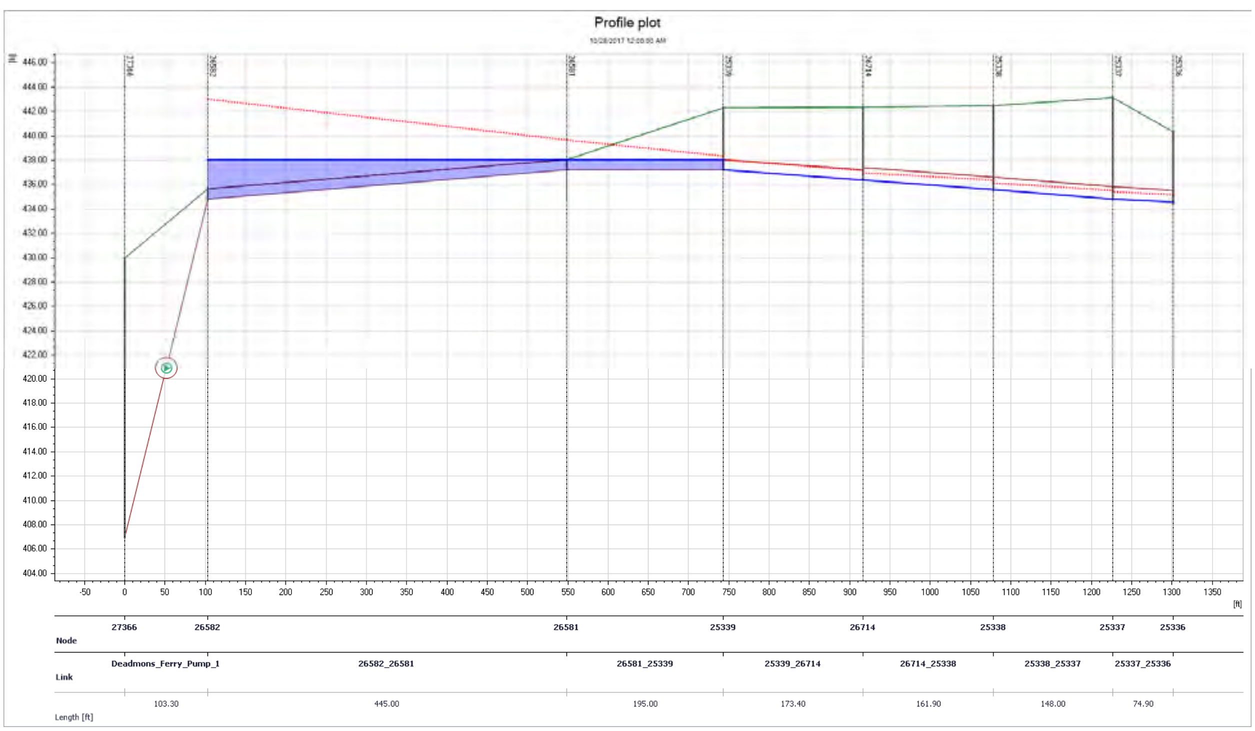


MH 26714

- Original Ground Elevation: 437.39 ft

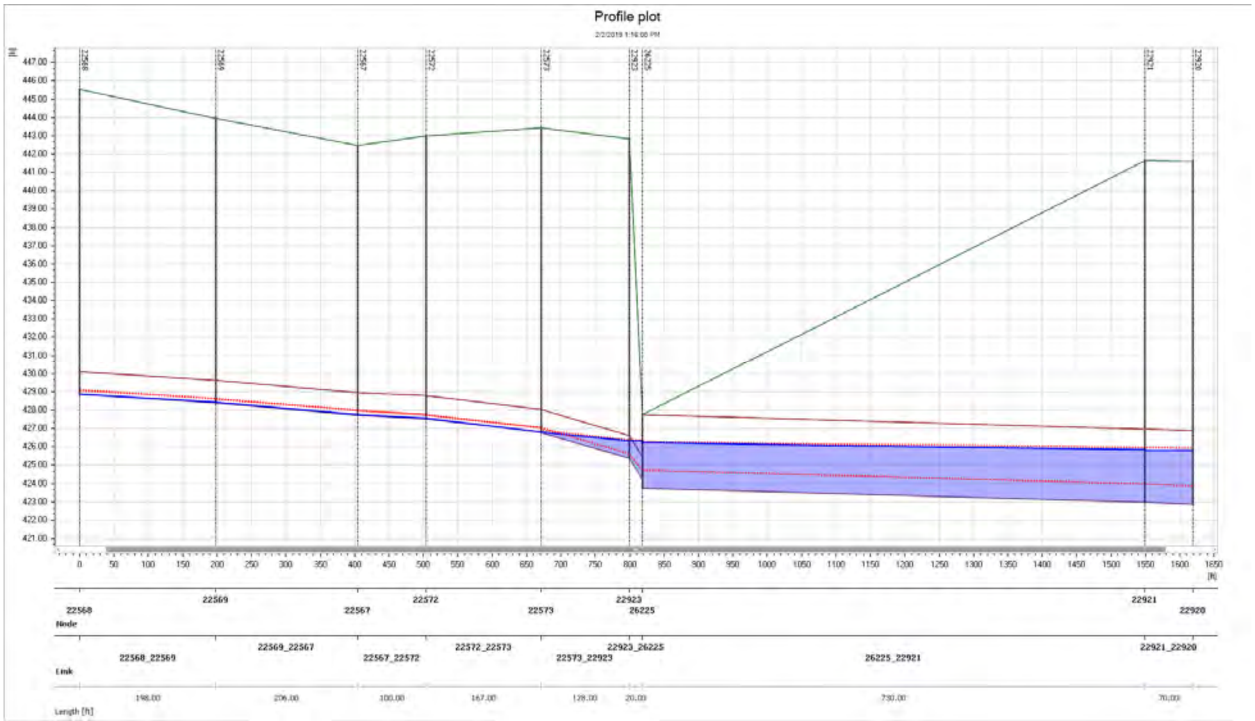


- Interpolated Ground Elevation: 442.3882 ft

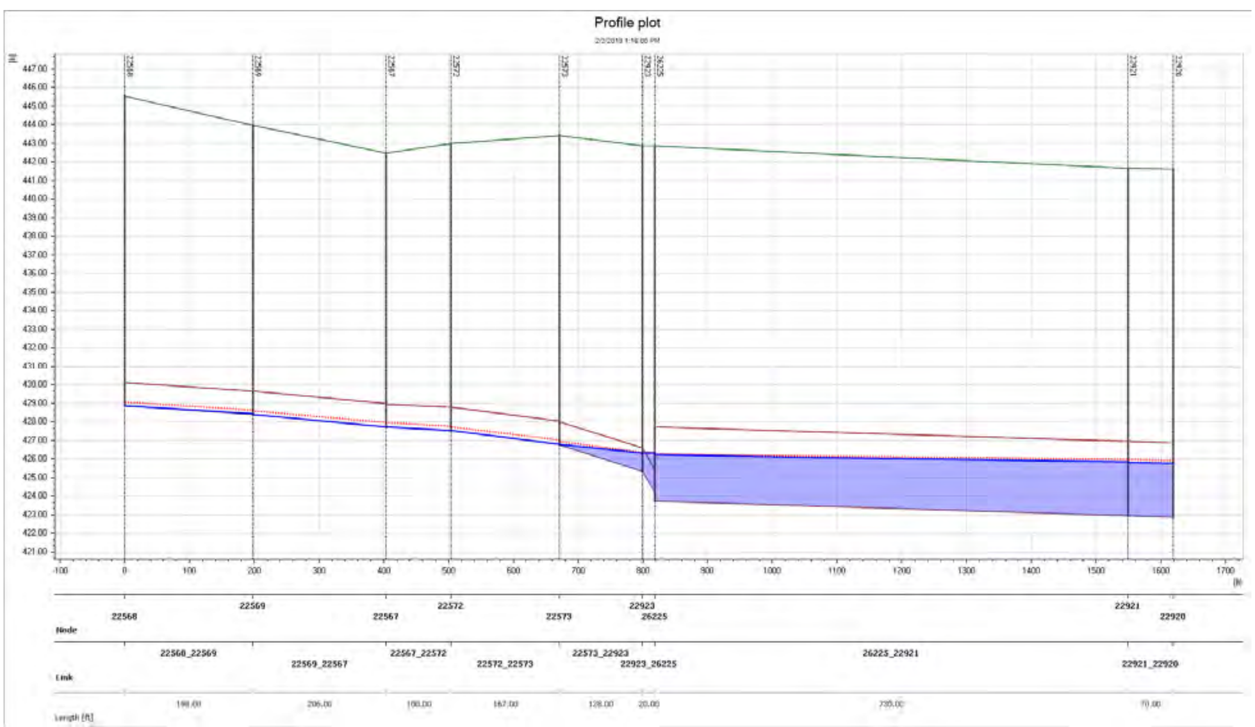


MH 26225

- Original Ground Elevation: 427.75 ft



- Interpolated Ground Elevation: 442.848 ft



Added a Weir at Manhole 564663 as per City Instruction and Field Observation

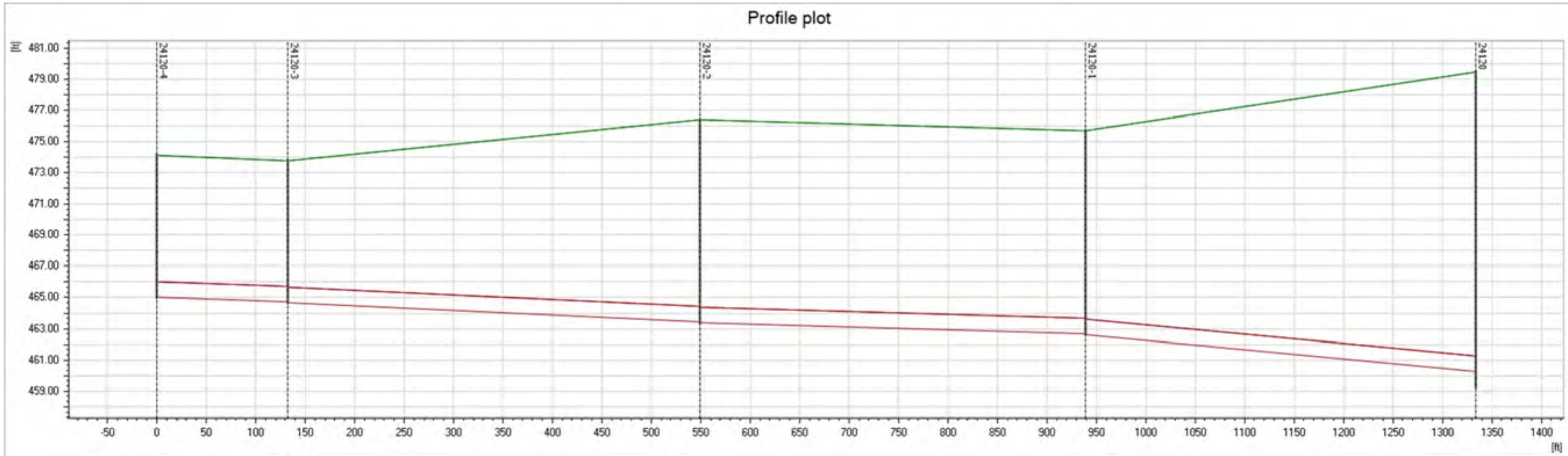
Original Network:

- Pipe 25144_564663 downstream invert at manhole 564663 = 496.09 ft
- Pipe 564663_23784 upstream invert at manhole 564663 = 496.09 ft
- Pipe 564663_564671 upstream invert at manhole 564663 = 495.98 ft

Corrected Network:

- Pipe 25144_564663 downstream invert at manhole 564663 = 496.09 ft
- Pipe 564663_23784 upstream invert at manhole 564663 = 496.09 ft
- Weir elevation at manhole 564663 = 497.21 ft
- Pipe 564663_564671 upstream invert at manhole 564663 = 495.98 ft

Added a New Pipeline: S 28th Street as per City Instruction (As-Built Project No P21166)



Node	24120-4	24120-3	24120-2	24120-1	24120
Diameter	4.00	4.00	4.00	4.00	4.00
Ground level	474.14	473.74	476.42	475.72	479.44
Bottom level	465.02	464.66	463.36	462.60	459.30

Link	24120-4_24120-3	24120-3_24120-2	24120-2_24120-1	24120-1_24120
Diameter	1.00	1.00	1.00	1.00
Length	132.50	416.60	390.20	394.40
Upstream level	465.02	464.66	463.36	462.60
Downstream level	464.74	463.44	462.67	460.30

consor

APPENDIX D
HISTORICAL NETWORK CAPACITY DEFINITION

In the 2008 WWMP, Springfield wastewater collection system capacity standards define each collection system improvement must meet the criterion of keeping maximum water surface elevations in manholes lower than critical elevations. There critical elevations included 3-feet above the pipe crown elevation in the manhole in areas where there are basements. In areas without basements, the water surface elevation must be 2-feet below the ground surface.

APPENDIX E
CITY OF SPRINGFIELD
CMOM DOCUMENTATION

Wastewater Collection System

CMOM Program

Commented [AS1]: Let's find a different picture for the management cube

Commented [HC2]: July 1st WW/SW meeting Take picture of the attendees as this is management. Talked with Matt Meeting was cancelled need to find new time for picture

Prepared by City of Springfield

Operations Division

July 2015

Table of Contents

Commented [n3]: I think the document could benefit from some reorganization as well as other content suggestions to strengthen it and clarify the Plan, Do, check, Act, elements.. I have some ideas but want to discuss as group. Any chance we could all meet?

Commented [n4]: I suggest the following:
1.1Background (Describe the MWMC IGA, the regulatory drivers for CMOM, mention previous work leading up to this plan like WWFMP, the 2004 MWMC Facilities Plan, and the 2008 Springfield Wastewater Master Plan, the CMOM Framework document, the CMOM gap analysis.)
1.2 Wastewater Collection System Description
1.3 CMOM Program Goals

Commented [n5]: Is this where we intend to describe all of the on-going process improvement assessments? If so, this section probably needs more content. If not, I'm unclear on what other self-evaluation makes sense to describe here.

Acronyms

BOLI --------- Bureau of Labor and Industries

CCTV -------- Closed Circuit Television

CIP ----------- Capital Improvement Plan

City ----------- City of Springfield

CMOM ------ Capacity Management Operation and Maintenance

CSR ---------- Customer Service Report

DEQ ---------- Department of Environmental Quality

ERT ----------- Emergency Response Team

FOG ---------- Fats Oils and Greases

FTE ----------- Full Time Employee

GIS ---------- GIS Division

H_2S ----------- Hydrogen Sulfide

IGA ----------- Intergovernmental Agreement

I/I ------------ Inflow and Infiltration

ISS ------------ Infrastructure System Specialist

LEL ----------- Lower Explosive Limit

MWMC ------ Metropolitan Wastewater Management Commission

NASSCO ---- National Association of Sewer Service Companies

NPDES ------ National Pollutant Discharge Elimination System

OERP --------- Overflow Emergency Response Plan

OSHA -------- Occupational Safety and Health Administration

SOPP --------- Standard Operating Policies and Procedures

SSO ---------- Sanitary Sewer Overflow

1.0 Introduction

The primary purpose of this Capacity, Management, Operations, and Maintenance plan is to outline the actions that the City of Springfield has taken and will take to prevent sanitary sewer overflows. These actions are measureable and reviewed quarterly to assure that they meet current industry standards. Furthermore, this plan sets forth the goals for the City's collection system and details the necessary activities to accomplish these goals. This document covers the City of Springfield's wastewater collection system CMOM plan. Review of measurable operational actions, current obstacles, and future changes to this plan is discussed in section 7.0, Self Evaluation.

1.1 Background

The Wet Weather Flow Management Program (WWFMP) was a regional program produced in 2001 aimed at reducing treatment plant wastewater inflow by reducing groundwater ~~inflitration~~infiltration in the local collection systems. During extreme wet weather events there were times that plant inflow exceeded its ability to optimally treat influent. The WWFMP was established using recommendations from a preliminary hydraulic model analysis of the collection system created as part of the 1997 Sewer Master Plan. The WWFMP outlined a series of capital construction and rehabilitation projects to occur over a 10 year period to help MWMC manage wet weather flows which were completed in January of 2010.

In August of 2009 the Department of Environmental Quality (DEQ) began issuing more stringent National Pollution Discharge Elimination System (NPDES) permits which no longer included a provision for exceptions to storm related sanitary sewer overflows (SSO) as required by the EPA. This increased the responsibility of wastewater system operators with respect to public health and water quality consideration when dealing with an SSO. Implementation of a well thought out, written CMOM plan, is the EPA recommended process of systematically eliminating SSOs.

The City of Springfield's first step in creating the CMOM program was to create the Gap Analysis. This document identified current activities and future activities that should be improved to effectively manage and operate local collection system capacity. The CMOM plan will detail all of these activities and how the City of Springfield plans to implement them. Concurrently, staff will implement continued process improvement through quarterly review of CMOM activities.

1.2 Wastewater Collection System Description

Commented [n6]: Recommend adding a sub-section "Background" where you briefly describe the context for this plan including the regional program (MWMC), WWFMP, regulatory considerations, and the gap analysis process.

Commented [HC7]: Expanded the introduction to show plan, do, review of collection system. Added a background on how we go here taken largely from the Council memo

Commented [HC8]: Brian is satisfied with this level of overarching background and will talk with Anette regarding .

Commented [n9]: Regarding regulatory background, this is a great start. I can help fill in some gaps (there is a federal piece that's missing).

Commented [HC10]: Brian to talk with Anette regarding this section.

Commented [n11]: I'm glad you mention the gap analysis here. My comment regarding the plan do review aspect extends beyond the gap analysis, however. In my opinion, this CMOM plan, to the extent possible, should describe for each element a plan to evaluate on an ongoing basis. That could include identification of activities, what's the objective(s), what's associated performance measures, what performance data will be collected, when there should be sufficient data to evaluate, how that evaluation will be reported and to whom.

The City of Springfield's wastewater collection system provides service to 18,496 domestic sewer accounts within a 10,000 acre area. This includes a total population served of 70,091 people consisting of 1,306 commercial, 53 Industrial, 66 public, and 17,071 residential customer accounts. The system consists of 235 miles of gravity sewers, 5.6 miles of force main pipes, 16 pump stations, and 5,000 maintenance holes. Based upon the best available data, 60% of the pipes are greater than 25 years old. Over 80% of the pipes are 8 inches in diameter or less and slightly more than half are constructed of non-reinforced concrete and approximately 37% are PVC. There is a separate conveyance system for stormwater.

Commented [AS12]: I agree, let's put in number of residential, commercial, industrial accounts

1.3 MWMC

Commented [HC13]: Brian to discuss with Anette and Matt regarding MWMC reference in Springfield plan

The Metropolitan Wastewater Management Commission (MWMC) was formed by Springfield, Eugene and Lane County through an intergovernmental agreement (IGA) in 1977 to provide wastewater collection and treatment services for the Eugene-Springfield metropolitan area. The seven member Commission is composed of members appointed by the City Councils of Eugene (3 members), Springfield (2 members) and the Lane County Board of Commissioners (2 members). Since its inception, the Commission has been responsible for the oversight of the Regional Wastewater Program, including construction, maintenance and operation of the regional sewerage facilities.

Together with Eugene and Springfield, the MWMC holds the NPDES permit for the waste water discharge to the Willamette River. The Water Pollution Control Facility (treatment facility) is owned, operated and maintained by MWMC, and designed to handle a peak wet weather flow of 277 MGD. Average daily dry weather flow at the treatment facility is 22 million gallons (MG). Since 2009, there have been 32 days where influent flows exceeded 100 MGD, the largest of which was 231 MGD.

Commented [n14]: As mentioned above, I would have a sub-section called Background where you explain the regional facilities, regulatory issues, partnership, and other contextual elements for this plan.

Commented [HC15]: Planned move to Background Section.

1.4 CMOM Program Goals

Commented [SM16]: I agree w/Josh's comment regarding moving to the Background section

Commented [n17]: Alternatively, these could be listed as overarching CMOM program goals under the Collection System Management section.

This program should act as an asset management tool in determining the City's wastewater collection capacity and rehabilitation needs so as to cost effectively protect public health and the environment in a manner that meets federal and state regulatory requirements and eliminates SSOs from local assets. In order to fulfill this purpose the following nine goals were created for our CMOM program.

Commented [n18]: I would start with a policy/purpose statement here. Potentially more than one operational policy to capture as professionals in the fields of operations and regulatory compliance, what we see as the guiding themes.

Commented [AS19]: Are these goals adopted by Council or are these just our internal management goals? If we need Council okay, then let's put them out there in the 7/20 presentation

Commented [n20]: My sense is that these should be internal operational goals driven by operational policies. As such, these would not be subject to council approval or adoption. They would need to be in line with and supportive of existing council goals and policies on the whole.

- Protect the public health of the citizens in our service area
- Protect water quality and the environment
- Eliminate SSOs due to wet weather, FOG, roots, and other blockages in the local collection system to the extent possible
- Provide sufficient capacity to convey average daily flows and peak flows without sanitary sewer overflows for all parts of the collection system.

- Implement steps to stop and mitigate the impacts of sanitary sewer overflows from any portion of the collection system as defined in SOPP D-3..16.
- Provide timely notification of sanitary sewer overflows from the collection system to DEQ, OERS, and the public when there is potential for exposure to pollutants from such overflows.
- Support the MWMC's partnership activities, participate in the regional Wastewater Policy Team, and assist with development and implementation of regional strategies.
- Ensure that a comprehensive financial strategy is in place, including appropriate local fee structures to adequately support the City of Springfield's wastewater collection system operations and Capital Improvement Projects
- Establish a collection system management planning framework for ongoing improvement and to inform system rehabilitation needs.

2.0 Collection System Management

2.1 Organizational Structure

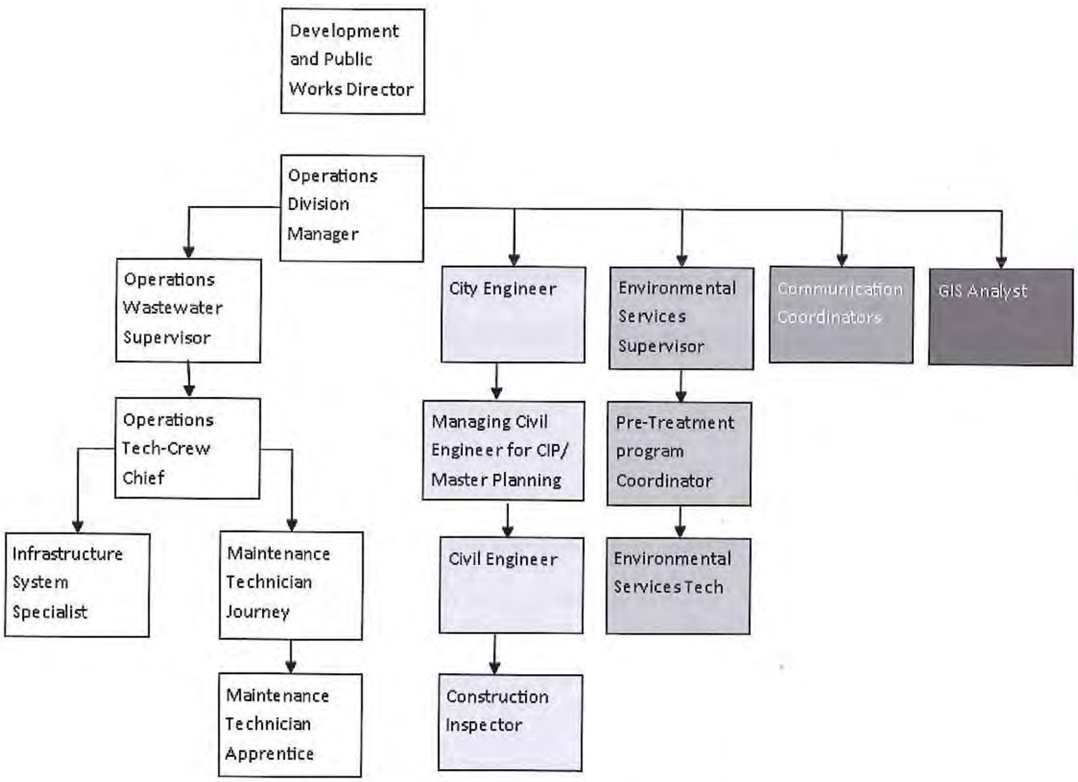
The figure on the following page shows the organizational structure of the Development and Public Works Department:

Commented [n21]: This is just a suggestion...I would have a policy or purpose statement ahead of these goals that says something to the effect that "...the purpose of CMOM is to cost effectively protect public health and the environment in a manner that meets federal and state regulatory requirements and protects local and regional assets from excessive flows." Then all the goals line up under that statement. And you would not need to repeat "Protect water quality and the environment" as a goal in that case because it would be part of the purpose statement.

Commented [n22]: What are the Collection System Management goals, objectives and activities? How do activities support objectives? How will you evaluate your plan?

Commented [n23]: I'm struggling with the standard org chart idea, but haven't yet come up with an alternative. In my view, a graphic that shows 1) positions that are involved in one or more CMOM elements (the list on page 4 seems to be a good fit for this), 2) the approximate FTE allotted to each element (need to tease this out), and 3) lines of communication/collaboration showing how the positions connect and communicate with one another. This "connection chart" would probably be a separate graphic.

Commented [AS24]: Need to put the newest organization chart in the document. Contact Rhonda Rice or Loralyn Spiro



CMOM Services Provided

Operate and Manage the Collection System Complete High velocity cleaning, root removal, CCTV, smoke testing, dye testing, locates, system inventory, flow monitoring	Leads the CMOM program including meetings, updating the program, and all miscellaneous activities that come with the program.	Provide design for collection system rehabilitation	Oversee and enforce the City's FOG program and industrial pretreatment programs	Organize events that teach the public about the wastewater collection system	Provides Operations with Maps of the Collection system, manages as-built drawings, update the geospatial database, organize

Commented [n25]: Chart is out of date (No Technical Services in DPW anymore). Because the wastewater assets data is managed by both Ops (Hansen) and IT (GIS/as-builts, etc.) there is interplay between these workgroups that should get captured in this discussion. See my comment above on this topic.

Commented [HC26]: Updated Chart June 22 needs update July 1st Further Discussion is included later in document see "Mapping" and "New Construction"

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Within the Development and Public Works Department there are four divisions. Operation and maintenance of the collection system is done by the Operations Division. The Operations Division includes street, traffic, landscaping, fleet, city facilities, and stormwater and wastewater collection systems maintenance crews.

Springfield currently has 9.39 budgeted full time employees (FTE) working within the Operations Division that ~~,~~managе~~ing~~ the collection system. The City contracts out all pump station maintenance to the City of Eugene through an intergovernmental agreement. The City of Eugene budgets 1.1 FTE for maintenance and operation of Springfield pump stations. The EPA suggests that a city with a population of 50,000 should have 16 FTE dedicated to operation and maintenance of the collection system. The Operations Division efficiently completes almost all necessary maintenance and operation activities within the wastewater collection system with fewer FTE's than recommended by the EPA. As funding for CMOM activities inevitably fluctuates, operations will continually reorganize and prioritize operation and maintenance activities that address the most critical aspects of the collection system.

Multiple Divisions within the Development and Public Works Department contribute to the business and operational oversight of the wastewater collection system:

- Community Development Division dedicates engineering staff towards improving the collection system through comprehensive system analysis, assessment of capacity and rehabilitation needs, and capital improvement design.
- Environmental Services Division maintains a Fat, Oils, and Grease (FOG) program and Industrial Pre-Treatment program. These programs protect the longevity of the collection system by reducing the likelihood of grease related backups and the amount of harmful chemical released by local industries.
- The IT Department - GIS Division is responsible to maintain current maps of the collection system in the City's Geospatial database as well as update the collection system asset management system, Infor.

The following positions within ~~the~~ Development and Public Works support the Wastewater Collections Maintenance program:

- Operations Division Manager
- Operations Supervisor (Wastewater Collections Program)
- Operations Tech-Crew Chief
- Operations Tech-Journey
- Operations Tech-Apprentice

- Infrastructure Systems Specialist
- Data Management Specialist
- City Engineer
- Managing Civil Engineer for CIP/Master Planning
- Construction Inspector
- Civil Engineer
- Environmental Services Supervisor
- Pre-Treatment program Coordinator/Technical Analyst
- Environmental Services Tech (Pre-Treatment and FOG program)
- Communication Coordinators

Details regarding the job duties concerned with these positions can be found in Appendix H.

2.2 Training

The City of Springfield's Operations Division is a member of the State of Oregon Joint Apprenticeship and Training Committee with the Bureau of Labor and Industries (BOLI). The City has the only state recognized municipal apprenticeship program that provides three years of extensive on the job training, coursework, and progressively responsible experience to advance staff through the apprenticeship to full journey level status. All Apprentices are required to obtain their DEQ, Wastewater certification level I in order to complete the apprenticeship. Regular training is provided throughout the course of the year to all Operations Division staff through internal trainings and APWA short schools.

Training on procedures specific to the maintenance of the local collection system is required of all employees and includes:

- Lockout/Tagout program, MSDS, Confined Spaces Permit, Trenching and Excavation, Biological Hazards in Wastewater, Traffic Control, Record Keeping, Pipe Repair, SSO Response, CCTV, Routine Sewer Line Maintenance, and Work Site Safety.

2.3 Communication

2.3.1 Internal Communication

The Operations Division has weekly Division meetings. City business is shared that may include any topic; however City business, customer service, and safety are always discussed. In addition, a crew meeting occurs each morning where daily work assignments are discussed. The Division also has an open door policy in which any employee may speak with the manager or supervisor at any time.

Commented [n27]: IT Department? If so, this needs to be identified and discussed above.

Commented [n28]: The interplay between ESD and Ops with regard to the collection system needs to be described in this section.

Commented [SM29]: I would consider removing the referenced positions.

Commented [n30]: Should there be a main heading called "Communication" For Example:

2.1.3 – Communication
2.1.3.1 – Internal Communication
2.1.3.2 – Customer Service and Community Outreach

Commented [n31]: I think the CMOM Communication section would be strengthened if it included a discussion about development of communication goals and objectives and describe a planning framework for communication. The communication plan itself can be a separate document, perhaps a future appendix. Maybe this preliminary CMOM implementation plan could discuss an intent to explore development of a CMOM communication plan as part of the implementation. The communication plan (yet to be developed) may come up with a different list of tactics than the ones we currently employ based on strategic considerations. For example, we may add CMOM content on the City website. We may also consider that the yet to be developed communication plan is where communication performance metrics could be established and effectiveness revisited periodically

Commented [n32]:
Operations division weekly meetings and the DPW wastewater policy team meetings are great examples of internal communications that we do now. If we stepped back and asked "what are the internal communication needs we need to implement a successful CMOM program?" would these be the only two forms of internal communication we would come up with?

Are there other teams we can think of that we might form to support specific CMOM activities such as:

- Annual wet weather management reporting
- Data analysis and results reporting
- Flow monitoring/data acquisition
- Capacity analysis and assessment
- Asset management
- Keeping as-builts up to date

If so how often would they meet? What other forms of communication may allow them to best function?

Commented [HC33]: Brian agrees with the consideration of team development to address the above comment most likely in self evaluation "Attacking the Gaps" Add bullets to departments

Commented [n34]: Somehow, we need to understand objectives, then describe the etams

The City of Springfield's Development and Public Works Department has a Wastewater Policy Team that makes the policy decisions that set the direction for efforts concerning the wastewater collection system. Members of the team include the Development and Public Works Director, Operation Division Manager, Environmental Services Division Manager, City Engineer, Capital Projects Manager, Operation Supervisors and other key staff as needed.

This team discusses upcoming collection system projects and how to achieve the overall goal of I/I reduction. Recent topics that have been discussed are how to approach a private lateral replacement program and how to expand the current flow monitoring program.

In order to ensure the effectiveness of this document there will be quarterly meetings that will serve to assess CMOM program progress. This will include reviewing the document itself as well as an internal discussion of the effectiveness of the previous quarter activities, accomplishments, and the obstacles encountered in performing necessary collection system support activities. One of these quarterly meetings will serve as an annual meeting in which there will be a comprehensive CMOM overview. An internal report will be generated from Infor for this meeting that will include the metrics within the Self Evaluation section of this document. Comparisons of metrics will be made from the previous year and new goals may be set for the following year.

2.3.2 Customer Service and Community Outreach

Commented [n35]: A critical CMOM community outreach need is likely going to be associated smoke testing, illicit connections, and private laterals. A communication plan would provide the appropriate framework (goals/objectives/tools/tactics, etc.) for such an important and possibly touchy issue.

The City has a customer service and community outreach program for direct communication with citizens. The City employs two Communication Coordinators who handle a variety of community outreach programs that teach Springfield citizens about the services provided by the city including the wastewater collection system. Two specific outreach programs are the Clean Water University and the Equipment Rodeo during Public Works week. They also produce targeted outreach materials to affected property owners for specific wastewater construction projects and activities such as smoke testing.

Clean Water University is an educational program for Springfield 5th grade classes that takes a holistic approach to water quality education. The program is a series of four, one-hour workshops and a half-day field trip to the wastewater treatment facility. Topics covered include wastewater treatment, wastewater conveyance, water quality testing, and aquatic macro invertebrates. During Public Works week, 3rd grade classes from Springfield School District enjoy a field trip to City Hall where they participate in the "equipment rodeo." This event educates the students about the equipment necessary to maintaining the collection system such as the CCTV vans and the high velocity cleaning truck.

Every year, Springfield staff work with the Springfield Utility Board staff to include a rate notification brochure with the utility's monthly bills. Besides notifying ratepayers of changes in sewer user rates the brochure includes information to increase the reader's understanding of what the sewer user rates pay for and the value the wastewater system holds for the community.

Communication Coordinators additionally alert citizens on a per project basis. Prior to and during smoke testing and construction projects, the City uses door hangers, newspaper articles, and public radio announcements to inform the public of the impending work.

Employees are trained on how to effectively communicate with customers in the office and in the field. This training includes communicating with "unfriendly" customers. All interactions with customers warranting resolution are documented in a Customer Service Report. A CSR includes:

- The name of the person reporting the issue
- The nature and source of the issue
- The location of the issue
- The date the issue was reported
- The staff who received the complaint/issue
- To whom the follow-up action is assigned

Once a CSR is created, it is entered into Infor and a work order is generated and routed to the appropriate supervisor. There is an expectation that the customer will receive a response within 24 hours. If the CSR mentions an emergency such as a collection system overflow or possible hazardous situation, a response is made immediately. If the CSR turns out to be a non-emergency a work order is created and scheduled as necessary.

It is the goal and expectation that all customers receive a response that includes a clear explanation of who is responsible for correcting or resolving the problem. When the problem is determined to be the responsibility of the City, an explanation will be provided to the customer along with a time frame of when the problem is expected to be resolved. If the customer wishes to file a damage claim, the Operations division will evaluate the circumstance and reimburse the customer or refer them to the city's Risk Management division.

2.4 ~~Management Information System~~Asset Management s

Springfield uses Autodesk and ESRI geospatial software to manage data. In addition, the city has recently upgraded its Asset Management System from Hansen 7 to Infor. This database is used throughout the city for street, stormwater, and wastewater data management. Within the wastewater system, it is used to manage the following information:

- Asset inventory, location and condition
- Customer service requests
- Safety incidents
- Emergency responses
- Inspection scheduling and tracking
- Planned maintenance schedules and work orders

Commented [n36]: Should these positions be included in the bullet list starting at the bottom of page 5?

Commented [n37]: Since we are identifying a goal here, I wonder if this paragraph should go ahead of the paragraph that begins "Employees are trained..." That way, the goal is described and then the activities and processes that support the goal come second.

Commented [n38]: Should we rename this "Asset Management"? The document has eight references to Asset Management, yet no section describing it.

Commented [n39]: If this is the section where the reader would find out about Springfield's Asset Management plan, it seems like there could be more discussion of: What are the principles (life-cycle approach, Level of Service, performance monitoring, process improvement, etc.), strategies, objectives, and activities of the City's AM program; which workgroups are, or could be, involved; how will the data be used to inform maintenance practices, operating cost analysis, forecasting, planning, etc. This section could be an opportunity to explore what minimum staffing might be necessary to build a robust AM program given that currently the resources aren't there. Building a robust AM program could be a goal that plays out over time.

- Parts and Equipment data
- Staff time, labor costs, and equipment costs

All documentation associated with this information is attached within Infor. Reports are run from this system on a day, week, month, and annual basis to provide department management with the information needed to make decisions related to work assignments, CSRs, maintenance, rehabilitation, and repair activities.

Updates to the Infor system in regards to asset inventory, location, and condition are the shared responsibility between the GIS Division (GIS) and Operations Division. Updates are done whenever new CCTV reports become available or when pipe rehabilitations occur.

2.5 Sanitary Sewer Overflow Emergency Response Plan (OERP)

The City places the highest priority on SSO responses. All response activities and reporting are in compliance with our NPDES permit and are described in SOPP D-3.16 (appendix A). The City of Springfield is responsible for responding to all SSO's within the local collection system. The City of Eugene's Wastewater Division is responsible for all maintenance and emergency responses through an IGA at regional and local pump stations including proper documentation and notification of SSOs at these facilities. However, the City of Springfield is legally responsible for the causes of these responses.

Commented [n40]: Per my earlier comment, consider if this document is where you want to house all your SOPPs related to CMOM. Alternatively, the SOPPs can live elsewhere and, be referenced in this plan if need be.

Commented [HC41]: SOPPs are easily grabbed from the H drive. It should only take a few minutes to adjust the SOPPs each year.

Commented [AS42]: Yes for our city facilities

Commented [HC43]: Brian does this read right?

It is the policy of the City, that the Development and Public Works (DPW) Department reports all SSOs to the appropriate agencies, City staff, and the public as needed within a timely manner. All City employees, contractors, and other agents of the City who identify or are notified of an SSO are required to notify DPW staff so that appropriate reporting and response actions can be taken. The DPW Operations Division responds to identified SSOs without delay. Response includes identification of the source, repair or correction of the problem, clean-up of residual contaminated material, and mitigation of damage or harm under the direction of a Wastewater Supervisor who holds a Wastewater Collections Grade IV Certification.

2.6 Legal Authority

Commented [n44]: The most important aspects of legal authority pertain to I/I reduction from private laterals and the industrial source control and FOG municipal codes. I would discuss these at more length than just bullet points. What do we have authority over, what do we need to change, ideally, in order to be effective? Addressing the needs should be part of the plan.

The City of Springfield has the following legal authorities in place:

- Springfield Municipal Code Chapters 3 and 4: Municipal Code Chapters 3 & 4
- Springfield Development Code Section 4.3-105: http://qcode.us/codes/springfield-development/
- Oregon DEQ delegation of authority letter to City for construction and approval of gravity collection system lines under OAR 340-52-040.
- Oregon DEQ authority for engineering standards and approvals of pump stations and force mains under OAR 340-52-040.

Commented [n45]: Is this delegation of authority like the above bullet?

- City of Springfield Engineering Design Standards and Procedures Manual for Waste Water Systems: http://www.springfield-or.gov/dpw/EngineeringDesignStandardsAndProceduresManual.htm
- City of Springfield Standard Construction & Materials Specifications/standard drawings: http://www.springfield-or.gov/dpw/StandardConstructionSpecifications.htm
- Metropolitan Wastewater Management Commission Intergovernmental Agreement: http://www.mwmcpartners.org/AboutMWMC/Documents/2005-IGA.pdf
- City of Springfield IGA with City of Eugene for pump station maintenance.
- Uniform Pretreatment Ordinance and Administrative Rule 4.0503
- Uniform General Requirements for non-industrial dischargers (restaurants, film processing, medical labs, grease, etc.).
- Electronic Acceptance Standards Chapter 10 Section II of Engineering Design Standards and Procedures
- City of Springfield Pollution Control Manual for Maintenance Activities (PC BMP's)
- 2008 Wastewater Master Plan found at:
- http://www.springfield-or.gov/dpw/Wastewater/SupportFiles/WastewaterMasterPlan.pdf

Through the above legal authorities the City has control over public wastewater collection utility and is responsible for operating and maintaining it. The public collection system extends from the main line to the edge of the public right of way and includes all public utility easements. In order to maintain this system the City has a FOG program in place within the Municipal codes to reduce restaurant food waste which cause blockages within the system. In addition, the City enforces control over industrial dischargers and through general requirements over commercial entities such as restaurants, film processers, medical labs, etc.

In order to more effectively manage I/I it may be necessary to adjust the legal codes pertaining to the private laterals that feed into the public wastewater system. These private laterals may contribute significantly to high I/I rates during storms or when the soil is highly saturated.

3.0 Collection System Operation

3.1 Budgeting

Commented [HC46]: Would it be helpful to describe the fee structure here.

The Development and Public Works Department establishes a budget each fiscal year running from July 1st to June 30. The budget ensures that the City is fiscally responsible and cost effective in its services to the rate payers. The department establishes projected budgets for upcoming years as well as a five year plan for capital expenditure costs in order to set priorities and realistic implementation schedules. The collection system budget, fund 611, is funded by wastewater user fees. Each year the wastewater budget and any proposed rate increases must be approved by the City Council. A detailed report of Fund 611 can be found in Appendix B.

Commented [AS47]: Should this be 5?

3.1.1 Capital Budgeting

The City's capital budget is prepared by the Managing Civil Engineer and is approved in June of each fiscal year. Capital improvements are critical to collection system operation as aging pipes has led to cracking, root intrusion, pipe collapses, and offset joints. Capital improvements, budgeted for Fiscal Year 16 through 20, can be found in appendix J.

3.1.2 Operations Budgeting

The Operations budget includes all funding for personnel and equipment for the collection system such as the CCTV van and the high velocity cleaning truck. Each year the collection system operation budget is prepared by the collection system's Operations Supervisor. In order to assure the approval of the budget by the City Council, the upcoming budget is prepared by late February each year. The FY16 collection system budget is approximately 1.6 million dollars.

Commented [n48]: It might be helpful to present the current annual operational budget categories and in addition, maybe a table that relates the CMOM elements to those existing cost categories, identifies any new categories that may be necessary, and maybe verbally describe that you intend to estimate a 5-year program plan assuming CMOM within the first year of program implementation for DPW internal consideration

3.2 Hydrogen Sulfide (H_2S) Monitoring and Control

Commented [n49]: Maybe we can say that ongoing CCTV efforts will assess for crown corrosion and if it begins to observed, additional H2S monitoring and control activities would be considered on an as-needed basis.

Hydrogen sulfide corrosion has not been observed within the City's collection system during CCTV or maintenance hole inspections and thus it is not considered a significant issue. It is believed that the velocity of the wastewater does not allow for the anoxic conditions necessary to create Hydrogen Sulfide. If corrosion is observed within the system, additional H2S monitoring and control activities will be considered on an as needed basis. Hydrogen Sulfide is currently only monitored when employees are entering a confined space.

The maintenance hole atmosphere is monitored for Carbon Monoxide, Oxygen levels, Hydrogen Sulfide, and other gases before all entries. While working in a confined space employees are equipped with atmospheric testing equipment and gas detectors. If a monitor registers H_2S, CO, or any other dangerous gas while an employee is working they are immediately hoisted out of the maintenance hole. Regular trainings occur to keep staff up to date on the procedures regarding hazardous gases and confined space.

3.3 Safety

Commented [n50]: This section could be strengthened if you listed safety program objectives and showed planned activities mapped to objectives.

The City has an active OSHA safety program that utilizes a Safety Committee comprised of management and Union represented staff that meets monthly. Regular safety trainings are provided throughout the course of the year to all Operations Division staff. Staff is rewarded for safe working practices through a safety incentive program during Monday morning Division meetings. The City conducts quarterly internal safety inspections and Crew Chiefs regularly visit field crews to confirm they are following safety practices. In addition, there is a daily stretching and strength conditioning program workers undergo to minimize injuries in the field.

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Safety Equipment and Training provided to staff includes:

- Gloves, confined space ventilation equipment, hard hats, safety glasses, steel toed boots, rubber boots, antibacterial soap, first aid kits, tripods or non-entry rescue equipment, fire extinguishers, equipment to enter maintenance holes, atmospheric testing equipment and gas detectors, oxygen sensors, Hydrogen Sulfide monitors, full body harness, protective clothing, traffic/public access control equipment, pneumatic and hydraulic systems safety, and LEL metering

3.4 Emergency Preparedness and Response

The City utilizes an on-call "Emergency Response Team" (ERT) for after-hours emergency coverage. Written procedures for the call out and notification process are posted and emailed to all employees. ERT members are regularly trained to deal with many scenarios. The City has an Emergency Manager who works with the Collection System management staff. Recent emergency response and preparedness activities include preparing a plan for catastrophic fire, flood, and earthquake events that disrupt the collections system.

Commented [HC51]: Needs further review, Brian and Mike

3.5 Modeling

Commented [AS52]: Let's put a more active description of our flow monitoring plan. It's first up on our to-do list.

Commented [HC53]: Tie the flow monitoring to modeling explain how they are correlated help calibration and what not Explain what goes into a model Possibly talk to ken vogeny

The city does not currently have a formal collection system modeling plan in place. Some simple modeling is occurring within the Community Development Division using XPSWMM, a modeling software package used for wastewater, stormwater, and flood modeling. It will be necessary to develop a more complex model, calibrated with collected flow monitoring data, to help management decide which rehab and replacement projects will be the most beneficial in preventing SSOs and I/I. When it comes time for this to occur, the Community Development Division will hire a consultant. It is the goal of the city to create a flow modeling plan before deciding the location of the next collection system rehabilitation project.

Commented [AS54]: Please replace anything that says Engineering Department with the correct division name. Is this Operations or CMD that will do the consultant hire?

3.6 Mapping

Contractors and developers submit all as-builts to the GIS Division in accordance to the electronic acceptance standards in Chapter 10 Section II of the City's Engineering Design Standards. These standards are required so that the City can collect and maintain accurate and reliable infrastructure information for the planning, design, construction and operation of public facilities; so that the City can meet obligations to maintain accurate records of public assets, and be able to serve the complex needs of diverse users of public information.

GIS receives "as-builts" as AutoCAD files and uploads them into the City's geospatial database. GIS has a long standing protocol for updating old assets and inputting new assets into the map server. To ensure consistency between systems, GIS has synchronized the map server and Infor so that all updates between the two systems happen simultaneously. Updates occur to the systems when there is new construction, pipe rehabilitations, and TV inspections. Each CCTV report is reviewed by GIS for updates to the system. The CCTV crews input data in accordance to NASSCO standards allowing GIS to easily update the locations of various taps as well as pipe conditions within MAPSPRING.

GIS provides maps to the Operations division in pdf formats. GIS has the ability to generate maps with service tap, maintenance hole, and pipe location given that the line has CCTV data. The Operations Division uses all mapping information available both new and old for all subsurface work activities. Older maps utilize a basin approach to geographic organization. The basin approach organizes assets by a ten digit code pertaining to a basin, map page, section, and asset number. In this way each asset can easily be located based on its ten digit inventory code. The basin mapping style is the preferred method by Operations for locating system assets as there is no access to the map server while out in the field. Operations utilizes mapping for providing accurate utility locates, CCTVing, high velocity cleaning, and responding to SSOs and customer service requests.

GIS prefers a mapping method that is easier to use electronically. GIS has transcribed all mapping assets from the previously used paper maps into a geospatial database. Each asset has a unique code that can easily be queried by GIS to obtain information about an asset as well as its location.

Although maps from GIS follow the city code they are sometimes missing information that the collection system's crew deems critical. In the past when errors were found on the maps, as-built corrections were made and returned to GIS for changes in the map server, but that practice is no longer in place. Now when assets or information such as public lateral lines and maintenance hole stationing are identified as missing, it becomes the responsibility of the Infrastructure System Specialist (ISS), within Operations, to update the operations maps as well as the map server.

The ISS utilizes AutoCAD Map 3D and PDF's of the original "as-builts" to update information as to the distance from a maintenance hole to a service line, the length of service lines, and how far from the property line a service line is located. The ISS currently verifies much of the information he receives from GIS by having the CCTV crews TV lines that have incomplete information. As a part of the "Call before you dig" campaign sponsored by the Oregon Utility Notification Center it is the responsibility of the collection systems crew to mark all sanitary collection lines including public laterals that are in the public right of way. As the city continues to move towards establishing a plan for rehabbing private laterals, it will be increasingly critical to have accurate locates on the public laterals to which they connect.

3.7 New Construction

All new construction design within city limits is submitted for review by engineers within the Development and Public Works Department. Design standards must follow the City's Engineering Design Standards & Procedures Manual on the construction and maintenance of gravity sewers as delegated by the DEQ. All construction of pump stations and force mains are subjected to the design standards of the state. City design standards are updated every few years. It would be in the best interest of the ISS and the collection systems crew to require the following information for electronic submittals by contractors for laterals:

- Location of tap as measured from the center of the manhole
- End of pipe distance from the property line or property corner
- The overall length of the installed service line

All public improvement projects have a one year warranty from contractors. This warranty goes into effect when the public improvement project becomes city property by council approval. During the eleventh month after approval the community development engineering assistant notifies the department of the need for visual inspection. Newly constructed maintenance holes are tested and visually inspected during this month for I/I. Newly constructed or rehabilitated collection lines are checked for I/I using CCTV by contractors.

Most construction occurs during the drier summer months. As such the 11th month after construction is usually after the rainy season. It would be in the best interests of the City to do these inspections when wet weather I/I is still prevalent in late winter or early spring.

3.8 Pump Stations

The City has an intergovernmental agreement with the City of Eugene operations staff for pump station maintenance and repair. Monthly reports are created and provided by the City of Eugene for the City of Springfield.

4.0 Equipment and Collection System Maintenance

4.1 Planned and Unplanned Maintenance

The planned maintenance schedules are directed by the collection systems Maintenance Supervisor and are maintained within the Infor system. Maintenance includes high velocity cleaning, root sawing, and FOG cleanup processes which follow standard operating plans and procedures. Maintenance of the pump stations is performed by the City of Eugene. Maintenance reports are provided to the City of Springfield on a monthly basis with regards to the maintenance and costs associated with pump stations.

Unplanned maintenance may or may not be an emergency. Unplanned maintenance may include patching cracked pipes, CCTVing lines due to Customer Service Requests, high velocity cleaning of blocked lines, or root sawing. If a situation warrants emergency maintenance because of a possible SSO it is responded to immediately. In the case that an SSO does occur it will be responded to in accordance to the OERP under the guidance of a Maintenance supervisor with a Level 4 Wastewater certification. After hour emergency maintenance is responded to by the ERT on an on call basis.

4.2 Wastewater Collection System Cleaning

The City of Springfield has policies, procedures, and management practices in place for sewer cleaning activities to ensure proper flow management to the Wastewater Treatment facility. The City has a high velocity cleaning program and root sawing program. Locations are identified for cleaning based on reported problems and call outs. Problem lines where SSO's have occurred or where known problems exist are cleaned twice a year. The City maintains the following information in the Asset Management database for sewer cleaning activities:

- Date, time, and location of routine cleaning activity
- Date, time, and location of stoppage removal
- Method of cleaning used
- Cause of stoppage
- Cleaning crew assigned, labor hours and materials used
- Further actions required
- Weather conditions

4.2.1 High Velocity Cleaning

High velocity cleaning utilizes a high pressure hose that self propels itself from the City's Vactor truck to the upstream maintenance hole. A mechanical winch on the Vactor pulls the hose and debris downstream towards larger pipes with greater flow. This task is critically important to maintaining the capacity of the collection system and reducing the likelihood of SSOs as it removes dirt, grit, solids, roots, and FOG from the cleaned line. High velocity cleaning of the collection system is done on a routine, by basin approach, but it may also occur as unplanned maintenance when blockages are discovered through CSRs, CCTV crews, or maintenance hole inspections. The City maintains a "problem list" of lines that require more frequent cleaning due to excessive root intrusion or grease buildup. These collection lines are cleaned twice annually. It is the goal of the City to hydraulically clean 80% of the system each year so that every two years the entire system will be cleaned. As stated earlier all cleaning activities are carefully recorded within Infor.

4.2.2 FOG Program

The City of Springfield does have a FOG program in its Environmental Services Division, although maintaining a FOG program is not specifically required under Schedule E of the MWMC NPDES permit for the wastewater treatment plant. As such, the NPDES permit does not establish any performance goals or criteria for a FOG abatement program. This is also true in the case of 40 C.F.R. part 403, which does not include any performance goals or criteria for managing a FOG abatement program. As a result, any performance goals for the program itself are those established internally by City of Springfield staff. The following goals are not codified, but are either stated or implied in the City's program documents relating to FOG:

- Ensure that the food service facilities in Springfield remain compliant with Chapter 4 of the Springfield Municipal Code (specifically the General Discharge Prohibitions) and the requirements of the General Requirement for Food Service Facilities.
- Respond to excessive FOG discharges in a timely and appropriate manner using our Enforcement Response Guide when appropriate.
- Prevent the occurrence of Sanitary Sewer Overflows and infrastructure failure resulting from FOG blockages.

The City has created an Enforcement Response Guide containing the relative information needed to deal with restaurants and businesses that have not complied with the rules needed to maintain these FOG related goals.

4.2.3 Root Control Program

The City's Root Control Program seeks to limit root intrusion into the collection system which can lead to significant capacity reduction and if left unchecked, overflows. Roots slow the flow in collection lines which leads to the accumulation of debris and grease. The City has a number of lines located below vegetated easements leading to root intrusion.

Roots are removed by high velocity cleaning, mechanical cutting, or chemicals. When the cleaning crews discover a root intrusion that is too big to be ripped out by high velocity cleaning they fit the jetter with a root sawing attachment. The saw is propelled up from the downstream maintenance hole by the hydraulic pressure created by the jetter. The saw rotates and cuts through roots on the way up and pulls the debris down towards the downstream maintenance hole as it is reeled back.

Wastewater collection crews may use chemicals to remove root intrusions in pipes under 8 inches in diameter including public laterals. The City uses a foam and herbicide mixture on lines up to six inches in diameter. The City is also exploring the possibility of using this mixture on eight inch collection lines.

Root sawing and chemical root removal is done on an as needed basis in response to blockages in lines and customer service requests. The Wastewater Collections Maintenance Supervisor keeps a list of problem lines that are more prone to root intrusions. This list was developed using CCTV reports, reoccurring flow restrictions, and employee experience. Root sawing actions occur biannually for problem lines on this list. All root sawing actions are documented within the City's asset management system.

4.3 Parts and Equipment Inventory

All trucks and heavy equipment used by the Wastewater Collections Program crews are serviced and maintained by the Fleet Maintenance Department. There is a written system in place for tracking the maintenance done on the fleet. The recorded maintenance log of each vehicle is kept within the vehicle. There is currently not a formal parts inventory for the fleet.

5.0 Collection System Capacity Evaluation – Testing and Inspection

5.1 Flow Monitoring

Flow Monitoring is an important aspect tot capacity management of the collection system. Measuring summer base flows and winter peak and average flows is a way that the City can directly measure inflow and infiltration. CCTV, maintenance hole inspections, and pipe age can give an idea of where there is infiltration in the system but flow monitoring can give quantitative evidence of I/I. Measuring multiple basins will give the City the ability to prioritize I/I reduction measures on where they are most needed. Flow monitoring post rehabilitation of large public collection system projects can give the City an idea of whetherh there is significant I/I from the private laterals as well.

The City is currently conducting flow monitoring in several sub-basin areas, but does not have a formal Flow Monitoring Plan at this time. Springfield operates three rain gauges and nine Hach FL900 flow meters. The most recent meters were placed in fall of 2014 prior to the rainy season. Monitors were placed in select locations on the east side of the City in areas identified as needing further monitoring. In addition, the City's regional partner, MWMC, continues to operate 6 regional flow monitors on the major East and West Bank interceptor systems. The data from the flow monitoring is stored on a city laptop and analysis occurs as engineering resources become available. The City has collected flow data for both pre- and post-rehabilitation projects.

It has been identified through the City's Gap Analysis that a comprehensive flow monitoring program is needed. ~~Currently the City's CIP calls for an RFP in order to receive direction for establishing a flow monitoring program.~~ When the City resources are available for a comprehensive flow monitoring program, the wet weather master plan will be updated to include

Commented [n55]: This is a really important section with regional importance for the MWMC. In my opinion, this section needs to be filled in. There is an overall capacity management strategy that is missing and that ties all the parts (like flow monitoring) together. Again, I think a structure of goals, objectives, activities, tactics and performance measures really helps to shape how you think about these sections. Put another way, if you impose that structure on this section, I think it forces you to have essential strategic conversations internally.

Commented [n56]: Explain why Flow monitoring is important in terms of objectives (i.e., capacity modeling and projection [which we don't do but is maybe important] understanding which basins have significant I/I and prioritize activities around those basins, and determining contributions of I/I from the private system]. Explain what we do now, but emphasize what we plan to do. Flow monitoring fits into a larger capacity management strategy, which I think needs to be filled in a little more.

Formatted: Normal, Line spacing: single

Commented [HC57]: Ask Jeff if this is true master plan first or flow monitoring program first

Brian we reworkd this and accepted changes

Formatted: Font: (Default) Times New Roman, 12 pt a section with regards to development of a formal flow monitoring program.-This program-, whether developed in house by engineering or by an outside consultant, should develop collection system modeling and analytical capability that will interface with Infor, the Asset Management System. This will establish -access for Engineering and Operations staff to use the data as neededin order to prioritize rehabilitation measures within basins with significant I/I contribution. Additionally, the data will be useful in providing -engineering- or a consultant with the ability to construct and calibrate the City's flow model.

5.2 Collection System Testing

5.2.1 Dye Testing

The City conducts Dye Tests as described in SOPP M-6.3 (Appendix C). The Wastewater Collections crew uses dye testing for troubleshooting collection system problems as well as illegal connections, broken or leaking pipes, and cross connections between sanitary and storm pipes. This is done by pouring the liquid dye into the system upstream of the study area. The study area must then be continually overseen for the appearance of dye. Dye testing results are provided to the Wastewater Collections Program Supervisor. Dye testing is only used on an as needed basis per customer request.

5.2.2 Smoke Testing

The City conducts Smoke Testing, as described in SOPP M-6.4 (Appendix D), on an as needed basis for surveying conditions, identifying pipeline locations, identifying system faults, and troubleshooting problem locations. A variety of system faults may be located by smoke testing including: cross connections between storm and sanitary systems, cracked or broken pipes and faulty joints, illegal connections, faults in private sewer laterals, and improper vents and traps in buildings. The City smoke tests pre- and post-rehabilitation in order to assess the effectiveness of the rehabilitation.

The Operations division has a goal to smoke test an average of 10,000 feet of pipe each year. However, depending on staffing levels, there may be substantially more or less testing carried out in a given year. All smoke testing is videoed to document any faults that may have been found. Residents may be shown these videos if they are notified that there is a problem on the private side of the collection system.

5.3 Collection System Inspection

5.3.1 CCTV Inspection

The City conducts CCTV inspections as described in SOPP M-6.2. As part of the preventative maintenance of the City's collection system, closed circuit television systems are used to visually inspect subsurface pipelines. Two types of television systems are available. The standard television inspection system is used for routine inspection of complete pipeline segments of 8" in diameter or greater. The micro television system is used for inspecting spot locations, identifying problem locations, and in pipelines 6" or less in diameter.

The Operations Division visually inspects the entire collection system in an 8 to 10 year time span. This is done systematically on a per basin approach following high velocity cleaning. The amount of routine TV inspection that occurs in a given year varies as unplanned maintenance takes precedence over this inspection. This includes inspecting new construction during warranty periods, pipeline failures, system problem spots, and locating various taps and clean outs to determine lateral line repair responsibility. These activities are done while responding to customer service reports (CSR) and verifying stationing before and after rehabilitation. When street construction is to occur the collections crew CCTVs the subsurface pipelines to determine whether collection lines should be rehabbed at the same time as the street construction.

Springfield utilizes the nationally recognized NASSCO standards for documenting CCTV data. This data is input into Infor and used by the GIS Division to update the city's GIS system and "as-builts" post construction. NASSCO data standards include the gathering and recording of the following information on pipe conditions:

- Pipe diameter, line segment footage, and joint spacing
- CCTV operator's name
- Overall location of the line within the collection system (this is usually referenced based upon the upstream and downstream maintenance holes)
- Cleanliness of the line
- Results of the inspection
- Overall pipe condition

We use CCTV inspections to identify the following conditions for cleaning, maintenance, and rehabilitation activities.

- Failed linings
- Leaking laterals
- Illegal connections
- Fats, Oils, and Grease (FOG)
- Voids or holes
- Debris (with type)
- Pipe sags or deflection

- Joint separation
- Crushed and/or collapsed pipes
- Offset joints
- Root intrusions

5.3.2 Maintenance hole Inspection

Maintenance hole inspections are done visually with basic documentation in accordance with SOPP M-6.1 (Appendix E). These inspections check for obvious signs of blockages, condition of the frame and cover, buildup of FOG and roots, location, flow characteristics, and I/I from maintenance hole covers and walls. Most inspections are done by newer employees as a training method for familiarizing themselves with the map system. It is planned that a more systematic approach to inspection will occur as more staff becomes available.

6.0 Collection System Rehabilitation

The objective of sewer rehabilitation is to maintain the overall viability of the collection system. This is done by: ensuring its structural integrity; limiting the loss of conveyance and wastewater treatment capacity due to excessive I/I; and limiting the potential for groundwater contamination by controlling exfiltration from the pipe network. The rehabilitation program should be built from information obtained from all forms of maintenance and observation activity as part of the capacity evaluation and asset inventory to assure the ability of the system to function properly. Rehabilitation should take place before it is required as an emergency maintenance activity.

The DPW focuses its rehabilitation efforts of the collection system on the public system. Rehabilitation efforts and design may call for open pit pipe replacement, pipe bursting, slip lining, or pipe patching.

6.1 Open Cut Pipe Replacement

Open cut pipe replacement requires contractors to remove and replace the existing defective pipe in the public right of way and or easements, including replacement of the service lateral to the private property line. Contractors are required to obtain utility locates prior to excavation. This type of replacement is most frequent when the pipe is easily accessible from the surface.

6.2 Pipe Bursting and Slip Lining

Pipe bursting is done when above ground access to the pipe is difficult or expensive. The new HDPE pipe is pulled through an existing pipe of equal or lesser diameter from an insertion pit to a receiving pit. This method generates enough force to shatter the existing pipe and increases the capacity of the new pipe.

Slip lining is similar to pipe bursting but the new pipe is of slightly lesser diameter than the existing pipe. Holes are drilled in the new pipe where there are connections for laterals. Slip lining leads to a reduction in volume of pipe but not capacity as the new pipe creates less friction with the water.

6.3 Pipe Patching

The Operations division has the ability to patch pipes up to 8 inches in diameter. This method uses a woven fabric and resin wrapped around a bladder and inserted into the pipe. When the bladder is inflated the resin cures over small holes and cracks creating a watertight seal. CCTV is used to determine the exact location that the patch is needed and high velocity cleaning occurs in the pipe just prior to the patch to ensure that there is a good seal.

6.4 Current Projects

Currently, there are no pipe rehabilitations taking place within the City. The next pipe rehabilitation is set to commence in summer of 2016.

Peak inflow rates at the MWMC treatment facility may also be due to leaks in the private laterals connected to the collection system. Quantifying this contribution of I/I from deteriorated private laterals is difficult, but it is considered potentially significant. The City currently does not have a written policy enforcing the upkeep of these private laterals. Discussions are being held within the Wastewater policy meetings and City Council meetings in order to approach a private lateral rehabilitation program.

7.0 Self-Evaluation

Members from the Operations , Environmental Services, and Community Development Divisions as well as IT Department will convene quarterly for a CMOM program updates, and annually for a comprehensive CMOM overview. The agenda of this meeting will be a discussion on the development and implementation of this CMOM program including its progress and obstacles. Before the meeting takes place the following actions will need to occur.

- Update the CMOM program with relevant information as to inventory, dates, and projects. Please see appendix for more details.
- Update the appendices. Some items in the appendix ~~are continually~~should be updated quarterly such as safety trainings and SOPPs.
- An updated version of the collection system map (Appendix G).

Commented [AS58]: Put in the correct references here. IT Department? CMD?

Commented [n59]: Should this be discussed in Section 2.1.3 – Internal Communications?

Commented [n60]: This is a great meeting to have, but it is very high level. Each element in the plan is made up of activities and processes, some of which should be evaluated periodically to understand if they are working effectively to meet specific identified objectives. My sense is the meeting you've described here is to broad to do that. Moreover, different subject experts would be involved depending on the specific activities or elements being reviewed.

Commented [n61]: What do you mean by inventory? Is this stock of shelved parts and material?

Commented [n62]: In my opinion, you are making busy work for yourselves if you require the CMOM plan (the thing that goes on the book shelf) to be updated with SOPPs and trainings every year. Those programs and associated binders and files can live independently elsewhere and be incorporated into the plan by reference only.

In order to quantify the effectiveness of this program it is necessary to establish performance metrics for the maintenance and operation of the collection system. All activities undertaken by the CMOM operations crew are monitored and tracked through the Infor Asset Management system. Maintenance target distances, time spent per task, SSOs, and blockages are measured and tracked daily. Metrics have been established through review of these activities. The CMOM annual meeting will reserve time for reviewing and reevaluating the metrics set forth by this program (Appendix F). Each year an internal report will be generated from Infor before the meeting which will include the following metrics.

- SSOs per 100 miles per year
- SSOs per year and their causes
- Emergency Response Reports
- Odor Complaints
- Customer Service Calls
- Maintenance Targets
    - Miles of CCTV
    - Miles of High velocity Cleaning
    - Number of Maintenance hole Inspections
    - Feet of Smoke Testing
    - Feet of Dye Testing
- Work Order Ratios (preventative to reactive maintenance) ?
- Number of Blockages per year
- Root Removal Efforts
- Grease Removal Efforts (Staff Updates to FOG Program)
- Cured-in-place sewer lining rehabilitation efforts
- Pipe and Maintenance hole repair efforts
- Updated Sewer Map (GIS and Operations Staff)
- Report as to the status of all collections lines rehabbed in the previous year
- Report on any additions to this plan

Each internal report will be useful in comparing yearly cleaning activity accomplishments to one another. Many activities, including maintenance targets, occur on a multiyear time cycle and must be measured as an average accomplishment over many years in order to be effective. In addition, ~~Each~~ internal reports will be saved ~~for a period of ten years as a~~to document ~~to~~ the efforts that the City of Springfield has taken to eliminate sanitary sewer overflows.

Commented [n63]: In my opinion, meetings are generally not a good venue to do evaluative technical work. A meeting could be a good place to review draft recommendations made earlier by teams or individuals who have done the evaluations and compiled them in a memo or report.

Commented [n64]: This is great!! But this list of metrics doesn't mean much without activities and processes to measure. Which processes, what data gets collected, who and how does the data get collected, who evaluates and reports (recommendations could be part to the evaluation and report), who puts the report together (someone to collate evaluations and recommendations from various work groups/teams)? Who is the team or individual that reviews the annual report?

Commented [n65]: More important than retention policy is how the reports will be used to adaptively manage. Some

Commented [HC66]: Staff should determine the frequency and storage parameters for these reports Infor?

Commented [n67]: What about removing I/I and ensuring capacity and function of the collection and conveyance system?

Appendix

Commented [HC68]: Do we want to disclose this information Do we want all of this to be public because then we are liable and taking a trisk

Yearly Updates

The following items will need to be updated within the CMOM program on a yearly basis

1.1 Customers, acre area, population served, miles of gravity sewer, miles of force main pipes, pump stations, maintenance holes, size of pipes, type of pipe, plant capacity, days with flow over 100 MGD, average of flow of days that are over 100 MGD

2.1.1 Organizational structure of the DPW, budgeted FTE

2.2.1 Capital Project Improvements set to occur in next year

2.3.3 Is there a formal parts inventory

2.4.1 Most recent flow monitors were place in (date)

2.5 Current Projects

Things to Note

The following is a list of important aspects of the CMOM program that should be tracked and given special attention to. This may include future goals or items that may change regularly. Upon review of these items changes may need to be made in the CMOM plan.

1.2 Implement feasible steps to stop and mitigate the impacts of sanitary sewer overflows from any portion of the collection system.
Establish a collection system management planning framework for ongoing improvement and to inform system rehabilitation needs.

2.1.1 The EPA suggests that a city with a population of 50,000 should have 16 FTE dedicated to operation and maintenance of the collection system. The City has fewer employees than recommended

2.1.2 Lockout/Tagout program, MSDS, Confined Spaces Permit, Trenching and Excavation, Biological Hazards in Wastewater, Traffic Control, Record Keeping, Pipe Repair, SSO Response, CCTV, Routine Line Maintenance, and Work Site Safety.

2.1.3 Recent topics that have been discussed are how to approach a private lateral replacement program and how to expand the current flow monitoring program.

2.1.5 Springfield uses Autodesk and ESRI geospatial software to manage data. In addition, the city has recently upgraded its Asset Management System from Hansen 7 to Infor.
Updates are done whenever new CCTV reports become available or there is some sort of pipe rehabilitation.

2.2.2 Monitoring (Whole Section)

2.2.6 Modeling (Whole Section)

2.2.7 As the city continues to move towards establishing a plan for rehabbing private laterals, it will be increasingly critical to have accurate locates on the public laterals to which they connect.

2.2.8 Most construction occurs during the drier summer months. As such the 11th month after construction is usually after the rainy season. It would be in the best interests of the City to do these inspections when wet weather I/I is still prevalent in late winter or early spring.

2.3.2 Problem lines where SSO's have occurred or where known problems exist are cleaned twice a year.
The City is also exploring the possibility of using "RootX" on eight inch collection lines.

2.4.1 Monitors were placed in select locations on the east side of the City in areas identified in the City's 2008 Wastewater Master Plan as needing further monitoring.
It is the goal of the city to prepare a formal Flow Monitoring Plan and develop collection system modeling and analytical capability with an interface to the Asset Management system that will allow direct access for Engineering and Operations staff to utilize the flow data for adaptive management.

2.4.2 Operations division has a goal to smoke test 10,000 feet of pipe each year

2.4.3 The Operations Division visually inspects the entire collection system in an 8 to 10 year time span.
It is planned that a more systematic approach to inspection will occur as more staff becomes available.

2.5 Discussions are being held within the Wastewater policy meetings and City Council meetings in order to approach a private lateral rehabilitation program.

3.0

- Update the CMOM program with relevant information as to inventory, dates, and projects. Please see appendix for more details.
- Update the appendices. Some items in the appendix are continually updated such as safety traingins and SOPPs.
- An updated version of the collection system map.

Each year an internal report will be generated before the meeting which will include the following metrics.

- SSOs per 100 miles per year
- SSOs per year and their causes
- Emergency Response Reports
- Odor Complaints
- Customer Service Calls
- Maintenance Targets
  - Miles of CCTV
  - High Velocity Cleaning

    - Maintenance hole Inspections
    - Smoke Testing
    - Dye Testing
- Preventative to reactive maintenance work order ratios
- Number of Blockages per year
- Root Removal Efforts
- Grease Removal Efforts
- Cured-in-place sewer lining rehabilitation efforts
- Pipe and Maintenance hole repair efforts
- Updated Sewer Map
- Report as to the status of all collections lines rehabbed in the previous year
- Report on any additions to this plan

Each internal report will be saved for a period of ten years as a document to the efforts that the City of Springfield has taken to eliminate sanitary sewer overflows.

consor

APPENDIX F
PUMP STATION INTERGOVERNMENTAL AGREEMENT

CONTRACT FOR OPERATION AND MAINTENANCE

OF

THE SPRINGFIELD WASTEWATER PUMP STATIONS

WHEREAS, the City of Springfield is a municipal corporation of the State of Oregon, and is hereinafter designated as Springfield; and,

WHEREAS, the City of Eugene is a municipal corporation of the State of Oregon, and is hereinafter designated as Eugene; and,

WEREAS, Eugene employs personnel qualified to operate and maintain Springfield's wastewater pump stations and has effectively performed this service for Springfield under previous contract since July 1, 1982.

NOW, THEREFORE, in consideration of the mutual considerations hereinafter set forth, it is hereby agreed by and between Springfield and Eugene as follows:

1. ***Term:*** The contract shall be renewed and effective on August 1, 2000, and shall remain in effect until either party should choose to withdraw from the agreement. Either party may call for a review of the contract for evaluation or amendments. Either party may withdraw from the agreement by giving 30-day notification to the other; this contract supersedes all previous agreements.

2. ***Applicability:*** This agreement applies to all wastewater pump stations which are more particularly described and set forth in Exhibit "A" attached hereto and incorporated herein by reference. This agreement also applies to any wastewater pump stations for which Springfield has given Eugene written notice that said pump stations have been accepted by Springfield during the term of this contract.

3. ***Operations and Maintenance Activities:*** Eugene shall accomplish and be responsible for performing the operations and maintenance activities more particularly described and set forth in exhibit "B" attached hereto and incorporated herein by reference. The pump stations will be operated and maintained in a manner consistent with the standard practices used to operate and maintain the regional (MWMC) and Eugene wastewater pump stations, unless equipment manufacturer's or supplier's recommendations or guarantee pre-conditions are more stringent, in which case the more stringent standard shall apply.

4. ***Payment:*** Except where the costs for a particular corrective action exceeds $5,000; Eugene will pay all costs for routine operations and maintenance activities. If the estimated total cost for a maintenance or operational activity exceeds an estimate of $5,000; prior authorization shall be obtained by Eugene from Springfield. After such authorization and upon completion of the authorized activity, Springfield will reimburse Eugene immediately as administratively practicable upon receipt of invoices for the activity.

   At the discretion of Eugene management personnel, an expenditure in excess of $5,000 may be made in the event of any emergency. In the event of such expenditure, Springfield shall reimburse Eugene immediately as practicable upon receipt of invoice for the activity.

   Apart from those expenditures for an operational or maintenance activity in excess of $5,000; all remaining costs for operation and maintenance of the Springfield wastewater pump stations will be submitted quarterly by Eugene to Springfield for reimbursement.

5. *Accounting:* Eugene will submit each month to Springfield a summary report of operational and maintenance activities, major expenditures, and anticipated future needs to maintain and operate the pump stations.

All records at the pump stations will be maintained in accordance with current record keeping practices. Any changes in record keeping must be approved by Springfield. Eugene will prepare a budget for expected operational and maintenance expenses and present it to Springfield in a timely manner for inclusion in the development of Springfield's annual budget.

6. *Emergencies:* Eugene shall maintain and provide continuous 24-hour per day service and emergency response to alarms and operational problems occurring at the pump stations. In responding to service calls and emergencies, Eugene will give higher priority to those pump stations where the need and/or the potential impact is greater. The priority of response actions will be determined by Eugene, unless otherwise specifically instructed by Springfield.

It will be the responsibility of Eugene's Wastewater Division to notify the state Department of Environmental Quality (DEQ) in the event of any overflow of wastewater caused by a failure of pump station equipment or operation. Springfield will have the responsibility to notify the DEQ in the event of an overflow of wastewater caused by any other problem in the wastewater collection system and that is not directly attributable to a pump station failure. Notification of the public, where necessary to prevent exposure to wastewater, will be the responsibility of Springfield in all cases. In the case of an emergency at one of the wastewater pump stations covered in this agreement and at the request of Eugene, Springfield will provide support (equipment and manpower) if available.

7. *Installation of Equipment Monitors:* The equipment necessary to monitor conditions at each pump station shall be installed at the expense of Springfield.

8 *Status:* In providing the services specified in this agreement (and any associated services) both parties are public bodies and maintain their public body status as specified in ORS 30.260. Both parties understand and acknowledge that each retains all immunities and privileges granted them by the Oregon Tort Claims Act (ORS 30.260 through 30.295) and any and all other statutory rights granted as a result of their status as local public bodies.

9. *Indemnification:* To the extent allowed by the Oregon Constitution and the Oregon Revised Statutes, each of the parties hereto agrees to defend, indemnify, and save the other harmless from any claims, liability, or damages including attorney fees arising out of any error, omission or act of negligence on the part of the indemnifying party, its officers, agents, or employees in the performance of this agreement.

10. *New Pump Stations:* Springfield shall in the planning, construction, review and inspection of new pump stations consult with Eugene.

Eugene's Wastewater Division shall provide recommended specifications for the design of wastewater pump stations. It shall be the responsibility of Springfield to approve design plans for the pump stations and ensure proper construction in accordance with the approved plans. The Wastewater Division may request to participate in the inspection process for information purposes. The Wastewater Division shall be included in the performance testing of new pump stations. All new or modified pump stations must meet applicable local, state, and federal safety regulations prior to final acceptance under this agreement for operation and maintenance by the Wastewater Division.

Springfield shall consult with the City of Eugene Wastewater Division prior to the acceptance of any new stations. Alarms must be installed and fully functional prior to acceptance.

11. ***Attorney's Fees:*** In the event a suit or action is instituted by either party to procure any remedy for breach thereof, it is understood and agreed by the parties hereto that the prevailing party shall be awarded such sum as the court may adjudge as reasonable attorney's fees in such suit or action, including fees or appeal.

CITY OF EUGENE:

By: ______________________
James R. Johnson, City Manager

Date: 8-2-00

CITY OF SPRINGFIELD:

By: ______________________
Michael A. Kelly, City Manager

Date: 8/16/00

REVIEWED BY
CITY OF SPRINGFIELD
RISK MANAGEMENT

NAME ______ DATE 8-14-00

REVIEWED & APPROVED
AS TO FORM
Joseph J Leahy
DATE: 8/14/2000
OFFICE OF CITY ATTORNEY

APPENDIX "A"

Local Springfield Sewage Pump Stations

	Station Name	Location Code
1.	Harlow Road	70
2.	Ramada	85
3.	Ken Ray	79
4.	21^{st} and "E" Streets	76
5.	Hayden-Lo	73
6.	Marcola Road	77
7.	15^{th} Street	81
8.	49^{th} Street	80
9.	Golden Terrace	71
10.	Lucerne Meadows	72
11.	Commercial	75
12.	Olympic	82
13.	Deadmond's Ferry	74
14.	Otto Street	83
15.	Nugget Way	78
16.	River Glen	88
17.	42^{nd} & Olympic	87

APPENDIX "B"

1. Inspect all pump stations as often as necessary to ensure that the pumps, motors and control system are functioning normally.

2. Test the function of the telemetry equipment used to monitor pump stations at least once per quarter.

3. Evaluate pumping efficiency of all pump stations annually.

4. Provide routine preventive maintenance of all pump stations so as to permit continuous and uninterrupted use of the wastewater collection/transmission system.

5. Schedule wet well cleaning and maintain wet wells so as to prevent odor nuisance, remove grease buildup, and permit efficient operation of the wastewater pumps.

6. Provide grounds and building maintenance such as painting, lawn and shrub care, etc.

7. Specify capital replacement needs in a timely manner so that the required expenditures can be included in the annual budget process.

8. Prepare and provide long range plans including schedules for rehabilitation of wastewater pump stations as age and/or performance requirements change.

9. Other activities as necessary to ensure effective and efficient use of the facilities identified in Appendix "A".

Public Works
Wastewater Division

City of Eugene
410 River Avenue
Eugene, Oregon 97404
(541) 682-8600
(541) 682-8601 FAX

Date: July 31, 2000

To: Contract Signees

From: Linda Delaplain, Contract Administrator

Subject: Springfield Pump Station Operation & Maintenance

Attached is a revised copy of the Springfield Pump Station Operation & Maintenance contract that you signed recently. After all the signatures were completed it was discovered that there was two minor changes that needed to be made. Those changes are on:

✓ Page 1, under "Term" – the date was changed from January 1, 1992 to August 1, 2000.

✓ Page 4, Appendix section – item 18 was removed (Glenwood Pump Station). Glenwood has actually been moved to a regional pump station and therefore, is funded with regional sewer funds.

Please sign the revised document and route back to me as soon as possible.

Public Works
Wastewater Division

City of Eugene
410 River Avenue
Eugene, Oregon 97404
(541) 682-8600
(541) 682-8601 FAX

MEMORANDUM

REVIEWED BY
CITY OF EUGENE
RISK SERVICES
NAME DATE 5-30-00

Date: May 25, 2000

To: Myrnie Daut

From: Dave Breitenstein DB

Subject: Contract for Operation & Maintenance of Springfield Pump Stations

I would appreciate your review of the attached draft revisions to the contract between the City of Eugene and the City of Springfield. The last revisions to the contract were in 1994. The document shows recommended edits (additions-bold and strikeouts) which I first sent to Springfield. Springfield's attorney, Joe Leahy, has reviewed and his comments are provided along with additions recommended by Springfield's Risk Manager. I also penciled in the additional edits based on their questions and comments. I may be contacted directly at 682-8611 for any questions.

Let me know how you prefer to proceed. I was intending to send to the City attorney's office for review but don't mind if you forward it.

On appendix "B" I'd suggest "as often as reasonably necessary"... Craig's ind. lingo looks ok.
G 5-30

Looks ok.
MD 5/26/00

MEMORANDUM OFFICE OF CITY ATTORNEY

DATE: April 17, 2000

TO: Keith Miyata
Maintenance Supervisor

FROM: Joe Leahy
Office of City Attorney

REVIEWED BY CITY OF EUGENE RISK SERVICES
NAME [signature] DATE 7-20-00

SUBJECT: Contract for Operation and Maintenance between the City of Springfield and the City of Eugene Wastewater Pump Stations

Thank you for the opportunity to review the above referenced Contract. On the basis of that review we have the following suggestions and comments. The suggestions and comments will be keyed to the respective section numbers of the Contract.

Section 2 There is a reference in Section 2 to Exhibit A. That reference should be to Appendix A or alternatively retitle Appendix A to Exhibit A. Also, Appendix A still uses the terminology local Springfield Sewage Pump Stations. Should these be referenced instead to Wastewater Pump Stations?

Section 6 In three instances the word raw has been left in the second paragraph prior to the word wastewater. Is that correct? Do we have raw wastewater?

Section 7 I am assuming that you will appropriately delete or leave in based on facts.

Section 8 I agree with Craig Gibons request that the two paragraphs he provided be substituted for your Section 8.

With respect Appendix A-1, where is that Appendix referenced?

With the exception of the above comments and suggestions, the contract appears satisfactory.

JJL:llk

cc: Craig Gibons
John Hiltbrand
Susie Smith

REVIEWED BY CITY OF EUGENE RISK SERVICES NAME [signature] DATE 5-20-00

8. ~~1.~~ **Status.** In providing the services specified in this agreement (and any associated services) both parties are public bodies and maintain their public body status as specified in ORS 30.260. Both parties understand and acknowledge that each retains all immunities and privileges granted them by the Oregon Tort Claims Act (ORS 30.260 through 30.295) and any and all other statutory rights granted as a result of their status as local public bodies.

9. ~~2.~~ **Indemnification.** To the extent allowed by the Oregon Constitution and the Oregon Revised Statutes, each of the parties hereto agrees to defend, indemnify, and save the other harmless from any claims, liability or damages including attorney fees arising out of any error, omission or act of negligence on the part of the indemnifying party, its officers, agents, or employees in the performance of this agreement.

Keith - I would like to see ¶8 replaced with these two ¶'s. Have Eugene people call me if any problem w/ this.

Thanks -
Craig
726-3706
Risk Manager

CONTRACT FOR OPERATION AND MAINTENANCE

OF

THE SPRINGFIELD ~~SEWAGE~~ *WASTEWATER* PUMP STATIONS

WHEREAS, the City of Springfield is a municipal corporation of the State of Oregon, and is hereinafter designated as Springfield; and,

WHEREAS, the City of Eugene is a municipal corporation of the State of Oregon, and is hereinafter designated as Eugene; and,

~~*WHEREAS,* on July 1, 1982, Springfield personnel responsible for the operation and maintenance of the Springfield sewage pump stations were transferred to Eugene and are now the employees of Eugene; and,~~

~~*WHEREAS,* Springfield no longer has personnel qualified to operate and maintain the Springfield sewage pump stations;~~

WEREAS, Eugene employs personnel qualified to operate and maintain Springfield's ~~sewage~~ wastewater pump stations and has effectively performed this service for Springfield under previous contract since July 1, 1982.

NOW, THEREFORE, in consideration of the mutual considerations hereinafter set forth, it is hereby agreed by and between Springfield and Eugene as follows:

1. *Term:* The contract shall be renewed and effective on January 1, 1992, and shall remain in effect until either party should choose to withdraw from the agreement. Either party may call for a review of the contract for evaluation or amendments. Either party may withdraw from the agreement by giving 30-day notification to the other; *This* contract supersedes all previous agreements.

2. *Applicability:* This agreement applies to all ~~sewage~~ ***wastewater*** pump stations which are more particularly described and set forth in Appendix ~~Exhibit~~ "A" attached hereto and incorporated herein by reference. This agreement also applies to any ~~sanitary sewer~~ ***wastewater*** pump stations for which Springfield has given Eugene written notice that said pump stations have been accepted by Springfield during the term of this contract.

3. *Operations and Maintenance Activities:* Eugene shall accomplish and be responsible for performing the operations and maintenance activities more particularly described and set forth in Appendix ~~exhibit~~ "B" attached hereto and incorporated herein by reference. The pump stations will be operated and maintained in a manner consistent with the standard practices used to operate and maintain the regional (MWMC) and Eugene ~~sewage~~ ***wastewater*** pump stations, unless equipment manufacturer's or supplier's recommendations or guarantee pre-conditions are more stringent, in which case the more stringent standard shall apply.

4. *Payment:* Except where the costs for a particular corrective action exceeds ~~$2,000~~ ***$5,000***, Eugene will pay all costs for routine operations and maintenance activities. If the estimated total cost for a maintenance or operational activity exceeds an estimate of ~~$2,000~~ ***$5,000***, prior authorization shall be obtained by Eugene from Springfield. After such authorization and upon completion of the authorized activity, Springfield will reimburse Eugene immediately as administratively practicable upon receipt of invoices for the activity.

   At the discretion of Eugene management personnel, an expenditure in excess of ~~$3000~~ ***$5,000*** may be made in the event of any emergency. In the event of such expenditure, Springfield shall reimburse Eugene immediately as practicable upon receipt of invoice for the activity.

Apart from those expenditures for an operational or maintenance activity in excess of ~~$2,000~~ ***$5,000***, all remaining costs for operation and maintenance of the Springfield ~~sewage~~ ***wastewater*** pump stations will be submitted quarterly by Eugene to Springfield for reimbursement.

5. *Accounting:* Eugene will submit each month to Springfield a summary report of operational and maintenance activities, major expenditures, and anticipated future needs to maintain and operate the pump stations.

All records at the pump stations will be maintained in accordance with current record keeping practices. Any changes in record keeping must be approved by Springfield. Eugene will prepare a budget for expected operational and maintenance expenses and present it to Springfield in a timely manner for inclusion in the development of Springfield's annual budget.

6. *Emergencies:* Eugene shall maintain and provide continuous 24-hour per day service and emergency response to alarms and operational problems occurring at the pump stations. In responding to service calls and emergencies, Eugene will give higher priority to those pump stations where the need and/or the potential impact is greater. The priority of response actions will be determined by Eugene, unless otherwise specifically instructed by Springfield.

Substitute "overflow" for "spill" and delete "raw."

It will be the responsibility of Eugene's Wastewater Division to notify the state Department of Environmental Quality (DEQ) in the event of any ~~spill~~ of ~~raw sewage~~ ***wastewater*** caused by a failure of pump station equipment or operation. Springfield will have the responsibility of notifying the DEQ in the event of a ~~spill~~ of ~~raw sewage~~ ***wastewater*** caused by any other problem in the wastewater collection system and that is not directly attributable to a pump station failure. Notification of the public, where necessary to prevent exposure to ~~raw sewage~~ ***wastewater*** ~~spills~~, will be the responsibility of Springfield in all cases. In the case of an emergency at one of the ~~sewage~~ ***wastewater*** pump stations covered in this agreement and at the request of Eugene, Springfield will provide support (equipment and manpower) if available.

7. *Installation of Equipment Monitors:* The equipment necessary to monitor conditions at each pump station shall be installed at the expense of Springfield. ~~and/or the Metropolitan Wastewater Management Commission.~~ ***(Delete if contract has no relationship to regional stations.)***

8. *Indemnification:* In the event that Eugene fails to perform the reasonable operations, maintenance and emergency response functions required by this agreement, Eugene shall defend, indemnify and hold harmless Springfield from all claims, costs, damages, suits and liability arising out of said operational and maintenance activities. Eugene further agrees to replace at Eugene's expense any and all equipment which is damaged and requires replacement where damage results from the negligence of Eugene in performing the operational and maintenance activities.

In the event that Springfield fails to perform any condition required by this agreement, including specifically but without limitation, the requirement for payment and/or authorization to perform as described in paragraph number 4, Springfield shall defend, indemnify and hold harmless Eugene from all claims, costs, damages, suits and liability arising out of said failure to perform said conditions.

9. *New Pump Stations:* Springfield shall in the planning, construction, review and inspection of new pump stations consult with Eugene.

Eugene's Wastewater Division shall provide recommended specifications for the design of ~~raw~~

~~sewage~~ ***wastewater*** pump stations. It shall be the responsibility of Springfield to approve design plans for the pump stations and ensure proper construction in accordance with the approved plans. The Wastewater Division may request to participate in the inspection process for information purposes. The Wastewater Division shall be included in the performance testing of new pump stations. All new or modified pump stations must meet applicable local, state, and federal safety regulations prior to final acceptance under this agreement for operation and maintenance by the Wastewater Division.

Springfield shall consult with the City of Eugene Wastewater Division prior to the acceptance of any new stations. Alarms must be installed and fully functional prior to acceptance.

10. *Attorney's Fees:* In the event a suit or action is instituted by either party to procure any remedy for breach thereof, it is understood and agreed by the parties hereto that the prevailing party shall be awarded such sum as the court may adjudge as reasonable attorney's fees in such suit or action, including fees or appeal.

CITY OF EUGENE:

By: ______________________________
Jim Johnson, City Manager

Date: ______________________________

CITY OF SPRINGFIELD:

By: ______________________________
Michael A. Kelly, City Manager

Date: ______________________________

APPENDIX "A"

Local Springfield ~~Sewage~~ Wastewater Pump Stations

Station Name		**Location Code**
1.	Harlow Road	*70*
2.	Ramada	*85*
3.	Ken Ray	*79*
4.	21st and "E" Streets	*76*
5.	Hayden-~~Lo~~ ***Road***	*73*
6.	Marcola Road	*77*
7.	15th Street	*81*
8.	49th Street	*80*
9.	Golden Terrace	*71*
10.	Lucerne Meadows	*72*
11.	Commercial	*75*
12.	Olympic	*82*
13.	Deadmond's Ferry	*74*
14.	Otto Street	*83*
15.	Nugget Way	*78*
16.	River Glen	*88*
17.	***42nd & Olympic***	*87*
18.	***Glenwood***	*86*

? should still be Hayden-Lo

APPENDIX "A-1"

Regional Springfield Sewage Pump Stations

~~1. "C" Street~~

~~2. "D" Street~~

~~3. Springfield Plant (North Walnut and Aspen Streets)~~

DELETE PAGE assuming regional stations located in Springfield are not applicable to this contract.

APPENDIX "B"

1. Inspect all pump stations ~~at least once per week~~ ***as often as*** reasonably ***necessary*** to ensure that the pumps, motors and control system are functioning normally.

2. Test the function of the telemetry equipment used to monitor pump stations at least once per ~~month~~ ***quarter***.

3. ***Evaluate pumping efficiency*** ~~Determine the pump-down rate (pumping capacity)~~ of ***all*** pump stations ~~"C" and "D" Street~~ annually.

4. Provide routine ***preventive*** maintenance of all pump stations so as to permit continuous and uninterrupted use of the ~~sewage~~ ***wastewater*** collection/transmission system.

5. Schedule wet well cleaning and maintain wet wells so as to prevent odor nuisance, ***remove grease buildup,*** and permit efficient operation of the ~~sewage~~ ***wastewater*** pumps.

6. Provide grounds and building maintenance such as painting, lawn and shrub care, etc.

7. Specify capital replacement needs in a timely manner so that the required expenditures can be included in the annual budget process.

8. ***Prepare and provide long range plans including schedules for rehabilitation of wastewater pump stations as age and/or performance requirements change.***

9. Other activities as necessary to ensure effective and efficient use of the facilities identified in Appendix "A".

Intergovernmental

City of Eugene and City of Springfield (Contractor)

CONTRACT #:	82-00422
P. O. #:	
BEGIN DATE:	7/1/1982
TERMINATION DATE:	
REVIEW DATE:	07/01/2001
MANAGER:	David Breitenstein
ADMINISTRATOR:	Linda Delaplain
DEPT/DIV.:	Public Works Department/Public Works
*CEORDR AUTH. NAME:	

ACCT. CODE:		AMOUNT:	$
ACCT. CODE:		AMOUNT:	$
ACCT. CODE:		AMOUNT:	$
		TOTAL:	$

NOTES:

This cover sheet and the City's original contract are to be sent to the City Recorder. The contractor should receive one original. The department is advised to keep a copy of the contract.