TUALATIN CITY PLANNING COMMISSION MEETING

THURSDAY, OCTOBER 17, 2019; 6:30 PM

JUANITA POHL CENTER
8513 SW TUALATIN ROAD
TUALATIN, OR 97062

CALL TO ORDER & ROLL CALL

Members: William Beers (Chair), Mona St. Clair (Vice-Chair), Alan Aplin, Janelle Thompson, Daniel Bachhuber, Mitch Green, and Ursula Kuhn.

ANNOUNCEMENTS & PLANNING COMMISSION COMMUNICATION

APPROVAL OF MINUTES

1. Approval of June 20, 2019 TPC Minutes.

COMMUNICATION FROM THE PUBLIC (NOT ON THE AGENDA)

Limited to 3 minutes

ACTION ITEMS

1. Consideration of amendments to the Tualatin Community Plan, Development Code, Transportation System Plan, and Maps and Figures (PTA-19-0003 and PMA-19-0003) reflecting the 2018 update to the Tualatin Parks and Recreation Master Plan.

2. Consideration of Amendments to the Tualatin Community Plan (PTA-19-0004) reflecting the 2019 updates to the Tualatin Sewer Master Plan.

COMMUNICATION FROM CITY STAFF

FUTURE ACTION ITEMS

1. Tualatin 2040 Project Update

ADJOURNMENT

Item Attachment Documents:

1. Approval of June 20, 2019 TPC Minutes.

City of Tualatin

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UNOFFICIAL

TUALATIN PLANNING COMMISSION **MINUTES OF June 20, 2019**

TPC MEMBERS PRESENT:	**STAFF PRESENT**
Mona St. Clair	Steve Koper
Alan Aplin	Karen Perl Fox
Janelle Thompson	Tabitha Boschetti
	Erin Engman
TPC MEMBERS ABSENT: Bill Beers, Travis Stout	Lynette Sanford

GUESTS: Dan Reif, Jaime Crawford, Lance Wargnier, Suzannah Stanley, Ben Schonberger, Bill Poulos, Ray Payne

1. CALL TO ORDER AND ROLL CALL:

Vice-chair St. Clair called the meeting to order at 6:50 pm and reviewed the agenda. Roll call was taken.

2. APPROVAL OF MINUTES:

Vice-chair St. Clair asked for approval of the May 16, 2019 TPC minutes.
MOTION by Thompson SECONDED by Aplin to approve the minutes as written.
MOTION PASSED 3-0.

3. COMMUNICATION FROM THE PUBLIC (NOT ON THE AGENDA)

None

4. ACTION ITEMS:

A. Mutual Materials conditional Use Permit (CUP 19-0001) for wholesale sale of building materials and supplies.

Vice-chair St. Clair read the script for quasi-judicial hearings and asked the Commission members if they had a conflict of interest, bias, or ex parte contact with the applicant. The Commission members stated that they had none.

Erin Engman, Associate Planner, entered the staff report and attachments into the record. Ms. Engman stated that the issue before the Planning Commission is consideration of a Conditional Use Permit (CUP 19-0001) for the wholesale sales of building materials and supplies, specifically for the sale of bricks and pavers by Mutual Materials at 10700 SW Tualatin-Sherwood Rd (TLID 2S127AA2100).

Ms. Engman explained that the site is an undeveloped 5-acre site in the General Manufacturing (MG) zone located off Tualatin-Sherwood Road. A similar conditional use permit and architectural review request was granted in 2008 but had expired.

Ms. Engman noted that the purpose of a conditional use permit is to provide standards for conditional uses of land/structures which, because of their unique characteristics relative to location, design, size, operation, circulation and public interest, require special consideration.

Ms. Engman stated that the applicant must provide evidence to demonstrate that the proposed use satisfies the following criteria:

a. The use is listed as a conditional use in the underlying zone;

b. The characteristics of the site are suitable for the proposed use, considering size, shape, location, topography, existence of improvements and natural features;

c. The proposed development is timely, considering the adequacy of transportation systems public facilities, and services existed or planned for the area affected by the use;

d. The proposed use will not alter the character of the surrounding area in any manner that substantially limits, impairs, or precludes the use of surrounding properties for the primary uses listed in the underlying zone; and

e. The proposal satisfies those objectives and policies of the Tualatin Community Plan that are applicable to the proposed use.

Ms. Engman explained that based on the application materials and the analysis and findings presented, staff recommends approval for the sale of bricks and pavers with the following conditions of approval:

1. Site improvements to support the wholesale sales of building materials and supplies approved under CUP 19-0001 must be constructed as conditioned under AR 19-0003 approval.

2. On-site retail sales to the general public must remain limited and incidental to wholesale sale of building materials and supplies.

3. Hours of operation shall be limited to 6:30 am to 4:00 pm Monday through Friday and 9:00 am to 3:00 pm on Saturdays between the months of April through October.

4. On-site showroom space must be limited to 4,200 sf of indoor space and 9.000 sf of outdoor space

5. Any modification to these conditions of approval will be subject to additional Conditional Use Permit application review.

Mr. Aplin asked if the application submitted in 2008 was similar to this one. Ms. Engman replied that it is very similar. Steve Koper, Planning Manager, added that the downturn impeded the establishment of the use. Ms. St. Clair asked if we have received any comments on this proposal. Ms. Engman replied that we have received comments from partner agencies but not from the public.

Lance Wargnier, Mutual Materials, 10700 SW Tualatin-Sherwood Rd, Tualatin, OR

Mr. Wargnier stated that he is the Oregon Operations Manager at Mutual Materials. Mr. Wargnier indicated that Mutual Materials provides high quality masonry materials used to build hospitals, schools, stadiums, and homes. It is a family-owned business, which has grown to operate 10 manufacturing plants and 16 branches throughout many states. Mr. Wargnier noted that their primary customer base includes architects, designers, builders, contractors, and distributors. Their primary customer is wholesale businesses, but they also serve retail customers on occasion.

Suzannah Stanley, Mackenzie, 1515 SE Water Ave, Portland, OR

Suzannah Stanley, Land Use Planner, noted that the use of Mutual Materials is considered wholesale sales of building materials and supplies. A similar approval was completed 10 years ago, which has expired.

Ms. Stanley showed an example of a similar design located in Vancouver and a conceptual design of the proposed Tualatin site. Ms. Stanley added that the site is off Tualatin-Sherwood Road and will not be visible from the street.

Ms. Stanley went through the wholesale use descriptions from the Development Code and the approval criteria. Ms. Stanley added that this site would be mainly wholesale sales; retail sales to the general public will be limited.

Ms. Stanley explained that the proposed development is timely, considering the adequacy of transportation system, public facilities, and services existing or planned for the area affected by the use. The traffic study showed that this is not a huge trip generator with the peak traffic being in the middle of the afternoon, not rush hour.

Ms. Stanley stated that the hours of operation have been provided to staff as

defined in Condition of Approval #3. Ms. Stanley added that although Mutual Materials plan on abiding by these hours of operation, listing the hours as a condition of approval is limiting and she would like it removed.

Vice-chair St. Clair asked what the hours of operations were altered, what would the change be. Mr. Wargnier replied that most of their customers arrive early; if they added hours, it would be an extra hour on Saturdays. Ms. Stanley added that one of the conditions of this approval is that a new review will be required if changes were made or if the hours of operation are extended in the future.

Commissioner Thompson asked if a retail customer would be turned away. Mr. Wargnier responded that they will sell to the public, but they will be encouraged to go elsewhere due to the higher price point. Vice-chair St. Clair asked how many employees will be on-site. Mr. responded that there are approximately 10 employees total. Ms. Thompson asked how many delivery trucks are on-site. Mr. Wargnier responded that there is one.

Hearing no further testimony, the hearing was closed.

Vice-chair St. Clair asked if the applicant would like to waive the 7-day waiting period. Ms. Stanley answered affirmatively.

MOTION by Commissioner Thompson with SECONDED by Commissioner Aplin to approve CUP 19-0001 with the removal of Condition of Approval #3. MOTION PASSED 3-0.

B. PGE Integrated Operations Center Conditional Use Permit (CUP 19-0002) for a wireless communications facility (WCF) and Variance (VAR 19-0001) for WCF height and fence setbacks.

Vice-chair St. Clair read the script for quasi-judicial hearings and asked the Commission members if they had a conflict of interest, bias, or ex parte contact with the applicant. The Commission members stated that they had none.

Tabitha Boschetti, Assistant Planner, entered the staff report and attachments into the record. Ms. Boschetti stated that the issue before the Planning Commission is to discuss a Conditional Use Permit and Variance for the proposed PGE Integrated Operations Center located at 12150 SW Tualatin-Sherwood Road. The Architectural Review Board meeting for this project is scheduled for July 24, 2019.

Ms. Boschetti explained that the Conditional Use Permit (CUP 19-0002) is for a wireless communication facility (WCF) and the Variance (VAR 19-0001) is for two standards related to the height of the WCF and the required setback for the related security fence.

Ms. Boschetti noted that the site is comprised of 43 acres and recently annexed in the City of Tualatin. It is in the Manufacturing Business Park (MBP) zone. Ms. Boschetti stated that the primary use for this site is an integrated operations center (IOC) for PGE. The communications tower would be key to critical infrastructure functions that are part of the IOC development. Overall site development is subject to a separate Architectural Review approval (AR 19-0005).

Ms. Boschetti mentioned that the tower on this site is unique from other cell towers because it will be used specifically for utility service communication. Mr. Koper added that MBP is the only zone where WCFs require conditional use permit approval.

Ms. Boschetti explained that the first variance is would allow for the height of the WCF to be increased from 100 feet to 140 feet. The applicant's analysis shows that this is the minimum height necessary to support line-of-site communications with other regional towers.

Ms. Boschetti stated that the second variance would allow for a reduction in the minimum fence setback, from the standard of 50 feet from the right-of-way to 20 feet from the right-of-way, to meet federal security standards and minimize impacts to trees that will provide screening for the WCF.

Commissioner Aplin asked if the road is off 124th Avenue. Mr. Koper replied that the road is the future extension of Blake Street.

Ms. Boschetti stated that the findings demonstrate that the proposal meets the applicable criteria of the Tualatin Development Code and staff recommends approval of the Conditional Use Permit and Variance applications.

Commissioner Aplin asked if the cell tower purpose is for the exclusive use of PGE. Mr. Koper replied that it is solely for PGE; this is not a cell tower. Vice-chair St. Clair asked if this tower will interfere with the existing Verizon tower. Ms. Koper replied that it will not.

Commissioner Thompson inquired about when Blake Street will go through. Ms. Boschetti replied that it will be considered as part of the architectural review.

Vice-chair St. Clair asked if there was correspondence on this matter. Ms. Boschetti replied that she has not heard from the general public.

Ben Schonberger, Winterbrook Planning, 610 SW Alder St, Suite 810, Portland, OR 97205

Bill Poulos, SERA Architects, Inc, 338 NW 5th Ave, Portland, OR 97209

Mr. Schonberger stated that he is representing PGE and the Architectural Review application is for an IOC for PGE.

Bill Poulos explained that there is a need for PGE to have their own tower to monitor the grid. The proposed building will be 180,000 square feet on two stories. It will have a discreet presence and the fence surrounding the building is a federal requirement. Mr. Poulos added that the main secure entry will be off Blake Street and approximately 300 employees will work at the location.

Mr. Paulus noted that the fence location reduction from 50-20 feet is proposed to retain existing trees. They plan to plant an additional six trees and extensive landscaping. Commissioner Aplin asked if this center will replace the facility on Avery Street. Mr. Paulus stated that this doesn't replace the other facility; the uses in this new facility is currently located in downtown Portland.

Mr. Schonberger added that the surrounding area is largely comprised of industrial businesses, vacant lots, and the Tigard Sand and Gravel quarry. The nearest residential area is 3,700 feet away. The tower itself will be within the tree growth, hidden from other properties. Mr. Schonberger added that noise, dust, and odor will not be omitted by the tower.

Commissioner Aplin asked if this is near the BPA power lines. Mr. Schonberger replied that power lines are located farther south.

Ray Payne, Portland General Electric, 121 SW Salmon St, Portland, OR 97204

Mr. Payne stated that the WCF is critical component of the building and allows them to operate their distribution lines and to monitor and control the grid. Mr. Payne added that radio communication system is used to dispatch the field crew to restore power to customers. Mr. Payne mentioned that PGE owns their own frequency so interference is not a problem.

Mr. Schonberger indicated that the variance is for the fence setback. The proposed facility will be a secure site with a security fence surrounding it. Due to the trees and tower location, they have asked that the 50-foot setback be reduced to 20 feet to maximize ground level screening. Mr. Schonberger added that if this variance is approved, fewer trees will need to be removed.

Vice-chair St. Clair inquired about the height of the proposed fencing. Mr. Schonberger replied that it will be 8 feet in height. Commissioner Aplin asked if sidewalks are planned on the site. Mr. Koper replied that it will be paved and sidewalks are planned. Commissioner Thompson inquired if this project will interfere with the rock quarry. Mr. Schonberger replied that it will not.

Vice-chair St. Clair asked if they would like to waive the 7-day waiting period. Mr. Schonberger answered affirmatively. Vice-chair St. Clair closed the hearing.

MOTION by Commissioner Thompson, SECONDED by Commissioner Aplin to approve CUP 19-0002 and VAR 19-0001. MOTION PASSED 3-0.

5. COMMUNICATION FROM CITY STAFF

A. Tualatin 2040 Project Update

Karen Perl Fox, Senior Planner, presented an update on the progress made on the Tualatin 2040 project including: public engagement, policy issue identification, a Housing Needs Analysis, an Economic Opportunity Analysis and the next steps in this project.

Ms. Perl Fox stated that in late 2018, Phase I was completed. In January 2019, the City launched the Tualatin 2040 project to carry out the next phase of the larger project, a policy phase that may lead to policy updates to the Comprehensive Plan and Development Code regulations.

Ms. Perl Fox stated that we are currently in the policy issue identification phase. The project team met with a wide range of stakeholders to share their interests, concerns and ideas regarding land use planning in Tualatin. Ms. Perl Fox stated that the top concerns were:

- Housing and Livability
- Transportation and Parking
- Civic Identity and Downtown
- Employment and Industrial Development
- Parks, Open Space and the Environment
- Community Engagement
- Equity, Diversity and Inclusion

Ms. Perl Fox explained that a Housing Needs Analysis examines a City's available residential land supply and forecasts future housing needs based on demographic trends to determine whether a city can accommodate future growth, or whether additional land supply is needed and/or growth can be accommodated through policy and regulatory changes.

Ms. Perl Fox noted that a Community Advisory Committee (CAC) provides community input for the analysis and a Technical Advisory Committee (TAC) provides the technical expertise for the analysis. There are a total of seven planned CAC meetings and four TAC meetings.

Ms. Perl Fox went through the presentation that detailed the process for developing the housing strategy, graphs of cost burden by tenure, buildable lands inventory, preliminary capacity results, and strategic housing issues.

Ms. Perl Fox mentioned that the next steps in the process include two Open House events in July and September. In addition, the City will be conducting additional advisory, commission, and council meetings in the fall. The Draft Prioritization Plan will be available for public review in October/November 2019.

Commissioner Aplin asked if the study places a cap on the forecasted population. Ms. Perl Fox replied that the forecast is based on a formula from Metro. Mr. Koper added that this encompasses a 20-year look ahead in the housing forecast.

Commissioner Thompson inquired if other cities are going through this process. Ms. Perl Fox answered affirmatively.

Vice-chair St. Clair asked where the cost burden data come from. Ms. Perl Fox replied that it comes from the census. Vice-chair. St. Clair inquired if they are looking at adding low-income housing. Ms. Perl Fox said that this topic will be discussed in the upcoming months.

6. FUTURE ACTION ITEMS

Mr. Koper stated there are no future action items at this time.

7. ANNOUNCEMENTS/PLANNING COMMISSION COMMUNICATION

None.

8. ADJOURNMENT

Vice-chair St. Clair adjourned the meeting at 8:20 pm.

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Lynette Sanford, Office Coordinator

Item Attachment Documents:

1. Consideration of amendments to the Tualatin Community Plan, Development Code, Transportation System Plan, and Maps and Figures (PTA-19-0003 and PMA-19-0003) reflecting the 2018 update to the Tualatin Parks and Recreation Master Plan.

CITY OF TUALATIN
Staff Report

City of Tualatin

TO: Tualatin Planning Commissioners

FROM: Tabitha Boschetti, AICP, Assistant Planner
Steve Koper, AICP, Planning Manager

DATE: 10/17/2019

SUBJECT: Parks and Recreation Master Plan Update (PTA 19-0003 and PMA 19-0003)

ISSUE BEFORE TPC:

The Planning Commission is asked to provide a recommendation to the Tualatin City Council on a Plan Text Amendment and Plan Map Amendment proposing to update the City of Tualatin Comprehensive Plan, Development Code, and Transportation System Plan to reflect the previously adopted 2018 Parks and Recreation Master Plan.

RECOMMENDATION:

Staff respectfully requests that the Planning Commission forward a recommendation of approval to the City Council of the proposed amendments (PTA 19-0003 and PMA 19-0003).

EXECUTIVE SUMMARY:

On November 13, 2018, the City Council adopted the Tualatin Parks and Recreation Master Plan (Resolution No. 5407-18), representing the first full update of the Master Plan since 1983. With that Resolution, the Council directed staff to prepare Comprehensive Plan Amendments consistent with the updated Parks and Recreation Master Plan.

In order to further implement the Parks and Recreation Master Plan, the proposed Plan Text Amendment would amend the following Chapters of the Tualatin Development Code (TDC): 11, 15, 36, 41-44, 49-52, 55, 57, 60, 61, 64, 72, and 74. The proposed text amendments primarily serve to update references to the Parks and Recreation Master Plan.

The proposed Plan Map Amendment would update trail designations in consistent with the updated Parks and Recreation Master Plan, and delete Figure 3-4 (Recreation Resources) which is superseded by Master Plan Figure 3. Figure 11-4 (Bicycle and Pedestrian Master Plan) and Map 72-2 (Greenway and Trail Development Plan), would be updated to include the Ice Age Tonquin Trail alignment identified in the Master Plan. The proposed Plan Map Amendment would also remove Map 74-1 (Street Tree Plantings), identifying street tree species by geographic area, and adding corresponding regulations to the development code consistent with urban forestry best practices.

City of Tualatin

CITY OF TUALATIN
Staff Report

OUTCOMES OF DECISION:

A recommendation of approval of the proposed amendments (PTA-19-0003 and PMA-19-0003) to the City Council would support updating the Tualatin Comprehensive Plan, Development Code, and Transportation System Plan consistent with the recently-adopted Parks and Recreation Master Plan (2018).

ALTERNATIVES TO RECOMMENDATION:

The Planning Commission may alternatively:

- Recommend approval of the proposed amendments (PTA 19-0003 and PMA 19-0003) to the City Council with further amendments.
- Continue the consideration of a recommendation on the proposed amendments (PTA-19-0003 and PMA-19-0003) to a later date.
- Recommend denial of the proposed amendments (PTA 19-0003 and PMA 19-0003) to the City Council.

FINANCIAL IMPLICATIONS:

N/A

ATTACHMENTS:

- Findings and Analysis
- Exhibit A: Proposed Text Amendments
- Exhibit B: TDC Figure 11-4 Bicycle and Pedestrian Plan (Updated)
- Exhibit C: TDC Map 72-2 Greenway and Trail Development Plan (Updated)
- Exhibit D: TDC Map 74-1 (Deletion)
- Exhibit E: Figure 3-4 from 1983 Parks and Recreation Master Plan
- Exhibit F: Parks and Recreation Master Plan (2018)

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October 17, 2019

Analysis and Findings for
PTA 19-0003 and PMA 19-0003

Case #:	PTA 19-0003 and PMA 19-0003
Project:	Parks and Recreation Master Plan

TABLE OF CONTENTS

I. INTRODUCTION

A. Applicable Criteria

Applicable Statewide Planning Goals; Division 34 of the Oregon Administrative Rules; Title 4 of Metro Chapter 3.07 (Urban Growth Management Functional Plan); applicable Goals and Policies from the City of Tualatin Comprehensive Plan; City of Tualatin Development Code, including Section 33.070 (Plan Amendments).

B. Project Description

City Council adopted the Tualatin Parks and Recreation Master Plan on November 13, 2018 with Resolution No. 5407-18, representing the first full update of the Master Plan since 1983. With that Resolution, the Council directed staff to prepare Comprehensive Plan Amendments related to the Parks and Recreation Master Plan.

In order to further implement the Parks and Recreation Master Plan, Plan Text Amendment (PTA) 19-0003 proposes amendments to Tualatin Development Code (TDC) Chapters 11, 15, 36, 41-44, 49-52, 55, 57, 60, 61, 64, 72, and 74. The proposed text amendments primarily serve to update references to the Parks and Recreation Master Plan.

The Plan Map Amendment (PMA) 19-0003 updates trail designations in line with the Parks and Recreation Master Plan. Specifically, PMA 19-0003 would follow the adoption of the Ice Age Tonquin Trail Master Plan into the Parks and Recreation Master Plan by adopting this proposed trail alignment into the Tualatin Development Code, following up on Resolution 5133-13 directing staff to implement the Ice Age Tonquin Trail Master Plan. PMA 19-0003 would also remove a map depicting zones for street tree planting, which does not reflect current practice informed by modern urban forestry.

C. Exhibit List

(a) Proposed Amended Tualatin Development Code Amendments
(b) TDC Figure 11-4: Bicycle and Pedestrian Plan (Updated)
(c) TDC Map 72-2: Greenway and Trail Development Plan (Updated)
(d) TDC Map 74-1: Street Tree Plantings (Deleted)
(e) Figure 3-4 (Recreation Resources) from 1983 Parks and Recreation Master Plan
(f) Parks and Recreation Master Plan (2018)

D. Proposed Amendments

The following Comprehensive Plan Text Amendments, Development Code Text Amendments, and Map Amendments have been proposed (Figure 1).

Figure 1: Summary of Proposed Amendments

Subject	Proposed Action	Notes
MAPS AND FIGURES		
Figure 3-4 (Recreation Resources) of the Parks Master Plan	Eliminate references to outdated Parks Master Plan figure in the Tualatin Development Code.	TDC contains references to "Other Natural Areas" in Figure 3-4 of the Parks Master Plan. The updated Master Plan does not retain this figure.
TDC Figure 11-4: Bicycle and Pedestrian Master Plan	Update to reflect greenway trail changes as seen in Map 3 of Parks and Recreation Master Plan and promote consistency between Figure 72-2 and Figure 11-4.	
TDC Map 72-2: Greenway and Trail Development Plan	Update to reflect greenway trail changes as seen in Map 3 of Parks and Recreation Master Plan and promote consistency between Figure 72-2 and Figure 11-4.	
TDC Map 74-1: Street Tree Planting	Delete	Map 74-1 exists solely to distinguish between two different zones of permitted street tree plantings. This package of amendments proposes to unify the list of permitted street trees and remove the arbitrary regional distinction between where different trees are allowed, reflecting current discretionary practice otherwise allowed by code.
TUALATIN COMMUNITY PLAN		
TDC 15.010	Generalize document references (e.g. "Parks and Recreation Master Plan" in place of discussing the background of the 1983 plan).	
TDC 15.020(18)	Update objective.	New language more inclusive.
TDC 15.100	Update references to refer to the relevant code maps.	
TUALATIN DEVELOPMENT CODE		
• TDC 36.400(5)(b) • TDC 41.320(3)(b) • TDC 42.320(3)(b) • TDC 43.320(3)(b) • TDC 44.320(3)(b) • TDC 49.320(3)(b) • TDC 50.310(2)(b) • TDC 51.310(3)(b)	Delete references to Figure 3-4.	

Subject	Proposed Action	Notes
• TDC 52.310(2)(b) • TDC 55.310(2)(b) • TDC 60.310(4)(b) • TDC 61.310(3)(b) • TDC 64.310(7)(b)		
TDC 36.400(5)	Delete references to Figure 3-4.	
TDC Chapter 31 Definitions: *Fish and Wildlife Habitat Area*	Delete references to Figure 3-4.	
TDC 57.100	Delete references to Figure 3-4.	
TDC 72.010	Delete references to Figure 3-4.	
TDC 72.070	Replace reference to "approved plant list" in Parks Master Plan with general reference to native species.	The updated Parks and Recreation Master Plan dispenses with an approved plant list. This section only applies to plant selection for paths in designated greenways.
TDC 72.055	Delete references to Figure 3-4 and Parks Master Plan page numbers.	Page number references are outmoded.
TDC 72.085	Delete reference to “Other Natural Areas.”	
TDC 72.090	Delete reference to “Other Natural Areas.”	
TDC 72.100	Delete reference to “Other Natural Areas.”	
TDC 72.110	Update map references to include specific figures and consistent document names.	
TDC Table 74-1	Modify street tree list.	Parks and Recreation desires to update street tree list to expand number or explicitly allowed trees.
TDC 74.705(3)	Replace references to "Schedule A" with "Table 74-1.”	Table was renamed with January 2019 code update.
TDC 74.707	Replace references to "Schedule A" with "Table 74-1.”	Table was renamed with January 2019 code update.

II. FINDINGS

A. Oregon Statewide Planning Goals

The following Oregon Statewide Planning Goals are applicable to the proposed amendments:

Goal 1 – Citizen Involvement

To develop a citizen involvement program that insures the opportunity for citizens to be involved in all phases of the planning process.

Finding:

The Parks and Recreation Master Plan was adopted by City Council in November 2018 following an 18-month planning and public involvement period. The Master Plan update and this Plan Text/Plan Map Amendment were additionally considered by the Tualatin Parks and Recreation Advisory Committee. Prior to consideration by City Council, additional notice is to be delivered to property owners where future trail development has been designated, in compliance with ORS 227.175. The proposed amendments conform to Goal 1.

Goal 2 – Land Use Planning

To establish a land use planning process and policy framework as a basis for all decision and actions related to use of land and to assure an adequate factual base for such decisions and actions.

[…]

Finding:

The proposed amendments have been reviewed pursuant to the City's established land use planning process and procedures. The existing land use plan references the previous version of the Parks and Recreation Master Plan, and it is appropriate to incorporate changes into the Comprehensive Plan and Development Code. The proposed amendments conform to Goal 2.

Goal 5 – Open Spaces, Scenic and Historic Area, and Natural Resource

Finding:

Applicability of Goal 5 to post-acknowledgment plan amendments is governed by OAR 660- 023-0250. The proposed map amendments do not modify the acknowledged Goal 5 resource list, or a policy that addresses specific requirements of Goal 5. The proposed amendments do not allow uses that would conflict with a particular Goal 5 resource site on an acknowledged resource list. The proposed amendments conform to Goal 5.

Goal 6 – Air, Water and Land Resources Quality

Finding:

The proposal does not affect policies associated with Goal 6 established by the Comprehensive Plan. As reported in the previous findings for Goal 5, the proposed Comprehensive Plan/Zoning Map Amendment will continue to preserve environmentally sensitive lands. The Oregon Department of

Environmental Quality (DEQ) regulates air, water and land with Clean Water Act (CWA) Section 401 Water Quality, Water Quality Certificate, State 303(d) listed waters, Hazardous Wastes, Clean Air Act (CAA), and Section 402 NPDES Construction and Stormwater Permits. The Oregon Department of State Lands and the U.S. Army Corps of Engineers regulate jurisdictional wetlands and CWA Section 404 water of the state and the country respectively. Clean Water Services (SWC) coordinates storm water management, water quality and stream enhancement projects throughout the city. Future development of trails or parks facilities as indicated by the Parks and Recreation Master Plan will still need to comply with these state, national and regional regulations and protections for air, water and land resources. The proposed amendments conform to Goal 6.

Goal 7 – Areas Subject to Natural Disasters and Hazards

Finding:

The proposed amendments do not affect policies associated with Goal 7 established by the Comprehensive Plan. Approval of the proposed amendments will not eliminate the requirement for future development to meet the requirements of the Chapters 70 and 72 of the Tualatin Development Code. The proposed amendments conform to Goal 7.

Goal 9 – Economy of the State

To provide adequate opportunities throughout the state for a variety of economic activities vital to the health, welfare, and prosperity of Oregon's citizens.

[…]

Finding:

The proposed amendments have a limited impact on future economic activities beyond the development of trails and parks facilities. The general health, welfare, and prosperity of Oregon's citizens is enhanced by access to a robust parks network and clarity in planning for regional trails. The proposed amendments conform to Goal 9.

Goal 11 – Public Facilities and Services

Finding:

The proposed code supports the development of trails and parks facilities, which would enhance local and regional services, while not significantly impacting other local transportation and utility facilities. No other amendments to the public facilities plans are necessary in order to accommodate the proposed map amendment. The proposed amendments conform to Goal 11.

Goal 12 – Transportation

To provide and encourage a safe, convenient and economic transportation system.

[…]

Goal 12 requires the provision and encouragement of a safe, convenient, multimodal and economic transportation system. The proposed map amendments apply to both Chapter 11, Transportation, and Chapter 72, Natural Resource Protection Overlay District. These changes to Map 11-4 would present a more consistent depiction of the bicycle and pedestrian plan as it has been established in the Transportation System Plan, as well as paths established by local and regional trail planning, more accurately depicting planned networks and providing a more user-friendly map. The proposed amendments would support multimodal transportation, and are consistent with the City's acknowledged policies and strategies for the provision of transportation facilities and services as required by Goal 12 the Transportation Planning Rule (TPR), the findings for which are found under Oregon Administrative Rules Chapter 660, Division 12. The proposed amendments would add to the potential network of future multimodal trails, and otherwise have little impact on the transportation system; these changes conform to Goal 12.

B. Oregon Administrative Rules
The following Oregon Administrative Rules (OAR) are applicable to the proposed amendments:

OAR Chapter 660, Division 12 (Transportation Planning)
[…]
660-012-0010
Transportation Planning
(1) As described in this division, transportation planning shall be divided into two phases: transportation system planning and transportation project development. Transportation system planning establishes land use controls and a network of facilities and services to meet overall transportation needs. Transportation project development implements the TSP by determining the precise location, alignment, and preliminary design of improvements included in the TSP.
(2) It is not the purpose of this division to cause duplication of or to supplant existing applicable transportation plans and programs. Where all or part of an acknowledged comprehensive plan, TSP either of the local government or appropriate special district, capital improvement program, regional functional plan, or similar plan or combination of plans meets all or some of the requirements of this division, those plans or programs may be incorporated by reference into the TSP required by this division. Only those referenced portions of such documents shall be considered to be a part of the TSP and shall be subject to the administrative procedures of this division and ORS Chapter 197.
(3) It is not the purpose of this division to limit adoption or enforcement of measures to provide convenient bicycle and pedestrian circulation or convenient access to transit that are otherwise consistent with the requirements of this division.

Finding:
The proposed Plan Text Amendment and Plan Map Amendment would update the Transportation System Plan (TSP) consistent with all applicable provisions of Division 12. The previously adopted TSP is consistent with 660-012-0010. As provided under this subsection, development of any specific trails and supporting amenities will be addressed separately at the appropriate time. The proposed amendments are consistent with these requirements.

660-012-0015
Preparation and Coordination of Transportation System Plans
(1) ODOT shall prepare, adopt and amend a state TSP in accordance with ORS 184.618, its program for state agency coordination certified under ORS 197.180, and OAR 660-012-0030, 660-012-0035, 660-012-0050, 660-012-0065 and 660-012-0070. The state TSP shall identify a system of transportation facilities and services adequate to meet identified state transportation needs:
(a) The state TSP shall include the state transportation policy plan, modal systems plans and transportation facility plans as set forth in OAR chapter 731, division 15;
(b) State transportation project plans shall be compatible with acknowledged comprehensive plans as provided for in OAR chapter 731, division 15. Disagreements between ODOT and affected local governments shall be resolved in the manner established in that division.
(2) MPOs and counties shall prepare and amend regional TSPs in compliance with this division. MPOs shall prepare regional TSPs for facilities of regional significance within their jurisdiction. Counties shall prepare regional TSPs for all other areas and facilities:
(a) Regional TSPs shall establish a system of transportation facilities and services adequate to meet identified regional transportation needs and shall be consistent with adopted elements of the state TSP;
(b) Where elements of the state TSP have not been adopted, the MPO or county shall coordinate the preparation of the regional TSP with ODOT to assure that state transportation needs are accommodated;
(c) Regional TSPs prepared by MPOs other than metropolitan service districts shall be adopted by the counties and cities within the jurisdiction of the MPO. Metropolitan service districts shall adopt a regional TSP for areas within their jurisdiction;
(d) Regional TSPs prepared by counties shall be adopted by the county.
(3) Cities and counties shall prepare, adopt and amend local TSPs for lands within their planning jurisdiction in compliance with this division:
(a) Local TSPs shall establish a system of transportation facilities and services adequate to meet identified local transportation needs and shall be consistent with regional TSPs and adopted elements of the state TSP;
(b) Where the regional TSP or elements of the state TSP have not been adopted, the city or county shall coordinate the preparation of the local TSP with the regional transportation planning body and ODOT to assure that regional and state transportation needs are accommodated.
(4) Cities and counties shall adopt regional and local TSPs required by this division as part of their comprehensive plans. Transportation financing programs required by OAR 660-012-0040 may be adopted as a supporting document to the comprehensive plan.
(5) The preparation of TSPs shall be coordinated with affected state and federal agencies, local governments, special districts, and private providers of transportation services.
(6) Mass transit, transportation, airport and port districts shall participate in the development of TSPs for those transportation facilities and services they provide. These districts shall prepare and adopt plans for transportation facilities and services they provide. Such plans shall be consistent with and adequate to carry out relevant portions of applicable regional and local TSPs. Cooperative agreements executed under ORS 197.185(2) shall include the requirement that mass transit, transportation, airport and port districts adopt a plan consistent with the requirements of this section.

(7) Where conflicts are identified between proposed regional TSPs and acknowledged comprehensive plans, representatives of affected local governments shall meet to discuss means to resolve the conflicts. These may include:
(a) Changing the draft TSP to eliminate the conflicts; or
(b) Amending acknowledged comprehensive plan provision to eliminate the conflicts;
(c) For MPOs which are not metropolitan service districts, if conflicts persist between regional TSPs and acknowledged comprehensive plans after efforts to achieve compatibility, an affected local government may petition the Commission to resolve the dispute.

Finding:
The proposed amendments comply with all of the applicable requirements for preparation, coordination and adoption of TSPs required under this section of the TPR. Given that the Plan Map Amendment is proposed to bring the Tualatin Development Code maps into alignment with Metro and Washington County trail maps, along with the City's Parks and Recreation Master Plan, the goal of improving consistency between levels of government is furthered by the proposed changes. Furthermore:

- The TSP and amendments are incorporated as part of the City's Comprehensive Plan.
- As described above, the preparation of proposed amendments followed the process in place for the development of the TSP and was closely coordinated with affected government agencies and service providers.
- OAR 660-012-0015 also requires that regional TSPs, such as Metro's RTP, be coordinated with state transportation plans and policies, such as those found in the Oregon Highway Plan (OHP). Both ODOT and Metro assisted in the development of the plans incorporated into the TSP. The proposed amendments are consistent with these requirements.

660-012-0016
Coordination with Federally-Required Regional Transportation Plans in Metropolitan Areas
(1) In metropolitan areas, local governments shall prepare, adopt, amend and update transportation system plans required by this division in coordination with regional transportation plans (RTPs) prepared by MPOs required by federal law. Insofar as possible, regional transportation system plans for metropolitan areas shall be accomplished through a single coordinated process that complies with the applicable requirements of federal law and this division. Nothing in this rule is intended to make adoption or amendment of a regional transportation plan by a metropolitan planning organization a land use decision under Oregon law.
(2) When an MPO adopts or amends a regional transportation plan that relates to compliance with this division, the affected local governments shall review the adopted plan or amendment and either:
(a) Make a finding that the proposed regional transportation plan amendment or update is consistent with the applicable provisions of adopted regional and local transportation system plan and comprehensive plan and compliant with applicable provisions of this division; or
(b) Adopt amendments to the relevant regional or local transportation system plan that make the regional transportation plan and the applicable transportation system plans consistent with one another and compliant with applicable provisions of this division. Necessary plan amendments or updates shall be prepared and adopted in coordination with the federally-required plan update or amendment. Such amendments shall be initiated no later than 30 days from the adoption of the RTP amendment or update and shall be adopted no later than one year from the adoption of the RTP amendment or update or according to a work plan approved by the commission. A plan amendment is

"initiated" for purposes of this subsection where the affected local government files a post-acknowledgement plan amendment notice with the department as provided in OAR chapter 660, division 18.
(c) In the Portland Metropolitan area, compliance with this section shall be accomplished by Metro through adoption of required findings or an amendment to the regional transportation system plan.
(3) Adoption or amendment of a regional transportation plan relates to compliance with this division for purposes of section (2) if it does one or more of the following:
(a) Changes plan policies;
(b) Adds or deletes a project from the list of planned transportation facilities, services or improvements or from the financially-constrained project list required by federal law;
(c) Modifies the general location of a planned transportation facility or improvement;
(d) Changes the functional classification of a transportation facility; or
(e) Changes the planning period or adopts or modifies the population or employment forecast or allocation upon which the plan is based.
(4) The following amendments to a regional transportation plan do not relate to compliance with this division for purposes of section (2):
(a) Adoption of an air quality conformity determination;
(b) Changes to a federal revenue projection;
(c) Changes to estimated cost of a planned transportation project; or
(d) Deletion of a project from the list of planned projects where the project has been constructed or completed.
(5) Adoption or amendment of a regional transportation plan that extends the planning period beyond that specified in the applicable acknowledged comprehensive plan or regional transportation system plan is consistent with the requirements of this rule where the following conditions are met:
(a) The future year population forecast is consistent with those issued or adopted under ORS 195.033 or 195.036;
(b) Land needed to accommodate future urban density population and employment and other urban uses is identified in a manner consistent with Goal 14 and relevant rules;
(c) Urban density population and employment are allocated to designated centers and other identified areas to provide for implementation of the metropolitan area's integrated land use and transportation plan or strategy; and
(d) Urban density population and employment or other urban uses are allocated to areas outside of an acknowledged urban growth boundary only where:
(A) The allocation is done in conjunction with consideration by local governments of possible urban growth boundary amendments consistent with Goal 14 and relevant rules, and
(B) The RTP clearly identifies the proposed UGB amendments and any related projects as illustrative and subject to further review and approval by the affected local governments.

Finding:
The proposed map changes reflect trail alignments that are already contained within the 2018 Regional Transportation Plan, which in turn is consistent with the Regional Transportation Functional Plan (RTFP). The proposed amendments are consistent with these requirements.

660-012-0020
Elements of Transportation System Plans
(1)A TSP shall establish a coordinated network of transportation facilities adequate to serve state, regional and local transportation needs.
(2) The TSP shall include the following elements:
(a) A determination of transportation needs as provided in OAR 660-012-0030;
(b) A road plan for a system of arterials and collectors and standards for the layout of local streets and other important non-collector street connections. Functional classifications of roads in regional and local TSP's shall be consistent with functional classifications of roads in state and regional TSP's and shall provide for continuity between adjacent jurisdictions. The standards for the layout of local streets shall provide for safe and convenient bike and pedestrian circulation necessary to carry out OAR 660-012-0045(3)(b). New connections to arterials and state highways shall be consistent with designated access management categories. The intent of this requirement is to provide guidance on the spacing of future extensions and connections along existing and future streets which are needed to provide reasonably direct routes for bicycle and pedestrian travel. The standards for the layout of local streets shall address:
(A) Extensions of existing streets;
(B) Connections to existing or planned streets, including arterials and collectors; and
(C) Connections to neighborhood destinations.
(c) A public transportation plan which:
(A) Describes public transportation services for the transportation disadvantaged and identifies service inadequacies;
(B) Describes intercity bus and passenger rail service and identifies the location of terminals;
(C) For areas within an urban growth boundary which have public transit service, identifies existing and planned transit trunk routes, exclusive transit ways, terminals and major transfer stations, major transit stops, and park-and-ride stations. Designation of stop or station locations may allow for minor adjustments in the location of stops to provide for efficient transit or traffic operation or to provide convenient pedestrian access to adjacent or nearby uses.
(D) For areas within an urban area containing a population greater than 25,000 persons, not currently served by transit, evaluates the feasibility of developing a public transit system at buildout. Where a transit system is determined to be feasible, the plan shall meet the requirements of paragraph (2)(c)(C) of this rule.
(d) A bicycle and pedestrian plan for a network of bicycle and pedestrian routes throughout the planning area. The network and list of facility improvements shall be consistent with the requirements of ORS 366.514;
(e) An air, rail, water and pipeline transportation plan which identifies where public use airports, mainline and branchline railroads and railroad facilities, port facilities, and major regional pipelines and terminals are located or planned within the planning area. For airports, the planning area shall include all areas within airport imaginary surfaces and other areas covered by state or federal regulations;
(f) For areas within an urban area containing a population greater than 25,000 persons a plan for transportation system management and demand management;
(g) A parking plan in MPO areas as provided in OAR 660-012-0045(5)(c);
(h) Policies and land use regulations for implementing the TSP as provided in OAR 660-012-0045;

(i) For areas within an urban growth boundary containing a population greater than 2500 persons, a transportation financing program as provided in OAR 660-012-0040.
(3) Each element identified in subsections (2)(b)–(d) of this rule shall contain:
(a) An inventory and general assessment of existing and committed transportation facilities and services by function, type, capacity and condition:
(A) The transportation capacity analysis shall include information on:
(i) The capacities of existing and committed facilities;
(ii) The degree to which those capacities have been reached or surpassed on existing facilities; and
(iii) The assumptions upon which these capacities are based.
(B) For state and regional facilities, the transportation capacity analysis shall be consistent with standards of facility performance considered acceptable by the affected state or regional transportation agency;
(C) The transportation facility condition analysis shall describe the general physical and operational condition of each transportation facility (e.g., very good, good, fair, poor, very poor).
(b) A system of planned transportation facilities, services and major improvements. The system shall include a description of the type or functional classification of planned facilities and services and their planned capacities and performance standards;
(c) A description of the location of planned facilities, services and major improvements, establishing the general corridor within which the facilities, services or improvements may be sited. This shall include a map showing the general location of proposed transportation improvements, a description of facility parameters such as minimum and maximum road right of way width and the number and size of lanes, and any other additional description that is appropriate;
(d) Identification of the provider of each transportation facility or service.

Finding:
The proposed update to the TSP, together with the previously adopted and acknowledged comprehensive plan, includes all of the elements required by the TPR, and the proposed amendments are consistent with OAR-660-012-0020. The proposed amendments modify the TSP and Concept Plan only to the extent of modifying Figure 11-4: Bicycle and Pedestrian System to be consistent with local and regional trails that would be managed by Tualatin Parks and Recreation. The proposed amendments are consistent with these requirements.

660-012-0025
Complying with the Goals in Preparing Transportation System Plans; Refinement Plans
(1) Except as provided in section (3) of this rule, adoption of a TSP shall constitute the land use decision regarding the need for transportation facilities, services and major improvements and their function, mode, and general location.
(2) Findings of compliance with applicable statewide planning goals and acknowledged comprehensive plan policies and land use regulations shall be developed in conjunction with the adoption of the TSP.
(3) A local government or MPO may defer decisions regarding function, general location and mode of a refinement plan if findings are adopted that:
(a) Identify the transportation need for which decisions regarding function, general location or mode are being deferred;

(b) Demonstrate why information required to make final determinations regarding function, general location, or mode cannot reasonably be made available within the time allowed for preparation of the TSP;
(c) Explain how deferral does not invalidate the assumptions upon which the TSP is based or preclude implementation of the remainder of the TSP;
(d) Describe the nature of the findings which will be needed to resolve issues deferred to a refinement plan; and
(e) Set a deadline for adoption of a refinement plan prior to initiation of the periodic review following adoption of the TSP.
(4) Where a Corridor Environmental Impact Statement (EIS) is prepared pursuant to the requirements of the National Environmental Policy Act of 1969, the development of the refinement plan shall be coordinated with the preparation of the Corridor EIS. The refinement plan shall be adopted prior to the issuance of the Final EIS.

Finding:
Consistency with statewide goals is discussed in Section A; this requirement has been addressed. The updated trail maps support human-powered modes of transportation, and depict the function and location of said trails. The proposed amendments do not include any refinement planning nor an Environmental Impact Statement; OAR 660-12-0025(3) – (4) therefore does not apply.
The proposed amendments are consistent with these requirements.

[…]

660-012-0035
Evaluation and Selection of Transportation System Alternatives
(1) The TSP shall be based upon evaluation of potential impacts of system alternatives that can reasonably be expected to meet the identified transportation needs in a safe manner and at a reasonable cost with available technology. The following shall be evaluated as components of system alternatives:
(a) Improvements to existing facilities or services;
(b) New facilities and services, including different modes or combinations of modes that could reasonably meet identified transportation needs;
(c) Transportation system management measures;
(d) Demand management measures; and
(e) A no-build system alternative required by the National Environmental Policy Act of 1969 or other laws.
(2) Local governments in MPO areas of larger than 1,000,000 population shall, and other governments may also, evaluate alternative land use designations, densities, and design standards to meet local and regional transportation needs. Local governments preparing such a strategy shall consider:
(a) Increasing residential densities and establishing minimum residential densities within one quarter mile of transit lines, major regional employment areas, and major regional retail shopping areas;
(b) Increasing allowed densities in new commercial office and retail developments in designated community centers;
(c) Designating lands for neighborhood shopping centers within convenient walking and cycling distance of residential areas; and

(d) Designating land uses to provide a better balance between jobs and housing considering:
(A) The total number of jobs and total of number of housing units expected in the area or subarea;
(B) The availability of affordable housing in the area or subarea; and
(C) Provision of housing opportunities in close proximity to employment areas.
(3) The following standards shall be used to evaluate and select alternatives:
(a) The transportation system shall support urban and rural development by providing types and levels of transportation facilities and services appropriate to serve the land uses identified in the acknowledged comprehensive plan;
(b) The transportation system shall be consistent with state and federal standards for protection of air, land and water quality including the State Implementation Plan under the Federal Clean Air Act and the State Water Quality Management Plan;
(c) The transportation system shall minimize adverse economic, social, environmental and energy consequences;
(d) The transportation system shall minimize conflicts and facilitate connections between modes of transportation; and
(e) The transportation system shall avoid principal reliance on any one mode of transportation by increasing transportation choices to reduce principal reliance on the automobile. In MPO areas this shall be accomplished by selecting transportation alternatives which meet the requirements in section (4) of this rule.
(4) In MPO areas, regional and local TSPs shall be designed to achieve adopted standards for increasing transportation choices and reducing reliance on the automobile. Adopted standards are intended as means of measuring progress of metropolitan areas towards developing and implementing transportation systems and land use plans that increase transportation choices and reduce reliance on the automobile. It is anticipated that metropolitan areas will accomplish reduced reliance by changing land use patterns and transportation systems so that walking, cycling, and use of transit are highly convenient and so that, on balance, people need to and are likely to drive less than they do today.
(5) MPO areas shall adopt standards to demonstrate progress towards increasing transportation choices and reducing automobile reliance as provided for in this rule:
(a) The commission shall approve standards by order upon demonstration by the metropolitan area that:
(A) Achieving the standard will result in a reduction in reliance on automobiles;
(B) Achieving the standard will accomplish a significant increase in the availability or convenience of alternative modes of transportation;
(C) Achieving the standard is likely to result in a significant increase in the share of trips made by alternative modes, including walking, bicycling, ridesharing and transit;
(D) VMT per capita is unlikely to increase by more than five percent; and
(E) The standard is measurable and reasonably related to achieving the goal of increasing transportation choices and reducing reliance on the automobile as described in OAR 660-012-0000.
(b) In reviewing proposed standards for compliance with subsection (a), the commission shall give credit to regional and local plans, programs, and actions implemented since 1990 that have already contributed to achieving the objectives specified in paragraphs (A)–(E) above;
(c) If a plan using a standard, approved pursuant to this rule, is expected to result in an increase in VMT per capita, then the cities and counties in the metropolitan area shall prepare and adopt an integrated land use and transportation plan including the elements listed in paragraphs (A)–(E) below.

Such a plan shall be prepared in coordination with the MPO and shall be adopted within three years of the approval of the standard.
(A) Changes to land use plan designations, densities, and design standards listed in subsections (2)(a)–(d);
(B) A transportation demand management plan that includes significant new transportation demand management measures;
(C) A public transit plan that includes a significant expansion in transit service;
(D) Policies to review and manage major roadway improvements to ensure that their effects are consistent with achieving the adopted strategy for reduced reliance on the automobile, including policies that provide for the following:
(i) An assessment of whether improvements would result in development or travel that is inconsistent with what is expected in the plan;
(ii) Consideration of alternative measures to meet transportation needs;
(iii) Adoption of measures to limit possible unintended effects on travel and land use patterns including access management, limitations on subsequent plan amendments, phasing of improvements, etc.; and
(iv) For purposes of this section a "major roadway expansion" includes new arterial roads or streets and highways, the addition of travel lanes, and construction of interchanges to a limited access highway
(E) Plan and ordinance provisions that meet all other applicable requirements of this division.
(d) Standards may include but are not limited to:
(A) Modal share of alternative modes, including walking, bicycling, and transit trips;
(B) Vehicle hours of travel per capita;
(C) Vehicle trips per capita;
(D) Measures of accessibility by alternative modes (i.e. walking, bicycling and transit); or
(E) The Oregon Benchmark for a reduction in peak hour commuting by single occupant vehicles.
(e) Metropolitan areas shall adopt TSP policies to evaluate progress towards achieving the standard or standards adopted and approved pursuant to this rule. Such evaluation shall occur at regular intervals corresponding with federally-required updates of the regional transportation plan. This shall include monitoring and reporting of VMT per capita.
(6) A metropolitan area may also accomplish compliance with requirements of subsection (3)(e), sections (4) and (5) by demonstrating to the commission that adopted plans and measures are likely to achieve a five percent reduction in VMT per capita over the 20-year planning period. The commission shall consider and act on metropolitan area requests under this section by order. A metropolitan area that receives approval under this section shall adopt interim benchmarks for VMT reduction and shall evaluate progress in achieving VMT reduction at each update of the regional transportation system plan.
(7) Regional and local TSPs shall include benchmarks to assure satisfactory progress towards meeting the approved standard or standards adopted pursuant to this rule at regular intervals over the planning period. MPOs and local governments shall evaluate progress in meeting benchmarks at each update of the regional transportation plan. Where benchmarks are not met, the relevant TSP shall be amended to include new or additional efforts adequate to meet the requirements of this rule.
(8) The commission shall, at regular intervals, evaluate the results of efforts to achieve the reduction in VMT and the effectiveness of approved plans and standards in achieving the objective of increasing transportation choices and reducing reliance on the automobile.

(9) Where existing and committed transportation facilities and services have adequate capacity to support the land uses in the acknowledged comprehensive plan, the local government shall not be required to evaluate alternatives as provided in this rule.
(10) Transportation uses or improvements listed in OAR 660-012-0065(3)(d) to (g) and (o) and located in an urban fringe may be included in a TSP only if the improvement project identified in the Transportation System Plan as described in section (12) of this rule, will not significantly reduce peak hour travel time for the route as determined pursuant to section (11) of this rule, or the jurisdiction determines that the following alternatives can not reasonably satisfy the purpose of the improvement project:
(a) Improvements to transportation facilities and services within the urban growth boundary;
(b) Transportation system management measures that do not significantly increase capacity; or
(c) Transportation demand management measures. The jurisdiction needs only to consider alternatives that are safe and effective, consistent with applicable standards and that can be implemented at a reasonable cost using available technology.
(11) An improvement project significantly reduces peak hour travel time when, based on recent data, the time to travel the route is reduced more than 15 percent during weekday peak hour conditions over the length of the route located within the urban fringe. For purposes of measuring travel time, a route shall be identified by the predominant traffic flows in the project area.
(12) A "transportation improvement project" described in section (10) of this rule:
(a) Is intended to solve all of the reasonably foreseeable transportation problems within a general geographic location, within the planning period; and
(b) Has utility as an independent transportation project.
[…]

Finding:
The City has an acknowledged TSP consistent with the Transportation Planning Rule provisions of 660-012-0035. The proposed amendments make adjustments to the TSP to further include information pertaining to regional trail alignments, supporting a greater use of alternative modes of transportation. The proposed amendments are consistent with these requirements.

660-012-0045
Implementation of the Transportation System Plan
(1) Each local government shall amend its land use regulations to implement the TSP.
(a) The following transportation facilities, services and improvements need not be subject to land use regulations except as necessary to implement the TSP and, under ordinary circumstances do not have a significant impact on land use:
(A) Operation, maintenance, and repair of existing transportation facilities identified in the TSP, such as road, bicycle, pedestrian, port, airport and rail facilities, and major regional pipelines and terminals;
(B) Dedication of right-of-way, authorization of construction and the construction of facilities and improvements, where the improvements are consistent with clear and objective dimensional standards;
(C) Uses permitted outright under ORS 215.213(1)(j)–(m) and 215.283(1)(h)–(k), consistent with the provisions of OAR 660-012-0065; and
(D) Changes in the frequency of transit, rail and airport services.

(b) To the extent, if any, that a transportation facility, service or improvement concerns the application of a comprehensive plan provision or land use regulation, it may be allowed without further land use review if it is permitted outright or if it is subject to standards that do not require interpretation or the exercise of factual, policy or legal judgment;
(c) In the event that a transportation facility, service or improvement is determined to have a significant impact on land use or to concern the application of a comprehensive plan or land use regulation and to be subject to standards that require interpretation or the exercise of factual, policy or legal judgment, the local government shall provide a review and approval process that is consistent with OAR 660-012-0050. To facilitate implementation of the TSP, each local government shall amend its land use regulations to provide for consolidated review of land use decisions required to permit a transportation project.
(2) Local governments shall adopt land use or subdivision ordinance regulations, consistent with applicable federal and state requirements, to protect transportation facilities, corridors and sites for their identified functions. Such regulations shall include:
(a) Access control measures, for example, driveway and public road spacing, median control and signal spacing standards, which are consistent with the functional classification of roads and consistent with limiting development on rural lands to rural uses and densities;
(b) Standards to protect future operation of roads, transitways and major transit corridors;
(c) Measures to protect public use airports by controlling land uses within airport noise corridors and imaginary surfaces, and by limiting physical hazards to air navigation;
(d) A process for coordinated review of future land use decisions affecting transportation facilities, corridors or sites;
(e) A process to apply conditions to development proposals in order to minimize impacts and protect transportation facilities, corridors or sites;
(f) Regulations to provide notice to public agencies providing transportation facilities and services, MPOs, and ODOT of:
(A) Land use applications that require public hearings;
(B) Subdivision and partition applications;
(C) Other applications which affect private access to roads; and
(D) Other applications within airport noise corridors and imaginary surfaces which affect airport operations; and
(g) Regulations assuring that amendments to land use designations, densities, and design standards are consistent with the functions, capacities and performance standards of facilities identified in the TSP.
(3) Local governments shall adopt land use or subdivision regulations for urban areas and rural communities as set forth below. The purposes of this section are to provide for safe and convenient pedestrian, bicycle and vehicular circulation consistent with access management standards and the function of affected streets, to ensure that new development provides on-site streets and accessways that provide reasonably direct routes for pedestrian and bicycle travel in areas where pedestrian and bicycle travel is likely if connections are provided, and which avoids wherever possible levels of automobile traffic which might interfere with or discourage pedestrian or bicycle travel.
(a) Bicycle parking facilities as part of new multi-family residential developments of four units or more, new retail, office and institutional developments, and all transit transfer stations and park-and-ride lots;

(b) On-site facilities shall be provided which accommodate safe and convenient pedestrian and bicycle access from within new subdivisions, multi-family developments, planned developments, shopping centers, and commercial districts to adjacent residential areas and transit stops, and to neighborhood activity centers within one-half mile of the development. Single-family residential developments shall generally include streets and accessways. Pedestrian circulation through parking lots should generally be provided in the form of accessways.
(A) "Neighborhood activity centers" includes, but is not limited to, existing or planned schools, parks, shopping areas, transit stops or employment centers;
(B) Bikeways shall be required along arterials and major collectors. Sidewalks shall be required along arterials, collectors and most local streets in urban areas, except that sidewalks are not required along controlled access roadways, such as freeways;
(C) Cul-de-sacs and other dead-end streets may be used as part of a development plan, consistent with the purposes set forth in this section;
(D) Local governments shall establish their own standards or criteria for providing streets and accessways consistent with the purposes of this section. Such measures may include but are not limited to: standards for spacing of streets or accessways; and standards for excessive out-of-direction travel;
(E) Streets and accessways need not be required where one or more of the following conditions exist:
(i) Physical or topographic conditions make a street or accessway connection impracticable. Such conditions include but are not limited to freeways, railroads, steep slopes, wetlands or other bodies of water where a connection could not reasonably be provided;
(ii) Buildings or other existing development on adjacent lands physically preclude a connection now or in the future considering the potential for redevelopment; or
(iii) Where streets or accessways would violate provisions of leases, easements, covenants, restrictions or other agreements existing as of May 1, 1995, which preclude a required street or accessway connection.
(c) Where off-site road improvements are otherwise required as a condition of development approval, they shall include facilities accommodating convenient pedestrian and bicycle travel, including bicycle ways along arterials and major collectors;
(d) For purposes of subsection (b) "safe and convenient" means bicycle and pedestrian routes, facilities and improvements which:
(A) Are reasonably free from hazards, particularly types or levels of automobile traffic which would interfere with or discourage pedestrian or cycle travel for short trips;
(B) Provide a reasonably direct route of travel between destinations such as between a transit stop and a store; and
(C) Meet travel needs of cyclists and pedestrians considering destination and length of trip; and considering that the optimum trip length of pedestrians is generally 1/4 to 1/2 mile.
(e) Internal pedestrian circulation within new office parks and commercial developments shall be provided through clustering of buildings, construction of accessways, walkways and similar techniques.
(4) To support transit in urban areas containing a population greater than 25,000, where the area is already served by a public transit system or where a determination has been made that a public transit system is feasible, local governments shall adopt land use and subdivision regulations as provided in (a)–(g) below:

(a) Transit routes and transit facilities shall be designed to support transit use through provision of bus stops, pullouts and shelters, optimum road geometrics, on-road parking restrictions and similar facilities, as appropriate;
(b) New retail, office and institutional buildings at or near major transit stops shall provide for convenient pedestrian access to transit through the measures listed in paragraphs (A) and (B) below.
(A) Walkways shall be provided connecting building entrances and streets adjoining the site;
(B) Pedestrian connections to adjoining properties shall be provided except where such a connection is impracticable as provided for in OAR 660-012-0045(3)(b)(E). Pedestrian connections shall connect the on site circulation system to existing or proposed streets, walkways, and driveways that abut the property. Where adjacent properties are undeveloped or have potential for redevelopment, streets, accessways and walkways on site shall be laid out or stubbed to allow for extension to the adjoining property;
(C) In addition to paragraphs (A) and (B) above, on sites at major transit stops provide the following:
(i) Either locate buildings within 20 feet of the transit stop, a transit street or an intersecting street or provide a pedestrian plaza at the transit stop or a street intersection;
(ii) A reasonably direct pedestrian connection between the transit stop and building entrances on the site;
(iii) A transit passenger landing pad accessible to disabled persons;
(iv) An easement or dedication for a passenger shelter if requested by the transit provider; and
(v) Lighting at the transit stop.
(c) Local governments may implement (4)(b)(A) and (B) above through the designation of pedestrian districts and adoption of appropriate implementing measures regulating development within pedestrian districts. Pedestrian districts must comply with the requirement of (4)(b)(C) above;
(d) Designated employee parking areas in new developments shall provide preferential parking for carpools and vanpools;
(e) Existing development shall be allowed to redevelop a portion of existing parking areas for transit-oriented uses, including bus stops and pullouts, bus shelters, park and ride stations, transit-oriented developments, and similar facilities, where appropriate;
(f) Road systems for new development shall be provided that can be adequately served by transit, including provision of pedestrian access to existing and identified future transit routes. This shall include, where appropriate, separate accessways to minimize travel distances;
(g) Along existing or planned transit routes, designation of types and densities of land uses adequate to support transit.
(5) In MPO areas, local governments shall adopt land use and subdivision regulations to reduce reliance on the automobile which:
(a) Allow transit-oriented developments (TODs) on lands along transit routes;
(b) Implements a demand management program to meet the measurable standards set in the TSP in response to OAR 660-012-0035(4);
(c) Implements a parking plan which:
(A) Achieves a 10 percent reduction in the number of parking spaces per capita in the MPO area over the planning period. This may be accomplished through a combination of restrictions on development of new parking spaces and requirements that existing parking spaces be redeveloped to other uses;
(B) Aids in achieving the measurable standards set in the TSP in response to OAR 660-012-0035(4);

(C) Includes land use and subdivision regulations setting minimum and maximum parking requirements in appropriate locations, such as downtowns, designated regional or community centers, and transit oriented-developments; and
(D) Is consistent with demand management programs, transit-oriented development requirements and planned transit service.
(d) As an alternative to (c) above, local governments in an MPO may instead revise ordinance requirements for parking as follows:
(A) Reduce minimum off-street parking requirements for all non-residential uses from 1990 levels;
(B) Allow provision of on-street parking, long-term lease parking, and shared parking to meet minimum off-street parking requirements;
(C) Establish off-street parking maximums in appropriate locations, such as downtowns, designated regional or community centers, and transit-oriented developments;
(D) Exempt structured parking and on-street parking from parking maximums;
(E) Require that parking lots over 3 acres in size provide street-like features along major driveways (including curbs, sidewalks, and street trees or planting strips); and
(F) Provide for designation of residential parking districts.
(e) Require all major industrial, institutional, retail and office developments to provide either a transit stop on site or connection to a transit stop along a transit trunk route when the transit operator requires such an improvement.
(6) In developing a bicycle and pedestrian circulation plan as required by OAR 660-012-0020(2)(d), local governments shall identify improvements to facilitate bicycle and pedestrian trips to meet local travel needs in developed areas. Appropriate improvements should provide for more direct, convenient and safer bicycle or pedestrian travel within and between residential areas and neighborhood activity centers (i.e., schools, shopping, transit stops). Specific measures include, for example, constructing walkways between cul-de-sacs and adjacent roads, providing walkways between buildings, and providing direct access between adjacent uses.
(7) Local governments shall establish standards for local streets and accessways that minimize pavement width and total right-of-way consistent with the operational needs of the facility. The intent of this requirement is that local governments consider and reduce excessive standards for local streets and accessways in order to reduce the cost of construction, provide for more efficient use of urban land, provide for emergency vehicle access while discouraging inappropriate traffic volumes and speeds, and which accommodate convenient pedestrian and bicycle circulation. Not withstanding section (1) or (3) of this rule, local street standards adopted to meet this requirement need not be adopted as land use regulations.

Finding:
The City has an adopted and acknowledged TSP. The proposed amendments, together with previously adopted and acknowledged ordinances fully implements all of the applicable provisions of OAR 660-012-0045.

- TDC Chapter 74 provides a process for coordinated review of land use decisions affecting transportation facilities, corridors, and sites as well as public notice.
- The TDC which is acknowledged to be consistent with the requirements of OAR 660-012-0050, provides a consolidated review process for land-use decisions regarding permitting of transportation projects.
- TDC Chapter 74 provide for review and protection of roadway safety, infrastructure and operations.

• Local street connectivity standards, as well as the requirements for safe and convenient pedestrian, bicycle and vehicular circulation, have been adopted by Tualatin. The TSP includes a Transportation Demand Management (TDM) Plan in Section 11.690 of the Comprehensive Plan.
The proposed amendments are consistent with these requirements.

660-012-0050
Transportation Project Development
(1) For projects identified by ODOT pursuant to OAR chapter 731, division 15, project development shall occur in the manner set forth in that division.
(2) Regional TSPs shall provide for coordinated project development among affected local governments. The process shall include:
(a) Designation of a lead agency to prepare and coordinate project development;
(b) A process for citizen involvement, including public notice and hearing, if project development involves land use decision-making. The process shall include notice to affected transportation facility and service providers, MPOs, and ODOT;
(c) A process for developing and adopting findings of compliance with applicable statewide planning goals, if any. This shall include a process to allow amendments to acknowledged comprehensive plans where such amendments are necessary to accommodate the project; and
(d) A process for developing and adopting findings of compliance with applicable acknowledged comprehensive plan policies and land use regulations of individual local governments, if any. This shall include a process to allow amendments to acknowledged comprehensive plans or land use regulations where such amendments are necessary to accommodate the project.
(3) Project development addresses how a transportation facility or improvement authorized in a TSP is designed and constructed. This may or may not require land use decision-making. The focus of project development is project implementation, e.g. alignment, preliminary design and mitigation of impacts. During project development, projects authorized in an acknowledged TSP shall not be subject to further justification with regard to their need, mode, function, or general location. For purposes of this section, a project is authorized in a TSP where the TSP makes decisions about transportation need, mode, function and general location for the facility or improvement as required by this division.
(a) Project development does not involve land use decision-making to the extent that it involves transportation facilities, services or improvements identified in OAR 660-012-0045(1)(a); the application of uniform road improvement design standards and other uniformly accepted engineering design standards and practices that are applied during project implementation; procedures and standards for right-of-way acquisition as set forth in the Oregon Revised Statutes; or the application of local, state or federal rules and regulations that are not a part of the local government's land use regulations.
(b) Project development involves land use decision-making to the extent that issues of compliance with applicable requirements requiring interpretation or the exercise of policy or legal discretion or judgment remain outstanding at the project development phase. These requirements may include, but are not limited to, regulations protecting or regulating development within floodways and other hazard areas, identified Goal 5 resource areas, estuarine and coastal shoreland areas, and the Willamette River Greenway, and local regulations establishing land use standards or processes for selecting specific alignments. They also may include transportation improvements required to comply with ORS 215.296 or 660-012-0065(5). When project development involves land use decision-making,

all unresolved issues of compliance with applicable acknowledged comprehensive plan policies and land use regulations shall be addressed and findings of compliance adopted prior to project approval.
(c) To the extent compliance with local requirements has already been determined during transportation system planning, including adoption of a refinement plan, affected local governments may rely on and reference the earlier findings of compliance with applicable standards.
(4) Except as provided in section (1) of this rule, where an Environmental Impact Statement (EIS) is prepared pursuant to the National Environmental Policy Act of 1969, project development shall be coordinated with the preparation of the EIS. All unresolved issues of compliance with applicable acknowledged comprehensive plan policies and land use regulations shall be addressed and findings of compliance adopted prior to issuance of the Final EIS.
(5) If a local government decides not to build a project authorized by the TSP, it must evaluate whether the needs that the project would serve could otherwise be satisfied in a manner consistent with the TSP. If identified needs cannot be met consistent with the TSP, the local government shall initiate a plan amendment to change the TSP or the comprehensive plan to assure that there is an adequate transportation system to meet transportation needs.
(6) Transportation project development may be done concurrently with preparation of the TSP or a refinement plan.

Finding:
The City has an adopted and acknowledged TSP, consistent with the Transportation Planning Rule provisions of 660-012-0050. The proposed amendments, together with previously adopted and acknowledged ordinances, fully implements all of the applicable provisions of OAR 660-012-0050.

- The 2018 RTP provides for coordination of project development.
- The TSP addresses the type of and function of transportation improvement and the City of Tualatin public works permit process is consistent with all the requirements of section OAR 660-012-0050.

The proposed amendments are consistent with these requirements.

660-012-0055
Timing of Adoption and Update of Transportation System Plans; Exemptions
(1) MPOs shall complete regional TSPs for their planning areas by May 8, 1996. For those areas within a MPO, cities and counties shall adopt local TSPs and implementing measures within one year following completion of the regional TSP:
(a) If by May 8, 2000, a Metropolitan Planning Organization (MPO) has not adopted a regional transportation system plan that meets the VMT reduction standard in OAR 660-012-0035 and the metropolitan area does not have an approved alternative standard established pursuant to OAR 660-012-0035, then the cities and counties within the metropolitan area shall prepare and adopt an integrated land use and transportation plan as outlined in OAR 660-012-0035. Such a plan shall be prepared in coordination with the MPO and shall be adopted within three years;
(b) When an area is designated as an MPO or is added to an existing MPO, the affected local governments shall, within one year of adoption of the regional transportation plan, adopt a regional TSP in compliance with applicable requirements of this division and amend local transportation system plans to be consistent with the regional TSP.
(c) Local governments in metropolitan areas may request and the commission may by order grant an extension for completing an integrated land use and transportation plan required by this division. Local governments requesting an extension shall set forth a schedule for completion of outstanding

work needed to complete an integrated land use and transportation plan as set forth in OAR 660-012-0035. This shall include, as appropriate:
(A) Adoption of a long-term land use and transportation vision for the region;
(B) Identification of centers and other land use designations intended to implement the vision;
(C) Adoption of housing and employment allocations to centers and land use designations; and
(D) Adoption of implementing plans and zoning for designated centers and other land use designations.
(d) Local governments within metropolitan areas that are not in compliance with the requirements of this division to adopt or implement a standard to increase transportation choices or have not completed an integrated land use and transportation plan as required by this division shall review plan and land use regulation amendments and adopt findings that demonstrate that the proposed amendment supports implementation of the region's adopted vision, strategy, policies or plans to increase transportation choices and reduce reliance on the automobile.
(2) A plan or land use regulation amendment supports implementation of an adopted regional strategy, policy or plan for purposes of this section if it achieves the following as applicable:
(a) Implements the strategy or plan through adoption of specific plans or zoning that authorizes uses or densities that achieve desired land use patterns;
(b) Allows uses in designated centers or neighborhoods that accomplish the adopted regional vision, strategy, plan or policies; and
(c) Allows uses outside designated centers or neighborhood that either support or do not detract from implementation of desired development within nearby centers.
(3) For areas outside an MPO, cities and counties shall complete and adopt regional and local TSPs and implementing measures by May 8, 1997.
(4) By November 8, 1993, affected cities and counties shall, for non-MPO urban areas of 25,000 or more, adopt land use and subdivision ordinances or amendments required by OAR 660-012-0045(3), (4)(a)–(f) and (5)(d). By May 8, 1994 affected cities and counties within MPO areas shall adopt land use and subdivision ordinances or amendments required by 660-012-0045(3), (4)(a)–(e) and (5)(e). Affected cities and counties which do not have acknowledged ordinances addressing the requirements of this section by the deadlines listed above shall apply 660-012-0045(3), (4)(a)–(g) and (5)(e) directly to all land use decisions and all limited land use decisions.
(5)(a) Affected cities and counties that either:
(A) Have acknowledged plans and land use regulations that comply with this rule as of May 8, 1995, may continue to apply those acknowledged plans and land use regulations; or
(B) Have plan and land use regulations adopted to comply with this rule as of April 12, 1995, may continue to apply the provisions of this rule as they existed as of April 12, 1995, and may continue to pursue acknowledgment of the adopted plans and land use regulations under those same rule provisions provided such adopted plans and land use regulations are acknowledged by April 12, 1996. Affected cities and counties that qualify and make this election under this paragraph shall update their plans and land use regulations to comply with the 1995 amendments to OAR 660-012-0045 as part of their transportation system plans.
(b) Affected cities and counties that do not have acknowledged plans and land use regulations as provided in subsection (a) of this section, shall apply relevant sections of this rule to land use decisions and limited land use decisions until land use regulations complying with this amended rule have been adopted.

(6) Cities and counties shall update their TSPs and implementing measures as necessary to comply with this division at each periodic review subsequent to initial compliance with this division. Local governments within metropolitan areas shall amend local transportation system plans to be consistent with an adopted regional transportation system plan within one year of the adoption of an updated regional transportation system plan or by a date specified in the adopted regional transportation system plan.
(7) The director may grant a whole or partial exemption from the requirements of this division to cities under 10,000 population and counties under 25,000 population, and for areas within a county within an urban growth boundary that contains a population less than 10,000. Eligible jurisdictions may request that the director approve an exemption from all or part of the requirements in this division. Exemptions shall be for a period determined by the director or until the jurisdiction's next periodic review, whichever is shorter.
(a) The director's decision to approve an exemption shall be based upon the following factors:
(A) Whether the existing and committed transportation system is generally adequate to meet likely transportation needs;
(B) Whether the new development or population growth is anticipated in the planning area over the next five years;
(C) Whether major new transportation facilities are proposed which would affect the planning areas;
(D) Whether deferral of planning requirements would conflict with accommodating state or regional transportation needs; and
(E) Consultation with the Oregon Department of Transportation on the need for transportation planning in the area, including measures needed to protect existing transportation facilities.
(b) The director's decision to grant an exemption under this section is appealable to the commission as provided in OAR 660-002-0020 (Delegation of Authority Rule)
(8) Portions of TSPs and implementing measures adopted as part of comprehensive plans prior to the responsible jurisdiction's periodic review shall be reviewed pursuant to OAR chapter 660, division 18, Post Acknowledgment Procedures.

Finding:
The proposed amendments, together with previously adopted and acknowledged ordinances, is consistent with the applicable provisions of OAR 660-012-0055. The proposed amendments are consistent with these requirements.

[…]

OAR Chapter 660, Division 34 (State and Local Park Planning)
[…]
660-034-0040
Planning for Local Parks

(1) Local park providers may prepare local park master plans, and local governments may amend acknowledged comprehensive plans and zoning ordinances pursuant to the requirements and procedures of ORS 197.610 to 197.625 in order to implement such local park plans. Local governments are not required to adopt a local park master plan in order to approve a land use decision allowing parks or park uses on agricultural lands under provisions of ORS 215.213 or 215.283 or on forestlands

under provisions of OAR 660-006-0025(4), as further addressed in sections (3) and (4) of this rule. If a local government decides to adopt a local park plan as part of the local comprehensive plan, the adoption shall include:
(a) A plan map designation, as necessary, to indicate the location and boundaries of the local park; and
(b) Appropriate zoning categories and map designations (a "local park" zone or overlay zone is recommended), including objective land use and siting review criteria, in order to authorize the existing and planned park uses described in local park master plan.
(2) Unless the context requires otherwise, this rule does not require changes to:
(a) Local park plans that were adopted as part of an acknowledged local land use plan prior to July 15, 1998; or
(b) Lawful uses in existence within local parks on July 15, 1998.

Finding:

The City of Tualatin updated its local park master plan and is seeking to amend the acknowledged comprehensive plan and zoning ordinance in order to implement this local park plan. This plan update does not include updating any map designations different from the local park plan adopted in 1983 aside from beyond planned trails and implementing standards. The proposed amendments are consistent with these requirements.

[…]

(4) Although some of the uses listed in OAR 660-034-0035(2)(a) to (g) are not allowed on agricultural or forest land without an exception to Goal 3 or Goal 4, a local government is not required to take an exception to Goals 3 or 4 to allow such uses on land within a local park provided such uses, alone or in combination, meet all other statewide goals and are described and authorized in a local park master plan that:
(a) Is adopted as part of the local comprehensive plan in conformance with Section (1) of this rule and consistent with all statewide goals;
(b) Is prepared and adopted applying criteria comparable to those required for uses in state parks under OAR chapter 736, division 18; and
(c) Includes findings demonstrating compliance with ORS 215.296 for all uses and activities proposed on or adjacent to land zoned for farm or forest use.

Finding:

The City of Tualatin updated its local park master plan and is seeking to amendment the acknowledged comprehensive plan and zoning ordinance in order to implement this local park plan. This plan update does not include updating any map designations beyond planned trails and implementing standards, and as such, does not have any impact on agricultural or forest land. The proposed amendments are consistent with these requirements.

C. Metro Code
The following Chapter and Titles of Metro Code are applicable to the proposed amendments:

Chapter 3.07, Urban Growth Management Functional Plan

[…]

3.07.420

[…]

(d) Cities and counties shall review their land use regulations and revise them, if necessary, to prohibit the siting of schools, places of assembly larger than 20,000 square feet or parks intended to serve people other than those working or residing in the RSIA. Nothing in this subsection is intended to prohibit trails and facilities accessory to and in support of trails from being located within an area designated RSIA on Metro's Title 4 Map, including but not limited to trailhead amenities, parking areas, benches, information kiosks, restrooms, shelters, bicycle racks, picnic areas and educational facilities. Where possible, trails and accessory facilities should be planned and located in a manner that limits impacts on industrial uses while still fulfilling the purpose of the trail and providing a positive experience for trail users.

Finding:

The Tualatin Development Code does not permit parks with the RSIA, and no revisions to the range of permitted uses is proposed with these amendments. Only trail facilities are proposed, consistent with the terms of this section. These standards are met.

[…]

D. Tualatin Comprehensive Plan
The following Chapters of the Tualatin Comprehensive Plan are applicable to the proposed amendments:

Chapter 11. Transportation

Section 11.610. Transportation Goals and Objectives

[…]

(3) Goal 2: Safety, improve safety for all users, all modes, all ages, and all abilities within the City of Tualatin.

Finding:

The proposed amendments would not impact safety relative to the transportation system. Future development of trails would require compliance with applicable safety and design standards. This objective is met.

(4) Goal 3: Vibrant Community. Allow for a variety of alternative transportation choices for citizens of and visitors to Tualatin to support a high quality of life and community livability.

Finding:

The proposed amendments include additional opportunity for multimodal trail development supporting alternative transportation choices. This objective is met.

(5) Goal 4: Equity. Consider the distribution of benefits and impacts from potential transportation options, and work towards fair access to transportation facilities for all users, all ages, and all abilities.

Finding:

The proposed amendments do not reflect a significant change to the existing transportation system. To the extent that the amendments facilitate for future trail development, it will represent an enhancement to broad access to employment centers and mobility. Further, all future transportation and pedestrian facilities will comply with applicable accessibility requirements. This objective is met.

(6) Goal 5: Economy. Support local employment, local businesses, and a prosperous community while recognizing Tualatin's role in the regional economy.

Finding:

Future parks development, including trail facilities, supported by the proposed amendments, would provide recreational amenities for employers, employees and the greater community. This objective is met.

(7) Goal 6: Health/Environment. Provide active transportation options to improve the health of citizens in Tualatin. Ensure that transportation does not adversely affect public health or the environment.

Finding:

The proposed map amendments support additional active transportation options in Tualatin. This objective is met.

(8) Goal 7: Ability to Be Implemented. Promote potential options that are able to be implemented because they have community and political support and are likely to be funded.

Finding:

The proposed amendments update the Community Plan, Development Code, and Transportation System consistent with the Parks and Recreation Master Plan (2018), which was supported by the Tualatin Parks Advisory Committee and the greater community, and adopted by the Tualatin City Council. The proposed amendments would increase the likelihood of implementation by enabling parks and trails identified in the Master Plan to be funded by System Development Charges. This objective is met.

Chapter 15. Parks and Recreation

Section 15.020. -Objectives

The following are the objectives of the Park and Recreation Plan. These objectives are to:

(1) Coordinate this Park and Recreation Plan with the plans of regional, state and federal agencies to achieve consistency among the various plans.

(2) Provide a high-quality park and recreation system to offset the environmental impact of large areas of commercial and industrial development.

(3) Create a park and recreation system that provides diverse recreation opportunity.

(4) Develop an advance land acquisition program that will assure the future availability of land for park and recreation use at the most reasonable cost.

(5) Preserve the scenic value of the Tualatin River by creating a greenway along the entire bank of the River within the City.

(6) Preserve as greenways, specific City creeks and drainage swales to provide sufficient area for stormwater runoff, enhance water quality, preserve fish and wildlife habitat and provide, where appropriate, public pedestrian and bicycle access.

(7) Preserve greenways, as much as possible, in their natural state.

(8) Preserve designated historic resources through public purchase or encouragement of compatible private reuse.

(9) Link the park and recreation system with a system of greenways and bicycle/pedestrian facilities.

(10) Develop design standards for development adjacent to greenways and natural areas.

(11) Preserve and enhance native vegetation in riparian and other natural areas for the purpose of providing favorable habitat for fish and wildlife. Encourage developers to preserve areas of natural vegetation, wherever possible, to provide habitat for wildlife.

(12) Encourage developers to utilize residential density transfers, landscaping credits, system development charge credits, reduction of minimum setback requirements, and other incentives for greenway, bikeway and pedestrian path purposes.

(13) Preserve the Hedges Creek Wetlands as a natural area and develop a Wetlands Protection Plan for this area.

(14) Discourage filling of the Hedges Creek Wetlands located westerly of those wetlands that may be identified by the City's Wetlands Protection District Ordinance until a general plan has been prepared for the remaining wetland area or until a consensus has been achieved among industrial and environmental interest groups and state and federal agencies on any individual request for a wetland fill permit.

(15) Develop a system of neighborhood parks that are geographically well distributed to serve the City's population.

(16) Whenever possible, locate neighborhood parks adjacent to school sites.

(17) Develop joint use agreements with the Tigard School District for the joint use of school land for neighborhood park facilities.

(18) Develop a comprehensive City recreation program with an emphasis on youth activities, cultural activities, and the City's natural environment.

(19) Encourage private donations of land or money, consistent with the Park and Recreation Plan, to augment City park development funds.

(20) Discourage acquisition of small mini-parks because of relatively high maintenance expenses, except where a specific recreation need has been identified as a priority.

(21) Develop a Capital Improvements Program to define recreation improvement priorities, financial requirements, and financing methods.

Finding:

The proposed set of amendments to the plan text and maps primarily update document references and information concerning tree species and planned trails. Objectives related to park development, natural areas, and recreational programming are not applicable. Proposed trail map updates are consistent with Objective (9), *Link the park and recreation system with a system of greenways and bicycle/pedestrian facilities* and Objective (1) *Coordinate this Park and Recreation Plan with the plans of regional, state and federal agencies to achieve consistency among the various plans,* since the Ice Age Tonquin Trail to be reflected in TDC maps will become consistent with Metro and Washington County maps. The Parks and Recreation Master Plan (2018) contains new, more specific, goals and objectives that remain consistent with the existing objectives contained with the Tualatin Community Plan. This Plan Text Amendment proposes to update Objective (18) from a statement specifically referencing "youth" and "cultural activities" to one that more broadly acknowledges Tualatin's diverse population and the need for recreation that serves people of all ages, ability, cultures, and interests. This changes is additive, and other objectives reflect the need to account for the City's natural environment. The Plan Text Amendment and Plan Map Amendment are consistent with the objectives under TDC 15.020.

E. Tualatin Development Code
The following Chapters of the Tualatin Development Code are applicable to the proposed amendments:

Chapter 33: Applications and Approval Criteria

Section 33.070 Plan Amendments

[…]

(2) Applicability. Quasi-judicial amendments may be initiated by the City Council, the City staff, or by a property owner or person authorized in writing by the property owner. Legislative amendments may only be initiated by the City Council.

Finding:

A Plan Text Amendment and Plan Map Amendment are proposed. This proposal is legislative in nature and therefore has been processed consistent with the Type IV-B procedures in Chapter 32. This criterion is met.

[…]

(5) Approval Criteria.
a.) Granting the amendment is in the public interest.

The amendment is implementing the Parks and Recreation Master Plan which was adopted by the City Council in November 2018. In order to ensure that the Tualatin Development Code accurately reflects the current Parks Master Plan for future implementation, it is necessary and in the public interest to update the corresponding maps and text contained therein. Criterion (a) is met.

b.) The public interest is best protected by granting the amendment at this time.

Since the Parks and Recreation Master Plan was adopted by the City Council in 2018, adoption of the proposed amendments is timely. The public interest is best protected by granting the amendments and updates at this time. Criterion (b) is met.

c.) The proposed amendment is in conformity with the applicable objectives of the Tualatin Community Plan.

The applicable objectives of the Tualatin Community Plan, as contained in Chapters 1-30 of the Tualatin Development Code have been considered, and are discussed above in Section D. Criterion (c) is met.

d.) The following factors were consciously considered:

- **i. The various characteristics of areas in the City.**
- **ii. The suitability of the area for particular land uses and improvements.**
- **iii. Trends in land improvement and development.**
- **iv. Property values.**
- **v. The needs of economic enterprises and the future development of the area; needed right-of-way and access for and to particular sites in the area;**
- **vi. Natural resources of the City and the protection and conservation of said resources.**
- **vii. Prospective requirements for the development of natural resources in the City.**
- **viii. The public need for healthful, safe, aesthetic surroundings and conditions.**
- **ix. Proof of change in a neighborhood or area, or a mistake in the Plan Text or Plan Map for the property under consideration are additional relevant factors to consider.**

Finding:
The proposed amendments were considered relative to criteria i-v, and have been determined to have no detrimental impact. Relative to criteria vi-viii, the proposed amendments would support enhancement to natural resources and the public need for healthful, safe, aesthetic surroundings and conditions. Criterion ix. Is not applicable. Criterion (d) is met.

e.) If the amendment involves residential uses, then the appropriate school district or districts must be able to reasonably accommodate additional residential capacity by means determined by any affected school district.

Finding:
The amendment does not involve residential uses. Criterion (e) does not apply.

f.) Granting the amendment is consistent with the applicable State of Oregon Planning Goals and applicable Oregon Administrative Rules, including compliance with the Transportation Planning Rule TPR (OAR 660-012-0060).

Finding:
Section C, above, addresses the proposed amendments' consistency with applicable the Oregon Planning Goals, Administrative Rules, and the TPR. Criterion (f) is met.

g.) Granting the amendment is consistent with the Metropolitan Service District's Urban Growth Management Functional Plan.

Finding:
Metro's Urban Growth Management Functional Plan is implemented by Metro's Chapter 3.07 of the Metro Code. Section B, above, details the proposed amendments' compliance. Criterion (g) is met.

h.) Granting the amendment is consistent with Level of Service F for the p.m. peak hour and E for the one-half hour before and after the p.m. peak hour for the Town Center 2040 Design Type (TDC Map 9-4), and E/E for the rest of the 2040 Design Types in the City's planning area.

i.) Granting the amendment is consistent with the objectives and policies regarding potable water, sanitary sewer, and surface water management pursuant to TDC 12.020, water management issues are adequately addressed during development or redevelopment anticipated to follow the granting of a plan amendment.

Finding:
The proposed amendments do not affect vehicle trips. Future development of parks and trails would be required to be consistent with applicable transportation and public facilities plans and requirements. Criteria (h) and (i) are met.

j.) The applicant has entered into a development agreement. This criterion applies only to an amendment specific to property within the Urban Planning Area (UPA), also known as the Planning Area Boundary (PAB), as defined in both the Urban Growth Management Agreement (UGMA) with Clackamas County and the Urban Planning Area Agreement (UPAA) with Washington County. TDC Map 9-1 illustrates this area.

Finding:
Criterion (j) is not applicable to the proposed amendments.

III. CONCLUSION AND RECOMMENDATION

Based on the application and the above analysis and findings, the proposed annexation complies with applicable Oregon Statewide Planning Goals, Oregon Administration Rules, Metro Code, and TDC. Accordingly, staff recommends that the Planning Commission forward a recommendation of approval of the proposed amendments (PTA 19-0003 and PMA 19-0003) to the City Council.

Parks and Recreation Master Plan
Amended Tualatin Development Code Text

Contents

TUALATIN COMMUNITY PLAN

Chapter 15: Parks and Recreation

Section 15.010 Background.

(1) Tualatin is fortunate to have significant natural features which provide the City with excellent opportunities for outdoor recreation in attractive settings. The Tualatin River and the area's many small creeks provide opportunities for water-oriented recreation and greenway loops connecting various parts of the City. Several forested and wetland areas remain undeveloped and available for the neighborhood park types of recreation as well as for natural areas. Because of Tualatin's rapid development, the City must aggressively promote the acquisition of park lands before they are developed for other uses.

(2) It is the basic premise of this Plan that Tualatin should develop the highest-quality park and recreation system to offset the effects of large amounts of industrial and commercial growth that are proposed for the central portions of the City. While the City's commercial and industrial development will be reviewed through the City's Architectural Review process, an atmosphere of intensive development will remain that can be partially offset by large amounts of open space land that are visible and accessible to the public. Additionally, the property values of this new commercial and industrial development should create a favorable financial environment, enabling the City to maintain a reasonable tax rate, while providing a high-quality recreation system.

(3) ~~An update of the Parks and Recreation Master Plan was initiated in the Fall of 1982 and adopted in mid-1983. This extensive document is based on the objectives from the 1979 plan, which appear in TDC 15.020. It includes~~ The Parks and Recreation Master Plan contains detailed analysis, discussions, and recommendations on community parks, neighborhood parks, greenways, bicycle and pedestrian routes, and recreation programs. ~~The May 1983 update of the Parks and Recreation Master Plan, together with the revisions, corrections, and additions to the master plan as contained in Exhibit B, are hereby adopted as part of the Tualatin Community Plan and are incorporated by reference into the Tualatin Development Code.~~ The Tualatin Development Code references figures and maps within the Master Plan.

(4) ~~The Bikeway Plan, adopted May 24, 1993, and t~~ The Greenway and Trail Development Plan~~, adopted July 24, 1995, in Ordinance 497-95 are~~ is incorporated into the Parks and Recreation Master Plan ~~(1983)~~ and the Tualatin Development Code by reference.

Section 15.020 Objectives.

The following are the objectives of the Park and Recreation Plan. These objectives are to:

(1) Coordinate this Park and Recreation Plan with the plans of regional, state and federal agencies to achieve consistency among the various plans.

(2) Provide a high-quality park and recreation system to offset the environmental impact of large areas of commercial and industrial development.

(3) Create a park and recreation system that provides diverse recreation opportunity.

(4) Develop an advance land acquisition program that will assure the future availability of land for park and recreation use at the most reasonable cost.

(5) Preserve the scenic value of the Tualatin River by creating a greenway along the entire bank of the River within the City.

(6) Preserve as greenways, specific City creeks and drainage swales to provide sufficient area for stormwater runoff, enhance water quality, preserve fish and wildlife habitat and provide, where appropriate, public pedestrian and bicycle access.

(7) Preserve greenways, as much as possible, in their natural state.

(8) Preserve designated historic resources through public purchase or encouragement of compatible private reuse.

(9) Link the park and recreation system with a system of greenways and bicycle/pedestrian facilities.

(10) Develop design standards for development adjacent to greenways and natural areas.

(11) Preserve and enhance native vegetation in riparian and other natural areas for the purpose of providing favorable habitat for fish and wildlife. Encourage developers to preserve areas of natural vegetation, wherever possible, to provide habitat for wildlife.

(12) Encourage developers to utilize residential density transfers, landscaping credits, system development charge credits, reduction of minimum setback requirements, and other incentives for greenway, bikeway and pedestrian path purposes.

(13) Preserve the Hedges Creek Wetlands as a natural area and develop a Wetlands Protection Plan for this area.

(14) Discourage filling of the Hedges Creek Wetlands located westerly of those wetlands that may be identified by the City's Wetlands Protection District Ordinance until a general plan has been prepared for the remaining wetland area or until a consensus has been achieved among industrial and environmental interest groups and state and federal agencies on any individual request for a wetland fill permit.

(15) Develop a system of neighborhood parks that are geographically well distributed to serve the City's population.

(16) Whenever possible, locate neighborhood parks adjacent to school sites.

(17) Develop joint use agreements with the Tigard School District for the joint use of school land for neighborhood park facilities.

(18) ~~Develop a comprehensive City recreation program with an emphasis on youth activities, cultural activities, and the City's natural environment.~~ Develop comprehensive City recreation programs by activating parks and facilities through vibrant programs, events, and recreation opportunities for people of all ages, ability, cultures, and interests.

(19) Encourage private donations of land or money, consistent with the Park and Recreation Plan, to augment City park development funds.

(20) Discourage acquisition of small mini-parks because of relatively high maintenance expenses, except where a specific recreation need has been identified as a priority.

(21) Develop a Capital Improvements Program to define recreation improvement priorities, financial requirements, and financing methods.

Section 15.100 Natural Resources: Wetlands and Natural Areas Plan.

(1) In October 1994, the City initiated preparation of the Wetland and Natural Areas Plan as Periodic Review Work Tasks 3 and 4 of the 1993 City of Tualatin Periodic Review as approved by the Oregon Land Conservation and Development Commission (LCDC). The purpose of the plan is to inventory natural resources in the Tualatin Planning Area, identify Significant Natural Resources and provide a plan that pre-serves, conserves or allows development of the resources. The natural resources include wetlands, stream and riparian areas, and open spaces which consist of upland forests and meadows, and unique geologic areas and features such as the Tonquin Scablands. The Plan recommends requirements for protecting Significant Natural Resources designated in the Natural Resource Protection Overlay District as Greenways and Natural Areas.

(2) The Wetlands and Natural Areas Plan consists of:

(a) An inventory of natural resources within Tualatin' s Planning Area, The City of Tualatin Natural Resource Inventory and Local Wetlands Inventory (December, 1995)~~(Plan Map 1).~~

(b) Significant Natural Resource Criteria. (TDC 72.011)

(c) Significant Natural Resource List (TDC 72.013) and Map 72-3 (~~Plan Map 2 and Map 72-2~~, ~~TDC~~

(d) Significant Natural Resource management programs such as the TDC Chapter 15.110 Objectives, the Natural Resource Protection Overlay District (NRPO), and shift of density provisions for residential Planning Districts.

(e) Wetlands and Natural Areas Plan Designations Map ~~(Plan Map 3)~~, (Natural Resource Protection Overlay District Map 72-1, TDC).

(f) Goal 5 Natural Resource Planning Analysis Conflicting Uses and Economic, Social, Environmental and Energy consequences of a decision to protect or not protect a significant resource. (Winterowd Planning Services Report, 1997).

Section 15.110 Wetlands and Natural Areas Plan Objectives

The following are the objectives of the Wetlands and Natural Areas Plan. The objectives are to:

(1) Identify and protect significant natural resources that promote a healthy environment and natural landscape that improves livability.

(2) Protect significant natural resources that provide fish and wildlife habitat, scenic values, water quality improvements, storm-water management benefits, and flood control.

(3) Protect significant natural resources that provide recreational and educational opportunities.

(4) Balance natural resource protection and growth and development needs.

(5) Provide incentives and alternative development standards such as reduced minimum lot sizes and building setbacks for property owners to preserve the natural resource while accommodating growth and development.

(6) Allow public facilities such as sewer, stormwater, water and public streets and passive recreation facilities to be located in significant natural resource areas provided they are constructed to minimize impacts and with appropriate restoration and mitigation of the resource.

(7) Except in Wetland Natural Areas, allow public boating facilities, irrigation pumps, water-related and water-dependent uses including the removal of vegetation necessary for the development of water-related and water-dependent uses.

(8) Except in Wetland Natural Areas, allow the replacement of existing structures with structures in the same location that do not disturb additional riparian surface.

TUALATIN DEVELOPMENT CODE

Update References to Figure 3-4

Setbacks
The following text changes to be updated in (note: this same text appears in each of these chapters):

- TDC 36.400(5)(b)
- TDC 41.320(3)(b)
- TDC 42.320(3)(b)
- TDC 43.320(3)(b)
- TDC 44.320(3)(b)
- TDC 49.320(3)(b)
- TDC 50.310(2)(b)
- TDC 51.310(3)(b)
- TDC 52.310(2)(b)
- TDC 55.310(2)(b)
- TDC 60.310(4)(b)
- TDC 61.310(3)(b)
- TDC 64.310(7)(b)

Setback Reduction for Developments Adjacent to Greenways and Natural Areas. To preserve natural areas and habitat for fish and wildlife, the decision-authority may provide a front, side, or rear yard

setback reduction for developments that are adjacent to Greenways or Natural Areas that dedicate land for conservation or public recreational purposes, in accordance with the following standards.

[…]

(b) Location of Greenway or Natural Area Lot. Each lot must be located wholly in one of the following conservation or protection areas:

(i) Natural Resource Protection Overlay (NRPO) District (TDC Chapter 72);

~~(ii) Other Natural Areas identified in Figure 3-4 of the Parks and Recreation Master Plan; or~~

(iii) Clean Water Services Vegetated Corridor.

Other References to Figure 3-4

Chapter 31 Definitions

Fish and Wildlife Habitat Area. An area in the Natural Resource Protection Overlay District~~, Other Natural Areas identified in Figure 3-4 of the Parks and Recreation Master Plan,~~ or in a Clean Water Services Vegetated Corridor.

TDC 36.400(5) Lot Dimensions; Frontage on Public Streets

(5) Frontage on Public Streets. All lots created after September 1, 1979 must abut a public street, except for the following:

(a) Secondary condominium lots, which must conform to TDC 73C and TDC 75;

(b) Lots and tracts created to preserve wetlands, greenways, Natural Areas and Stormwater Quality Control Facilities identified by TDC Chapters 71, 72, ~~Figure 3-4 of the Parks and Recreation Master Plan~~ and the Surface Water Management Ordinance, TMC Chapter 3-5 respectively, or for the purpose of preserving park lands in accordance with the Parks and Recreation Master Plan;

(c) Residential lots where frontage along a public street is impractical due to physical site restraints. Access to lots must occur via a shared driveway within a tract. The tract must have no adverse impacts to surrounding properties or roads and may only be approved if it meets the following criteria:

TDC 57.100 Access (MUCOD)

Section 57.100 Access.

Except as provided below, no lot shall be created without provision for access to the public right-of-way in accordance with TDC 73.400 and TDC Chapter 75. Such access may be provided by lot frontage on a public street or by creating uninterrupted vehicle and pedestrian access between the subject lot and the public street. Lots and tracts created to preserve wetlands, green-ways, Natural Areas and Stormwater Quality Control Facilities identified by TDC Chapters 71, 72, ~~Figure 3-4 of the Parks and Recreation Master Plan~~ and the Surface Water Management Ordinance, TMC Chapter 3-5, as amended, respectively, or for the purpose of preserving park lands in accordance with the Parks and Recreation Master Plan, may not be required to abut a public street.

TDC 73C.040 Joint Use Parking Requirements

(2) Joint use of parking spaces may be allowed if the following standards are met:

[…]

(f) Areas in the Natural Resource Protection Overlay District~~, Other Natural Areas identified in Figure 3-4 of the Parks and Recreation Master Plan,~~ or a Clean Water Services Vegetated Corridor would be better protected.

TDC 72.010

Section 72.010 Purpose.

(1) To identify and protect by preservation and conservation the designated significant natural resources and Other Natural Areas. The designated significant natural resources are greenways and natural areas, which include the riparian areas and scenic areas of the Tualatin River and certain creeks and drainage swales, wetlands, upland forests, meadows, fish and wildlife resources, and the geologic features of the Tonquin Scablands. Significant Natural Resources are identified on the Significant Natural Resource List and Map TDC 72.013 and Map 72-3, TDC). The significant natural resources designated for protection are shown on Map 72-1, TDC. ~~Other Natural Areas identified in Figure 3-4 of the Parks and Recreation Master Plan~~

Section 72.020 Location of Green-ways and Natural Areas.

(1) The designated significant natural resources are the Greenways and Natural Areas on Map 72-1, which shows the general location of the NRPO District. ~~The general locations of Other Natural Areas identified in Figure 3-4 of the Parks and Recreation Master Plan~~

(2) Lands in the Wetland Protection District (WPD) are subject to Chapter 71, and other applicable regulations, but not Chapter 72.

Section 72.085 Landscaping Credit within Commercial and Industrial Planning Districts Adjacent to Greenways and Natural Areas.

(1) When a property owner in a Commercial, Institutional, or Industrial Planning District dedicates to the City a portion of the NRPO District, ~~an Other Natural Area~~ or vegetated corridor located within or adjacent to the NRPO District in accordance with a City-approved landscape plan, a Greenway and Natural Area Landscaping Credit shall be applied toward a portion of the site's percentage landscaping requirement.

(2) The amount of the Greenway and Natural Area Landscaping Credit shall be as provided in TDC Chapter 73. The applicant must meet all landscaping requirements in this Code to the satisfaction of the Planning Director through the Architectural Review process.

Section 72.090 Reduction in Setback Requirements.

When a property owner in a IN, CO, CR, CO/MR, ML, or MG Planning District dedicates to the City land in the NRPO District ~~or Other Natural Area~~ , a bikeway or pedestrian path facility, or a vegetated corridor located within or adjacent to the NRPO District , the minimum front yard setback may be reduced through the AR process as provided in Chapters 50, 51, 52, 55, 60, and 61.

Section 72.100 Parks Systems Development Charge (SDC) Credit.

Ordinance 833-91 establishes a System Development Charge for Parks in residential planning districts. The ordinance contains provisions for credits against the Parks SDC, subject to certain

limitations and procedures. Credit may be received up to the full amount of the Parks SDC fee. Dedication of NRPO District Areas~~, Other Natural Areas~~ or vegetated corridors located within or adjacent to the NRPO District listed in the SDC capital improvement list are eligible for a SDC credit. Dedication and improvement of bicycle and pedestrian paths may also be eligible for a SDC credit.

Section 72.110 Easements for Pedestrian and Bicycle Access.

In any portion of the NRPO District, the City may, through the subdivision, partition, conditional use, architectural review, or other applicable development approval process, require that easements for pedestrian and bicycle access and maintenance uses be granted as a condition of approval when said easements are necessary to achieve the purposes of the Parks and Recreation Master Plan, Greenways~~ and~~ Trail Development Plan (Figure 72-2), or ~~Bikeways~~ Bicycle and Pedestrian Plan (Figure 11-4).

Plant List

Section 72.070 General Guidelines for Pedestrian and Bike Paths in Greenways.

(4) Replant trees in the vicinity where they were removed. Use native species. ~~as outlined in the approved plant list incorporated in the Parks and Recreation Master Plan.~~

Other Natural Areas defined

Section 72.055 Other Greenways and Natural Areas.

~~Section 72.055 Other Greenways and Natural Areas.~~

~~(1) Other Natural Areas are not shown on Map 72-1. They are shown in the Parks and Recreation Master Plan (pp. 7, 65 and 70). They are natural resources not designated as NRPO Greenways or Natural Areas.~~

~~(2) Other Natural Areas may be voluntarily conserved or preserved using measures such as land dedication, granting conservation easements and acquisition programs.~~

Update Reference to "Schedule A of the TDC Chapter 74"

Schedule A was updated to Table 74-1 in TDCIP Phase I, but could make sense to fix now:

TDC 74.705(3)(b)

(b) Replace the removed tree by planting a species of street tree permitted by ~~Schedule A of the TDC Chapter 74~~ Table 74-1 within the time period specified in writing by the City Manager; or, the applicant may request within sixty (60) days of the permit approval date that the City replace the street tree and pay the applicable fee(s) established in TDC 74.706. If an applicant opts for the City to plant the replacement tree, the City may plant the tree on its usual tree-planting schedule. Planting done by the applicant or designated contractor must comply with all applicable TDC sections and any additional requirements imposed by the City Manager.

TDC 74.705(3)(c)

(iv) limit the selection of species from ~~Schedule A~~: Table 74-1 and;

TDC 74.707

A person who desires to plant a tree in or upon a public right-of-way may plant or have the City plant a species of street tree permitted by ~~TDC Chapter 74 Schedule A of the TDC Chapter 74~~ Table 74-1 without a City permit, if the tree is not a re-placement for a tree that the person has removed. Such a person may submit a request to the City with payment of fee(s) so that the City may plant a street tree. If a stump exists where a street tree is to be planted, the person must remove the stump or pay a fee to the City as established in TDC 74.706 so that the City may remove the stump on behalf of the person. In all instances, a person who desires to plant a tree must comply with other applicable TDC sections and any additional requirements of the City Manager.

TDC.765

TDC 74.765. - Street Tree Species and Planting Locations.

All trees, plants or shrubs planted in the right-of-way of the City must conform in species and location and in accordance with the street tree plan and City standards, including Table 74-1. If the City Manager determines that none of the species in City standards, including Table 74-1 is appropriate or finds appropriate a species not listed, the City Manager may substitute an unlisted species.

Table 74-1
Street Tree Species

~~The following street trees are authorized for planting in the City of Tualatin. Please refer to Map 74-1 to reference locations of the following species of trees.~~					
~~Species Common Names~~	~~Planting Strip Width (feet)~~			~~Power line Compatible~~	~~Spacing on center (feet)~~
~~**Zone 1**~~	~~4~~	~~5~~	~~6+~~		
~~Leprechaun Ash~~	~~•~~	~~•~~	~~•~~		~~30~~
~~Purple Beech~~	~~•~~	~~•~~	~~•~~		~~30~~
~~European Hornbeam~~	~~•~~	~~•~~	~~•~~	~~•~~	~~30~~
~~Armstrong Maple~~	~~•~~	~~•~~	~~•~~		~~30~~
~~Scanlon/Bowhall Maple~~	~~•~~	~~•~~	~~•~~		~~30~~
~~Skyrocket English Oak~~	~~•~~	~~•~~	~~•~~		~~30~~
~~Capital Flowering Pear~~	~~•~~	~~•~~	~~•~~		~~30~~

~~Persian Parrotia~~	~~●~~	~~●~~	~~●~~		~~30~~
~~Eastern Redbud~~	~~●~~	~~●~~	~~●~~		~~30~~
~~Zelkova Musashino~~	~~●~~	~~●~~	~~●~~		~~30~~
~~Autumn Applause Ash~~		~~●~~	~~●~~		~~30~~
~~Shademaster Honey Locust~~		~~●~~	~~●~~		~~30~~
~~**Zone 2**~~					~~30~~
~~Golden Desert Ash~~	~~●~~	~~●~~	~~●~~	~~●~~	~~30~~
~~Leprechaun Ash~~	~~●~~	~~●~~	~~●~~		~~30~~
~~Purple Beech~~	~~●~~	~~●~~	~~●~~		~~30~~
~~Goldenrain~~	~~●~~	~~●~~	~~●~~		~~30~~
~~European Hornbeam~~	~~●~~	~~●~~	~~●~~	~~●~~	~~30~~
~~Ivory Japanese Lilac~~	~~●~~	~~●~~	~~●~~	~~●~~	~~30~~
~~Amur Maackia~~	~~●~~	~~●~~	~~●~~	~~●~~	~~30~~
~~Amur Maple~~	~~●~~	~~●~~	~~●~~	~~●~~	~~30~~
~~Crimson Sentry Maple~~	~~●~~	~~●~~	~~●~~	~~●~~	~~30~~
~~Trident Maple~~	~~●~~	~~●~~	~~●~~	~~●~~	~~30~~
~~Skyrocket English Oak~~	~~●~~	~~●~~	~~●~~	~~●~~	~~30~~
~~Persain Parrotia~~	~~●~~	~~●~~	~~●~~		~~30~~
~~Eastern Redbud~~	~~●~~	~~●~~	~~●~~		~~30~~
~~Yellowwood~~	~~●~~	~~●~~	~~●~~		~~30~~

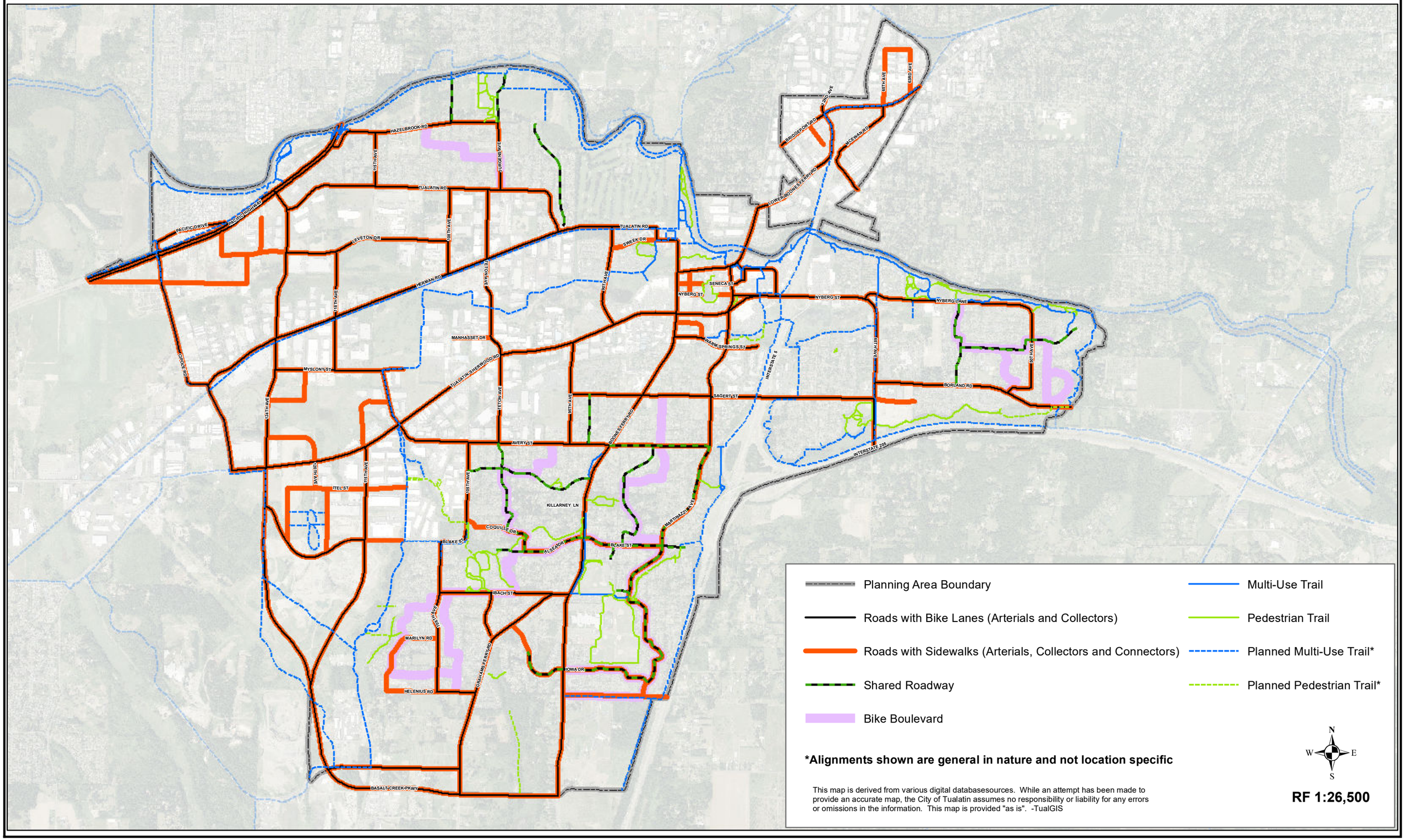
~~Raywood Ash~~		~~•~~	~~•~~	~~•~~	~~30~~
~~Urbanite Ash~~		~~•~~	~~•~~		~~30~~
~~Ginko~~		~~•~~	~~•~~		~~30~~
~~Greenspire Linden~~		~~•~~	~~•~~		~~30~~
~~Crimson King Maple~~		~~•~~	~~•~~		~~30~~
~~Tri-Color Beech~~			~~•~~		~~60~~
~~Frontier Elm~~			~~•~~		~~60~~
~~Globe Sugar Maple~~			~~•~~		~~60~~
~~Red Sunset Maple~~			~~•~~		~~60~~
~~Red Oak~~			~~•~~		~~60~~
~~Scarlet Oak~~			~~•~~		~~60~~

Species Common Names	**Planting Strip Width (feet)**			**Power line compatible**	**Spacing on center (feet)**
	4	5	6+		
Amur Maackia	•	•	•	•	30
Amur Maple	•	•	•	•	30
Armstrong Maple	•	•	•		30
Autumn Applause Ash		•	•		30
Black Tupelo	•	•	•		30
Capital Flowering Pear	•	•	•		30
Cascara	•	•	•	•	30
Crimson King Maple		•	•		30
Crimson Sentry Maple	•	•	•	•	30
Eastern Redbud	•	•	•		30
European Hornbeam	•	•	•	•	30
Frontier Elm			•		60
Ginko		•	•		30
Globe Sugar Maple			•		60
Golden Desert Ash	•	•	•	•	30
Goldenrain	•	•	•		30

Greenspire Linden		•	•		30
Ivory Japanese Lilac	•	•	•	•	30
Leprechaun Ash	•	•	•		30
Persain Parrotia	•	•	•		30
Purple Beech	•	•	•		30
Raywood Ash		•	•	•	30
Katsura	•	•	•		30
Red Oak			•		60
Red Sunset Maple			•		60
Scanlon/Bowhall Maple	•	•	•		30
Scarlet Oak			•		60
Shademaster Honey Locust		•	•		30
Skyrocket English Oak	•	•	•		30
Japanese snowbell	•	•	•	•	30
Sourwood	•	•	•	•	30
Tall Stewartia	•	•	•	•	30
Chinese Fringetree	•	•	•	•	30
Tri-Color Beech			•		60
Trident Maple	•	•	•	•	30
Urbanite Ash		•	•		30
Yellowwood	•	•	•		30
Zelkova Musashino	•	•	•		30

Figure 11-4: Bicycle and Pedestrian Plan

TUALGIS



Planning Area Boundary

Roads with Bike Lanes (Arterials and Collectors)

Roads with Sidewalks (Arterials, Collectors and Connectors)

Shared Roadway

Bike Boulevard

Multi-Use Trail

Pedestrian Trail

Planned Multi-Use Trail*

Planned Pedestrian Trail*

***Alignments shown are general in nature and not location specific**

N
W E
S

RF 1:26,500

Map 72-2: Greenway and Trail Development Plan

TUALGIS

Hedges Creek Greenway

Nyberg Creek Greenway

Nyberg Creek (South) Greenway

Saum Creek Greenway

Indian Meadows Greenway

Chieftan/Dakota Greenway

Planning Area Boundary

Multi-Use Trail

Pedestrian Trail

Planned Multi-Use Trail*

Planned Pedestrian Trail*

City Parks & Greenways

***Alignments shown are general in nature and not location specific**

N W E S

RF 1:26,500

Map 74-1: Street Tree Plantings

TUALGIS

DELETE

Zone 2

Zone

Zone 2

Planning Area Boundary

Zone 1

Zone 2

N

W E

S

RF 1:26,500

Zone 1

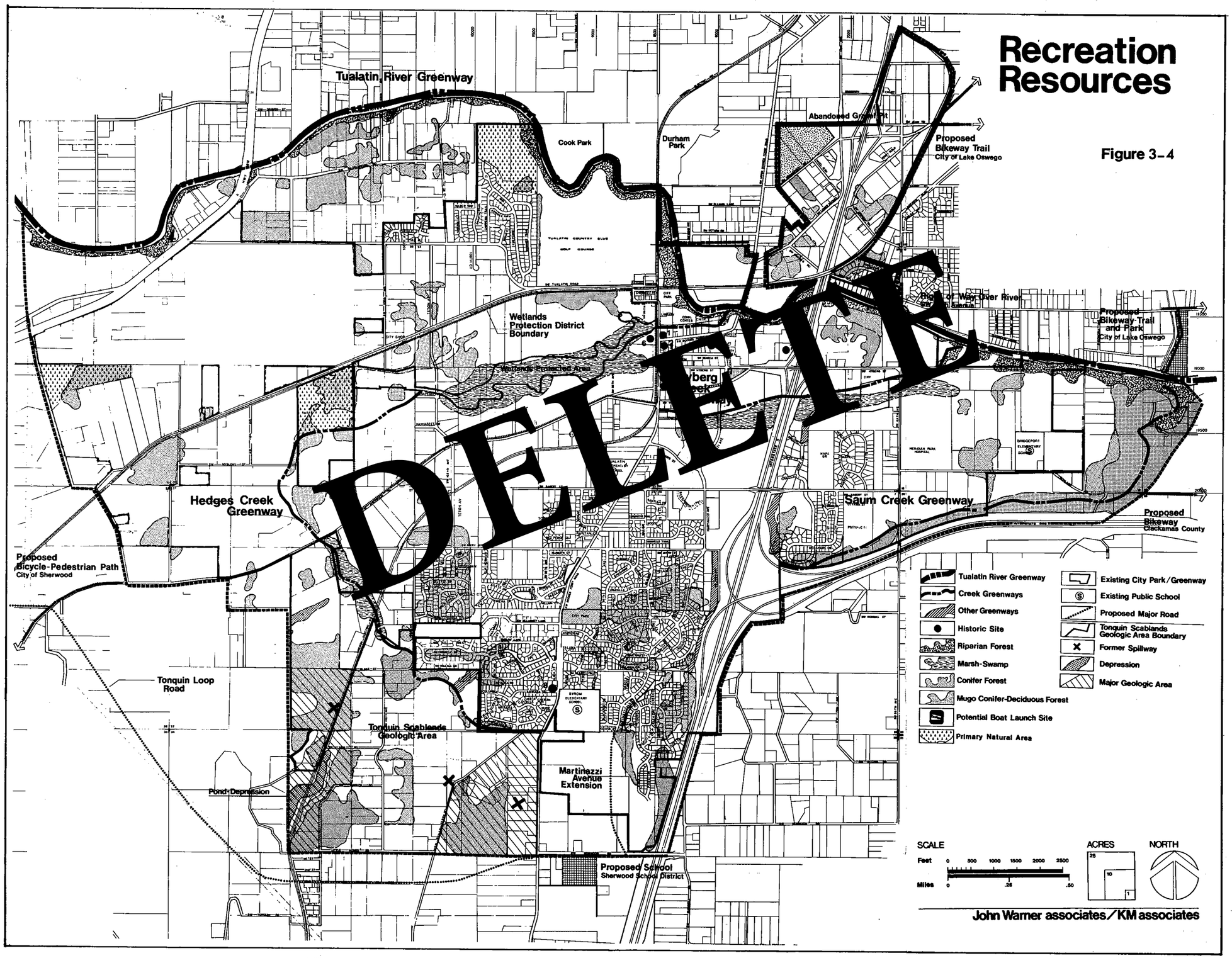
4 Foot Planter Strips	5 to 6 Foot Planter Strips	6 Foot or More Planter Strips
Leprechaun Ash	Any of the listing above, plus:	Any of the listing above
Purple Beech	Shademaster Honey Locust	
European Hornbeam	Autumn Applause Ash	
Armstrong Maple		
Scanlon/Bowhall Maple		
Skyrocket English Oak		
Capital Flowering Pear		
Persian Parrotia		
Eastern Redbud		
Zelkova Musashino		

Zone 2

4 Foot Planter Strips	5 to 6 Foot Planter Strips	6 Foot or More Planter Strips
Golden Desert Ash	Any of the listings above, plus:	Any of the listing above, plus:
Leprechaun Ash	Raywood Ash	Tri-Color Beech
Purple Beech	Urbanite Ash	Frontier Elm
Goldenrain	Ginko	Globe Sugar Maple
European Hornbeam	Greenspire Linden	Red Sunset Maple
Ivory Japanese Lilac	Crimson King Maple	Red Oak
Amur Maackia		Scarlet Oak
Amur Maple		
Crimson Sentry Maple		
Trident Maple		
Skyrocket English Oak		
Persian Parrotia		
Eastern Redbud		
Yellowwood		

Recreation Resources

Figure 3-4



John Warner associates / KM associates

Exhibit A to Resolution No. 5407-18

TUALATIN PARKS & RECREATION MASTER PLAN

Exhibit A to Resolution No. 5407-18

TUALATIN PARKS & RECREATION MASTER PLAN

Final Plan

November 2018

Prepared by:

815 SW 2nd Avenue, Suite 200 | Portland, OR 97204

503.297.1005 | www.migcom.com

Exhibit A to Resolution No. 5407-18

ACKNOWLEDGEMENTS

We appreciate the guidance provided by our advisory groups, as well as the involvement of many City committees and commissions, interest groups, civic leaders, and community members who have given their time, energy, and ideas to this Master Plan. Together, we have created the vision for parks and recreation that will support our high quality of life.

CITY COUNCIL

Mayor Lou Ogden

Council President Joelle Davis

Councilor Frank Bubenik

Councilor Jeff DeHaan

Councilor Nancy Grimes

Councilor Paul Morrison

Councilor Robert Kellogg

CITY STAFF

Sherilyn Lombos, City Manager

Ross Hoover, Parks and Recreation Director

Jerianne Thompson, Library Director

Aquilla Hurd-Ravich, Community Development Director

Sean Brady, City Attorney

Don Hudson, Finance Director

Rich Mueller, Parks Planning and Development Manager

Tom Steiger, Park Maintenance Manager

Julie Ludemann, Recreation Manager

Sara Shepherd, Center Supervisor

Paul Hennon, Parks and Recreation Director (retired)

Sou Souvanny, Management Analyst II

PROJECT ADVISORY COMMITTEE

Valerie Pratt, Chair

Candice Kelly, Vice Chair

Graehm Alberty

Diane Bonica

Beth Dittman

Kay Dix

Andrew Evans

Anthony Gallegos

Tom Gile

Cyndy Hillier

Robert Knight

Krista Nanton

Dana Paulino

Christen Sacco

Ted (Ata) Saedi

Maureen Sevigny

Anthony Warren

Dennis Wells

Exhibit A to Resolution No. 5407-18

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EXECUTIVE SUMMARY

From paddling and playing to public art and concerts in the park, the City of Tualatin Parks & Recreation Department provides a unique combination of parks, arts, trails, recreation facilities, programs, and events. The City's variety of parks and recreation experiences serves Tualatin's dynamic and growing community of residents, businesses and visitors.

The City's parks and recreation system, including parks, natural areas, greenways, trails, programs, events and public art, are essential to Tualatin's quality of life. The 2018 Park & Recreation Master Plan (Master Plan) provides strategic direction for managing and enhancing this system.

Extensive community involvement in the Master Planning process revealed that community members want a greater variety of parks and recreation opportunities that are accessible for more people across a wide range of ages, cultures, interests and abilities.

The community-driven Master Plan presents a vision for the future of Tualatin's parks and recreation and recommends investments the City can make to achieve the community's vision.

OUR PARKS AND RECREATION SYSTEM

Tualatin's parks and recreation services:

- Help improve individual health, wellness, and fitness
- Connect the community to nature
- Involve people in lifelong learning
- Steward the City's cultural and natural resources
- Attract businesses and support our economic vitality
- Foster community cohesion and vibrancy

PARKS

8 SITES
83.75 ACRES

Examples: Tualatin Community Park, Ibach Park

GREENWAYS

10 SITES
119.63 ACRES

Examples: Tualatin River Greenway, Hedges Creek Greenway

NATURAL PARKS & AREAS

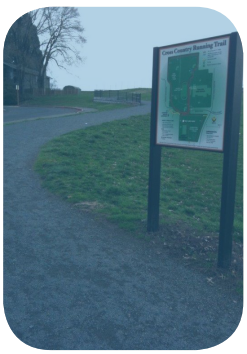
10 SITES
107.07 ACRES

Examples: Brown's Ferry Park, Little Woodrose Park, Hedges Creek Wetlands

SCHOOL JOINT-USE FACILITIES

2 SITES
- ACRES

Examples: Tualatin High School Sports Field, TuHS–Byrom Elementary Cross-Country Trail



SHARED USE PATHS

6 SITES
6.37 ACRES

Examples: Ice Age Tonquin Trail, Byrom Shared Use Path

TOTAL

36 SITES
316.82 ACRES

THE COMMUNITY'S VISION

More than 2,850 Tualatin community members participated in the Master Plan process through a multi-faceted community engagement program that ensures the Master Plan reflects Tualatin's priorities and needs. Tualatin community members from diverse demographics, different neighborhoods, and a range of experiences, perspectives, and needs all contributed comments and insights about their priorities and preferences for enhancing Tualatin's park and recreation system. Online and in-person events and activities created convenient opportunities for people to share their insights.

The Project Advisory Committee and City Council provided regular and ongoing guidance for the Master Planning process. Other advisory groups and nonprofit organizations, including the Parks Advisory Committee, the Tualatin Arts Advisory Committee, Youth Advisory Council, the Juanita Pohl Center Advisory Committee, the Tualatin Library Advisory Committee, the Diversity Task Force, Chamber of Commerce, and the Aging Task Force, also provided feedback at key points during the planning process.

Community input identified priority improvements and needs that were confirmed through a technical analysis of the park and recreation system. Priority improvements include:

- Invest in parks and recreation to maintain and enhance Tualatin's quality of life.
- Expand trail access and connectivity.
- Focus attention on sports facilities and programs.
- Improve indoor recreation facilities.
- Take care of existing assets.
- Provide access to nature.
- Diversify programs and recreation opportunities.
- Re-envision art in public spaces.
- Ensuring equitable and accessible parks and recreation opportunities.
- Meet the needs of a growing community.
- Improve information through enhanced marketing and communications.

BROAD-BASED OUTREACH TECHNIQUES

- **Stakeholder Interviews (7)**
- **Focus Groups (76)**
- **Hispanic/Latino Focus Group (9)**
- **Questionnaire (1,454)**
- **Pop-Up/Intercept Activities (1,340)**
- **Park Walks (6)**
- **Recommendation Workshops and Meetings (59)**
- **Draft Master Plan Review Online Questionnaire (55)**

ACHIEVING THE VISION

The Master Plan framework, presented on the next page, including values, vision, mission and goals, will guide the City's efforts to improve and enhance parks and recreation opportunities in Tualatin over the next fifteen years.

The Master Plan describes objectives and recommendations to guide systemwide improvements, along with more specific recommendations for existing and proposed park sites. Together, the goals, objectives, systemwide recommendations, and site recommendations provide direction for how the City can develop, program, and manage the park and recreation system to meet community needs. Highlights of these recommendations and sample projects are described on the following pages.

Exhibit A to Resolution No. 5407-18

CORE VALUES

- Inclusiveness & equity
- Diversity
- Economic vitality
- Accessibility & connectivity
- Community engagement
- Social cohesion
- Family-friendliness
- Community vibrancy & livability
- Health & wellness
- Conservation & stewardship

VISION

Tualatin is a vibrant city, with a healthy and cohesive community, connected through attractive parks, diverse facilities, trails, conservation of natural areas, recreation opportunities, and art and culture that are engaging and accessible to all.

MISSION

We actively care for our parks, connect our community through trails and programs, and protect our river, greenways and natural areas to create a beautiful, livable city.

GOALS

Goal 1: Expand accessible and inclusive parks and facilities to support community interests and recreation needs.

Goal 2: Create a walkable, bikeable, and interconnected city by providing a network of regional and local trails.

Goal 3: Conserve and restore natural areas to support wildlife, promote ecological functions, and connect residents to nature and the outdoors.

Goal 4: Activate parks and facilities through vibrant programs, events, and recreation opportunities for people of different ages, abilities, cultures, and interests.

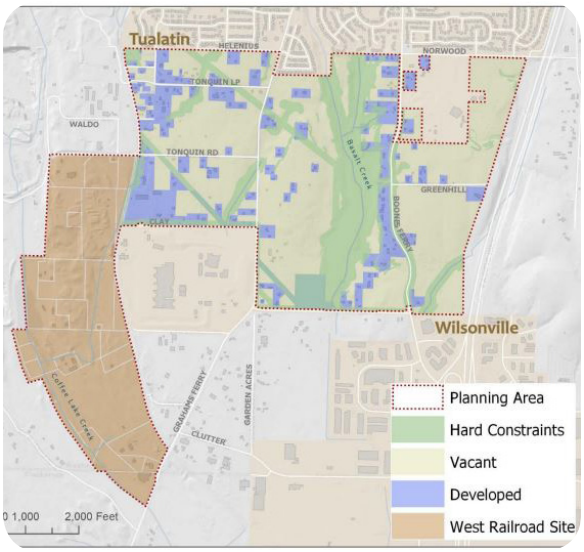
Goal 5: Support the arts through programs, parks, and public spaces that reflect Tualatin's identity, heritage, history, and expressive character.

Goal 6: Promote Tualatin's unique identity, economic vitality, and tourism through parks, natural resources, historic preservation, events, programs, and placemaking.

Goal 7: Manage, administer, and maintain quality parks, facilities, and programs through outstanding customer service, stewardship, and sustainable practices.

GOAL 1: EXPAND ACCESSIBLE AND INCLUSIVE PARKS AND FACILITIES TO SUPPORT COMMUNITY INTERESTS AND RECREATION NEEDS.

To achieve Goal 1, the Master Plan recommends providing well-maintained parks, greenways, natural areas and a diversity of recreation opportunities to fill existing gaps and serve future development areas. Thoughtfully designed facilities and activities will be accessible and meet the needs of Tualatin's diverse, growing and changing community.



Develop a new park in the Basalt Creek area to serve new residents and address unmet facility needs in south Tualatin.

Prioritize deferred maintenance projects and renovate aging amenities in parks.

Improve existing sport fields, acquire new parks for sports, and evaluate the financial feasibility of a tournament complex.

Design parks to be accessible and respond to demographic, cultural and neighborhood needs.

GOAL 2: CREATE A WALKABLE, BIKEABLE, AND INTERCONNECTED CITY BY PROVIDING A NETWORK OF REGIONAL AND LOCAL TRAILS.

To achieve Goal 2, the Master Plan recommends developing an interconnected system of accessible high-quality on and off-street bike and pedestrian facilities. The trail network should increase connections to local and regional destinations and trails and provide access to the city's natural areas. Trail additions and enhancements may include improving accessibility and adding amenities such as directional signage, lighting, art, and resting areas.

Develop more local and regional trails to improve connections across the city.

Provide more non-motorized boat launches along the river for access to the Tualatin River Water Trail.

Provide bike repair stations, restrooms, and other trailhead amenities to support trail use.

Add signage at trail cross-roads noting the distance to key destinations.

GOAL 3: CONSERVE AND RESTORE NATURAL AREAS TO SUPPORT WILDLIFE, PROMOTE ECOLOGICAL FUNCTIONS, AND CONNECT RESIDENTS TO NATURE AND THE OUTDOORS.

To achieve Goal 3, the Master Plan recommends identifying, protecting, maintaining and stewarding nature resources in Tualatin's parklands. A Natural Resource Management Plan, Urban Forest Management Plan, and adequate funding will allow the City to care for its natural resources. The Master Plan guides the City in balancing expanded access to nature with the protection of healthy ecosystems and wildlife.

Develop a Community (Urban) Forestry Plan to protect the tree canopy in parks, along streets and other public spaces in the city.

Increase maintenance funding to improve natural resource stewardship.

Add interpretive elements, viewing blinds, pollinator patches, and nature play elements in parks and greenways to increase connections to nature.

Provide more environmental education and nature interpretation programs.

GOAL 4: ACTIVATE PARKS AND FACILITIES THROUGH VIBRANT PROGRAMS, EVENTS, AND RECREATION OPPORTUNITIES FOR PEOPLE OF DIFFERENT AGES, ABILITIES, CULTURES, AND INTERESTS.

To achieve Goal 4, the Master Plan recommends expanding, strengthening and diversifying programs, including sports, fitness, library, and enrichment programs. Program offerings should evolve to respond to community needs as Tualatin grows and changes. Continued events, social gatherings, and celebrations will connect residents and strengthen community spirit as the City grows.

Increase outdoor programs to support Sports and Fitness, Nature, Arts & Culture.

Provide neighborhood-oriented events such as movies and social gatherings at Atfalati, Ibach, and Jurgens parks.

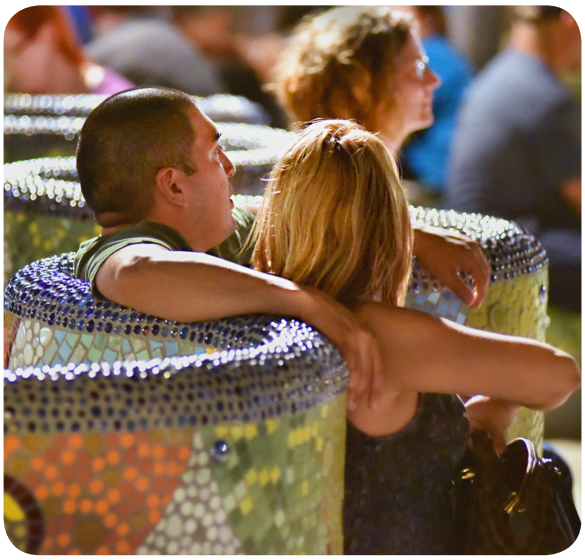
Work with partners to develop a temporary or permanent maker-space/technology hub.

Complete a financial feasibility study to evaluate options to improve indoor recreation space or build a new recreation center.

GOAL 5: SUPPORT THE ARTS THROUGH PROGRAMS, PARKS, AND PUBLIC SPACES THAT REFLECT TUALATIN'S IDENTITY, HERITAGE, HISTORY, AND EXPRESSIVE CHARACTER.

To achieve Goal 5, the Master Plan recommends working with partners to expand the role of art in public spaces, including interactive, educational and interpretive art. The City's art should define a sense of place and reflect the character and identity of Tualatin. Diversified and expanded arts programming and public art should include the community's many cultural traditions and rich history of the area.

Update the Ibach Park play area and develop new play elements that integrate Tualatin's art, history and culture.



Integrate art into signage and functional park amenities.

Integrate innovative play and educational pieces that encourage people to explore art, music, nature, and history.

Encourage performances in parks or other under-utilized public spaces.

GOAL 6: PROMOTE TUALATIN'S UNIQUE IDENTITY, ECONOMIC VITALITY, AND TOURISM THROUGH PARKS, NATURAL RESOURCES, HISTORIC PRESERVATION, EVENTS, PROGRAMS, AND PLACEMAKING.

To achieve Goal 6, the Master Plan recommends designing parks and facilities that contribute to a sense of place, including community gathering hubs in City center parks and improved connections to the Tualatin River. The City and its partners should communicate the benefits provided by Tualatin's parks, natural areas, trails, art and programs and engage community members and local organizations in supporting art, recreation, and tourism.

Market and promote Tualatin as a regional tourist destination.

Plan and develop Tualatin Community Park as a civic hub and focal point for civic and community activities.

Connect Tualatin residents to the river by expanding riverfront trails, viewpoints, boat launches, and floating docks.

Improve communications and promote Tualatin's park and recreation opportunities.

GOAL 7: MANAGE, ADMINISTER, AND MAINTAIN QUALITY PARKS, FACILITIES, AND PROGRAMS THROUGH OUTSTANDING CUSTOMER SERVICE, STEWARDSHIP, AND SUSTAINABLE PRACTICES.

To achieve Goal 7, the Master Plan recommends adopting design and development guidelines to guide park and facility maintenance, management, renovation, and development. The Department should continue its fiscally and financially prudent approach to service provision while identifying and expanding resources. The City can improve information, communication, and relationships with park users, city residents, and employees with increased opportunities for input and feedback.

Leverage resources to expand and enhance parks, facilities, programs and events

Invest in technology to improve energy conservation and irrigation efficiency.

Provide more frequent restroom cleaning, trash removal and clean-up in high-use parks during peak-use times.

Update reservation and programming fees to reinvest in facilities and programs.

IMPLEMENTING THE VISION

The projects and programs recommended in the Master Plan will not all be implemented at once. Instead, on an annual basis, the Parks & Recreation Department staff will evaluate funding and prioritize projects for implementation. The prioritization process will inform the Department's short-term capital improvement plans. The Master Plan presents a two-step evaluation process for prioritizing and scheduling capital projects for implementation in coming years.

$215.9 MILLION

COST OF ALL CAPITAL PROJECTS, INCLUDING LAND ACQUISITION AND IMPROVEMENTS

$2.1 MILLION

AMOUNT THAT WILL BE NEEDED ANNUALLY TO MAINTAIN ALL SITES AFTER DEVELOPMENT AND RENOVATION

$2 MILLION

ADDITIONAL AMOUNT THAT SHOULD BE SET ASIDE ANNUALLY TO REPAIR AND REPLACE FACILITIES WHEN NEEDED

To implement the Master Plan recommendations, the City will need to diversify funding sources and increase revenues from existing sources. There are a variety of funding sources available for recreation services (operations) and capital improvements (projects) in Oregon, many of which are already used by Tualatin.

- Capital funding supports new construction, expansion, renovation, or replacement projects for existing parks and facilities.
- Operations funding supports ongoing services, such as maintenance, facility operations, recreation programming, events, marketing, and management.

There are big decisions to be made about funding for Tualatin's parks and recreation. Residents need to express their continued support to Council and City leaders to fund parkland, facilities, trails, programs, and the arts. Working together, residents, businesses, partners, City staff, elected officials, and community leaders can create the accessible, inclusive, vibrant park and recreation system they envision.

Exhibit A to Resolution No. 5407-18

1 INTRODUCTION

Canoeing and kayaking on the Tualatin River. Playing an evening kickball game with coworkers. Steering your wheelchair on the Ice Age Tonquin Trail. Enjoying a family picnic at Community Park. Dancing at a Salsa concert. Playing bingo at the Juanita Pohl Center. Climbing on a pre-historic themed playground. Exploring Tualatin's history through art. Winning a baseball championship. Paddling in a giant pumpkin regatta. Where can you do all of these things?

Tualatin Parks and Recreation is a leader in the Portland Metro Area for its unique combination of parks, arts, trails, recreation facilities, programs, and events. The wide variety of parks and recreation experiences offers something for everyone—appealing to residents and employees, as well as people of different ages, cultures, abilities, and interests. Tualatin's wide-ranging activities offer many benefits. Parks and recreation experiences:

- Help improve individual health, wellness, and fitness.
- Connect residents to nature.
- Involve people in lifelong learning.
- Steward the City's cultural and natural resources.
- Attract businesses and support our economic vitality.
- Foster community cohesion and vibrancy.

Tualatin completed its last Parks and Recreation Plan nearly 35 years ago. Since then, the city has grown; the community is more culturally diverse; new recreation trends have emerged; traffic congestion has increased; tourism and visitation has grown; and new businesses have located here. Residents want City leaders to invest in parks, facilities, trails, and programs to respond to the dynamic needs of this community. To do this, the City needs an innovative, forward-thinking Master Plan to define the community's vision, identify current and future needs, and strategically guide this investment.

PLAN PURPOSE

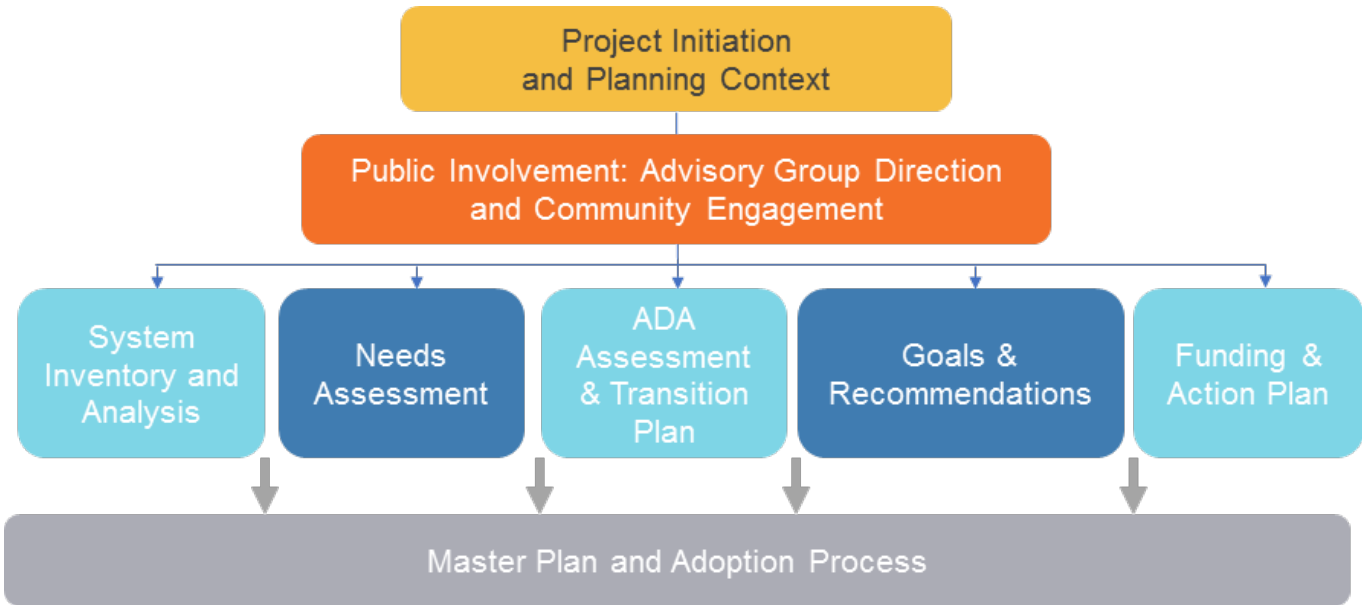
The 2018 Park & Recreation Master Plan (Master Plan) provides direction for the stewardship, enhancement, and development of Tualatin's parks, natural areas, greenways, trails, programs, events, and public art. An update of the 1983 plan, this Master Plan provides guidance for the City's parks, recreation, trails, and arts investments through the year 2035. The Master Plan will guide Parks and Recreation Department staff (the Department), City Council, the Parks Advisory Committee (TPARK) and the Tualatin Arts Advisory Committee (TAAC) in related decisions.

PLAN PROCESS

This Master Plan is a community-driven plan, presenting vision goals, and recommendations that emerged from extensive community input and a robust technical analysis. The Master Plan process launched in Summer 2017 and was completed in Fall 2018 (Figure 1-1). A Project Management Team (PMT), consisting of City staff and consultants from MIG, provided technical expertise, spearheaded and facilitated community and stakeholder engagement, and produced interim reports.

The process started with an evaluation of the planning context and an analysis of the City of Tualatin's parks, greenways, natural areas, paths, and recreational facilities and programs. A needs assessment incorporated demographic trends and an evaluation of the community's park, recreation, and trail needs.

Figure 1-1: The Master Plan Process



The planning process also included the concurrent development of an American with Disabilities Act (ADA) Assessment and Transition Plan (Transition Plan) to ensure that parks, facilities, and programs are accessible to people of all abilities. Available under a separate cover, the Transition Plan identified improvements needed in existing parks, trails, and buildings.

Based on the needs assessment and input from the public involvement, the project team developed the Master Plan's vision, mission, and goals. This framework guided systemwide and site-specific recommendations.

To guide implementation, the PMT created an action plan and identified funding sources and prioritization criteria to sequence future projects in the City's annual budgeting process. This element of the planning process also included an update of the City's Parks System Development Charge (SDC) Methodology.

Advisory groups and the community were engaged early on and provided input throughout the planning process. This ensures the Master Plan reflects Tualatin's priorities and needs.

ADVISORY GROUP DIRECTION

Established City of Tualatin advisory groups, including TPARK, the TAAC, Youth Advisory Council (YAC), the Juanita Pohl Center Advisory Committee, the Tualatin Library Advisory Committee (TLAC), the Diversity Task Force, and the Aging Task Force, also provided feedback at key points during the planning process. Two groups provided regular and ongoing guidance for the Master Planning process:

- **Project Advisory Committee (PAC):** The PAC included representatives from the Park Advisory Committee, City Council, local businesses, youth, sports and recreation users. This group met regularly in each phase of the planning process to review key deliverables, provide guidance on the analysis, and help brainstorm recommendations.
- **City Council:** Councilmembers received regular updates and provided policy direction to shape the Master Plan vision, goals, recommendations, funding strategies, and SDC methodology.

COMMUNITY ENGAGEMENT

More than 2,850 Tualatin community members participated in the Master Plan process through a multi-faceted community engagement program. People of diverse demographics, different neighborhoods, plus a range of experiences, perspectives, and needs all contributed comments and insights about their priorities and preferences for enhancing the park and recreation system. Online and in-person events and activities created convenient opportunities for people to share their insights. Outreach forums included:

- **Stakeholder Interviews:** In August 2017, seven City Council members, key City staff, and School District administrators participated in one-on-one interviews to describe opportunities and challenges that the Master Plan should address.
- **Focus Groups:** In August and September 2017, 11 focus groups were held with committees and groups representing specialized interests in Tualatin. Combined, 76 individuals participated in the meetings, which included guided discussions about their favorite park and recreation opportunities, areas for improvement or expansion, and their vision and priorities for parks and recreation.
  - » Aging Task Force
  - » Business Group
  - » Citizen Involvement Organization
  - » Historical Society
  - » Juanita Pohl Center Advisory Committee
  - » Planning Commission
  - » Tualatin Arts Advisory Committee
  - » Tualatin Library Advisory Committee

  - » Tualatin Tomorrow
  - » Youth Advisory Committee
  - » Youth Sports Group
- **Hispanic/Latino Focus Group:** On September 20, 2017, nine leaders of the Hispanic/Latino community gathered for a Spanish-language focus group. The discussion covered similar topics as other focus groups and also included a specific discussion of the unique park and recreation needs for the Hispanic and Latino communities.
- **Questionnaire:** From August to September 2017, a total of 1,454 individuals responded to a questionnaire designed to identify community priorities and needs. The questionnaire was available primarily online, with a paper version available in Spanish and English. City staff advertised the questionnaire widely via traditional and social media; through printed flyers, posters, and handouts and with targeted emails.
- **Pop-Up/Intercept Activities:** From July to September 2017, a total of 1,340 individuals participated in 32 pop-up events to provide input about the importance of parks, their frequency of visitation, activities needed in Tualatin, and priority improvements to the parks and recreation system. Interactive displays were set up at special events, festivals, and meetings, or in prominent, busy locations, such as the Public Library and the Juanita Pohl Center. These activities were designed to reach people who might not otherwise participate in public meetings, by taking the planning process to them.
- **Park Walks:** Tualatin explored a new method of engaging the community

Park Walks participants used a camera and signs such as this one to take photos about park elements they loved and/or wanted to see improved.

City staff used social media, newspaper advertisements, emails, press releases and other announcements to inform people about opportunities to participate in the planning process. Invitations were extended in English and in Spanish.

through scheduled walks in parks, where community members could meet with staff at an advertised time to discuss and take photos at particular parks. Staff targeted six different parks. Walks at Jurgens and Ibach Parks attracted participation, and six participants provided unique insights into what they loved about these sites and what opportunities they found for improvements.

- **Recommendation Workshops and Meetings:** In August 2018, the Project Management Team hosted a series of meetings and workshops with advisory groups and community members to receive input on Master Plan goals, objectives, and recommendations. Participating advisory groups included the Juanita Pohl Center Advisory Committee, the Library Advisory Committee, the Diversity Task Force, the PAC, and the Aging Task Force. Two community meetings/open houses provided opportunities for the broader public to provide feedback. Fifty-nine people participated.
- **Draft Master Plan Review:** An online questionnaire and downloadable materials were available in September 2018 for review and public comment on the Draft Master Plan. Community insights were discussed by the PMT, PAC and Council and incorporated into final plan revisions.

MASTER PLAN INTEGRATION

The Master Plan is consistent with the City policies, standards, practices, and plans as they relate to Tualatin's parklands, and considers Tualatin's plans for areas of new residential and commercial development and its projected

population. All relevant City and regional plans were consulted during the development of this Master Plan, including but not limited to:

- Tualatin demographic forecasts
- Tualatin Community Plan and Development Code
- Basalt Creek Concept Plan
- Northwest Concept Plan
- Southwest Concept Plan
- Metro 2018 Regional Trails System Plan
- Existing park and trail site master plans

The Master Plan process coincided with the development of two separate elements, which were also integrated into this planning process:

- ADA Assessment and Transition Plan
- Parks System Development Charge Methodology Update

The Master Plan included the development of several interim reports to assist in decision-making during the planning process.

- The Existing Park and Recreation System
- Public Outreach Summary Report
- Parks, Facilities, Programs, and Art Needs Analysis Preliminary Findings
- Goals, Objectives, and Systemwide Recommendations
- Site Recommendations and Matrix Overview

MASTER PLAN AT A GLANCE

This Master Plan includes six chapters and four appendices:

- Chapter 1 introduces the Master Plan.
- Chapter 2 provides an overview of current parks and recreation system.
- Chapter 3 describes the community's needs and priorities for the future, including the core values, vision, mission, and goals that will guide the implementation of the Master Plan.
- Chapter 4 and 5 identify goals, systemwide recommendations and site recommendations.
- Chapter 6 summarizes costs and implementation strategies.
- Appendix A presents the detailed inventory of parkland and facilities by site.
- Appendix B provides a matrix noting the types of site interventions recommended, including capital projects, capital replacement and reinvestment, maintenance, programming, and partnerships.
- Appendix C lists additional site considerations that can be reviewed and incorporated into site master planning processes.
- Appendix D presents cost matrices that show planning-level cost estimates for park acquisition, development, improvements, reinvestment and maintenance by category.

Exhibit A to Resolution No. 5407-18

2 PARK & RECREATION SYSTEM

Tualatin is centrally located in the rapidly-growing Portland Metro region and has a reputation for a high quality of life and good schools. Tualatin has a variety of parks and open spaces, which are referred to collectively as its parklands. Situated in the Tualatin Valley, the City's unique natural landscape features—including the Tualatin River, creeks, greenways, and undeveloped upland forests and wetlands-provide exceptional recreation opportunities that have been incorporated into its parklands. Within its parklands, Tualatin provides trails, greenways, and natural features as well as sports fields and courts, play features, and picnic areas that support a variety of recreation opportunities. Tualatin's unique landscape and culture are recognized in design elements throughout the park system, including natural and cultural interpretive elements and art pieces. The City also provides specialized facilities that house many of the Parks and Recreation Department's recreation and enrichment programs. Art displays and programming are a key element of the City's parks and recreation system. This chapter provides an overview of the City's parks and recreation service area, current parks and recreation facilities, maintenance, programs and services, and arts and culture programs and assets.

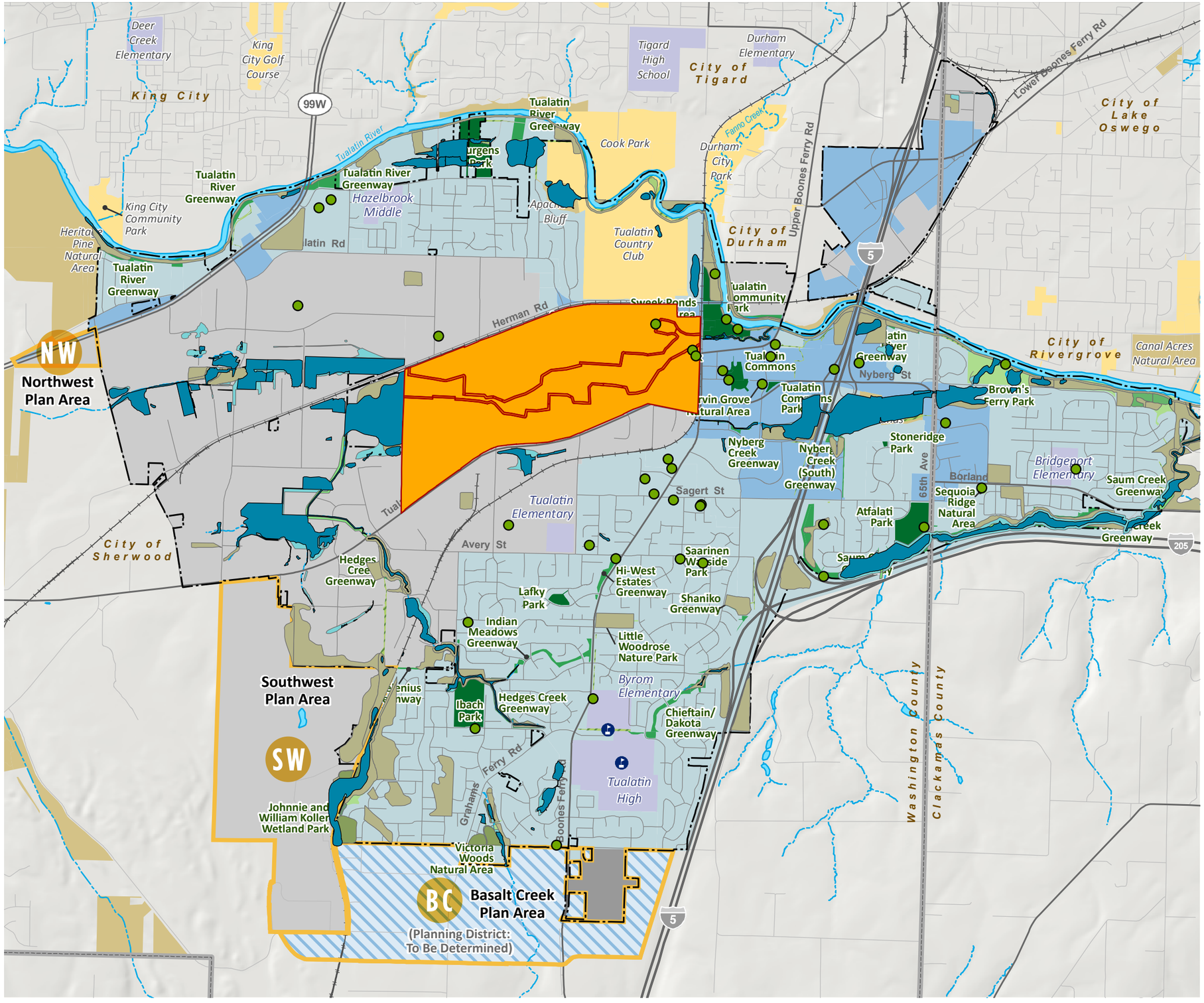
SERVICE AREA

The City of Tualatin is located along I-5, in between I-205, 99W, and 217, southwest of Portland. The City's service area for the Master Plan includes mix of residential, commercial and industrial land uses (Map 1). This includes the area within the current city limits, as well as three future expansion areas:

- **Northwest Concept Plan Area:** This 15-acre planning area is located just outside the City in the far northwest corner. The triangular site is designated for industrial uses, specifically for General Manufacturing (MG). The area is planned to include the Ice Age Tonquin Trail corridor but not developed parks. In the future, the trail corridor could connect this area to Metro's Heritage Pine Natural Area and the proposed Westside Trail connection via a bridge across the Tualatin River.
- **Southwest Concept Plan Area:** The 614-acre planning area is located just beyond the southwest corner of the City. The site is designated for industrial uses, specifically for Manufacturing Business Park (BP). Unlike the Northwest Plan area, this area is intended to feature some supporting retail uses that will generate additional needs. The plan does not call for any developed parks, as parks are not permitted in Regionally Significant Industrial Areas. However, the wetlands and surrounding habitat will be protected as required by State regulation. The Ice Age Tonquin Trail is also proposed to run through this area.
- **The Basalt Creek Concept Plan Area:** This planning area is located south of Tualatin and includes approximately 848 acres, split between the City of Tualatin and the City of Wilsonville. Tualatin's portion of this area is proposed to include Low Density Residential, Medium-Low Density Residential, High Density Residential, Manufacturing Park, and Neighborhood Commercial areas. The area includes the Basalt Creek Canyon natural area. Given anticipated development, parks, greenways, natural areas, and trails will be needed to serve new residents and businesses.

Exhibit A to Resolution No. 5407-18

Exhibit A to Resolution No. 5407-18



TUALATIN
Accessible, Inclusive & Vibrant
Parks and Recreation

PARKS & RECREATION MASTER PLAN

Map 1: Park and Recreation Service Area (2035)

Tualatin Park and Recreation Facilities
- Parks
- Greenways
- Natural Parks & Areas
- Shared Use Paths
- School Joint-Use Facilities

Other Park and Natural Areas
- Other Developed Parks and Recreation Areas
- Other Greenways and Natural Areas
- Tigard-Tualatin District Schools

Land Uses
- Residential
- Commercial
- Industrial
- Institutional
- Mixed Use: Residential, Commercial & Industrial

Planning Areas
- XX Planning District

Base Map Features
- Tualatin City Boundary
- County Boundary
- Freeways/Highways
- Major Arterials
- Local Streets
- Railroads
- Streams
- Rivers and Waterbodies

MIG Date: October 2017

Sources: City of Tualatin, Parks and Recreation, 2017; Metro Regional Government, 2017; Oregon Spatial Data Library, State of Oregon, 2017.

Disclaimer: This map is derived from various digital database sources. While an attempt has been made to provide an accurate map, the City of Tualatin, OR assumes no responsibility or liability for any errors or omissions in the information. This map is provided "as is".

0 500 1,000 2,000 3,000 4,000 5,000 Feet

Exhibit A to Resolution No. 5407-18

PARKLANDS

Within this service area, the Parks and Recreation Department currently manages 317 acres of parklands at 36 sites. These parklands are inventoried in five different classifications. The parkland classifications support City staff in implementing Master Plan policies by providing parameters for design and development, maintenance and operations, and future funding and acquisition opportunities.

- **Parks:** Parks are designed to support active and passive recreation, preserve and enhance natural resources, improve public health, and strengthen economic development. The City has eight parks, ranging from 0.23 to 27.11 acres in size. The sites collectively provide indoor and outdoor recreation facilities and a variety of amenities to support park use. These developed parks represent slightly more than one-fourth of City parklands (26%).
- **Greenways:** Trails are divided into two parkland categories: greenways and shared use paths. Greenways are protected open space and trail corridors maintained for conservation, recreation, non-motorized transportation, flood control, and utilities. They range in size from 0.43 to 54.22 acres. Although a few are not intended for trail development, most are at least partially developed and support trails ranging from 750 feet to nearly four miles in length. Combined, greenways currently provide more than 44,000 feet of trails, slightly more than eight miles in total. With 120 acres, greenways represent the largest land category of parklands (38%).
- **Natural Parks & Areas:** Natural Parks and Areas are protected natural resources with limited improvements such as trail heads, paths, and interpretive signs. These range in size from 0.06 acres to 43.21 acres. Natural Parks and Areas represent approximately 34% of the City's parklands.
- **School Joint-Use Facilities:** Through a joint use agreement, the City invests in and ensures public access to two school facilities. The acreage associated with these partner sites is not counted in the City's inventory, but these facilities represent important shared resources for residents and students.
- **Shared Use Paths:** Shared use paths also provide trail corridors. Unlike City-owned greenways, these sites allow public access to corridors and easements that include (or will include when developed) trails to support trail connectivity. In some cases, they provide an extension of a trail associated with a greenway. The two longest corridors have not yet been developed; consequently, shared use paths currently add approximately half a mile of trails.

The graphic below summarizes City parkland acreage by classification. The majority of acreage is natural in character; fewer acres provide developed parks. See Appendix A for further details on each site as well as a map showing the distribution of all parklands in the City.

Parkland Classification Summary

PARKS

8 SITES
83.75 ACRES

Examples: Tualatin Community Park, Ibach Park

GREENWAYS

10 SITES
119.63 ACRES

Examples: Tualatin River Greenway, Hedges Creek Greenway

NATURAL PARKS & AREAS

10 SITES
107.07 ACRES

Examples: Brown's Ferry Park, Little Woodrose Park, Hedges Creek Wetlands

SCHOOL JOINT-USE FACILITIES

2 SITES
- ACRES

Examples: Tualatin High School Sports Field, TuHS–Byrom Elementary Cross-Country Trail

SHARED USE PATHS

6 SITES
6.37 ACRES

Examples: Ice Age Tonquin Trail, Byrom Shared Use Path

TOTAL

36 SITES
316.82 ACRES

Park Type Summary

Developed parks are further subdivided into four different park types, further defining their function, role, and potential for facilities and programs (Figure 2-1).

Fig. 2-1: Park Type Summary

COMMUNITY PARKS

Large parks that provide a variety of recreation opportunities for the entire community, typically support large group gatherings, protect natural resources, and include specialized facilities such as community centers, sports fields, courts, and boat ramp.

SITES: **1**
ACRES: **27.11**
PARK SITES: **TUALATIN COMMUNITY PARK**

LARGE NEIGHBORHOOD PARKS

Mid-sized parks, accessible by walking, biking or driving that support sports, recreation, picnicking, and play opportunities for surrounding neighborhoods.

SITES: **3**
ACRES: **13.27-20.08**
PARK SITES: **ATFALATI PARK, IBACH PARK, JURGENS PARK**

COMMUNITY PARKS

Small parks located within biking and walking distance that provide gathering and play space for nearby neighbors.

SITES: **2**
ACRES: **0.23-2.0**
PARK SITES: **LAFKY PARK, STONERIDGE PARK**

COMMUNITY PARKS

Parks, recreation facilities, or sites designed around a singular purpose, such as plazas, historic properties, gateways, waysides, sports complexes, etc.

SITES**: 2**
ACRES**: 0.64-4.83**
PARK SITES**: TUALATIN COMMONS, TUALATIN COMMONS PARK**

RECREATION FACILITIES

In addition to its parklands, the City also provides a variety of recreation facilities, ranging from floating docks to sports fields to indoor recreation centers (Figures 2-2 & 2-3). Because the City offers an extensive network of trails, greenways, and natural areas to support outdoor recreation, it has several wildlife viewing areas, trails, river access points, and interpretive features. It also provides sports fields and courts, play features, and picnic areas, as well as amenities that support park comfort and use, such as restrooms, barbecues, picnic tables, and seating. Art is provided at seven sites.

Fig. 2-2: Facility Types by Number

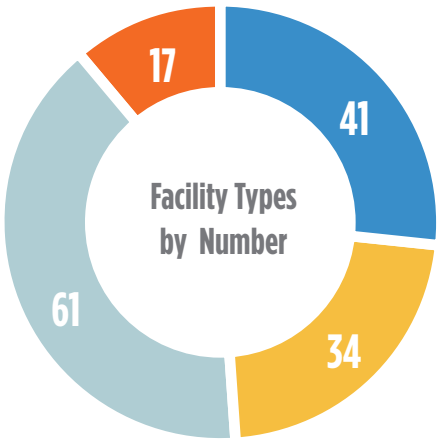


Fig. 2-3: Recreation Facilities by the Numbers

FACILITY TYPE	#
ATHLETIC FACILITIES	
Rectangular Fields	8
Ball Fields	5
Basketball Courts	6
Tennis Courts	8
Pickleball Courts	14
OUTDOOR RECREATION FACILITIES	
Play Features	9
Water Play/Spray Features	4
Flexible Use Lawn Areas	8
Covered Picnic Shelters	9
Horseshoe Pits	2
Skate Parks	1
Dog Park	1
TRAILS/NATURAL FEATURES	
Natural Areas & Wildlife Viewing	18
Trails	23
River Access	4
Interpretive Features	11
Floating Dock/ Boat Ramps	4
Kayak & Canoe Rentals	1
SPECIALIZED	
Art	7
Special Use Buildings	10

The Parks and Recreation Department manages ten special use buildings. The Van Raden Community Center, Brown's Ferry Community Center, and Tualatin Heritage Center are small, re-purposed houses and buildings used for programs. Three facilities (the Parks and Recreation Administration Offices, Lafky House, and Louis Walnut House) are used for office space. Additionally, the Tualatin Library, now managed through the Library Department (but formerly within Parks and Recreation), and the Juanita Pohl Center are major program hubs, accounting for nearly two-thirds of all program participation.

PARK MAINTENANCE

The City's parks and facilities are maintained by the Parks Maintenance Division. However, maintenance staff take care of more than the parks and facilities listed in the inventory. They are responsible for:

- The City's 317 acres of parklands (consisting of developed facilities, infrastructure, landscaping, and natural resources)
- Public spaces and landscaping around public buildings, parking lots, and rights-of-way
- Vegetation management of 82 water quality facilities
- Street tree and sidewalk maintenance
- Riverside frontage landscape maintenance

These responsibilities require specific skill-sets and different maintenance strategies to address the variety of areas maintained.

RECREATION PROGRAMMING

The City of Tualatin is recognized for several unique events—such as the West Coast Giant Pumpkin Regatta, Blender Dash, and Crawfish Festival—that highlight the fun and family-oriented character of the community. It also provides movies and concerts on the commons, Library and Heritage Center programs, and other recreation activities that contribute to residents' quality of life.

City programs are provided by the Parks and Recreation and Library departments in 11 core program areas (Table 2-1). These programs provide opportunities for all ages and integrate underserved user groups, such as Hispanic/Latino residents and people with special needs, into existing programs. Current programs emphasize Special Events (approximately 35%) and Enrichment and Learning (20%), which in past years accounted for more than half of all program participation. Programs also focus on the needs of older adults and seniors, youth, and library patrons. Nearly 30% of all program participation is facilitated at the Juanita Pohl Center, which primarily serves older adults and seniors.

Table 2-1: Tualatin Recreation Programs Service Areas and Participation

PROGRAM AREA	DEFINITION	COMMUNITY RECREATION PROGRAMS	LIBRARY PROGRAMS	JUANITA POHL CENTER PROGRAMS	TOTAL
Arts & Culture	Visual, fine and performing arts, and cultural heritage	2000	1,386	490	3,876
Before & After School Youth Programs	Youth programs before or after the school day	0	1,525	0	1,525
Day Camps	Activities when school is not in session	615	0	0	615
Development & Leadership	Age appropriate development programs	701	165	0	866
Enrichment & Learning	Classes, lectures, instruction and learning	358	11,013	371	11,742
Health, Wellness & Fitness	Physical activity, nutrition and health	0	279	8325	8,604
Nature-Based Programs (Parks)	Outdoor recreation, nature interpretation and environmental education	80	888	0	968
Social Activities	Drop-in programs and games	170	2,865	5006	8,041
Special Events	Community festivals and events	18,600	2,069	601	21,270
Sports	Recreational and competitive sports leagues and tournaments	0	0	2551	2,551
Volunteerism	Volunteer service projects and activities	1,332	634	782	2,748
TOTALS		23,856	20,824	18,126	62,806
PERCENTAGE		37.9%	33.2%	28.9%	

Participation data is based on City counts, FY 2016-2017.

The City also provides reservable indoor and outdoor facilities to facilitate recreation opportunities organized by others. Reservable rooms and picnic shelters serve more than 20,000 people each year. In addition, the City provides sports fields for league use and space at the Juanita Pohl Center for the Meals on Wheels Program, which served more than 18,000 people last year. The City also contracts with Alder Creek Kayak and Canoe to provide family-friendly kayak and canoe rentals on the Tualatin River from the rental center in Brown's Ferry Park.

PUBLIC ARTS

Tualatin promotes its identity and history through the arts. It curates display art and supports cultural experiences through arts programming and events. The City owns more than 350 pieces of art that are displayed, stored, or incorporated in parks, facilities, and trails. While most is comprised of wall hangings, there are sculptures, signs, play features, and infrastructure elements integrated into parks, plazas, and other outdoor public spaces (Table 2-2).

Display arts include permanent installations and rotating displays in City buildings, categorized into three types.

- **Tualatin Visual Chronicle:** Includes three collections (General, Student, and Historical collections) of non-educational prints, drawings, paintings, photographs, and other wall hangings that can be displayed in different locations to document the social, built, and/or natural landscape of Tualatin, capturing elements of the past and present, thereby providing an archival record and resource for the future.

- **Other On-Site Art:** Includes non-educational sculptures, wall hangings, drinking fountains, and etched granite in trails that enhance a specific site or building, may or may not have Tualatin-specific components. Examples include The Storyteller (bronze sculpture, Library Plaza); Crawfish (mosaic tile infrastructure/play feature/fountain, Tualatin Commons).
- **Educational Art Displays:** Includes educational or interpretive displays, signs, and play features centered on Tualatin's natural and cultural history, including elements of the Ice Age Discovery Trail. Examples include Birds (baked porcelain sign, Atfalati Park); Mastodon Teeth (bronze cast sculpture, Tualatin River Greenway).

Table 2-2: City of Tualatin Display Arts by Category and Location, 2017

CATEGORIES	TOTAL PIECES	ART WALK[1]	ICE AGE DISCOVERY TRAIL	PARKS AND RECREATION FACILITIES[2]	LIBRARY[2]	PUBLIC BUILDINGS[3]	OTHER/ MULTI SITE	PARKS/
Tualatin Visual Chronicle	233	*	0			233	0	0
Other On-Site Art	49	22[4]	0	7	11	0	4	27
Educational Art Displays	68	35[5]	31[5]	4	1	0	2	61
TOTALS	350	57	31	11	12	233	6	88

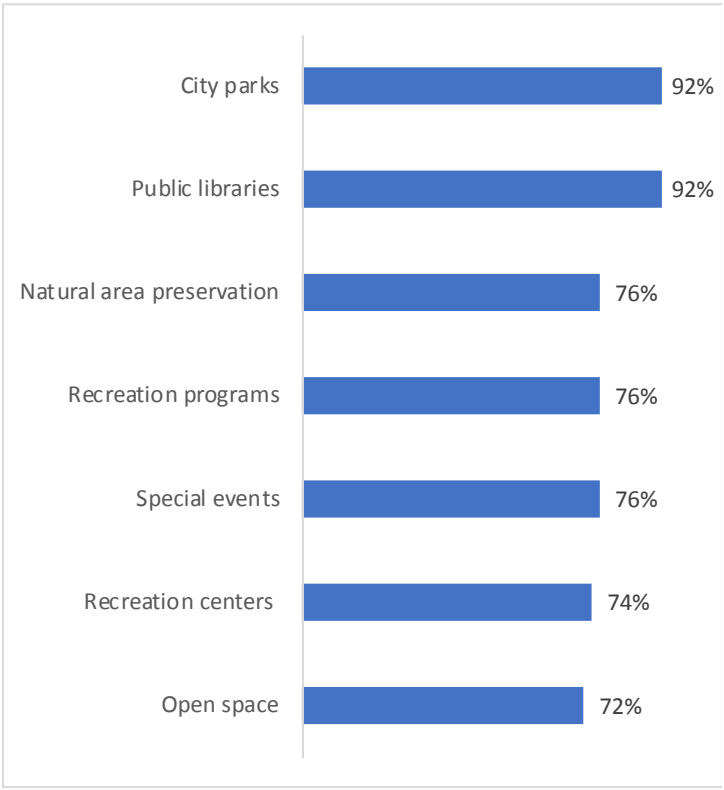
1. Pieces from the Tualatin Visual Chronicle are incorporated into the ArtWalk (not counted).
2. Visual Chronicle artwork in Parks and Recreation Facilities and Library are included in Public Building totals.
3. Pieces of the Tualatin Visual Chronicle in public buildings are rotated as capacity allows.
4. This count overlaps data in the location columns.
5. Some art displays are part of both.

Given the emphasis on the arts, the City also distinguishes five types of arts programming:

- **Cultural Programming:** performing arts such as dance, music, drama, and including events such as ArtSplash, Movies on the Commons, and Concerts on the Commons.
- **Educational Arts**: lectures, public presentations, "Artists in Residence" type programs, school presentations.
- **Fine Arts:** painting or drawing classes, graphic arts
- **Literary Arts:** storytelling, poetry, Reader's Theater programs
- **Media Arts**: film and video programs

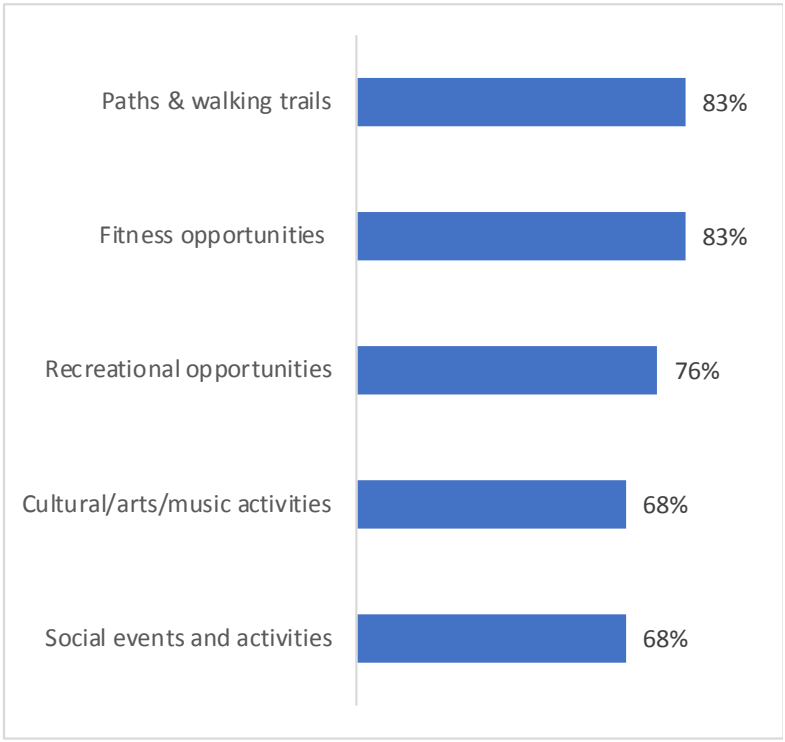
As noted in this chapter, the City strives to provide a variety of parks, facilities, programs, and services. Most residents across Tualatin are satisfied the quality of City services—although satisfaction is higher with parks, the Library and trails than with other types of facilities, programs and activities. The City is known for its recreation opportunities, creating an interest in expanding, enhancing, diversifying, and improving parks, facilities, and programs in the future.

Figure 2-4: Resident Satisfaction with the Quality of City Services



Source: 2016 Tualatin Community Livability Report (NCS)

Figure 2-5: Residents Satisfaction with Existing Community Characteristics



Source: 2016 Tualatin Community Livability Report (NCS)

Exhibit A to Resolution No. 5407-18

3 COMMUNITY VISION

Through the master plan process, more than 2,850 community members shared their preferences and priorities for parks, recreation, natural areas, trails, and programs. From this feedback, the Project Management Team and Project Advisory Committee identified key needs and used those to craft the core values, vision, mission, and goals that form the framework for this Master Plan.

This chapter summarizes community priorities and needs, presenting key outreach findings and supporting information about those needs. It concludes by introducing the core values, vision, mission, and goals.

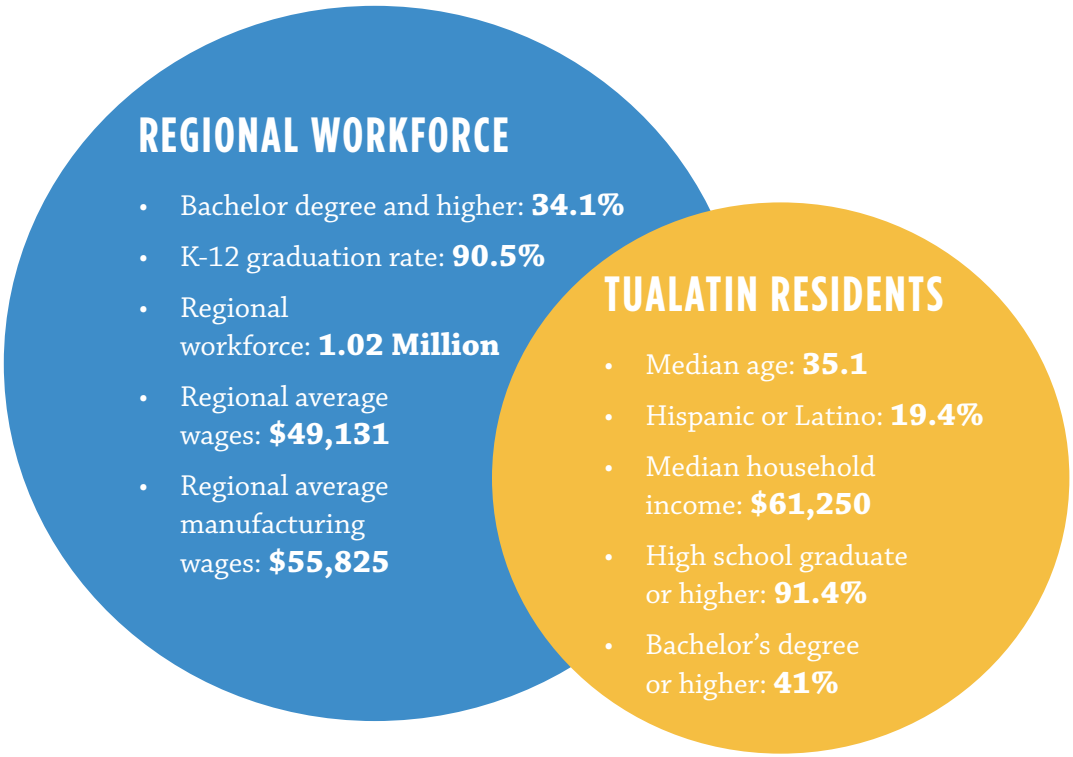
COMMUNITY PRIORITIES & NEEDS

Park and recreation priorities are influenced by a variety of factors, such as age, income, education, cultural background, and children in the household. Not surprisingly, individual priorities and preferences differ. Taken collectively, however, they paint a picture of the community's vision and needs for different types of parks and recreation opportunities. Common desires and needs emerge.

Through community outreach, the Master Planning process identified top priorities for the parks and recreation system. The common themes were cross-checked through a technical analysis to identify key needs. The top priorities and needs from this analysis include:

- Investing in parks and recreation to maintain and enhance Tualatin's quality of life.
- Expanding trail access and connectivity.

Figure 3-1: Regional Workforce & Tualatin Residents Demographic Data



Tualatin's parks and recreation system serves residents and local employees, as well as business patrons and visitors. Demographic data helps understand the population characteristics and unique needs of people who live and work in Tualatin. Source: American Community Survey (ACS) 2013 5-year data

- Focusing attention on sports facilities and programs.
- Improving indoor recreation facilities.
- Taking care of existing assets.
- Providing access to nature.
- Diversifying programs and recreation activities.
- Re-envisioning art in public spaces.
- Ensuring equitable and accessible parks and recreation opportunities.
- Meeting the needs of a growing community.
- Improving information through enhanced marketing and communications.

Each of these are described in more detail on the next several pages. Statistics highlighted are from the online questionnaire unless otherwise noted.

INDIVIDUAL COMMENTS AND GROUP RESPONSES CONTRIBUTED TO OUR UNDERSTANDING OF PARK NEEDS. HERE'S A SAMPLE FROM THE 100+ PAGES OF COMMENTS RECEIVED.

Ibach Park is my favorite park. It is the place I took my children, and now my grandchildren. I also love Tualatin Park and Brown's Ferry Park for walking, kayaking and other outdoor activities.

Atfalati es lo más cerca de la comunidad Latina. En Atfalati, quiero ver más actividades para los Hispanos, más actividades culturales, y más actividades baratas (asequibles) para los niños y familias. Es necesario para familias de bajos recursos.

We love Tualatin's parks. They are well maintained and have supported activities for our family. The items we would most like to see added are paved biking paths and more sports fields. There are many sports that compete for access to very heavily used fields. A sports complex would be a great asset for our community.

Get pickleball courts. There are a TON of pickleball players in Tualatin.

Would love to have direct river access that is ADA accessible (some ramps are too steep).

The best features are the festivals (ArtSplash!, Crawfish, and Pumpkin Regatta), the greenway trail system, and the library space and programs. Keep up this good work!

Focus on the trail system: Build out what's planned and build even more trails with direct routes from the outer neighborhoods to the town center, the western industrial area, major employers, Pacific Highway, and the Bridgeport / Lower Boones Ferry area–even if a route wouldn't be along a creek or the river. I suggest a walking and cycling bridge over the Tualatin River.

PRIORITY: INVESTING IN PARKS AND RECREATION TO MAINTAIN AND ENHANCE TUALATIN'S QUALITY OF LIFE

Master Plan participants agreed almost unanimously that parks, recreation programs, events, and trails are important to Tualatin's quality of life. They affirmed that **parks and recreation offer important benefits for themselves and their families**, such as opportunities to be outdoors (53%) and positive activities for youth (33%). They suggested many different ways to enhance or expand recreation activities and provided more than 100 pages of comments about the types of improvements desired. When faced with the reality that enhancing and expanding the system would require a larger investment, outreach participants identified these funding priorities**:** trails, sports, indoor recreation, asset stewardship, and natural resource protection.

95% BELIEVE PARKS, RECREATION, ARTS, AND TRAILS ARE IMPORTANT TO TUALATIN'S QUALITY OF LIFE.

Figure 3-2: Most Important Activities to Provide or Expand

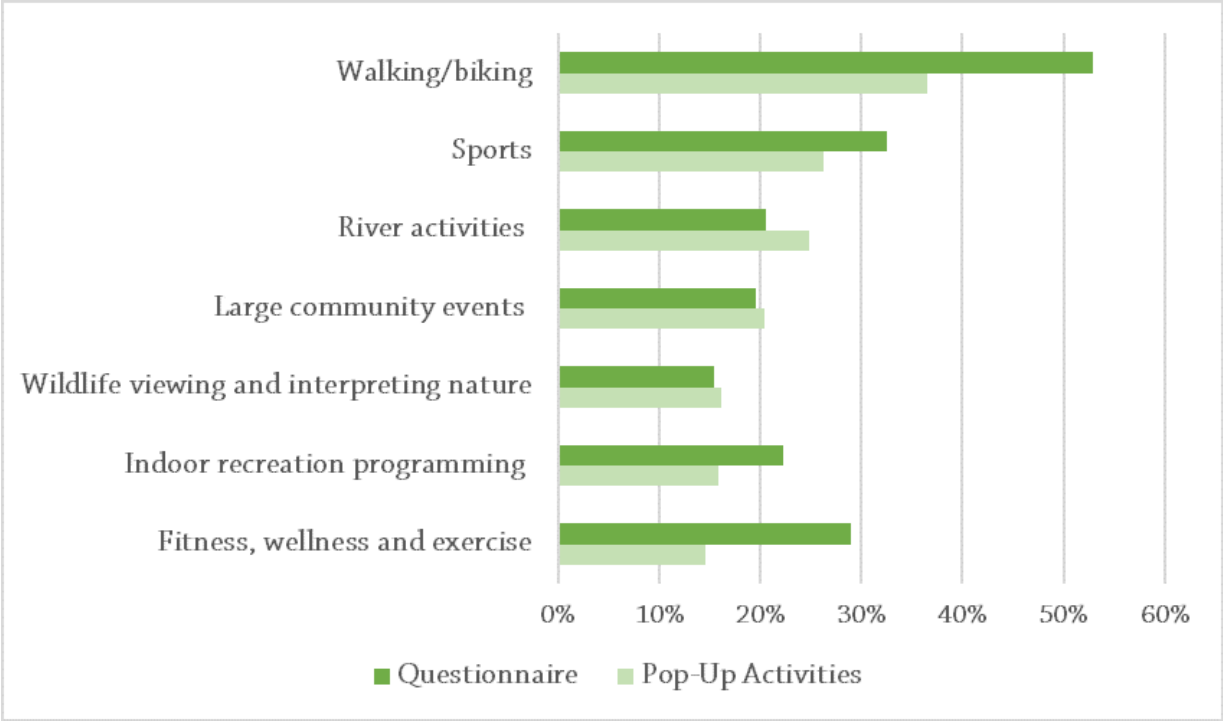
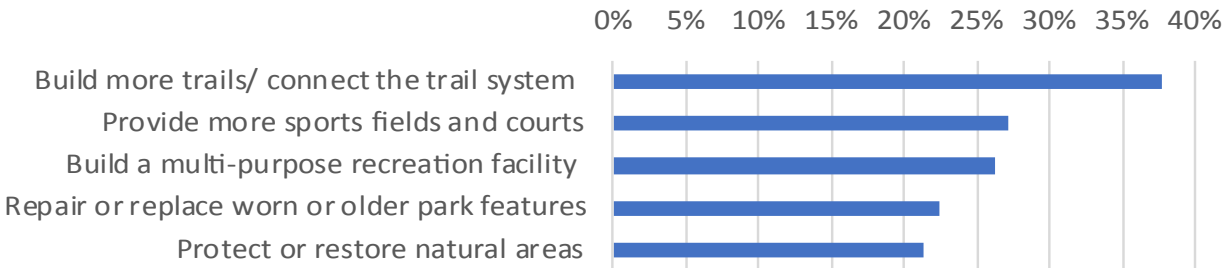


Figure 3-3: Top Five Funding Priorities



PRIORITY: EXPANDING TRAIL ACCESS AND CONNECTIVITY

More trails are the clear priority for outreach participants. **Expansion of trail-related activities was the top recreation activity desired and the top funding priority.** Through different findings across outreach activities, trails were valued broadly. Trail-related activities appealed to residents and nonresidents, people of all different ages, and different cultural groups. They were valued for recreation, active transportation, and improved access to parks, public facilities, neighborhoods, and commercial areas. Respondents noted that trails provide health benefits associated with exercise and being outdoors. Greenways also protect wildlife corridors and support wellness and stress reduction by connecting people to nature. Because of their multi-faceted benefits, a variety of trail types are in demand:

- Trails that link with other existing trails (43%)
- Paved trails for walking, biking, etc. (42%)
- Nature trails (36%)
- Trails that link neighborhoods with community businesses and public facilities (35%)
- Trails that connect to other cities and the regional trail system (24%)

The City set high standards for trail development in its 1983 Master Plan. It has not met those standards. Building out the planned local and regional trail system would require roughly tripling the amount of trails in the Tualatin Service Area. To achieve this vision, the City needs to focus on trail development along the Tualatin River and continue to work with Metro and other partners to take advantage of easements and opportunities as they arise. Adding trails in the expansion areas (Basalt Creek, Northwest and Southwest) is also needed.

61% BELIEVE ADDITIONAL TRAILS AND GREENWAYS ARE NEEDED.

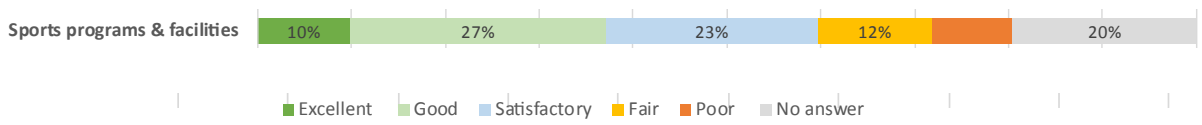
Participants in all outreach activities expressed a high level of support for expanded trails and improved connectivity.

PRIORITY: FOCUSING ATTENTION ON SPORTS FACILITIES AND PROGRAMS

Sports participation and interest is high in Tualatin. Outreach participants noted that "sports" collectively is the second most popular recreation activity to expand. **Providing more sports fields in courts was the second most popular funding priority.** Existing sports programs and facilities received the second lowest rating in quality from online questionnaire respondents, with 21% rating them as fair or poor. In a community that prides itself on quality design and recreation facilities, this was surprising. The issue, as discussed extensively in the Sports Focus Group and echoed in other outreach forums, is not the condition of existing facilities. It is the need for more sports facilities to support organized league play for recreation, competitive, and school sports as well as informal pick-up games. It's also the need for field enhancements (lighting, drainage), amenities (seating, shade), policies (leaving soccer goals out in the off-season and coordinating City/School District partnerships), and variety of play spaces (futsal, pickleball and game courts) to expand the capacity for sports play.

38% OF HOUSEHOLDS REPORTED A FAMILY MEMBER PARTICIPATING IN SPORTS. THIS IS HIGHER THAN IN MANY COMMUNITIES.

Figure 3-4: Quality Ratings for Sports



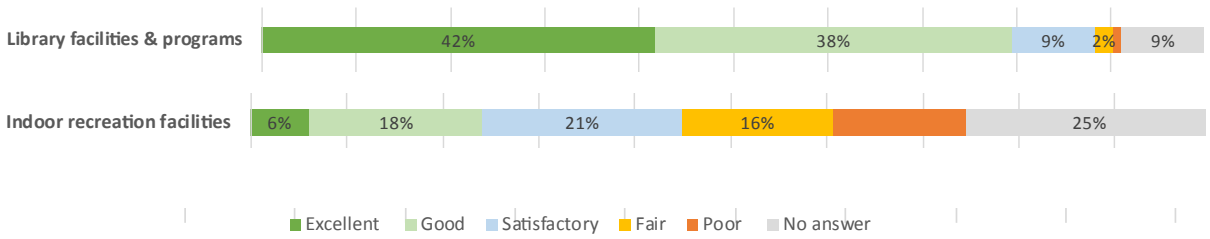
PRIORITY: IMPROVING INDOOR RECREATION FACILITIES

City residents love their Library. The Tualatin **Library received the highest quality rating of any type of parkland or facility**. More people reported visiting the Library more frequently than any other public facility. In comparison, the City's indoor recreation facilities such as Van Raden, Brown's Community Center, the Heritage Center and Juanita Pohl Center (JPC) received the lowest quality rating. While the JPC received slightly more visitation than Van Raden and Heritage Center, these facilities were also visited the least frequently.

As noted in a 2017 Facility Condition Assessment, Tualatin has several specialized buildings that are used for programs and office space. Most are older, remodeled houses not designed for indoor recreation. The JPC is in demand for programs serving older adults and seniors; it also serves as the current Council Chambers. However, the City has no centralized civic hub to provide social gathering space, meeting rooms, and activity areas to support the types of recreational and educational programs desired.

66% VISIT THE LIBRARY AT LEAST ONCE OR TWICE A MONTH. IN COMPARISON, 90% RARELY OR NEVER VISIT VAN RADEN AND THE HERITAGE CENTER.

Figure 3-5: Quality Ratings for Indoor Facilities



PRIORITY: TAKING CARE OF EXISTING ASSETS

The success of the park and recreation system depends in part on ensuring that parks and facilities are safe, clean, and in good condition. As noted in Chapter 2, maintenance staff take care of parkland infrastructure, street right-of way, and public buildings, while also helping preserve a variety of historical, cultural, and natural assets. Although 80% of outreach participants rated City parks and facilities as good or excellent, 37% believe **a greater investment will be needed in the future to support maintenance and renovation of aging facilities.**

City staff agree with these residents. In early 2017, staff conducted a Facility Condition Assessment rating the condition of all sites and facilities as "good," fair," or "poor." Overall, the system is in good shape. However, many parks features are aging–in need of remodeling or replacement in the future. Deferred maintenance has been an issue, and natural resources have not received as much attention as needed because of limited resources. Given the demand to increase programming and add more facilities, staff know more maintenance funding will be needed.

PRIORITY: PROVIDING ACCESS TO NATURE

Community members strongly value Tualatin's natural resources and want access to natural features, especially the river, for recreation, education, and interpretation. Given the funding challenges that have affected the City's ability to maintain and steward its natural resources in parkland, questionnaire respondents were specifically asked what types of natural resource improvements should be the highest priority. Responses included:

- Restoring or maintaining natural areas in parks (50%)
- Providing natural areas to support environmental education, nature interpretation, and outdoor recreation (39%)
- Protecting water quality and riparian corridors (39%)
- Protecting wildlife habitat with limited or no public access (28%)
- Protecting the City's trees (18%)

In other outreach activities, participants noted that access is important. In addition to developing or improving water trails, river access points, and nature parks, **participants prioritized providing recreation programs that enhance community members' access to nature.** The Recreation Programs Assessment conducted for the Master Plan found that most existing programs are provided indoors or in developed parks—despite the fact that the City has more acreage in greenways and natural areas than developed parks. There is a strong opportunity to expand nature-based programming and environmental education.

92% BELIEVE NATURAL RESOURCE PROTECTION IS IMPORTANT.

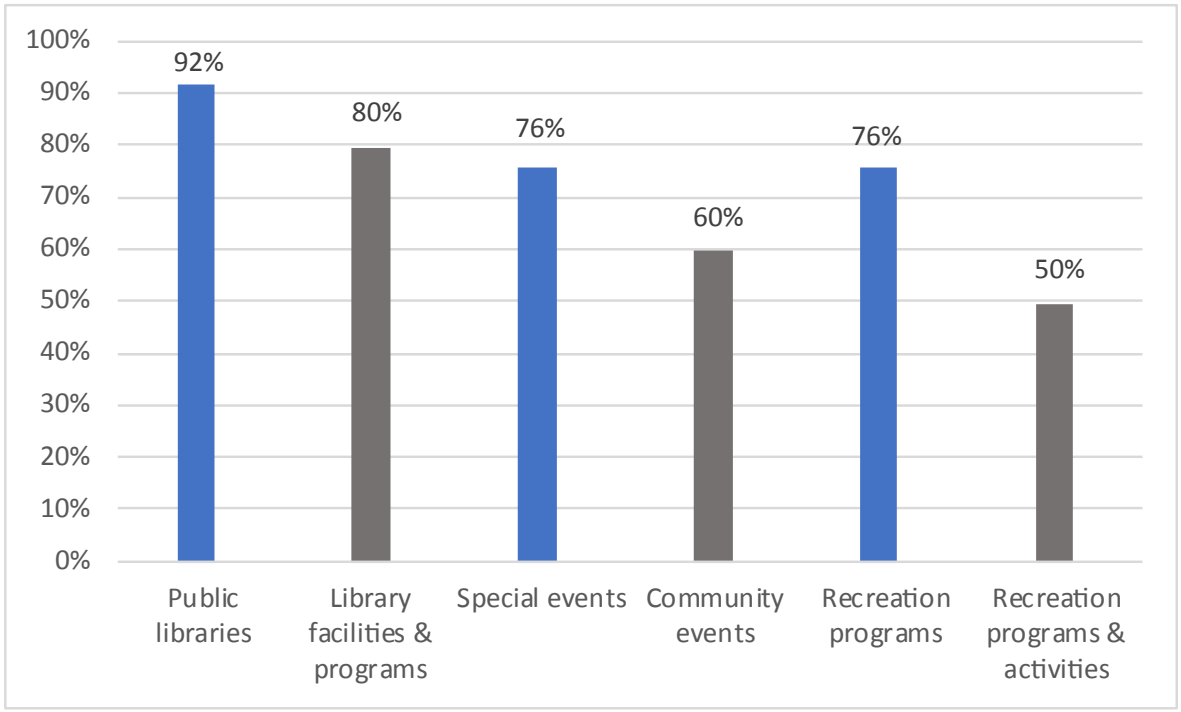
PRIORITY: DIVERSIFYING PROGRAMS AND RECREATION ACTIVITIES

Tualatin residents want a greater variety of recreation activities and programs. Across all outreach activities, participants expressed a desire for multi-generational opportunities, year-round recreation options, low-impact activities such as pickleball, more challenging activities for adults, and opportunities for people of all ages, cultures, and abilities.

Hispanic and Latino residents would like to see more activities that respond to their diverse cultural needs, such as Salsa dancing at summer concerts, fiestas and markets that celebrate Hispanic cultural heritage, affordable sports programs, and social spaces that accommodate extended families and larger groups. Business groups would like to see more activities for employees, as well as events that attract visitors to Tualatin. Seniors and older adults note that Tualatin lacks fitness opportunities designed for their age group.

76% PARTICIPATED IN COMMUNITY FESTIVALS, MUSIC CONCERTS, OR CULTURAL AND HISTORICAL EVENTS LAST YEAR.

Figure 3-6: Respondents rating the availability, quality and diversity of programs as GOOD or EXCELLENT:



Sources: 2016 Tualatin Community Livability Report (NCS); 2017 Parks & Recreation Master Plan Outreach Summary Report (MIG). Note: The 2016 survey was a random sample of all residents, including ones who do and do not participate in these programs. The 2017 online questionnaire targeted residents who participate and/or are interested in parks, recreation facilities, programs and events. Results suggest that the latter group has higher expectations for programs and events.

Recreation and Library staff provide quality programs. The majority of residents rate existing programs highly. However, **program participants want a greater variety of opportunities and experiences**. As echoed in the Needs Assessment analysis that looked at participation by program area, the City primarily supports special events, Library programs, and indoor programs for older adults and seniors. There are opportunities through park design and programming to encourage new and different types of recreation activities and provide the unique experiences that residents desire.

Table 3-1: Percent of respondents participating in programs annually by type

ANSWER	PERCENTAGE
Community events (concerts, cultural or historical events, festivals)	75.7%
Sports	38.2%
Youth summer camps and programs	20.9%
Nature programs or activities	10.1%
Arts and crafts	9.0%
Storytime or pre-school programs	8.4%
Fitness classes	7.7%
Older adult or adult programs	7.3%
Before or after-school programs	5.7%
Dance, theater, or other performing arts (performing in)	4.6%

PRIORITY: DIVERSIFYING PROGRAMS AND RECREATION ACTIVITIES

The City has a large art collection, consisting of prints, drawings, paintings, photographs, and other wall hangings displayed on a rotating basis in City buildings. The City also has integrated art through sculpture, etchings, signage, and play elements into its parks and public spaces. Much of the focus has been on the past: natural history, tribal history, and geologic and glacial processes with an emphasis on the Ice Age floods., Feedback and input has indicated the need for the City to **shift focus to adding abstract and expressive art to the mix, and introducing more art reflecting Tualatin's current cultural and ethnic diversity.** More than that, they're challenging the City to move away from display arts to embrace temporary art installations, performance art in parks and public spaces, and a greater variety of public art and experiential art elements.

PRIORITY: ENSURING EQUITABLE AND ACCESSIBLE PARKS AND RECREATION OPPORTUNITIES

Tualatin prides itself in providing an accessible, equitable, and inclusive park and recreation system. Providing easy access to parks, facilities, programs, and activities has been shown to improve public health and is essential to having a vibrant park and recreation system. **Staff recognize that all people—regardless of their housing status, abilities, income, culture, or neighborhood where they live—can benefit from quality parks and recreation opportunities.**

In public outreach comments, participants recommended improving park and trail lighting, seating, and the slope of paths and ramps for floating docks and boat launches. They also referenced needs to add and better distribute sports fields, dog parks, neighborhood parks, and other developed features to improve close-to-home access and use.

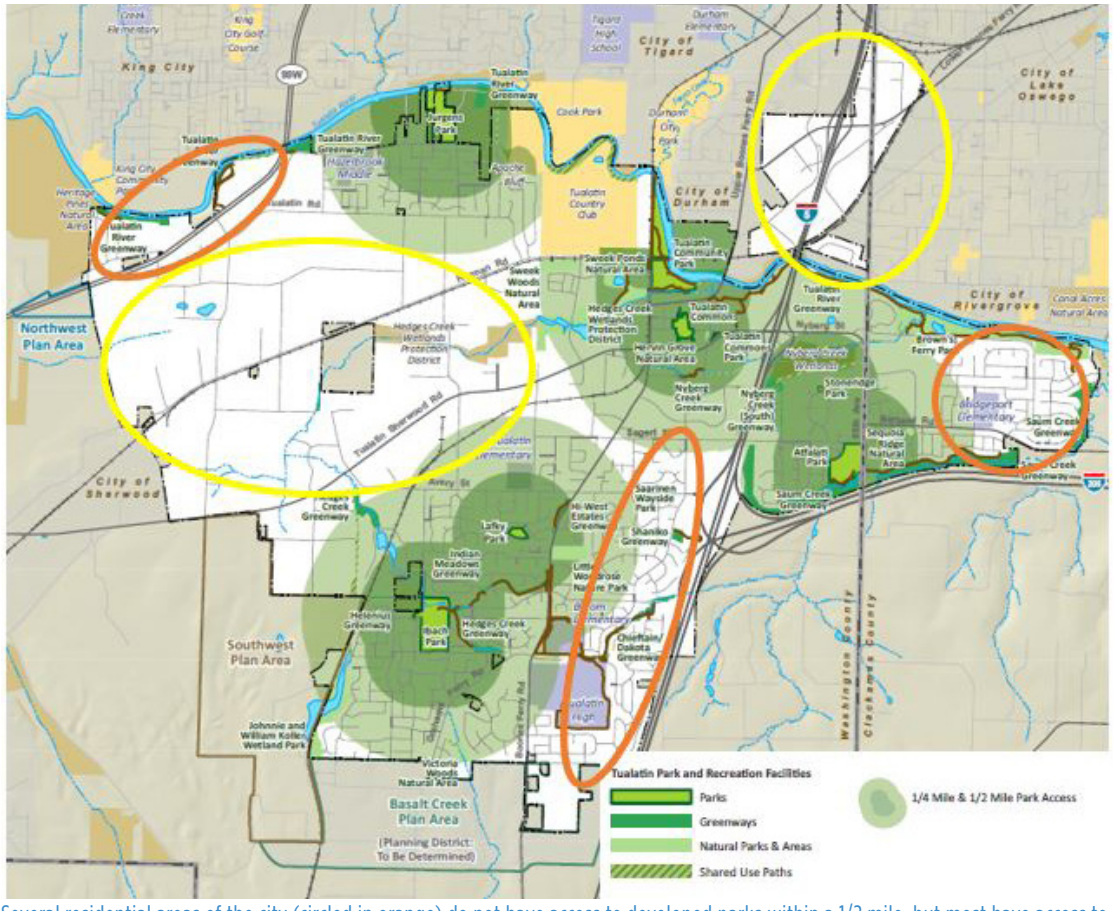
To further evaluate accessibility, the Master Plan included a technical analysis of parkland service, the geographic distribution of facilities, and accessibility as per the Americans with Disabilities Act (ADA). Highlights include:

- **Parkland Service:** Tualatin has a long-established goal of providing parkland within ½ mile of all residents. That distance is the equivalent of a 10-minute walk or short bike ride, and it has become the national standard as seen the 10-minute walk campaign championed by the National Recreation and Parks Association and Trust for Public Land. Many residents have access to some type of parkland within a 10-minute walk, but not all do. Residential areas in east Tualatin, along Hwy 99 in Northwest Tualatin (Pony Ridge), and west of I-5 in central to south Tualatin do not have access to a developed park within ½ mile of their home (Figure 3-7).

6,909 RESIDENTS IN TUALATIN DO NOT HAVE A PARK WITHIN A 10-MINUTE WALK OF HOME (SOURCE: TRUST FOR PUBLIC LAND).

- **Geographic Distribution of Facilities:** The Project Advisory Committee (PAC) and City staff carefully evaluated needs for developed parks, parkland, and recreation facilities to establish standards for the future. The PAC advocated for greater level of investment to accommodate more developed parks, trails, and features such as sports fields and other outdoor facilities to improve nearby access for pedestrian and bicyclists.
- **ADA and Universal Accessibility:** The planning process included an ADA Assessment of all City parkland. The ADA Assessment and Transition Plan identified site-specific and programmatic improvements to make parkland, trails, and recreation programs more accessible to people of varying abilities as per ADA guidelines. The recommended improvements are incorporated into Master Plan recommendations and the capital improvement plan (Chapters 4 and 5, Appendices B and D) to be addressed when facilities are renovated or replaced. Given the community's aging population and other demographics, the needs assessment further identified opportunities to support universal play and senior needs.

Figure 3-7: Access to Developed Parks



Several residential areas of the city (circled in orange) do not have access to developed parks within a 1/2 mile, but most have access to greenways, natural parks and areas, and school open space. Several commercial and industrial areas (circled in yellow) also do not have nearby City parkland.

PRIORITY: MEETING THE NEEDS OF A GROWING COMMUNITY

The City of Tualatin is anticipated to grow to an estimated 29,950 residents by the year 2035. Plus, the City may have 40,668 employees by then (City estimates). While some growth will occur through infill and business expansion within the existing City limits, most will occur in three future expansion areas: Basalt Creek Concept Plan Area, Northwest Concept Plan, and Southwest Concept Plan. **New growth means that the City must add developed parks, recreation facilities, programs, greenways, trails, and natural areas** just to maintain the existing level of service in the future.

The City bases its service level standards on residential needs—even though it strives to better serve all park users and community members as well. Currently, the City is deficient in developed parks, but exceeding the 1991 standard for greenway, natural parks and areas, and shared use paths. If the City adjusts its standards to address the outreach priorities noted through community outreach and by Master Plan advisory groups, then 66 acres of developed parkland will be needed, and nearly 94 acres in total (Table 3-2).

3,110 ESTIMATED RESIDENTIAL GROWTH IN TUALATIN BY 2035 (CITY OF TUALATIN).

11,162 ESTIMATED EMPLOYMENT GROWTH BY 2035 (CITY OF TUALATIN).

Table 3-2: Parkland Level of Service (LOS) Standards and Needs

PARKLAND TYPE	ADOPTED STANDARD (ACRES/1,000 RESIDENTS)[1]	EXISTING LOS (ACRES/1,000 RESIDENTS)	PROPOSED GUIDELINE (ACRES/1,000 RESIDENTS)[5]	NET FUTURE ACREAGE NEEDS 2035 (29,950)
Parks[2]	5.00	3.1	5.0	66.0
Greenways	0.87	4.5	4.5	15.1
Natural Parks & Areas	3.48	4.0	4.0	12.7
School Joint-Use Facilities[3]	-			
Shared Use Paths[4]	-	0.2	-	-
TOTALS	9.35	11.8	13.5	93.8

1. Existing standards are based on Table 3-1 of the 1991 Park System Development Charges Findings.
2. Existing standards for "area parks" and "community parks" are combined here.
3. School joint-use sites are not counted in terms of parkland acreage.
4. Standards for bikeways were set in 1991 based on miles of trails, not acreage.
5. The proposed guidelines noted here would ensure that the adopted standard for developed parks and the existing level of service for greenways and natural parks & areas are carried forward into the future.

PRIORITY: IMPROVING INFORMATION THROUGH ENHANCED MARKETING AND COMMUNICATIONS

Community members prioritized stronger, inclusive communications and marketing from the Parks & Recreation Department. For some community members, improved communication and marketing would provide a better understanding of the programs and services available and the location of available services. Spanish-speaking community members, as well as non-Spanish-speaking community members, indicated that there is a need for bilingual resources about programs and scholarships. Community members also desire a stronger dialogue with City officials about community preferences, needs, and concerns.

VALUES, VISION, MISSION AND GOALS

The community's priorities and needs helped identify Tualatin's core values, vision. and mission for the future, as well as Master Plan goals. Aligned with City Council's 2030 Vision, these elements are described below.

Core Values

Ten key values emerged from the outreach comments and community priorities. These shared beliefs are defined below to guide the City's parks and recreation services.

- **Health & wellness** (mental and physical health, activity, stress reduction).
- **Conservation & stewardship** (sustainability, natural resource protection, asset management, green infrastructure, resource conservation).
- **Inclusiveness & equity** (social justice, fairness in resource allocation, opportunities and services for people of different ages, cultures, interests, languages and abilities).
- **Diversity** (respect for different languages, cultures and peoples, variety in recreation opportunities to respond to diverse community needs).
- **Economic vitality** (prosperity, economic vibrancy and health, accountability, fiscal responsibility, community development).
- **Accessibility & connectivity** (interconnected trails and pathways, close-to-home parks, walkable/bikeable neighborhoods, accessible facilities and services to people of different abilities).
- **Community engagement** (informed and engaged residents, involved residents and neighbors, volunteerism).
- **Social cohesion** (socially interconnected through community events, neighborhood programs and public gathering spaces).
- **Community vibrancy & livability** (sense of place/community identity, integration of arts/culture/history, attractive open space and gateways, park activation, historic preservation, civic pride).
- **Family-friendliness** (opportunities for youth development, lifelong learning, multi-generational activities).

Vision

The vision statement describes Tualatin's aspirations for parks and recreation services. This vision paints a picture of the parks and recreation system the community wants to achieve.

Tualatin is a vibrant city, with a healthy and cohesive community, connected through attractive parks, diverse facilities, trails, conservation of natural areas, recreation opportunities, and art and culture that are engaging and accessible to all.

Mission

A mission describes the approach that Parks & Recreation staff will take in providing parks, recreation facilities, trails, natural areas, events, and programs for Tualatin.

We actively care for our parks, connect our community through trails and programs, and protect our river, greenways, and natural areas to create a beautiful, livable city.

Goals

Seven central goals emerged to provide directions for long-range change (Figure 3-8).

The community priorities and needs, along with the values, vision, mission, and goals, provide the planning framework for the Master Plan recommendations, presented in the next two chapters.

Figure 3-8: Master Plan Goals

GOAL 1 Expand accessible and inclusive parks and facilities to support community interests and recreation needs.

GOAL 2 Create a walkable, bikeable, and interconnected City by providing a network of regional and local trails.

GOAL 3 Conserve and restore natural areas to support wildlife, promote ecological functions, and connect residents to nature and the outdoors.

GOAL 4 Activate parks and facilities through vibrant programs, events, and recreation opportunities for people of different ages, abilities, cultures, and interests.

GOAL 5 Support the arts through programs, parks, and public spaces that reflect Tualatin's identity, heritage, history, and expressive character.

GOAL 6 Promote Tualatin's unique identity, economic vitality, and tourism through parks, natural resources, historic preservation, events, programs, and placemaking.

GOAL 7 Manage, administer, and maintain quality parks, facilities, and programs through outstanding customer service, stewardship, and sustainable practices.

Exhibit A to Resolution No. 5407-18

4 GOALS, OBJECTIVES AND SYSTEMWIDE RECOMMENDATIONS

The aspirations for Tualatin's parks, greenways, natural areas, trails, recreation programs, events, and public art are the guiding forces for the Master Plan. This chapter identifies seven goals for the park and recreation system, along with the systemwide recommendations that City staff will implement to achieve the community's vision.

These systemwide recommendations provide the context for additional site recommendations presented in Chapter 5. Together, the goals, objectives, systemwide recommendations, and site recommendations provide overarching direction for the development, programming, and management of the park and recreation system.

GOALS, OBJECTIVES AND SYSTEMWIDE RECOMMENDATIONS

Master Plan objectives and systemwide recommendations are organized by seven central goals. Table 4-1 explains the relationship between goals, objectives, and systemwide recommendations.

TABLE 4-1: DEFINITIONS OF GOALS, OBJECTIVES AND RECOMMENDATIONS

GOALS	OBJECTIVES	RECOMMENDATIONS
Goals are directions for long-range change. ***Where do we want to be in the future?***	Objectives are specific and measurable outcomes that contribute to achieving the stated goal. ***What do we want to achieve?***	Recommendations are specific activities and initiatives that will achieve the stated goal. ***What actions will we take to achieve our goals?***

Goals, objectives, and systemwide recommendations are presented on the following pages, structured in the following format:

Goal X: OVERVIEW

Xa. Objective

Xa.1 Recommendation

GOAL 1: EXPAND ACCESSIBLE AND INCLUSIVE PARKS AND FACILITIES TO SUPPORT COMMUNITY INTERESTS AND RECREATION NEEDS.

1a. Provide parks, greenways, and natural areas in residential areas.

1a.1 Strive to provide access to parkland or a recreation resource within a ½-mile travel distance from residential homes. (Note: Parkland includes parks, greenways, and natural areas. Recreation resources include joint-use facilities and shared use paths.)

1a.2 Acquire and develop parkland in targeted underserved areas and near new residential development to meet neighborhood needs, as guided by park design and development guidelines.

1a.3 Develop parkland in underserved areas to meet the needs of nearby neighbors. Consider partnerships with the Tigard-Tualatin School District, Metro, and others, and, if feasible, develop parkland in unserved areas. These partnerships may include development at partner sites, joint-use agreements for school facilities, and/or improved access and connections to partner sites.

1b. Provide parks, greenways, and natural areas in commercial and industrial areas to meet the needs of employees.

1b.1 When planning areas expand, apply applicable park, recreation, and library standards to conserve natural resources and assure the availability of facilities, programs, and services citywide.

1b.2 Ensure that all new expansion areas and concept area plans include provisions for natural areas, greenways, and trails, as aligned with regional, state, and/or federal criteria.

1b.3 Continue to coordinate with City staff and officials to provide parks, natural areas, greenways, and trails in the Basalt Creek Concept Plan.

1b.4 Consider options to collaborate in the provision of public access to privately owned spaces that clearly set expectations for public access, recreation use, and natural elements in commercial and industrial areas.

1c. Provide more parks, greenways, and natural areas to increase the City's existing level of service for parkland to support community livability as Tualatin grows.

1c.1 Provide a mix of parks, greenways, and natural areas, aiming for 13.5 acres per 1,000 residents and exceeding this target if opportunities arise (through acquisitions, partnerships, easements, or donations) that are consistent with the goals of the Master Plan.

1c.2 Strive to achieve 5 acres of developed parks per 1000 residents, carrying forward Tualatin's long-standing target.

1c.3 Continue to provide 4.5 acres per 1,000 residents for greenways and 4.0 acres per 1,000 residents for natural areas.

1c.4 Site new parks to connect with the on- and off-street bike networks and, where feasible, with the regional trail network.

1c.5 Acquire land in advance of need to assure the future availability of land for park and recreation use at the most reasonable cost.

1d. Address deferred maintenance projects and improve facility conditions by implementing an asset replacement plan.

1d.1 Prioritize and sequence deferred maintenance projects identified in the Master Plan in annual capital improvement planning and annual operating budgets.

1d.2 Identify and track the safety and lifecycle of existing facilities to plan for their replacement or renovation when worn.

1d.3 Evaluate new trends and changing needs before making like-for-like replacements of old, worn, damaged facilities; ensure best practices and current and future recreation needs are addressed.

1d.4 Ensure resources, in particular funding, are available to provide necessary maintenance and upkeep of existing facilities and landscaping to lengthen the lifespan of facilities and minimize deferred projects.

1e. Distribute a variety of recreation amenities and facilities throughout Tualatin to improve recreation opportunities and access.

1e.1 Consider equity, access, and the distribution and location of existing facilities when adding new ones to improve access.

1e.2 Increase the variety of sport and recreation options to respond to new trends and needs. Consider adding facilities such as pickleball courts, futsal courts, outdoor fitness equipment, bike skills course/pump track, climbing walls, bocce, game tables, dog parks, skate parks, etc.

1e.3 Design new facilities in parks for multipurpose uses.

1e.4 Consider joint-use and programming opportunities in schools across the City to address indoor recreation needs.

1e.5 Evaluate opportunities for a new community park with space to include elements such as sports fields, sports courts, picnic areas, nature interpretive areas, and other specialized facilities.

1e.6 Provide support amenities such as dog waste stations, benches, recycling receptacles, and other standard features commensurate with the scale of the site and level of use.

1f. Diversify sports and play experiences across the City.

1f.1 Increase the availability of sports fields. Add lighting to existing fields to increase play where appropriate. Collaborate with the school district to develop multi-use sports fields. Consider developing lighted, multi-use fields with synthetic turf that can be lined for several sports to diversify and increase play.

1f.2 Integrate more sports courts in parks, including but not limited to futsal, pickleball and basketball, as well as unique courts that respond to new trends, such as badminton, bocce, and outdoor table tennis where appropriate.

1f.3 Continue to provide innovative play opportunities. Provide play experiences that integrate specific landscape and topography of the park. Develop nature play areas made from natural components such as logs, sand, water, mud, boulders, hills, plants, and trees.

1f.4 Provide a universal play area to meet the needs of all residents, including those of varying abilities.

1f.5 Increase adventure play opportunities for older children and teens, adding facilities such as challenge courses, zip lines, rope swings, net climbers, and climbing spires.

1f.6 Provide outdoor and, if feasible, indoor fitness stations, equipment, and programs for adults and older adults.

1g. Ensure that the City's parks, greenways, natural areas, trails, and other facilities are safe and accessible to people of varying abilities, ages, and skill levels.

1g.1 Ensure new and renovated parks, facilities, and trails meet or exceed the requirements of the Americans with Disabilities Act (ADA).

1g.2 Implement the ADA Transition Plan to prioritize ADA improvements throughout City parks, greenways, natural areas, and shared use paths.

1g.3 Factor in long-term use, programming, and costs before phasing in major ADA improvements for public buildings as noted in the ADA Transition Plan. Review all barriers and first address those that can be resolved through programmatic modifications and maintenance tasks.

1g.4 Make City parks welcoming for people with disabilities by providing more information at sites and online about accessible facilities and challenge levels; continue to ensure policies and procedures support inclusion.

1g.5 Address the needs of an aging population and multi-generational families when designing, improving, and maintaining parks, facilities, and programs. Consider elements such as slopes, seating arrangements, restrooms, equipment, etc.

1g.6 Provide lighting in community parks, large neighborhood parks, and on high-use trails to extend use hours and ensure safety.

1g.7 Provide parks, facilities, and programs that respond to different skill levels, ranging from novice/recreational to advanced/competitive with a focus on connecting new and more participants to parks and recreation opportunities.

1h. Design parks and facilities to respond to demographic, cultural, and neighborhood needs.

1h.1 Create dynamic parks and recreation facilities by adding or incorporating historic and cultural resources, public art, innovative features, diverse landscaping, varied color palettes, and amenities and furnishings to support social gatherings and user comfort.

1h.2 For new and renovated parks, identify a design theme and use it to guide design choices.

1h.3 Involve the community in site master planning to ensure local needs are met.

1h.4 Provide parks, facilities, and services that consider the needs of people of all demographics, including different ages, gender, incomes, race/cultures, abilities, family configuration, and education levels.

1h.5 Address the needs of underserved populations across the park system and at key sites. Integrate bilingual signage, culturally specific or expressive art, and elements such as plazas, futsal courts, community gardens, sports fields. and group picnic areas.

1h.6 Create small group seating/activity areas in parks, by grouping benches and adding small activity/game tables in parks.

1h.7 Facilitate community conversation and discussion regarding veterans recognition at a park(s) or facility(ies).

GOAL 2: CREATE A WALKABLE, BIKEABLE, AND INTERCONNECTED CITY BY PROVIDING A NETWORK OF REGIONAL AND LOCAL TRAILS.

2a. Develop trails to connect Tualatin to the regional trail system.

2a.1 Coordinate with Metro and neighboring communities to plan, design, and develop regional trails, such as the Ice Age Tonquin Trail, in Tualatin as proposed.

2a.2 Prioritize regional trails that provide access to natural areas and connect parks, natural areas, and greenways, such as the Tualatin River Greenway Trail and the planned Ice Age Tonquin Trail.

2b. Develop an interconnected system of on- and off-street bike and pedestrian facilities to connect people to a variety of destinations, including public facilities, nature, and residential, commercial, and industrial areas.

2b.1 Implement the current trails plan. (See Map 3 in Chapter 5 for the location of planned and proposed trails.)

2b.2 Prioritize planned local greenway and creek paths and trails that extend or connect to existing trails and connect existing parks and greenways, such as the Saum Creek, Hedges Creek, and Nyberg Creek Greenway trails.

2b.3 Prioritize and develop trails that connect the proposed park in the Basalt Creek Concept Plan Area to local trails and the regional trail system.

2b.4 Evaluate opportunities to connect Ibach Park to Helenus Greenway and Blake Street via local trails.

2b.5 Assure shared use pathways and bikeways are developed as land rights and resources are available.

2b.6 Assure that shared used trails are developed in future City planning areas.

2c. Improve park access and wayfinding for pedestrians and cyclists.

2c.1 Develop park entries and access points for pedestrian and bicyclists where trails connect to parks and greenways. Provide park identification and wayfinding signage, and in larger parks provide bike racks, seating, and restrooms.

2c.2 Provide park directional and distance signage along trails to note the distance to key destinations, including parks, schools, commercial spaces, and major City or public facilities.

2d. Connect the community to the existing Tualatin River Water Trail.

2d.1 Increase input/takeout points for canoes and kayaks on the Tualatin River Water Trail.

2d.2 Work with partners to provide information online and in other formats to communicate water recreation opportunities and available support amenities for water trail users, such as trailhead amenities and facilities, interpretive features, art, safety, culture, and natural resources.

2e. Design and develop quality trails to enhance the trail experience.

2e.1 Develop greenways and trails by implementing adopted policies for the Natural Resource Protection Overlay (NRPO) District, as noted in Section 72 of the City's Development Code.

2e.2 Implement trail design and development guidelines and best practices that comply with federal, state and regional bike and pedestrian standards, to guide trail development, access, and use. Follow guidelines related to trail surfacing, lighting, slope, width, seating/resting stations, and adjacencies to natural areas.

2e.3 Implement ADA and/or Architectural Barriers Act (ABA) recommendations for trail improvements.

2e.4 Consider adding lighting to selected trails corridors to increase commuter and after-hours use and improve trail safety.

GOAL 3: CONSERVE AND RESTORE NATURAL AREAS TO SUPPORT WILDLIFE, PROMOTE ECOLOGICAL FUNCTIONS, AND CONNECT RESIDENTS TO NATURE AND THE OUTDOORS.

3a. Identify and protect Tualatin's natural resources.

3a.1 Identify, inventory, and assess the condition of habitat and significant natural resources in parks, greenways, and other areas throughout the City.

3a.2 Work with partners to strategically connect and protect riparian areas (river and creek corridors), and wetlands to preserve vital ecological functions, improve water quality, and increase biodiversity.

3a.3 Balance natural resource protection with access when planning trails through or adjacent to greenways and natural areas.

3b. Ensure natural resources in parks, greenways, and natural areas are maintained and stewarded.

3b.1 Provide adequate maintenance funding to achieve established levels of service and best practices in greenways, natural areas, and natural resources in parks.

3b.2 Establish a standard of maintenance in all parks, natural areas, and greenways to control invasive species, remove/prune hazardous trees, control river- and stream-bank erosion, minimize wildfire hazards, and promote safe access.

3b.3 Identify natural areas that need a higher level of maintenance and/or restoration.

3b.4 Create a natural resource management plan for significant natural areas, identifying the tasks, frequencies, staffing, and budget needed to manage and maintain them to established maintenance standards to accomplish a level of good ecological conditions for natural resources management.

3b.5 Limit public access to sensitive natural areas in parks through fencing and other barriers, with informational and interpretive signage to inform residents about the natural resource value of parks.

3b.6 Provide periodic creek clean-ups near parks and along trails.

3c. Restore and enhance natural resources in parks, greenways, and natural areas to support wildlife and the ecological function of parks.

3c.1 Protect and conserve natural areas and greenways by implementing adopted policies for the Natural Resource Protection Overlay District, the Wetlands Protection District, and Floodplain District as noted in Sections 72, 71, and 70 respectively of the City's Development Code.

3c.2 Update the City's plant palette to encourage horticultural diversity in parks for ecological benefits, visual interest, and sustainability. Include a variety of carefully selected shrub, grass, succulent, and groundcover species that have unique textures and colors that are best suited for Tualatin's climate, soil, and wildlife. Utilize native and/or climate appropriate plants when possible.

3c.3 Include an invasive removal plan when establishing maintenance standards in natural areas and greenways.

3c.4 Incorporate stormwater management standards from Clean Water Services into the City's Development Code for green infrastructure elements such as rain gardens, bioswales, permeable pavers, and detention ponds to help reduce flooding, and filter pollutants.

3c.5 Implement community forestry strategies and best practices. Maintain healthy, mature trees and increase tree canopy where opportunities exist. Develop an Urban Forest Management Plan for maintaining and managing parkland, street, and community trees canopy and update regularly.

3c.6 Integrate pollinator corridors along street rights-of-way and pollinator patches in parks and beautification areas where appropriate.

3c.7 Review current street development and Municipal Code sections and update to current best practices and standards.

3c.8 Seek to acquire contiguous natural areas and connected corridors to create larger habitat areas and wildlife migration routes.

3c.9 Establish and implement an integrated pest management plan. Create pollinator gardens when possible.

3d. Expand opportunities to experience nature in Tualatin.

3d.1 Encourage interaction with nature through the provision of nature trails, natural play areas, community gardens, habitat-viewing areas, and interpretive nature, historic, and art features.

3d.2 Coordinate with schools, to develop outdoor classrooms and community gardens for environmental education in parks, schools, and community locations.

3d.3 Add plantings in developed parks to attract birds and butterflies for viewing; incorporate boulder groupings and other niches where insect and plant discovery could occur.

3d.4 Develop and maintain parks to support nature programs and events in designated locations, including birding and wildlife viewing, nature play, etc. Avoid high-impact programming in sensitive natural areas.

3d.5 Support and partner with organizations and agencies for outdoor education opportunities.

3d.6 Market and promote Tualatin as a bird and wildlife viewing destination by designing and building distinct and creative viewing areas in natural areas and greenways to attract tourism.

GOAL 4: ACTIVATE PARKS AND FACILITIES THROUGH VIBRANT PROGRAMS, EVENTS, AND RECREATION OPPORTUNITIES FOR PEOPLE OF DIFFERENT AGES, ABILITIES, CULTURES, AND INTERESTS.

4a. Provide recreation and library programs in core program areas (noted below) to respond to community needs.

4a.1 Identify and provide services in the core program areas where the Parks & Recreation and Library Departments play a significant role: Arts & Culture; Enrichment & Learning; Health, Wellness & Fitness; Nature Programs; Older Adult & Senior Programs; Social Activities; Special Events; Sports; and Youth Programs.

4a.2 Continue to provide youth programs that include day camps, youth and teen development, and leadership. Assess the need and potential for partnerships to facilitate youth and teen before & after-school recreation programs.

4a.3 Create and redefine programs to support the City's vision and values, including cultural diversity, inclusiveness, health and wellness, conservation and stewardship, and others.

4a.4 To support core program areas, increase programs, activities, and events in Sports and Nature Programs. Diversify Arts & Culture and Enrichment & Learning programs.

4a.5 Increase programs for all demographics and populations, including Hispanic and Latino residents. In the next three to five years, re-evaluate City demographics and

revisit whether Cultural Diversity should be added as a core service area. Culturally diverse programming is defined as events, activities, classes, and bilingual programs that celebrate or promote all cultures.

4a.6 Ensure that core area programs are adapted and modified to support all ages, cultures, and abilities, plus provide multi-generational opportunities. Increase programs for teens, young adults, and active adults.

4a.7 Implement specific ADA Transition Plan recommendations related to providing notice about program modifications; ensuring that programs and special events are accessible; ensuring that programs and services offered by other entities at parks and recreation facilities are accessible; and improving information about the accessibility of parks, facilities, trails, programs, and events.

4a.8 Use the actual annual data on the numbers of participants in each core program area, as well as the numbers and types of programs, activities, classes, and leagues provided or facilitated, to support decision-making regarding the numbers and types of programs to provide.

4a.9 Determine a mechanism for financial assistance to support program participation for underserved residents in the community.

4b. Expand sports programs to support health, fitness, and team building.

4b.1 Provide or partner to provide learn-to-play sports classes and camps to help prepare and connect children to physical activity and local sports leagues.

4b.2 In conjunction with new sports facility development, organize drop-in, learn-to-play, or skill development programs for futsal, pickleball, basketball, and other activities. Consider recreation-oriented competitions (e.g. 3-on-3 tournaments by age group).

4b.3 Offer or expand sports leagues (e.g., kickball, softball, dodgeball, pickleball, futsal, volleyball, basketball) to connect and improve the health and fitness of residents and employees.

4c. Continue to provide events, social gatherings, and celebrations to connect residents and strengthen community spirit.

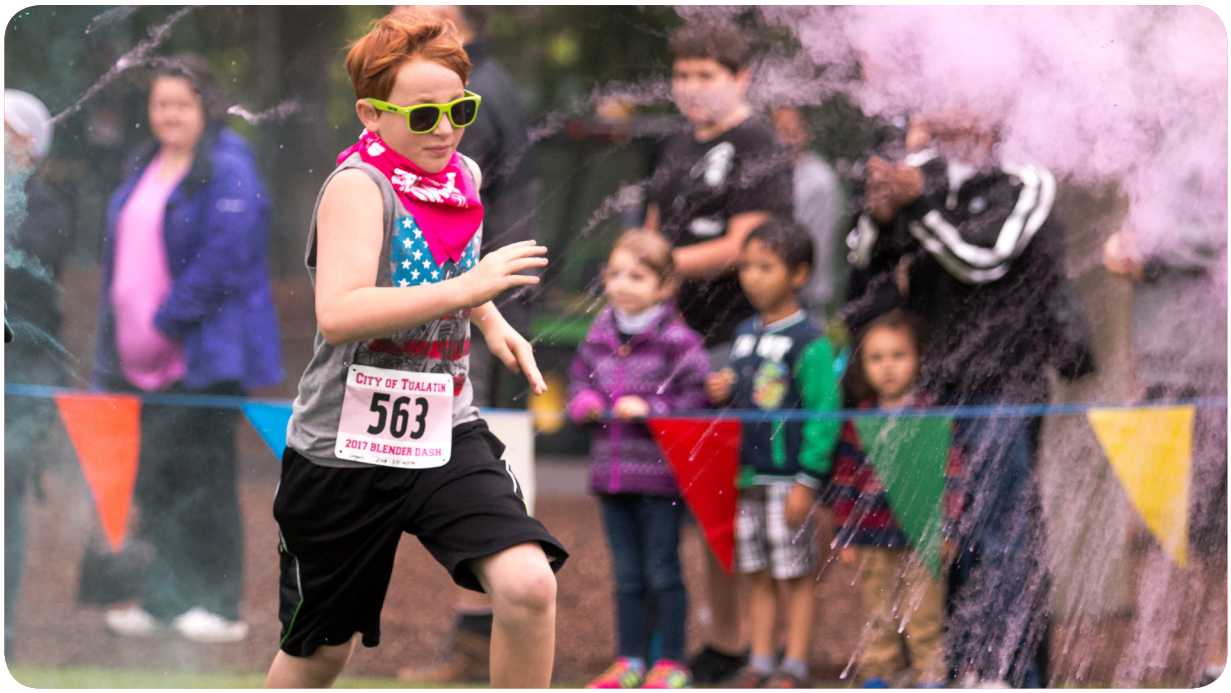
4c.1 Ensure there are adequate resources to continue successful programs such as the Pumpkin Regatta, Blender Dash, and Summer on the Commons that support community identity and that promote Tualatin as a destination place for tourism.

4c.2 Offer community-oriented programs such as movies and concerts in the park at more sites. Identify events appropriate for large neighborhood parks (Atfalati, Ibach, and Jurgens), as well as community parks (Tualatin) and special use sites (Tualatin Commons).

4c.3 Expand events at Brown's Ferry Park and other natural areas and greenways.

4c.4 Increase cultural festivals, art festivals, and cultural events.

4c.5 Support walks, races, markets, fitness challenges, and other healthy lifestyle and fitness programs and events to support health and wellness and enhance tourism.



4d. Strengthen and diversify enrichment and learning programs.

4d.1 Maintain coordination between Library staff, Recreation staff, and other organizations and agencies in programming.

4d.2 Bring neighborhood enrichment programs to underserved areas by continuing and expanding activities at parks, recreation facilities, the Library, and schools. Invest in methods to bring arts and crafts, music, nature activities, sports, recreation equipment, and staff-led activities to parklands and other community locations. Focus on underserved neighborhood parks, public spaces, and lower-income areas to introduce more youth to activities in core program areas.

4d.3 Support bilingual communication to expand communication, bilingual enrichment, and recreation programs.

4d.4 Continue to explore funding sources and joint investment opportunities with school and industry partners to develop a temporary or permanent makerspace/ technology hub. In the long term, integrate these functions into the Library.

4d.5 When needed, update the Library strategic plan to evaluate and enhance programs, facilities, and services at Tualatin Library.

4e. Increase outdoor and nature programming.

4e.1 Support year-round recreation opportunities and outdoor programs by providing and programming outdoor classrooms and covered pavilions in parks. Consider outdoor fitness and activity, natural history, and other recreation, arts, enrichment, and interpretive programs.

4e.2 Expand and make available online, and in other formats, self-guided activities such as the Art Walk, nature walk, self-guided bike tours, river access maps, and nature guides for key parklands.

4e.3 Encourage trail-related recreation through walking groups, birding groups, and, in timely response to key trends, activities such as gaming outings.

4e.4 Provide programs in Tualatin's natural areas, greenways, and parks to increase nature programs, interpretive programs, and environmental education.

4e.5 Provide a balance of drop-in and programmed opportunities in parks, recreation facilities, the Library, and other City facilities.

4f. Phase in more indoor programming.

4f.1 Complete a market analysis, financial feasibility study, and master plan for a new community recreation center. Consider programming and revenue-generating opportunities to provide gymnasium/fitness space, indoor track, multi-purpose banquet room, meeting/classrooms, art room, sound-proof music rooms, dance floor, maker/incubator space, theater/stage, social gathering space, office space for staff, indoor/outdoor program spaces, and support amenities, such as restrooms, locker rooms, storage, and parking. Consider replacing three or four existing Tualatin Community Park buildings when developed.

4f.2 Establish a makerspace in the new community recreation center or the Library, as per the findings of the market analysis and financial feasibility study.

4f.3 Continue successful programming of the Library. In the short term, explore opportunities to offer Library and recreation programs in other locations, including outdoors in parks or indoors in schools.

4f.4 Should a City Hall or municipal center be built in the future, convert the existing City offices for Library or recreation program use (or replace with the community recreation center).

4f.5 Expand physical activity and evidence-based lifelong learning programs for adults at the Juanita Pohl Center (JPC).

4f.6 Continue the current successful programming of the JPC. If an indoor recreation and community center is developed, expand and/or include programming and space for older adults and seniors.

4f.7 Continue to rely on the Van Raden Community Center in the short term for youth programs, considering supervision and safety considerations in a building not designed or well suited for some programs. Consider demolition or repurposing this building for non-recreation uses.

4f.8 Carefully consider significant remodels/upgrades to existing community centers and park buildings that are not designed for programs. Factor in long-term building use, programs, and costs before phasing in ADA improvements noted in the Transition Plan.

4f.9 Consider options to replace the Brown's Ferry Park "community center" house with a nature-oriented event space suitable for indoor/outdoor nature programs or weddings and other rentals.

4f.10 Acquire land and develop a new recreation/community center that is centrally located with adequate parking and accessible to residents by roads, trails, bike routes, and transit, and able to accommodate indoor/outdoor programmed uses.

4f.11 Provide full service indoor recreation programs to expand and enhance the needs and desires of the community.

GOAL 5: SUPPORT THE ARTS THROUGH PROGRAMS, PARKS, AND PUBLIC SPACES THAT REFLECT TUALATIN'S IDENTITY, HERITAGE, HISTORY, AND EXPRESSIVE CHARACTER.

5a. Recognize and expand the role of art in public spaces to define a sense of place, reflect the character and identity of Tualatin and contribute to the happiness, fulfillment, and well-being of the community.

5a.1 Adopt all objectives and recommendations pertaining to public art in the Parks and Recreation Master Plan as the Tualatin Public Arts Plan–providing an update every five years.

5a.2 Diversify art and art experiences in parks and recreation facilities, including but not limited to interactive art, educational/interpretive art, art installation and sculptures, visual/display arts, media art, and art programs/events including expressive and performing arts.

5a.3 Include artists and Tualatin Arts Advisory Committee (TAAC) representatives on parks, trails, and facility design teams to provide artistic and cultural perspective and contribute creative ideas that support the site's identity or theme, where appropriate.

- When designing facilities, such as but not limited to trails, parks, buildings, and other key features, encourage artists to work with maintenance and recreation staff to ensure functionality, determine where maintenance efficiencies can

be incorporated, and identify where art can be interactive to support the park theme or play environment.

5a.4 Consider decorative and artistic elements in parks, greenways, and trails such as creative bicycle racks and benches, unique lampposts, decorative sidewalk paving, wall etchings and mosaics, artistic planters, wide sidewalk promenades, interpretive and educational features, murals, monuments, and modern media in the design and development phases.

5a.5 Explore ways to integrate art into City-managed facilities.

- Identify locations for strategic public art placements.
- Incorporate art installations at City entrances and utility box wraps at key road intersections.
- Consider strategically placed murals on building facades in public facilities (parks, public buildings, public spaces) to activate areas.

5a.6 Following adoption of the Tualatin Public Arts Plan, develop a public art implementation strategy, which may include private-public partnerships to support public art in commercial and industrial spaces throughout the City.

5a.7 Encourage understanding of different cultures through artwork and provide opportunities for information sharing through all forms of display, performing, expressive, and visual art to facilitate better diversity and inclusion among different demographics.

5b. Emphasize interactive art in parks and facilities.

5b.1 Integrate creative and innovative play and educational pieces in play areas that encourage people to create, play, interact with, and explore art, music, nature, and history. This includes but is not limited to climbable sculptures, interactive spray or musical fountains, sensory gardens, outdoor xylophones and drums, bioswales with stackable rocks (cairns) and other natural play features or structures, decorated book share boxes, play areas with movable parts, and other artistic park elements.

5b.2 Continue to develop new and update existing thematic play areas for all age groups, including tiny tots.

5b.3 Provide versatile spaces using strategically placed infrastructure that allow for "pop-up" performances with less preparation and effort by staff.

5c. Provide educational art displays and interpretive features that promote Tualatin's history, culture, and character.

5c.1 Incorporate art in parks and public spaces that reflects or calls attention to Tualatin's natural and cultural history through educational or interpretive elements.

5c.2 Partner with culturally relevant organizations such as the Confederated Tribes of Grand Ronde, Tualatin Historical Society, and the Ice Age Floods Institute to support interpretive and educational art.

5c.3 Selectively provide interpretive signage and kiosks in parks to provide information about local history, natural resources, etc.

5c.4 Include plant/tree identification plaques in high traffic areas to educate about native and non-native flora and fauna.

5c.5 Continue to promote the region's geologic history, Native American history, and Tualatin River.

5c.6 Encourage the development of sidewalk or traditional building façade murals on public and/or commercial buildings. Collaborate with partners such as the Tualatin Riverkeepers, Tualatin Historical Society, and TAAC.

5c.7 Display art that reflects community demographics, including the culture of Hispanic/Latino residents and other groups.

5c.8 Move beyond these existing themes to creative expressions of Tualatin's character and identity. Encourage both realistic and abstract or expressive representations of Tualatin's identity.

5d. Enhance the City's visual environment by encouraging the display of visual arts in public spaces.

5d.1 Expand the provision of sculptures and art installation on an opportunity and site basis. Integrate non-educational, non-interpretive art where appropriate to make a park or facility more playful, colorful, attractive, or interesting.

5d.2 Identify opportunities to display art on a rotating basis.

5d.3 Continue to support visual arts in heavily used spaces such as the Tualatin Library and the Juanita Pohl Center to encourage a sense of place for patrons.

5d.4 Continue to inventory and catalog art pieces that the City acquires.

5e. Invest in facilities that support art and arts programming.

5e.1 Work with the Library to combine the City's interest in creating a maker space/ incubator hub with an emphasis on art technology.

5e.2 Support investment in art technology at the Library or community recreation center.

5e.3 Ensure that arts, performing arts, and cultural programming spaces are incorporated into a new recreation/community center, pending feasibility study. Consider dedicated art classrooms, stage/theater, music/dance rooms, display space, and necessary equipment such as but not limited to a kiln, pottery wheels, computers, video and audio recording equipment, etc.

5e.4 Integrate art into useable features and displays in a proposed recreation community center.

5e.5 Evaluate options to provide permanent and/or additional outdoor performance space, such as a small amphitheater or multiuse fountain, plaza, or performance space.

5f. Expand opportunities to participate in experiential art.

5f.1 Involve the TAAC and staff in defining the types of experiential, immersive, or performing art installations, events, and programs to support. Identify and implement pilot projects to test new opportunities each year.

5f.2 Activate parks with temporary art projects or installations that encourage play and draw attention to lesser-known sites.

5f.3 Encourage performances located in parks or other under-utilized public spaces to bring more performing arts viewing opportunities to residents.

5g. Diversify Arts & Culture programs and events as a core recreation service area to promote and create opportunities for creativity.

5g.1 Provide and track arts programming and participation in the major service categories: fine arts, cultural arts, educational arts, literary arts and media arts, and expressive arts.

5g.2 Continue the City's emphasis on cultural programming, such as ArtSplash Show and Sale and Summer on the Commons, but also expand other types of art classes, events, and activities.

5g.3 Continue to support community events such as ArtSplash as a destination for artists and spectators in the region and abroad.

5g.4 Expand Science, Technology, Engineering, Arts and Mathematics (STEAM) programs.

5g.5 Develop art programs for youth to increase participation, encourage art appreciation and creativity and to develop young artists.

5g.6 Expand art and STEAM programs for adults to provide a creative outlet for expression and reflection.

5h. Market, promote, and fund art and art programs.

5h.1 Market and promote Tualatin's arts programming and events to raise awareness among residents and visitors.

5h.2 Encourage businesses and commercial entities to display or incorporate art in their facilities and/or landscaping.

5h.3 Recruit artists to serve as instructors or ambassadors to Tualatin's art programs.

5h.4 Consider funding possibilities to support art resources and programming.

- Adopt a percent for arts ordinance for new private development.
- Provide incentives for new developments that incorporate art into or design and development stages.
- Explore opportunities to create an arts endowment to provide long-term, stable funding for art-related venues and programs.
- Explore arts funding and grants to support STEAM programs, incubator/ makerspaces, as well as expressive art opportunities.

5h.5 Work with various local and regional partners to expand art opportunities.

- Invite and involve potential partners to TAAC meetings to discuss and implement opportunities for collaborative art programs, classes, and events.
- Partner with the Tualatin Chamber of Commerce to encourage visual arts or installations and performing arts in commercial spaces.
- Work with organizations to understand resources and funding available for arts appreciation and art as an economic development opportunity.
- Work closely with the City's Economic Development Division to create strategies that advance public arts as a tourism generating sector.

GOAL 6: PROMOTE TUALATIN'S UNIQUE IDENTITY, ECONOMIC VITALITY, AND TOURISM THROUGH PARKS, NATURAL RESOURCES, HISTORIC PRESERVATION, EVENTS, PROGRAMS, AND PLACEMAKING.

6a. Provide and design parks and facilities to promote a sense of place.

6a.1 Use art and facility design to reflect the City's unique identity.

6a.2 Preserve, conserve, and provide access to designated historic resources and significant natural resources that contribute to Tualatin's sense of place.

6a.3 Develop a tourism strategy that strikes a balance between visitation, economic impact, natural resource conservation, and livability.

6a.4 Ensure tourism goals are aligned with Washington and Clackamas County's rural tourism plan.

6a.5 Market and promote the City as a tourist destination between Portland Metro and Willamette Valley wine country, emphasizing the City's parks, trails, and programs.

6a.6 Promote the Library as a visitor center for tourists on the Ice Age Floods National Geologic Trail.

6b. Improve City center parks as community gathering hubs.

6b.1 Update the site master plan for Tualatin Community Park to improve access, reduce user conflicts, better meet recreation and indoor facility needs, and serve as a focus point for community activities.

6b.2 Strengthen connections between Tualatin Community Park, the Library, Juanita Pohl Center, and Tualatin Commons to serve as a community and tourist focus point for civic life, recreation, public art, and cultural opportunities.

6b.3 Update the fountain and plaza at Tualatin Commons to become a more versatile play and programming space.

6b.4 Complete a market analysis, financial feasibility study, and master plan for a new recreation/community center to serve as a civic and community gathering space. (See 4f.)

6c. Increase connections to the Tualatin River.

6c.1 Preserve the scenic value of the Tualatin River by expanding the greenway and riverfront trail along the riverbank within the city.

6c.2 Improve and increase water access points, including boat launches and floating docks to support recreation, including boating and fishing.

6c.3 Identify and improve views of the Tualatin River, creating overlooks for water viewing.

6c.4 Encourage art and interpretive elements to reflect and promote connections to the river.

6c.5 Continue partnerships to provide rental non-motorized boats.

6c.6 Continue to partner with organizations to ensure clean waters, steward the riparian corridor, and educate residents, visitors, and youth about local ecological traditions through interactive, engaging, and creative methods.

6d. Communicate the benefits provided by Tualatin's parks, natural areas, trails, art and programs.

6d.1 Continue to promote Tualatin's park and recreation brand: Accessible, inclusive, vibrant parks and recreation.

6d.2 Work with the TAAC to define Tualatin's art brand through the development and use of iconic images, media, and social media.

6d.3 Collect data to illustrate how City parks and programs are accessible and inclusive to people of different abilities, ages, and cultures.

6d.4 Build on current promotions to increase awareness of the variety and diversity of park and recreation opportunities in Tualatin. Use traditional media, social media, and art that is bilingual to communicate more broadly to residents.

6d.5 Promote and provide unique events, parkland, and art opportunities to support tourism and visitors from outside the city. Work with local businesses to promote local services during events to encourage people to stay in the City longer.

6d.6 Provide elected officials and the City staff with talking points on the ways that parks and recreation, the Library, and public art attract residents and businesses and support economic development and tourism.

6d.7 Develop a comprehensive Marketing Plan for the Parks and Recreation Department.

6e. Engage volunteers, partners, stakeholders, and local businesses to support art, recreation, and tourism.

6e.1 Continue to collaborate and cultivate partnerships to increase Parks and Recreation's influence and support. Work with the School District, businesses, sports leagues, and contract program providers to enhance recreation options.

6e.2 Increase outreach to engage volunteers in programs and events, building on the Recreation volunteer program, Library volunteer program, the Park Maintenance volunteer program, and Youth Advisory Council. Recruit, train, recognize, and reward volunteers.

6e.3 Involve residents, local artists, nonprofit organizations, the business community, agencies, partners and others in the planning and design of parkland and major recreation facilities.

6e.4 Reach out to businesses to cultivate sponsorships and partnerships for parks, programs, facilities and art.

6e.5 Explore opportunities to leverage the existing Washington County and Clackamas County Rural Tourism Studies for funding and strategic policy alignment.

6e.6 Continue working with the Chamber of Commerce, the Historical Society, and the Ice Age Floods Institute to make the city a designated partner in the Ice Age Floods National Geologic Trail.

GOAL 7: MANAGE, ADMINISTER, AND MAINTAIN QUALITY PARKS, FACILITIES, AND PROGRAMS THROUGH OUTSTANDING CUSTOMER SERVICE, STEWARDSHIP, AND SUSTAINABLE PRACTICES.

7a. Maintain and operate parks effectively to support quality use.

7a.1 Implement Master Plan goals, objectives, strategies, and recommendations relating to asset maintenance, replacement, reinvestment, and stewardship. (See 1d.)

7a.2 Ensure that routine and preventative maintenance services are adequately funded in parklands to ensure park safety, make parks more attractive, provide a quality user experience, and avoid a park maintenance backlog.

7a.3 Invest additional funds in natural resource stewardship.

7a.4 Improve maintenance efficiencies. Consider integrating native and/or climate appropriate plants and avoid difficult-to-maintain amenities that do not function well.

7a.5 Invest in technology to conserve resources and reduce utility and water costs.

7a.6 Continue City landscaping maintenance and the street tree program to design standards, applying the maintenance expertise of Parks staff to take care of City trees and landscaping around City buildings.

7a.7 Incorporate best practices in park management and sustainability practices to ensure the wise use of resources.

7a.8 Develop a Parks Resource Management Plan that is updated regularly.

7a.9 Develop an Urban Forestry Plan that provides direction for the maintenance and improvement of the City's forested areas and update regularly.

7b. Adopt design and development guidelines to guide park and facility maintenance, management, renovation, and development.

7b.1 Update park and trail design and development guidelines. Consider federal and state bike and pedestrian design standards for on- and off-road development in and adjacent to greenways and natural areas.

7b.2 Develop the City's maintenance management plan.

7b.3 Develop a Resource Management Plan that is updated regularly.

7b.4 Ensure that new standards and guidelines are incorporated into the City's Development and Municipal Code updates.

7c. Be fiscally and financially prudent in funding the park and recreation needs of the Tualatin community.

7c.1 Coordinate with City leaders to identify and potentially expand the Department's resources to support parkland and facilities, park and natural area maintenance and restoration, recreation, and public arts.

7c.2 Review and revise the Department's fees and charges philosophy and cost recovery expectations through a comprehensive fee study and update regularly.

7c.3 Expand staff capacity, as resources allow, for grant writing, grant management, and the solicitation of sponsorships and donations.

7c.4 Diversify funding sources, considering a bond measure, operational levies, utility fee, and other alternatives to fund capital projects and operations.

7c.5 Set aside funding for capital reinvestment to remove, renovate, or replace aging and worn facilities at the end of their lifecycle.

7c.6 Implement the System Development Charge (SDC) methodology to support park, greenway, and trail development in residential, commercial, and industrial areas in accordance with state law.

7c.7 Leverage and expand resources by collaborating with partners, stakeholders, and volunteers. (See 6e.)

7c.8 Develop and maintain relationships with targeted public and private organizations and entities to support City objectives and standards for providing recreation opportunities.

7d. Continue the provision of high quality, responsive customer service.

7d.1 Provide an online contact option on the Parks and Recreation home page for residents to provide feedback to City staff.

7d.2 Designate department staff as the contact person for people who have questions or need immediate information.

7d.3 Continue to provide high-quality services and support friendly, welcoming, and inclusive recreation environments.

7d.4 Update rules, policies, and programs as noted in the ADA Transition Plan to enhance customer service.

7d.5 Improve and assess locations to add comfort amenities, such as trash receptacles, restrooms, shade, picnic tables, barbecues, drinking fountains, park lighting, benches, and doggie bag stations.

7d.6 Provide more frequent park janitorial services, trash removal, and clean-up in high-use parks or during peak use times.

7d.7 Continue close coordination with Tualatin Police to patrol parks and connect residents to options to discuss park safety concerns.

7e. Improve information, communication, and relationships with park users, residents, and nonresidents.

7e.1 Conduct satisfaction surveys and post-program follow-up to track and measure park use, satisfaction, and the benefits that City parks and programs provide.

7e.2 Implement ADA Transition Plan policy recommendations related to communication, accessible and inclusive documentation, and the provision of information on accessible facilities and trails to provide more inclusive community services.

7e.3 Continually update website pages, signage and communication materials. Provide bilingual information, where warranted.

7e.4 Reach out to employees and businesses to identify employee-oriented program opportunities.

Exhibit A to Resolution No. 5407-18


ART splash
Katie Martin

5 SITE RECOMMENDATIONS

There are many opportunities to enhance and develop parks, greenways, and natural areas to achieve community goals for the park and recreation system. As a companion document to systemwide recommendations, this chapter defines recommendations for existing and proposed sites. This includes a matrix noting recommendations for sites by category, followed by more detailed directions for key sites.

SITE MATRIX

The Park Recommendations Matrix, presented in its entirely in Appendix B, identifies the types of capital projects recommended for existing parkland and potential future sites in the City of Tualatin's park system. It also notes expectations for ongoing maintenance and operations. These recommendations provide overarching guidance for park investment. They are summarized below. See Appendix B for the matrix and details.

Site Overview

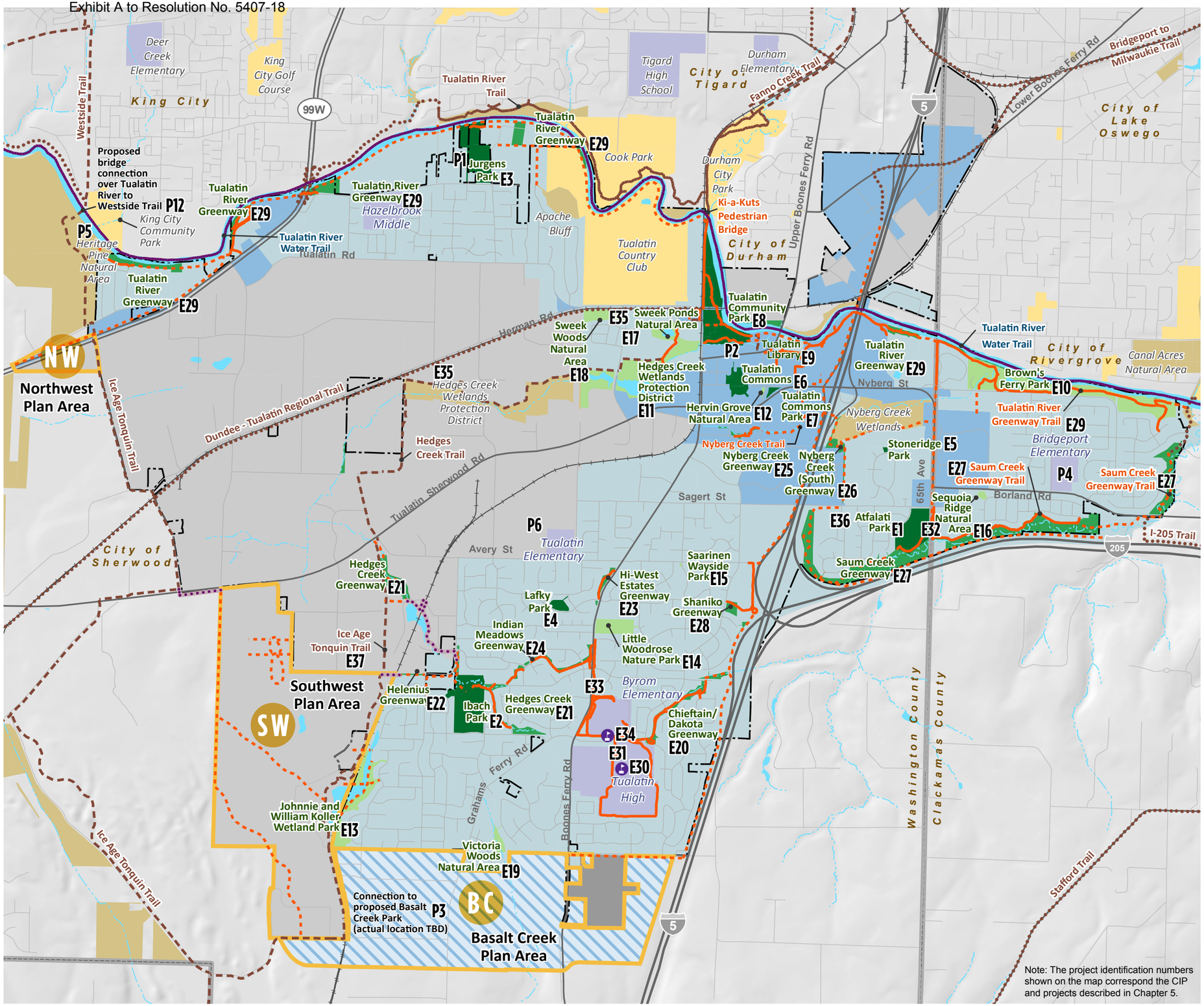
Every site is identified by a project identification (ID) number, name, existing or proposed acreage, and classification as noted in the approved parkland inventory. Map 2: Proposed Park and Recreation System illustrates the location of all projects according to their project ID number.

Exhibit A to Resolution No. 5407-18

TUALATIN
Accessible, Inclusive & Vibrant
Parks and Recreation

PARKS & RECREATION MASTER PLAN

Map 2: Proposed Park and Recreation System



Note: The project identification numbers shown on the map correspond the CIP and projects described in Chapter 5.

Site Recommendations

- E## Existing Site Project ID Number
- P## Proposed Site Project ID Number

Tualatin Trails

- Existing Paths and Trails
- Planned Paths and Trails

Regional Trails

- Existing Muti-Use Trails
- Planned Multi-Use Trails
- Proposed Multi-Use Trails

Other Trails

- Potential Trail Opportunity
- Existing Tualatin River Water Trail

Tualatin Park and Recreation Facilities

- Parks
- Greenways
- Natural Parks & Areas
- Shared Use Paths
- School Joint-Use Facilities

Other Park and Natural Areas

- Other Developed Parks and Recreation Areas
- Other Greenways and Natural Areas
- Tigard-Tualatin District Schools

Planning Areas

- XX Plan Area

Land Uses

- Residential
- Commercial
- Industrial
- Institutional
- Mixed Use: Residential, Commercial & Industrial

Base Map Features

- Tualatin City Boundary
- County Boundary
- Freeways/Highways
- Major Arterials
- Local Streets
- Railroads
- Streams
- Rivers and Waterbodies

MIG Date: July 2018

Sources: City of Tualatin, Parks and Recreation, 2017; Metro Regional Government, 2017; Oregon Spatial Data Library, State of Oregon, 2017.

0 500 1,000 2,000 3,000 4,000 5,000 Feet

Exhibit A to Resolution No. 5407-18

Capital Projects

Build

Recommendations to "*build*" parks identify sites that need these four types of projects: site master planning and business planning, land acquisition, site development, and/or construction of a major new facility or building. Since some existing sites are developed in phases, this category also specifies what percentage of the site (if any) is affected by the next phase of development.

As noted in the matrix, the numbers of sites with these projects include:

- *Master Plan/Feasibility Study:* 20
- *Parkland Acquisition or Easements:* 10
- *Site Development:* 24
- *Major Facility Construction:* 4

Enhance

There are seven different types of recommended projects to *"enhance"* sites. These include making improvements to existing parks, such as renovating and adding facilities. Most refer to improving a City-owned park. In a few cases, the recommendation is to add facilities at sites owned or managed by partners. These collaborative projects are also noted as enhancements.

The numbers of sites with enhancement projects include:

- *Added Recreation Element:* 3
- *Added Trail:* 18
- *Added Integrated or Functional Art:* 22
- *Minor Renovation:* 7
- *Major Renovation:* 6
- *Special Use Building Renovation:* 4
- *Enhancement Through Partnership:* 5

Steward

Recommendations to "*steward*" sites include restoring natural resources, addressing deferred amenity and facility maintenance, and improving sites as recommended in the

Americans with Disability Act (ADA) Transition Plan.

The numbers of sites with stewardship projects include:

- *Natural Resource Restoration:* 25
- *Deferred Maintenance:* 11
- *Accessibility Improvements:* 25

Replace

Recommendations to "*replace*" aging and worn facilities at the end of their lifecycles are noted at all sites (37) to prolong the life of the park.

Maintenance and Operations

All City parks and facilities are assets that require maintenance. Factors such as the level of park development, use, programming, and uniqueness affect the level of maintenance needed. Recommendations to "*maintain*" sites are noted at three different levels:

- *Standard Maintenance:* 30 existing and proposed sites should receive a standard level of care, including all routine and preventative tasks necessary to maintain parks for safe access and use.
- *Enhanced Maintenance:* 14 existing and proposed sites are characterized by specialized assets, programs and special events, and/or reservable facilities. These should receive a higher level of maintenance and more frequent tasks, and also receive priority for maintenance attention during peak use times and seasons.
- *Natural Resource Maintenance:* 25 sites have natural resources that require specialized maintenance, including routine monitoring and inspection, tree pruning, invasive species management or removal, dump and litter pickup, and hazard removal.

Recreation Programming

Tualatin's recreation programs enliven the park system. Recommendations to "program" parks include providing or facilitating recreation classes, programs, special events, activities,

and/or league play in core program service areas. The Master Plan recommends broadening programming at eight sites and events at six sites. These include developed parks as well as targeted natural areas and greenways.

Partnerships

Some sites and projects will require a partnership or collaborative effort, with details defined in a Memorandum of Understanding (MOU), Partnership Agreement, or Joint Use Agreement. The Master Plan recommends that the City *"partner"* to provide recreation opportunities at five sites.

See Appendix B for further definition of these categories and the matrix noting what types of projects are recommended at each existing and proposed park site.

SITE RECOMMENDATIONS

On the following pages, more detailed recommendations are provided for key sites as well as key facilities where sites have not yet been identified. These are organized as noted below.

- Existing parks and facilities
- Existing natural parks and areas
- Existing greenways and shared use paths
- Proposed new parks
- Proposed facilities
- Proposed natural parks and areas
- Proposed greenways and shared use paths
- Public art

Site recommendations identify a general direction for site improvements. Following each section heading, graphics are presented for each goal that is advanced by implementing these recommendations. Where applicable, projects are noted by an identification number that ties to the project matrix. E stands for existing parks and P stands for proposed parks.

To supplement this guidance, Appendix C identifies other opportunities for site improvements identified through community outreach, the park and facility condition assessment, and the technical analysis of the park and recreation system. These site considerations, concepts, and ideas should be vetted along with site recommendations noted in this chapter through further site design, partnership, and master planning processes when funds are available for renovation and development.

Existing Parks and Facilities

Implementing the following recommendations for existing parks will help achieve all seven Master Plan goals:

Atfalati Park (E1)

Atfalati Park is a 13-acre large neighborhood park that provides both active and passive recreation opportunities. Site recommendations primarily focus on enhancing recreation opportunities and restoring natural resources. Focused efforts should improve and expand the gathering and play areas, add shade trees, add sport and challenge elements as space allows, and better integrate/restore Saum Creek frontage.

- Fully implement the current site master plan, including adding a second parking lot at SW 65th Avenue, a small picnic shelter, a large group picnic shelter with shade and movable tables for programming and group events, and an adjacent nature play area.
- Work with the Diversity Task Force and other local organizations to understand the needs of nearby Hispanic/Latino neighbors and incorporate into design site plans.
- Consider futsal courts.

Ibach Park (E2)

Ibach Park is a 20-acre large neighborhood park surrounded by single-family homes. The site supports sports, picnicking, recreation, and play. It includes a unique play area that speaks to the City's prehistoric, American Indian, and pioneer historic eras. The park also connects to an adjacent greenway and trail. Site recommendations for Ibach Park primarily focus on enhancement projects, natural area restoration, and connections.

- Fully implement site master plan.
- Renovate the play area.
- Replace amenities and facilities at end of lifecycle.
- Design and construct proposed boardwalk and bridge over Hedges Creek to connect to existing sidewalks and trails.
- Connect existing concrete sidewalk to the Hedges Creek trail.
- Install trail drainage.
- Consider adding site and/or field lighting to increase hours of play.
- Expand teen zone area, adding selected adventure play elements for teens (see Proposed Facilities).
- Add shade trees throughout.
- Renovate the parking lot.

- Consider spray park or splash pad.
- Remove the fence on the west side of the park.
- Stabilize banks of Hedges Creek with native vegetation.
- Work with the Youth Advisory Council, Aging Task Force, Diversity Task Force, and the recreation staff to add new program uses to lawn areas.

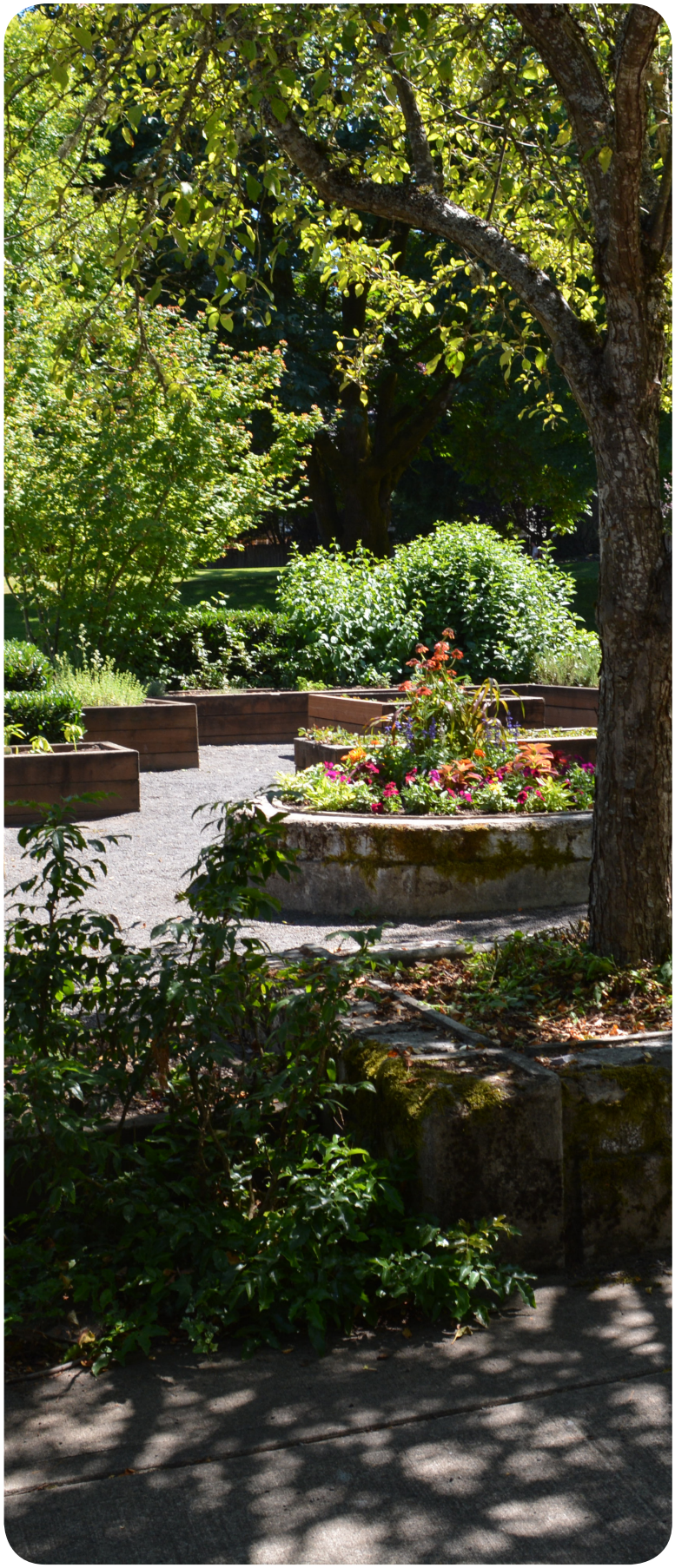
Jurgens Park (E3)

Jurgens Park is a 15.5-acre large neighborhood park that serves as a center for neighborhood activity and team sports in northwest Tualatin. The site offers thematic and open play opportunities, gathering areas, and access to the Tualatin River. Site recommendations for Jurgens Park focus on expanding the park by acquiring an adjacent space, enhancing the site to introduce new uses, and restoring/stewarding natural areas around the pond and along the river.

- Acquire adjacent property as available.
- Create and implement a site master plan with a public involvement process including the entire site.
- Stabilize banks of Tualatin River with native vegetation.
- Connect this site to the Tualatin River Greenway trail.
- Consider off leash dog area.

Lafky Park (E4)

Lafky Park is a 2-acre small neighborhood park located in central Tualatin that provides local gathering and play opportunities. Site recommendations for Lafky Park focus on minor enhancements to improve site function, expand walking opportunities, and extend the lifespan of site infrastructure.



- Add an on-street walking loop on Siletz, Willapa, and Ochoco.
- Consider picnic shelter and restrooms.
- Update park irrigation and drainage system.
- Replace amenities and facilities at end of lifecycle.

Stoneridge Park (E5)

Stoneridge Park is a quarter-acre park that provides shaded play space in a residential neighborhood in east Tualatin. Site recommendations for Stoneridge Park include making the space more relevant to the surrounding community, providing family gathering space, maintaining safety and sightlines, and activating the site to connect nearby neighbors, families, and children to the park.

- Work with a community-based organization and the Diversity Task Force to conduct a bilingual design process with nearby neighbors to design and implement a "parque" or plaza.
- Continue coordinating with the community-based organization and Library Department on programming and stewarding the site to create a new use pattern.
- Replace amenities and facilities at end of lifecycle.

Tualatin Commons (E6)

Tualatin Commons is located in the heart of city and is the result of a public/private partnership that began in the early 1990s, with a major redevelopment of downtown. The Commons will continue to be the city's prime urban gathering spot for city celebrations and special events. Site recommendations for the site focus on overall reinvestment, enhancing the fountain, and maintaining to the original design standards.

- Aerate the lake or improve water circulation to upgrade water quality.
- Renovate or replace the surface, system, plumbing, and spray heads at fountain.
- Renovate, improve, and install additional restrooms and storage space.
- Consider addition of non-slip surfacing to improve pedestrian safety.
- Replace amenities and facilities at end of lifecycle.

Tualatin Commons Park (E7)

Tualatin Commons Park is a small gateway located near Interstate 5 along Nyberg Road. The park provides art and passive opportunities. Site recommendations for Tualatin Commons Park focus on maintenance, safety, and adding new touches that enhance its function as a visible gateway.

- Improve sight lines into park.
- Improve site drainage.

- Add artwork or sculpture.
- Consider a community process for site redesign.

Tualatin Community Park (E8)

Tualatin Community Park is the City's first and largest park located at the heart of the city on the Tualatin River below the Southern Pacific Railroad trestle. Site recommendations for Tualatin Community Park focus on improving access and recreation opportunities through the re-siting of existing facilities and infrastructure. Improvements will address the future use of existing site buildings and facilities to maintain the park's role as an indoor and outdoor gathering hub for the city. Natural area restoration and associated maintenance activities along the river are another major emphasis of the site recommendations.

- Acquire additional land (as the opportunity exists) to enhance the role of the park as the heart of the Tualatin community.
- Update and implement master plan to enhance the role of the park as the heart of the Tualatin community.

Tualatin Library (E9)

The Tualatin Library serves as the community living room, providing library and reading resources, a teen space, and meeting and gathering spaces.

- Update the Library to improve accessibility, as per the recommendations in the ADA Transition Plan.
- Seek partnership opportunities to add a maker/incubator space. (See also Proposed Facilities, Community Recreation Center)
- If an opportunity arises to expand the Library, create a site design and business/ operations plan, evaluating site needs

in conjunction with plans for a separate community recreation center. Renovate and expand the Library.

- Add art, art space, and/or functional and interactive artwork or sculpture.

Existing Natural Parks & Areas

Implementing the following recommendations for natural parks and areas will help achieve all seven Master Plan goals:

Brown's Ferry Park (E10)

Brown's Ferry Park is a 28.33-acre natural area park located on the Tualatin River in east Tualatin. The park provides river access and passive recreation such as walking, picnicking, and wildlife viewing. Seasonally, the park provides kayak rentals and a summer art program. Site recommendations for Brown's Ferry Park are geared towards overall enhancement and focused investment to better connect residents to nature and the river.

- Redevelop portions of Brown's Ferry Park to better facilitate programs and events.
- Fully implement the site master plan.
- Stabilize banks of Tualatin River and Nyberg Creek with native vegetation.
- Replace amenities and facilities at end of lifecycle.
- Develop a business plan and identify options for renovating the existing Community Center and improving accessibility and function in conjunction with planning a multigenerational community recreation center (see Community Recreation Center recommendations in the Proposed Facilities section).

Little Woodrose Nature Park (E14)

Little Woodrose Nature Park is a 6.55-acre natural area located in central Tualatin. The vision for Little Woodrose Nature Park aims to provide surrounding residential uses access to nature, shade, trail opportunities, and mature vegetation. Site recommendations for Little Woodrose Nature Park focus on stewardship to address deferred maintenance and natural area restoration and associated maintenance activities.

- Plant site with native vegetation.
- Rebuild trail, entry, and stairways throughout the park and entryways.
- Improve overall ADA access as part of all trail improvements.
- Provide safety lighting.
- Replace amenities and facilities at end of lifecycle.

Other Natural Areas

Tualatin's natural areas provide a range of experience for users to interact with the City's waterways, forests, wetlands, and wildlife. Site recommendations focus on interpretive enhancement, stewardship, and natural area restoration and associated maintenance activities.

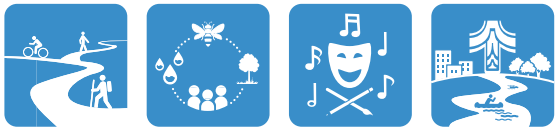
Other natural areas include Hedges Creek Wetlands Protection District, Hervin Grove Natural Area, Johnnie and William Koller Wetland Park, Saarinen Wayside Park, Sequoia Ridge Natural Area, Sweek Ponds Natural Area, Sweek

Woods Natural Area, and Victoria Woods Natural Area.

- Monitor and repair creek and river erosion issues.
- Fully implement site master plans, improving nature trails and wetland trails.
- Add interpretive information and directional signage.
- Improve natural resource stewardship and restoration as per systemwide recommendations.
- Provide additional access to Johnnie and William Koller Wetland Park.

Existing Greenways and Shared Use Paths

Implementing the following recommendations for greenways and shared use paths will help achieve these four Master Plan goals:



Tualatin's trails and greenways support both local and regional trail connections, including land and water trails. Recommendations focus on completing trails, developing trailheads, and adding recreation amenities and facilities to enhance site use.

- Develop or extend trails in existing greenways and trail corridors as planned.
- Maintain current boat access to the Tualatin River Trail at Brown's Ferry Park, Tualatin Community Park, Jurgens Park, and Hazelbrook Road at Hwy 99.
- Add lighting, seating, dog waste stations, trash receptacles, viewpoints, interpretative, and interactive art in appropriate trail locations throughout the trail system.
- Provide trailheads with a range of amenities at large neighborhood and community parks that connect to trails (restrooms, parking, seating, bike racks, water fountains, directional signage).
- Replace trails and trail amenities at end of lifecycle.

Proposed New Parks

Implementing the following recommendations for new parks and partnerships will help achieve all seven Master Plan goals:

Jurgens Park Addition (P1)

Site recommendations for Jurgens Park include expanding the park by acquiring an adjacent space to introduce new uses.

- Acquire adjacent property as available.
- Master plan and develop this site in conjunction with the existing park.

Tualatin Community Park Addition (P2)

Tualatin Community Park is the City's largest park located at the heart of the city on the Tualatin River. The City should take advantage of opportunities to acquire adjacent land that would improve park access and site use.

- Acquire additional land (if the opportunity exists) to enhance the role of the park as the heart of the Tualatin community.
- Master plan and develop this site in conjunction with the existing park.

Basalt Creek Park (P3)

A new large neighborhood park is proposed for the Basalt Creek Concept Plan Area in south Tualatin to serve residents and employees. Prior to acquisition, opportunities should be evaluated to acquire additional land to support community-wide recreation needs and protect natural resources in the Basalt Creek Canyon. A larger park in the Basalt Creek Concept Plan area would help address traffic congestion by developing the City's second community park, connected to the local and regional trail system, providing tourism attractions and space for community events, large and small group gatherings, sports (fields or a sports complex), as well as other active and passive recreation uses.

- Acquire 10-20+ acres of park space through an area master plan process.
- Acquire additional land for greenways and natural parks to support planned trail connectivity and protect creek canyon habitat and natural resources.
- Master Plan and develop park site as a community park to meet neighborhood, employee, and community needs.

East Tualatin/Bridgeport Elementary Partnership (P4)

Residents in east Tualatin lack access to a nearby neighborhood park. The City should explore a partnership or joint-use agreement with the Tigard-Tualatin School District for the use and/or improvement of recreation facilities of Bridgeport Elementary. The partnership would expand the range of park lands available in east Tualatin, which is now limited to greenways and natural areas.

- Pursue a school partnership with Bridgeport Elementary to formalize the joint use of the outdoor play areas, lawn, sports field, basketball courts, and track during out-of-school hours.
- Add programming for Hispanic/Latino community in partnership with Bridgeport Elementary.

- Identify options to provide jointly funded facilities at this site to expand recreation options.

Pony Ridge / Heritage Pine Partnership (P5)

Residents in the Pony Ridge area of north Tualatin lack access to a nearby neighborhood park. To meet these needs, the City of Tualatin should continue to develop the Tualatin River Greenway trail to connect residents to Metro's planned Heritage Pine Natural Area, just west of the City. The City may consider a partnership with Metro to add elements to the Heritage Pine Natural Area to meet resident needs.

- Develop and connect the Ice Age Tonquin Trail in northwest Tualatin to provide access to and through Heritage Pine Natural Area.
- Explore joint development opportunities of Heritage Pine Natural Area, and connect to River Bend and the Tualatin Wildlife Refuge.

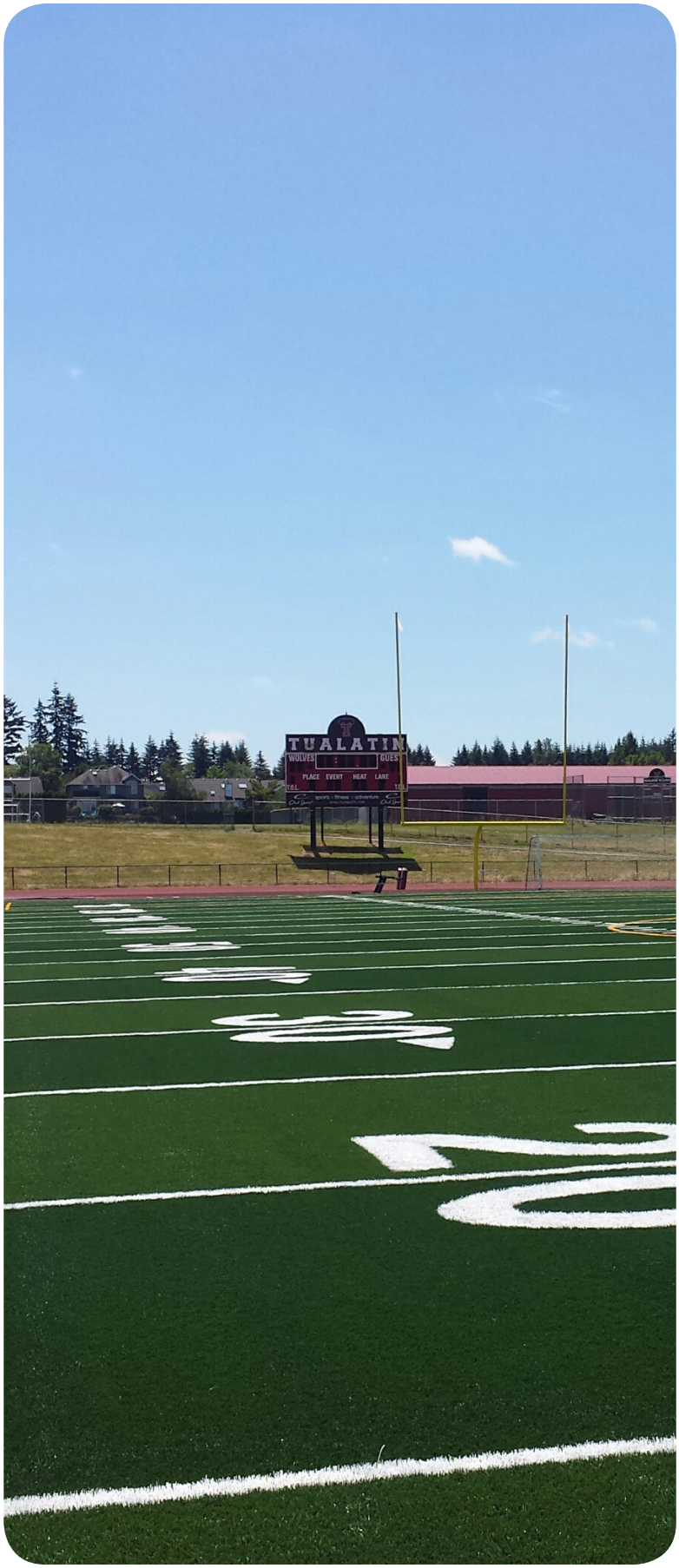
Central Tualatin Sports Park (P6)

Improved access to parkland is needed south/central Tualatin, where developed parks are lacking. The City should explore expanding school partnerships to meet park and sport field needs.

- Explore the joint use of outdoor recreation facilities at Byrom Elementary, in addition to the existing cross-country trail.
- Explore the acquisition of property adjacent to Tualatin Elementary School for sports field development.

Community Recreation Center Land Acquisition (P7)

Acquire land and develop parks consistent with Master Plan systemwide recommendations and proposed park standards.



- Acquire 4-5 acres to develop a new community recreation center as noted in Proposed Facilities, or develop in an existing community park.
- Provide sufficient space for indoor/outdoor programming opportunities.

Additional Park Opportunities (P8)

Acquire land and develop parks consistent with Master Plan systemwide recommendations and proposed park standards.

- Identify and develop developed parks to support recreation and social gathering needs in residential and commercial areas.
- Provide parks and recreation facilities, programs, and services in accordance with established standards as new expansion areas are planned by and annexed to the City.
- Acquire space to develop other new facilities as noted below, or develop these in parks where appropriate.
- Identify where park acreage should be combined or co-developed (such as a sports complex and community park) to expand opportunities and fit desired facilities

Proposed Facilities

Implementing the following recommendations for new facilities will help achieve these four Master Plan goals:

Community Recreation Center (P7)

Multipurpose community recreation centers are full-service, multi-generational facilities offering recreation, health, wellness, and social engagement opportunities.

Modern recreation centers are generally at least 25,000 to 30,000 square feet (sf) in size, and can be much larger (65,000+ sf, though this size facility typically also includes an indoor aquatic center). Modern multipurpose recreation centers include a variety of spaces, and the final building program is usually

determined as part of a business and operations plan that focuses on cost recovery and financial performance. Frequently, an equity partner is involved in development and/or site operations; partnerships should be addressed in the business and operations plan.

Though these centers typically do not fully recover their operating costs, the right mix of features that maximize revenue potential and adjacencies that are efficient to staff will minimize the operating subsidy needed for the facility. A business and operations plan will help the City determine the best location, the right mix of features, and the preferred operating model. Many centers of this type include a health and fitness component and offer memberships as part of their operating model. Typical features included in a multi-purpose recreation center building program are:

- Social gathering hub/lobby space designed for multi-uses/events, often with an entry checkpoint for members
- Gymnasium (multiple courts if possible)
- Additional health and fitness elements such as a fitness equipment, a walking track, a climbing wall, dance/exercise studio space
- Locker rooms
- Multi-purpose banquet room and event space suitable for both programs and private rentals
- Meeting rooms (wired for meeting technology)
- Classroom space, which sometimes includes a "messy room" with a sink for art classes
- Storage space to allow flexibility in programming
- Office space for staff

Additional features that should be considered as part of a business and operations plan for a multipurpose recreation center in Tualatin include:

- Indoor soccer field(s)
- Cultural, performing, and fine arts space, such as a theater/stage, studio space, dance studios, sound-proof music studios, and gallery/exhibit space
- Maker/incubator space
- Career center
- Work-share space
- Additional social gathering space
- Indoor/outdoor connected programming and event space
- Multi-story structure

The business and operations plan should address facility location. Acquisition may be needed. General guidelines for locating a multipurpose recreation center include:

- Located relatively centrally within the market area
- Good visibility from a major street
- Connected to the trail and bikeway network
- If a stand-alone site, approximately 4-5 acres of buildable land suitable for indoor/outdoor programming opportunities
- Access to public transportation and/or bicycle transportation network
- Space for sufficient parking
- Space for indoor/outdoor recreation programming and events

The business and operations plan should consider impacts of this facility on Parks & Recreation's other indoor buildings, including

those in Tualatin Community Park, Brown's Ferry Park, and Sweek Ponds Natural Area

- Depending on site selection, consider repurposing existing buildings for other uses or eliminating them.
- Evaluate operational impacts associated with providing one consolidated arts, recreation, sports, and community facility (with Department administrative space) versus 2-3 smaller buildings.

Sports Facilities (Fields and Courts) (P9)

There is a need for additional sport field space, enhancements to existing fields to improve and expand playability, as well as an added variety of sports courts.

- **Sports fields:** Investigate options to acquire land, plan, and develop sports fields adjacent to Tualatin Elementary, as part of a new park in the Basalt Creek Concept Plan Area, and/or at other sites. Consider both multi-use rectangular and diamond sports fields (lighted, synthetic turf, multi-use, seating) suitable for league and tournament play.
- **Tournament sports complex:** Evaluate the financial feasibility and create a business, operations, and tourism plan to determine whether a multi-field sports complex or stadium venue is needed to further attract regional tournament play, in addition to the sports fields noted above. Determine the appropriate size, scale, field types, number of fields, additional facilities (e.g., batting cages), and associated amenities needed, such as parking, concessions, locker rooms, restrooms, shelters/shade, picnic areas, seating, bike racks, etc. For larger acreage needs, consider combining this with other recommended parks to create one larger site.
- **School joint use agreement**: Coordinate on use of school facilities; formalize a system-wide joint-use agreement.
- **Sports courts**: Add pickleball courts, futsal courts, and a variety of sports courts such

as bocce, volleyball, basketball, and similar sports courts and games (See Appendix C).

- **Indoor sports space**: Consider gymnasiums and fieldhouse elements in conjunction with the community recreation center.
- **Existing field improvements:** Ensure sports facilities have nearby shade, restrooms, seating, and field lighting where appropriate.

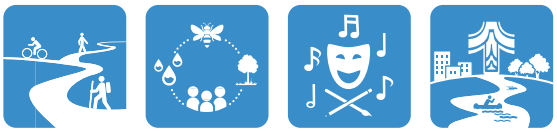
Other Outdoor Facilities

Options to expand the variety of recreation experiences and facility access should be evaluated through site planning, design, and master planning at various sites. The variation and geographic distribution of several different types of elements should be considered at targeted sites across the City.

- Appendix C notes recreation opportunities that respond to trends and community needs.
- Additional types of facilities consistent with Master Plan goals may be considered as well.

Proposed Natural Parks & Areas

Implementing the following recommendations for new natural parks and areas will help achieve these four Master Plan goals:



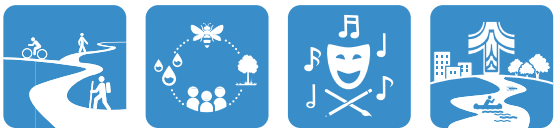
Protect natural resources in the Basalt Creek Canyon and throughout Tualatin.

- Identify and protect natural areas following the guidance noted in systemwide recommendations.
- Consider opportunities to acquire natural areas in conjunction with park development in the Basalt Creek Concept Plan Area. Acquire additional land for natural parks to support planned trail connectivity, protect

creek canyon habitat and natural resources, and provide opportunities for nature interpretation.

Proposed Greenways and Shared Use Paths

Implementing the following recommendations for new reenways and paths will help achieve these four Master Plan goals:



Recommendations for proposed greenways, shared use paths, and trails focus on acquiring and developing trail corridors to provide regional and local trails that create interconnected loops, improve access to parks and open space, and connect residents to other community destinations.

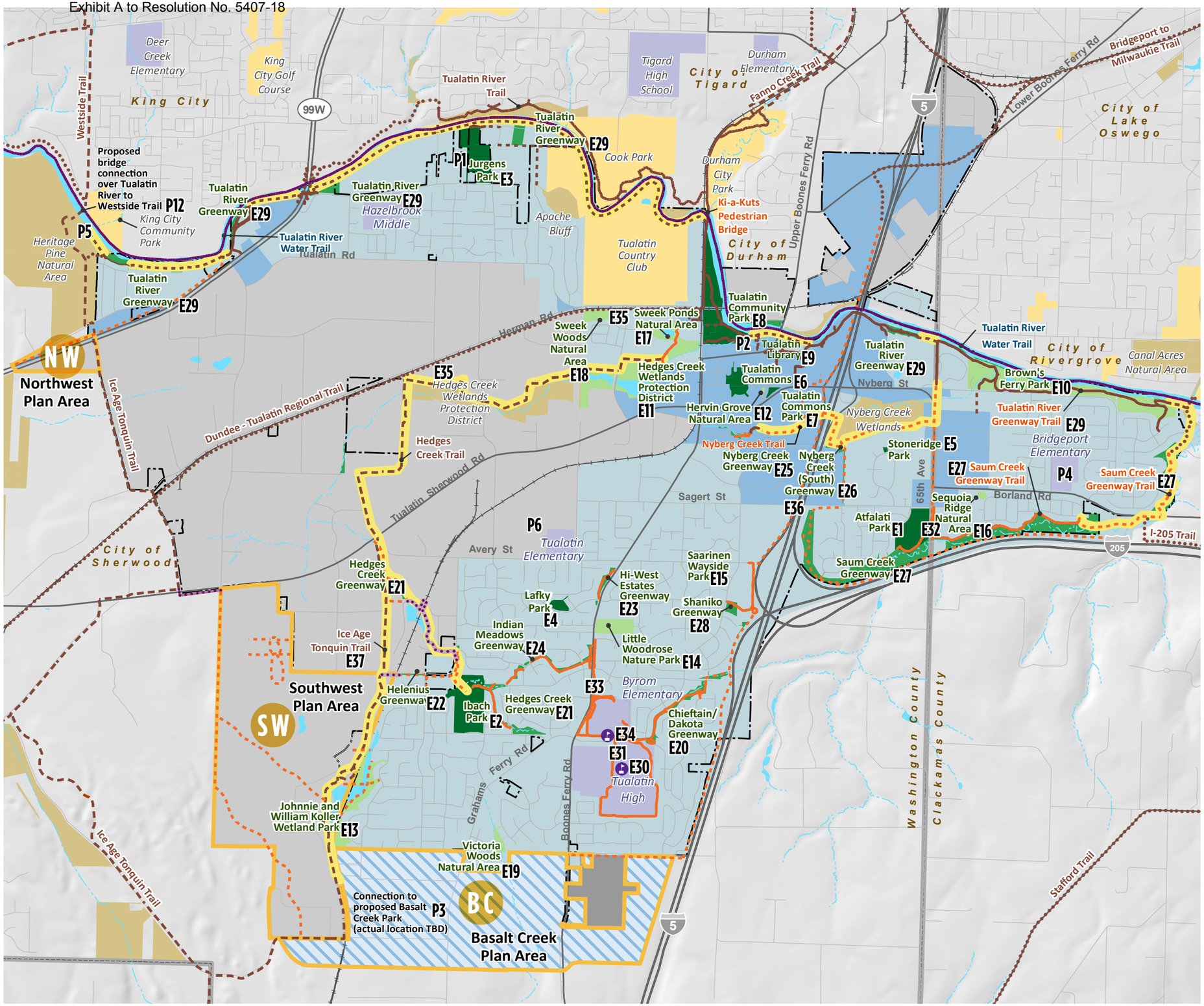
- Connect the trail system by developing planned and proposed paths as noted in Map 3: Existing, Planned, and Proposed Parks and Trails.
- Focus efforts on acquiring priority trail segments (see Map 3) as opportunities arise to improve access to parks and other community destinations. Continue to re-assess trail priorities to achieve proposed trail guidelines and greenway standards.
- Explore a partnership with Metro, King City, and others to provide a bridge over the Tualatin River connecting to the planned Westside Regional Trail at the Heritage Pine Natural Area.
- Expand water access in selected sites.
- Work with Tigard to expand Tualatin River Greenway as a loop around the river (consider bridge at end of Cook Park Greenway to connect).
- Connect existing trail segments in South and Central Tualatin to improve recreation opportunities and access to nearby schools, natural areas, retail services, medical, and public facilities, as well as the proposed park in the Basalt Creek Concept Plan Area.
- Add lighting, seating, dog waste stations, trash receptacles, viewpoints, interpretative features, and interactive art in appropriate trail locations throughout the trail system.

Exhibit A to Resolution No. 5407-18

TUALATIN
Accessible, Inclusive & Vibrant
Parks and Recreation

PARKS & RECREATION MASTER PLAN

Map 3: Existing, Planned, and Proposed Trails



Tualatin Trails
- Existing Paths and Trails
- Planned Paths and Trails

Regional Trails
- Existing Muti-Use Trails
- Planned Multi-Use Trails
- Proposed Multi-Use Trails

Other Trails
- Priority Trail Segments
- Potential Trail Opportunity
- Existing Tualatin River Water Trail

Tualatin Park and Recreation Facilities
- Parks
- Greenways
- Natural Parks & Areas
- Shared Use Paths
- School Joint-Use Facilities

Other Park and Natural Areas
- Other Developed Parks and Recreation Areas
- Other Greenways and Natural Areas
- Tigard-Tualatin District Schools

Planning Areas
- Plan Area

Land Uses
- Residential
- Commercial
- Industrial
- Institutional
- Mixed Use: Residential, Commercial & Industrial

Base Map Features
- Tualatin City Boundary
- County Boundary
- Freeways/Highways
- Major Arterials
- Local Streets
- Railroads
- Streams
- Rivers and Waterbodies

MIG Date: July 2018

Sources: City of Tualatin, Parks and Recreation, 2017; Metro Regional Government, 2017; Oregon Spatial Data Library, State of Oregon, 2017.

Disclaimer: This map is derived from various digital database sources. While an attempt has been made to provide an accurate map, the City of Tualatin, OR assumes no responsibility or liability for any errors or omissions in the information. This map is provided "as is".

0 500 1,000 2,000 3,000 4,000 5,000 Feet

Exhibit A to Resolution No. 5407-18

Public Art

Implementing the following recommendations for public art will help achieve these three Master Plan goals:

Public art in Tualatin is important in connecting people to art, culture, history, and nature, as well as strengthening the City's identity and sense of place. Art and/or interpretive elements should be integrated in many public parks, facilities, greenways and spaces as noted in the site recommendations above, as well as systemwide recommendations.

Recommendations for the City's public art program include:

- Integrate art into public parks and greenways.
- Distribute public art broadly in public spaces throughout the community.
- Continue to focus on themes for place-based art that enhance Tualatin's identity and sense of place, but also move beyond these themes to creative expressions of Tualatin's character and identity.
- Curate more temporary art installations and performance art in parks and public spaces throughout Tualatin.
- Provide for diverse forms of art at park sites, since a wide range of style, media, subjects, and viewpoints will offer perspective and interest for everyone.


BLENDER
BOSS

6 IMPLEMENTATION

The City must take a strategic approach to investing in parks and recreation to achieve the community's vision and goals. This chapter identifies cost assumptions for implementing recommendations, reviews potential funding sources and strategies, and provides prioritization criteria and an approach to sequence new projects. It concludes with a short-term action plan for moving forward.

CAPITAL AND OPERATIONS COSTS

It is estimated that more than $215 million will be needed to implement all recommendations in the Master Plan. Some recommended projects are needed to support existing level of park use and some are more aspirational.

The Master Plan identifies planning-level cost estimates to implement recommendations for acquisition, development, and improvements. The estimates are based on a general order-of-magnitude in costs and are intended to assist in evaluating and prioritizing projects. Costs are in 2018 dollars not accounting for inflation. The costs are divided into three types (capital projects, reinvestment/replacement costs, and maintenance costs) to ensure

that the City has the funds to develop, maintain, and replace amenities, facilities, and landscaping when needed.

Table 6-1 summarizes all costs for recommended projects by category. It distinguishes the level of investment needed in existing parkland versus proposed parks and facilities. For details, see Appendix D, which identifies the cost basis for these estimates and breaks down costs by site and category. Costs are presented in an updateable matrix that allows the City to adjust per-unit costs to account for changing land values, changing construction costs, and inflation.

$215.9 MILLION

COST OF ALL CAPITAL PROJECTS, INCLUDING LAND ACQUISITION AND IMPROVEMENTS

$2.1 MILLION

AMOUNT THAT WILL BE NEEDED ANNUALLY TO MAINTAIN ALL SITES AFTER DEVELOPMENT AND RENOVATION

$2 MILLION

ADDITIONAL AMOUNT THAT SHOULD BE SET ASIDE ANNUALLY TO REPAIR AND REPLACE FACILITIES WHEN NEEDED

Table 6-1: Cost Matrix Summary

	ACQUISITION OR EASEMENTS	IMPROVEMENT COSTS	TOTAL CAPITAL COST	TOTAL REINVESTMENT & REPLACEMENT COST	TOTAL MAINTENANCE COST
Existing Parks & Facilities					
Parks & Facilities	-	$49,729,787	$49,729,787	$554,538	$699,870
Natural Parks & Natural Areas	-	$35,230,852	$35,230,852	$456,300	$340,040
Greenways	-	$16,204,180	$16,204,180	$448,613	$478,520
Joint-Use Facilities	-	$605,889	$605,889	-	$13,700
Shared Use Paths	-	$1,185,500	$1,185,500	$18,113	$19,110
Total Existing Parkland	-	$102,350,319	$102,350,319	$1,477,563	$1,537,540
Proposed Parks & Facilities					
Proposed Parks & Facilities	$15,987,500	$69,995,000	$85,982,500	$424,688	$471,925
Proposed Natural Parks & Areas	$2,540,000	$5,115,000	$7,655,000	$63,500	$31,750
Proposed Greenways & Shared Use Paths	$4,025,000	$14,890,000	$18,915,000	$60,375	$63,400
Total Proposed Parkland	$22,552,500	$90,000,000	$112,552,500	$548,563	$567,075
Proposed Additional Planning					
Additional Planning	-	$400,000	$400,000	-	-
TOTAL EXISTING PARKLAND, PROPOSED PARKLAND & ADDITIONAL PLANNING	**$22,552,500**	**$193,356,208**	**$215,908,708**	**$2,026,125**	**$2,118,315**

Consistent with community priorities, the most extensive capital investment is in developed parks and trails. The project costs support the following:

- **$49.7 million: Developed Park Improvements:** Improvements to developed parks to renovate sites, address deferred maintenance, improve Americans with Disabilities Act (ADA) accessibility, increase recreation use, and improve or replace aging and worn facilities.
- **$35.2 million: Improvements to Developed Facilities in Natural Areas:** Improvements to natural parks and natural

areas, focusing on building renovations and improvements to indoor facilities (Brown's Ferry Community Center and Heritage Center), ADA improvements, and added recreation uses to support nature programming.

- **$36.3 million: Trail Development:** Extension or development of trails at existing City-owned sites and new trail corridors (greenways and shared use paths).
- **$86.0 million**: **New Land and Facilities to Support Standard for Developed Parks:** Acquisition and development of new parks and major facilities to provide close-to-home parks, indoor recreation center, sports fields, a new community park in the Basalt Creek Concept Plan Area, and other new recreation opportunities.
- **$7.7 million:** Natural Area Acquisition and Protection.
- **$1.0 million:** Other Planning and Partnerships.

FUNDING SOURCES

There are a variety of funding sources available for recreation services (operations) and capital improvements (projects) in Oregon, many of which are already used by Tualatin.

- **Capital funding** supports new construction, expansion, renovation, or replacement projects for existing parks and facilities.
- **Operations funding** supports ongoing services, such as maintenance, facility operations, recreation programming, events, marketing, and management.

To implement Master Plan recommendations, the City will need to diversify funding sources and increase revenues from existing sources. Both capital and operations funding should be expanded to ensure the City is able to operate and maintain existing and new assets in the long term.

Table 6-2 and the text below summarize potential funding sources. This list is not all-inclusive and new funding sources will be utilized and considered as they become available or projects qualify.

Property Taxes

Property taxes are the most significant source of operating revenue for Oregon cities. Property taxes make up almost half of Tualatin's General Fund revenues, though the City has one of the lowest permanent tax rates in the Portland Metropolitan Area ($2.2665 per $1,000 of assessed value). Property tax revenues are based upon the assessed value of a property, which differs from the property's real market value (the estimated value it would sell for), due

Table 6-2: Summary of Funding Sources and Potential Applications

FUNDING SOURCE	CURRENTLY USED BY TUALATIN?	MAY BE USED FOR OPERATIONS	MAY BE USED FOR CAPITAL IMPROVEMENTS	RESTRICTIONS ON USE
Property Taxes	Y	√	√	
Charges for Services	Y	√	√	
Parks System Development Charges	Y		√	Capacity enhancement projects
Transient Lodging Tax	Y	√	√	70% for tourism-related projects
General Obligation Bond	Y		√	
Operating Levy	N	√		
Park Utility Fee	N	√		
Public Agency Grants			√	Specified by grant
Philanthropic Grants		√	√	Specified by grant
Donations	Y	√	√	May be specified by donor

Note: Funding amounts and revenues may be limited by other factors, such as market considerations, tax limits/compression, voter support, amount of new development, etc.

to the limitations put in place by Measures 5 and 50 (passed by Oregon voters in the 1990s).

Charges for Services

Fees and charges are generated from recreation programs and facility rental fees, providing a source of operating funding. Within Tualatin's budget, these General Fund revenues are categorized as "Recreation program fees" and "Recreation user fees." In addition to costs for recreation program registration, Tualatin has an established fee schedule for facility rentals.

Within the budget document, fees are tracked as line items in the following categories:

- Picnic shelter fees
- Ballfield fees
- Juanita Pohl Center use fees
- Browns' Ferry Community Center
- Heritage Center
- Concession fee
- Street Tree fees
- Community room rental

Parks – System Development Charges

Section 4 of Tualatin's charter grants the City authority to impose Systems Development Charges, known as SDCs, to equitably spread the cost of essential capital improvements to new development and pay for infrastructure expansion required to serve the additional demand. Oregon State Law allows local jurisdictions to charge SDCs for parks and recreation facilities, and Tualatin has had Parks SDCs in place for residential development. The Parks SDC is a main source of revenue for the Park Development Fund, which is used to fund park improvements. In conjunction with the Parks & Recreation Master Plan Update, Tualatin's SDC methodology is being updated. The new methodology considers the park impacts associated with development in residential and non-residential areas.

Transient Lodging Tax

Chapter 09-09 of Tualatin's Municipal Code authorizes a Transient Lodging Tax, which requires all transient lodging within Tualatin to pay a tax. Hotels, motels, inns, campgrounds, and short-term rentals (such as AirBnB) are subject to this tax. This is a new revenue source for City of Tualatin, and it requires that at least 70% of these funds must be used for tourism promotion or tourism-related facilities. Since some Parks and Recreation programs and projects are tourism and visitor-related, they may be eligible for TLT funds.

General Obligation Bond (Bond Measure)

General Obligation Bonds are voter-approved bonds with the authority to levy an assessment on real and personal property. The proceeds can be used for capital improvements but not maintenance. This property tax is levied for a specified period of time. Tualatin has passed bonds in the past, notably the bond measure passed after the Tualatin Facilities Visioning

project to fund the new library and variety of parks improvement. Tualatin voters most recently passed a bond (57% in favor) on the May 2018 ballot for traffic congestion and safety improvements.

Operating Levy

Levies are voter-approved assessments on real property that extend for up to a 5-year term and can be used for maintenance and operations. Locally, voters have passed operating levies for parks and recreation, including the November 2016 renewal of Metro's parks and natural areas levy.

Park Utility Fee

A park utility fee creates dedicated funds to help offset the cost of park maintenance. Most City residents pay water and sewer utility fees. Park utility fees apply the same concepts to City parks, and a fee can be assessed to all businesses and households. The monthly fee would be paid upon connection to the water and sewer system. Creating a new source of maintenance funding could free up General Fund dollars for other capital project uses. Park utility fees have the potential to be a significant and stable revenue stream for local jurisdictions. For example, Medford assesses a per unit/monthly fee that is charged on the water bill and West Linn charges a monthly residential park maintenance fee of $13.01 per month per household, charged on the utility bill.

Public Agency Grants

Federal, state, and other public agency grant funding may be available for parks and recreation improvements. These sources are competitive, and generally require matching funds. The Federal Land and Water Conservation Fund (LWCF) is administered by Oregon Parks and Recreation Department (OPRD) and is one of the most common funding sources. The Recreational Trails

Program (RTP) grant provides funds to develop and maintain recreational trails and trail-related facilities, including non-motorized recreational trail uses. The lottery-funded Local Government Grant Program helps local government agencies fund outdoor park and recreation areas and facilities and acquire property for park purposes. The Oregon Department of Fish and Wildlife also offers grants for land conservation and habitat improvements.

Transportation improvements can improve connectivity to parks and provide recreation benefits. Oregon's Statewide Transportation Improvement (STIP) grants provide transportation improvement funding for projects identified in the local transportation plan. Travel Oregon's Competitive Grant program also provides funding support for projects that are linked to tourism and demonstrate a direct tie to the mission of Travel Oregon.

Philanthropic Grants

Some foundations offer grant funding to support their mission and objectives, funding projects or programs in local communities. Philanthropic foundations such as the Ford Family Foundation and Meyer Memorial Trust provide funding to support initiatives that improve local communities, typically to non-profit organizations rather than to local governments. The Tualatin Library Foundation is a 501(c)(3), but there is no non-profit specifically for Tualatin's parks and arts.

Donations

The donations of labor/in-kind services, land, or cash by service agencies, private groups, or individuals can provide sources of revenue, most typically for specific projects or programs. Service agencies such as Lions and Rotary often fund small projects such as playground improvements or shelter. The City has garnered donations for projects from service clubs, businesses, and individuals. In addition, Tualatin has a volunteer program. Generally, a 501(c)(3) organization makes donations more appealing to potential donors, because they may benefit from the tax deduction.

Currently, Tualatin tracks donations within both the General Fund and the Park Development Fund. Volunteer labor is not tracked within the budget. The Park Development Fund tracks donations to Parks and Recreation as a line item. There are line items within the Miscellaneous Revenue category of the General Fund for:

- Donations – Art
- Donations – Parks and Recreation
- Donations – Concerts – Commons
- Donations – Library

PRIORITIZATION CRITERIA

- As part of its annual budgeting and development of a short-term capital improvement plan, Parks & Recreation Department staff will evaluate funding and prioritize projects for implementation. The Master Plan presents a two-step evaluation process for prioritizing capital projects. The initial screening can be used to establish project priorities. The secondary evaluation will help sequence projects to support project phasing and scheduling for implementation in coming years.

Initial Screening: Goals and Priorities

The initial screening criteria can be used to sort projects to determine their eligibility for inclusion in the capital program. Tables 6-3 and 6-4 will be used as a checklist to see how well the proposed project addresses Master Plan goals and responds to the top community priorities. These scores will be applied to criteria that are incorporated into the secondary evaluation (Table 6-5).

Note: Each project must advance at least one of the seven Master Plan goals. Projects not aligned with at least one goal will be excluded from the Capital Improvement Plan (CIP) and from further evaluation.

Secondary Evaluation: Sequencing Criteria

For projects that advance Master Plan goals, each project will be evaluated against the ten criteria in Table 6-5 to determine project sequencing. The scores from Tables 6-3

Table 6-3: Evaluation by Master Plan Goals

MASTER PLAN GOALS	POSSIBLE SCORE	TOTAL SCORE
Goal 1: Expand accessible and inclusive parks and facilities to support community interests and recreation needs.	1	
Goal 2: Create a walkable, bikeable, and interconnected City by providing a network of regional and local trails.	1	
Goal 3: Conserve and restore natural areas to support wildlife, promote ecological functions, and connect residents to nature and the outdoors.	1	
Goal 4: Activate parks and facilities through vibrant programs, events, and recreation opportunities for people of different ages, abilities, cultures, and interests.	1	
Goal 5: Support the arts through programs, parks, and public spaces that reflect Tualatin's identity, heritage, history, and expressive character.	1	
Goal 6: Promote Tualatin's unique identity, economic vitality, and tourism through parks, natural resources, historic preservation, events, programs, and placemaking.	1	
Goal 7: Manage, administer and maintain quality parks, facilities, and programs through outstanding customer service, stewardship, and sustainable practices.	1	
TOTAL (FOR APPLICATION IN TABLE 6-5)	**7**	

Note: Project must advance at least one Master Plan goal to be considered further.

through 6-5 will be tallied to calculate percent favorability and determine which projects to add into the annual CIP.

Evaluation Notes

A project that scores high in priority in many categories may show up outside of the near-term project list due to difficulty in implementation, lack of operations sustainability, or other challenges. Facets and features to each project may occur over time. For example, site identification and design work might take place years in advance of a project having funding for construction. Similarly, land acquisition may occur many years in advance of park design or construction. For realities of implementation, larger projects can be divided into smaller entities that focus on different priority timelines.

As projects, priorities, opportunities, and community needs shift, so can that project ranking. The ranking produced by this checklist will be applied to the annual capital improvement program process as new projects arise and other projects are completed.

Table 6-4: Evaluation by Community Outreach Priorities

COMMUNITY OUTREACH PRIORITIES	POSSIBLE SCORE	TOTAL SCORE
Expand trail connections and trail activities.	1	
Expand capacity or improve sport facilities.	1	
Provide a greater variety of recreation activities and programs to meet the needs and interests of people of all ages and cultures.	1	
Protect Tualatin's natural resources or provide access to natural features, especially the river, for recreation.	1	
TOTAL (FOR USE IN TABLE 6-5)	**4**	

Table 6-5: Evaluation by Sequencing Criteria

SEQUENCING CRITERIA	SCORING GUIDANCE	POSSIBLE SCORE	TOTAL SCORE
Performance Improvements	Repairs or improves an existing asset to restore or enhance use.	1-3	
Capacity Expansion	Increases opportunities and/or builds capacity to serve a greater number of people.	1-3	
System Diversity	Increases or provides variety in the assortment of uses or recreation opportunities in the community.	1-3	
System Balance	Increases equity, access, or geographic distribution of recreation opportunities (e.g., meets an unmet need, addresses a gap in services, serves an underserved group or area).	1-3	
Urgency/ Immediacy	Meets health and safety/regulatory elements; action must be taken now before the opportunity is lost; completion is needed before another priority project can be started.	1-3	
Ease of Implementation	Can be easily attained or accomplished; uses existing site; necessary planning, feasibility studies, and permitting have already been completed.	1-3	
Available Resources	Uses or leverages available resources (staffing, funding, partnerships, equipment) for capital development and/or ongoing operations.	1-3	
Return on Investment/ Value	Delivers high value for the cost or resources needed, relative to other projects.	1-3	
Operational Sustainability	Increases sustainability, reduces costs, increases maintenance and operational efficiencies, and/or increases facility revenues.	1-3	
Vision Alignment	Coincides with or supports another City project, goal, or City Council initiative.	1-3	
Master Plan Goals Alignment	Supports Master Plan goals (see Table 6-3). 1 goals = 1 point; 2-3 goals = 2 points; 4+ goals = 3 points	1-3	
Community Priority Alignment	Is aligned with community priorities (see Table 6-4). 1 priority = 1 point; 2 priorities = 2 points; 3-4 priorities = 3 points	1-3	
TOTAL		**36**	
	PERCENT FAVORABILITY (TOTAL SCORE/36 * 100)		

Scoring
0 points – N/A
1 point – Low
2 points – Medium
3 points - High

INITIAL ACTION PLAN

The prioritization criteria will help sequence short and long-term projects over the next 15+ years. However, there are several projects and policy initiatives that should move forward in the short term (first 1-3 years.) This action plan is intended to inform the City's workplan, which should be updated annually in conjunction with budgeting and CIP development.

- Adopt the updated System Development Charge Methodology and new rates.
- Hire a Park Planning & Development Director to oversee Master Plan implementation.
- Identify and complete "quick win" projects to build public support for future initiatives. These projects use or leverage available resources and have high favorability scores. Publicize these successes. Examples include:
  - » Ibach Park play area renovation
  - » Tualatin Commons fountain renovation
  - » Tualatin Community Park dog park renovation
  - » School District partnerships to provide recreation opportunities in underserved areas
  - » Jurgens Park and Tualatin Community Park site master plans
- Initiate pilot recreation and arts programs. Consider one new event or program to support Sports and Fitness, Nature Programs, Arts & Culture.
- Acquire and develop priority trail connections by coordinating with Metro and other partners.
- Consistent with the Citywide ADA Assessment and Transition Plan, proceed with barrier removal at the highest priority sites.
- Incorporate Master Plan recommendations and standards into the City of Tualatin's Development Code update.

- Incorporate Master Plan recommendations into the Basalt Creek Concept Plan and development strategies.
- Initiate the Park & Recreation Comprehensive Fee Analysis and Plan to evaluate all charges and identify cost recovery targets for program services.
- Explore opportunities to increase existing funding sources and maintenance and operations funding. Continue to pursue grants and donations.
- Complete a Marketing and Outreach Plan that improves information on available opportunities and also builds public support for a future voter-approved funding measure.

MOVING FORWARD

This Master Plan is the culmination of a year and a half of work by Tualatin staff, the Project Advisory Committee, City Council, and other City and community leaders to determine how best to invest in parks and recreation services. It comes almost 35 years after the City's previous Master Plan and is anticipated to guide Tualatin until the year 2035.

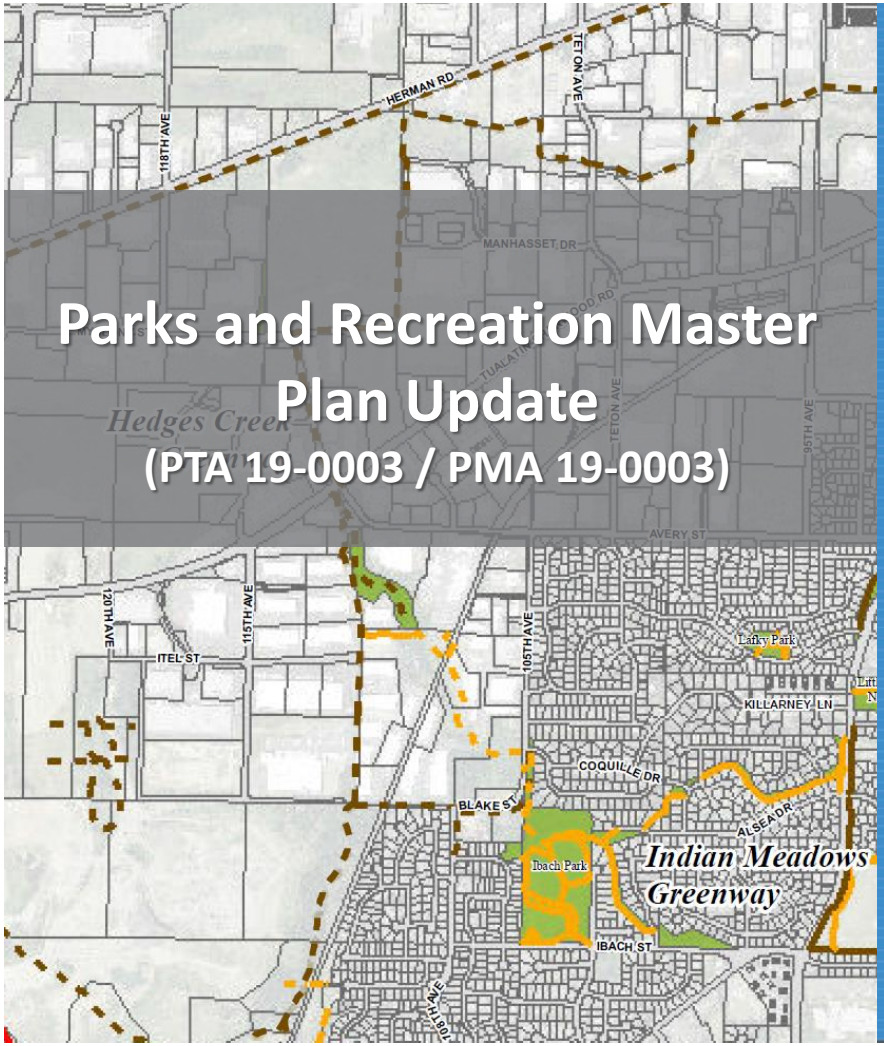
Those who were involved in the planning process thoughtfully considered the question about what level of service to provide in Tualatin. The recommendation to enhance parks and recreation—rather than simply maintain the existing level of service as the community grows—did not come easily. City staff spent considerable time soliciting resident feedback and making sure all stakeholders and interest groups were involved in Master Plan decision-making. Project Advisory Committee members attended more meetings than anticipated, including being present at Council meetings to ensure their recommendations and guidance were carried forward. The result is a visionary plan, but a realistic one nonetheless. It recommends the City invest in a higher level of service to support a higher quality of life.

THE MASTER PLAN RECOMMENDS THE CITY INVEST IN A HIGHER LEVEL OF SERVICE TO SUPPORT A HIGHER QUALITY OF LIFE.

That higher level of service comes with a price. It represents a long-term investment in the assets and values the community treasures. The Master Plan inventoried those assets. It identified those values, along with the vision, priorities, and needs of the community. Then it recommended an investment strategy to support Tualatin's vision and goals through park and recreation improvements.

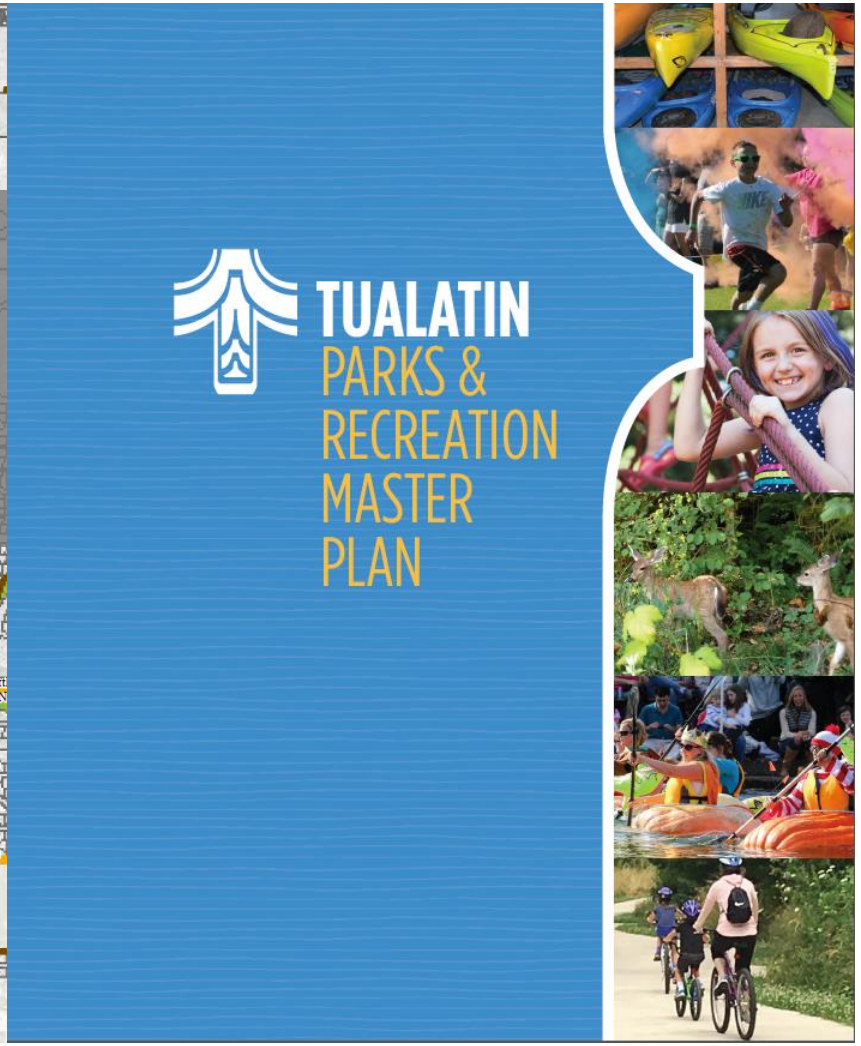
There are big decisions to be made about funding in order to fully implement this plan. Residents need to express their continued support to Council and City leaders to fund parkland, facilities, trails, programs, and the arts. Working together, residents, businesses, partners, City staff, elected officials, and community leaders can create the **accessible, inclusive, vibrant park and recreation** system they envision.

Parks & Recreation Department
18880 SW Martinazzi Ave.
Tualatin OR 97062
(503) 692-2000
https://www.tualatinoregon.gov/recreation



Parks and Recreation Master Plan Update

(PTA 19-0003 / PMA 19-0003)



PTA and PMA 19-0003
Parks and Recreation Master Plan Update

TUALATIN PLANNING COMMISSION
October 17, 2019

Tonight's Presentation

1. Objective
2. Proposed Plan Text Changes
3. Proposed Map Changes
4. Applicable Criteria
5. Conclusion

Objective

- Update applicable elements of the Tualatin Development Code to be consistent with the Parks and Recreation Master Plan, updated in 2018, including:
  - The Community Plan;
  - The Development Code; and
  - Supporting Maps and Figures

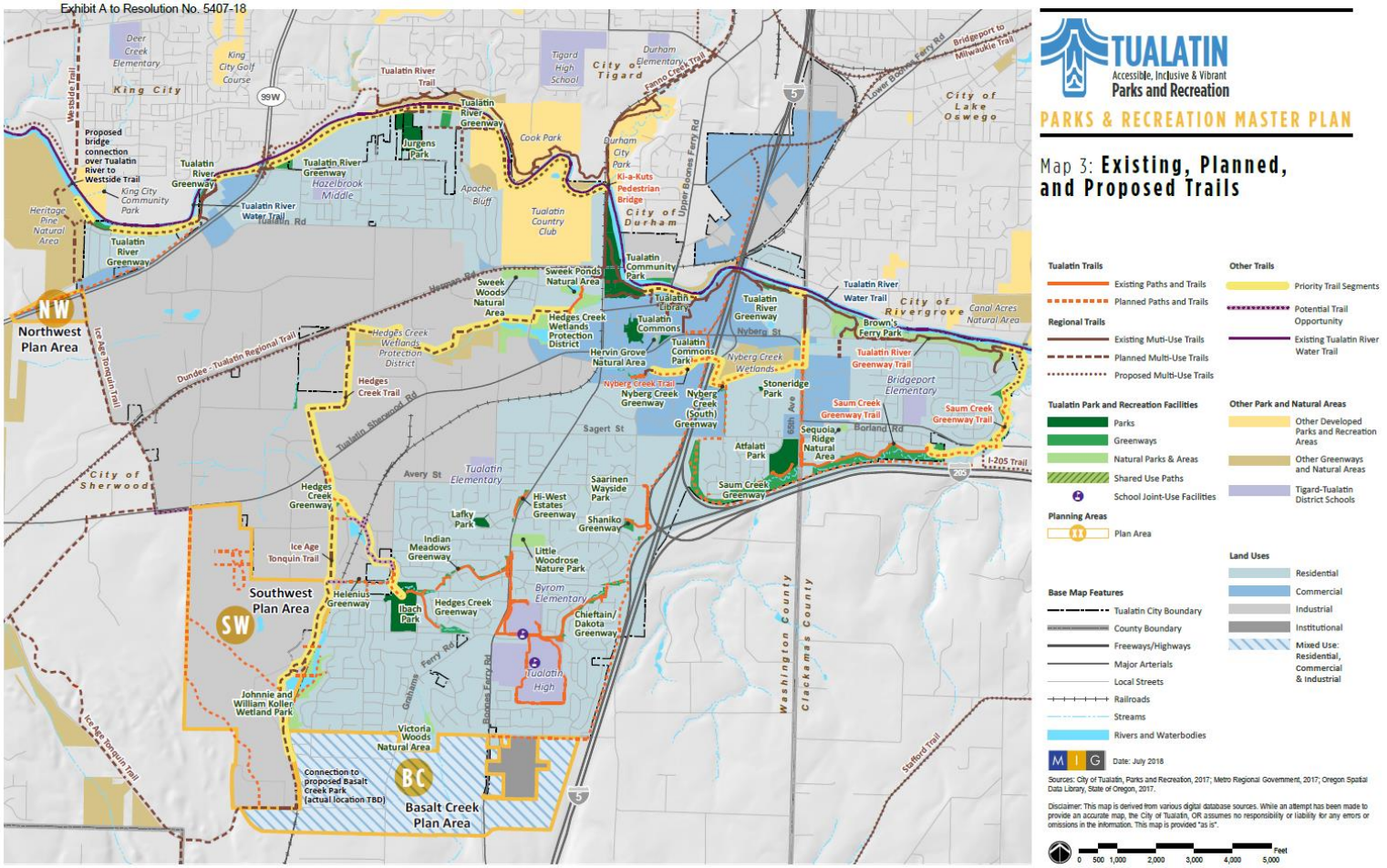
Proposed Plan Text Changes

- Update Community Plan Chapter 15 to reflect most recent Parks and Recreation Master Plan and its community objectives.
- Update outdated code references to prior Parks Master Plan in various Chapters.
- Update Development Code Chapter 74 to align with current best practices.

Proposed Map Changes

- Update Development Code Figure 11-4: Bicycle and Pedestrian Master Plan and Map 72-2: Greenway and Trail Development Plan consistent with Parks and Recreation Master Plan Map 3.
- Delete Figure 3-4: Recreation Resources (replaced by Master Plan Map 2, which is shown on existing TDC Map 72-3)
- Delete Map 74-1: Street Tree Plantings (replaced by updated code in Chapter 74).

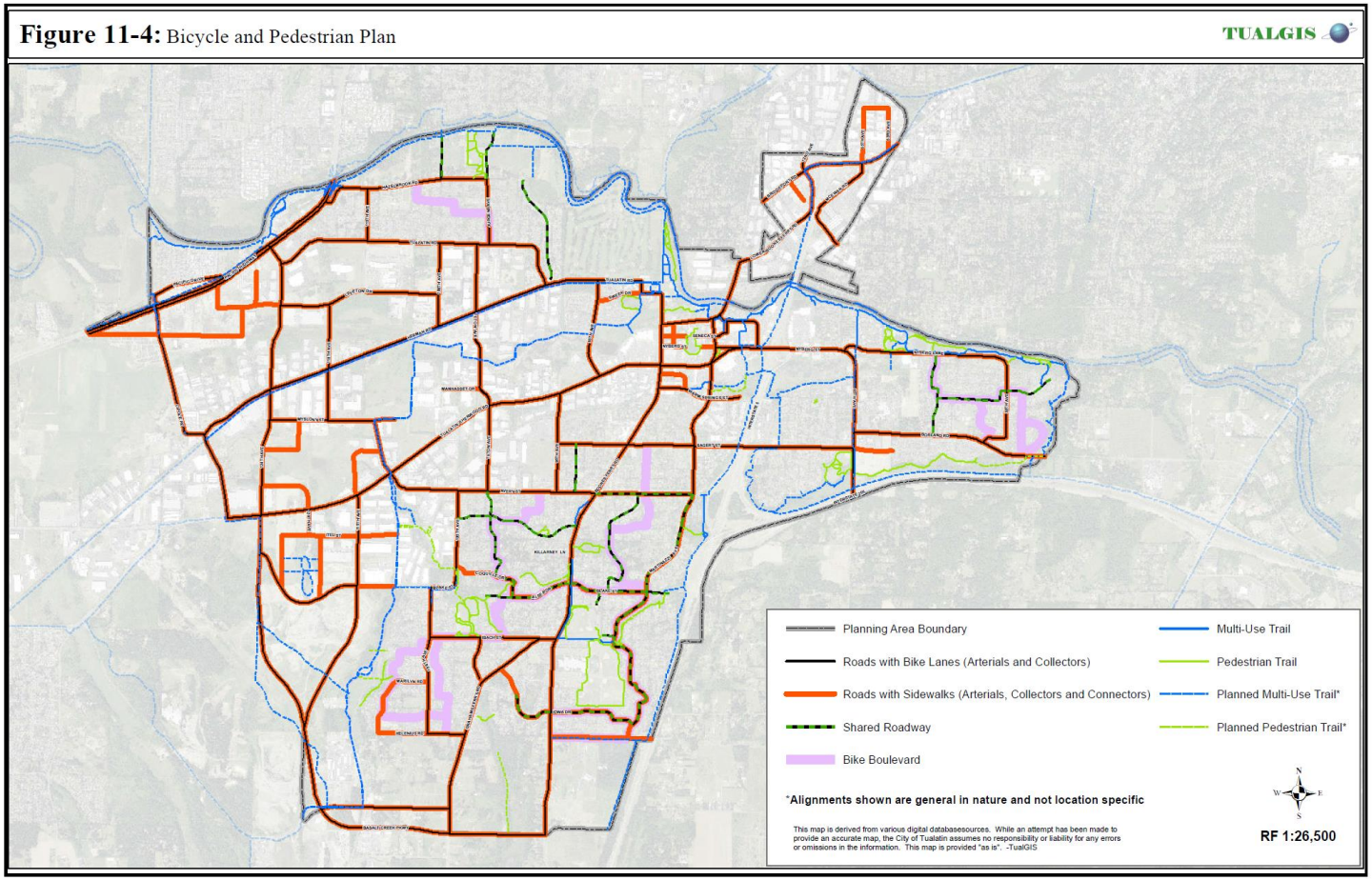
Parks Master Plan Map 3



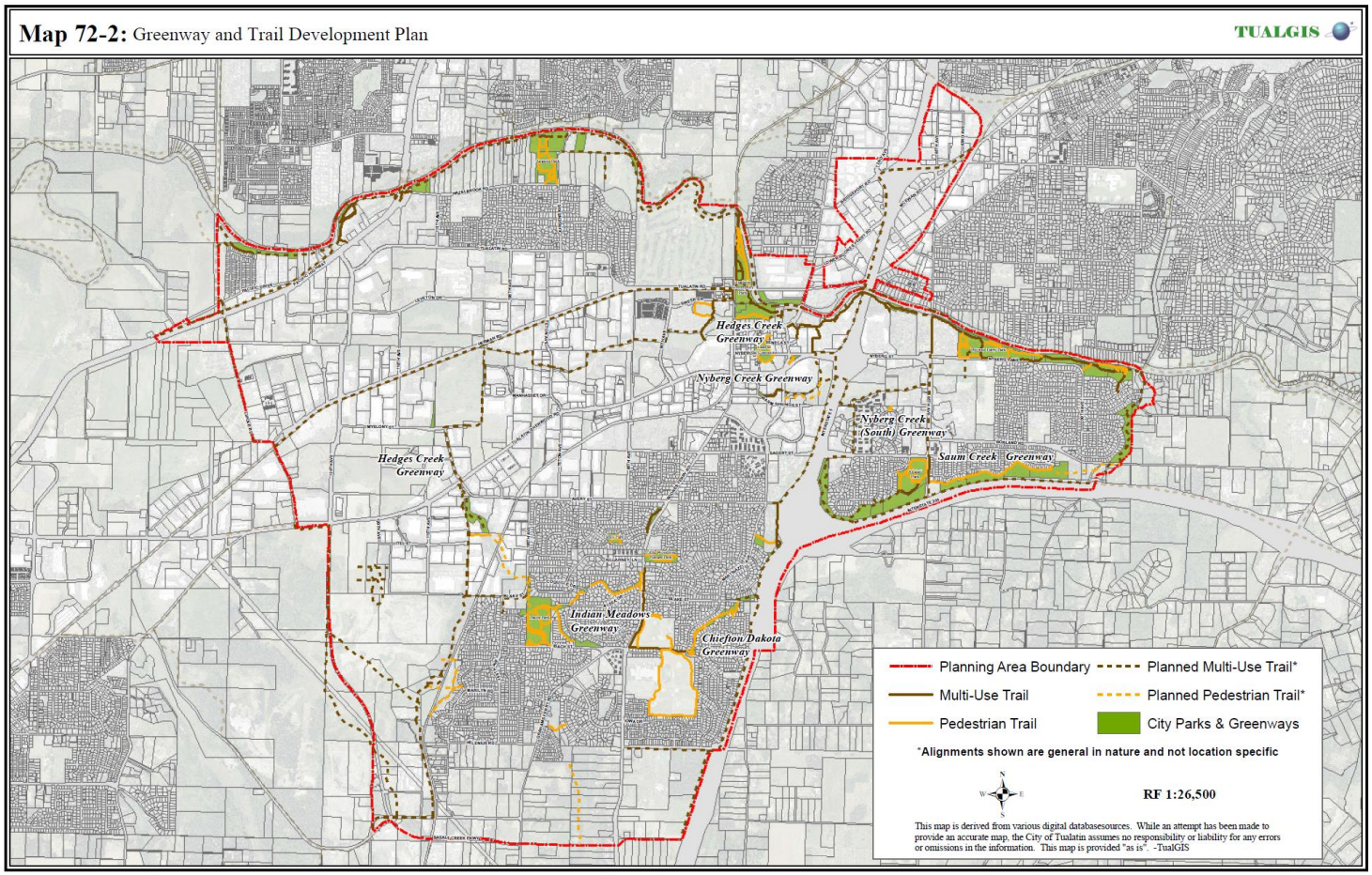
PTA and PMA 19-0003
Parks and Recreation Master Plan Update

TUALATIN PLANNING COMMISSION
October 17, 2019

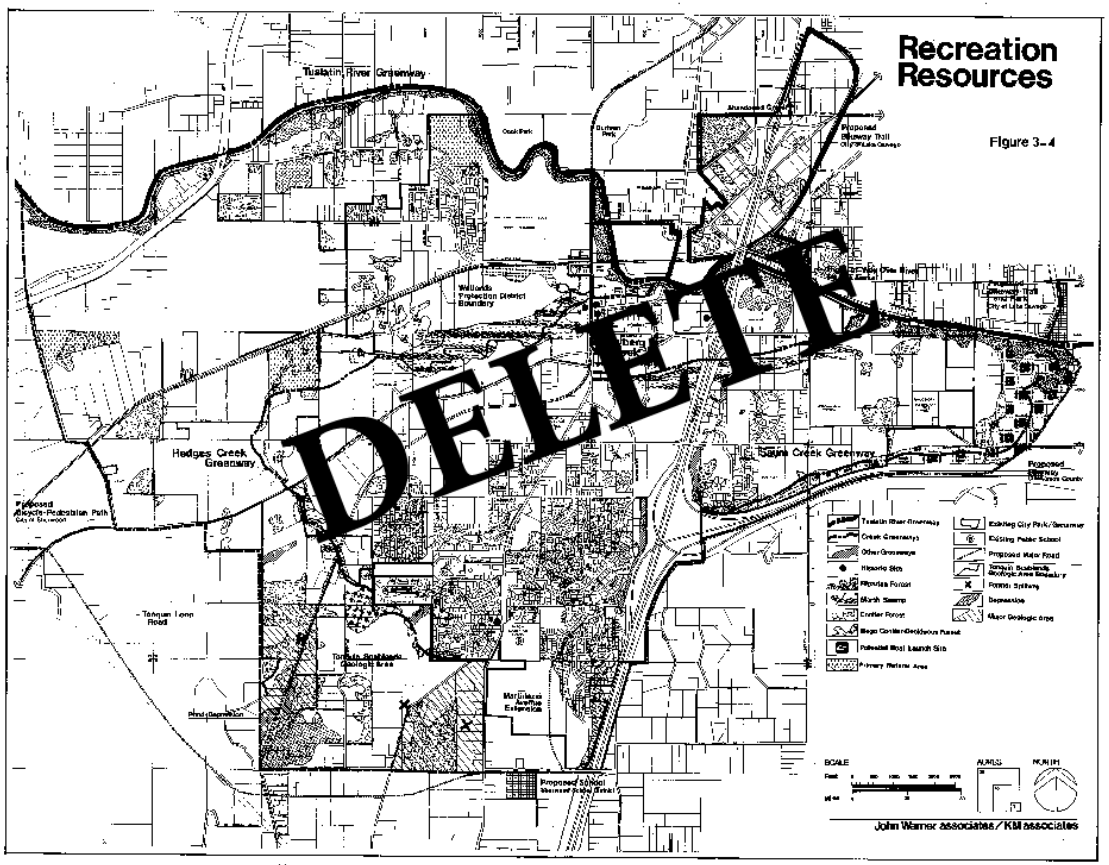
Map Change: Figure 11-4



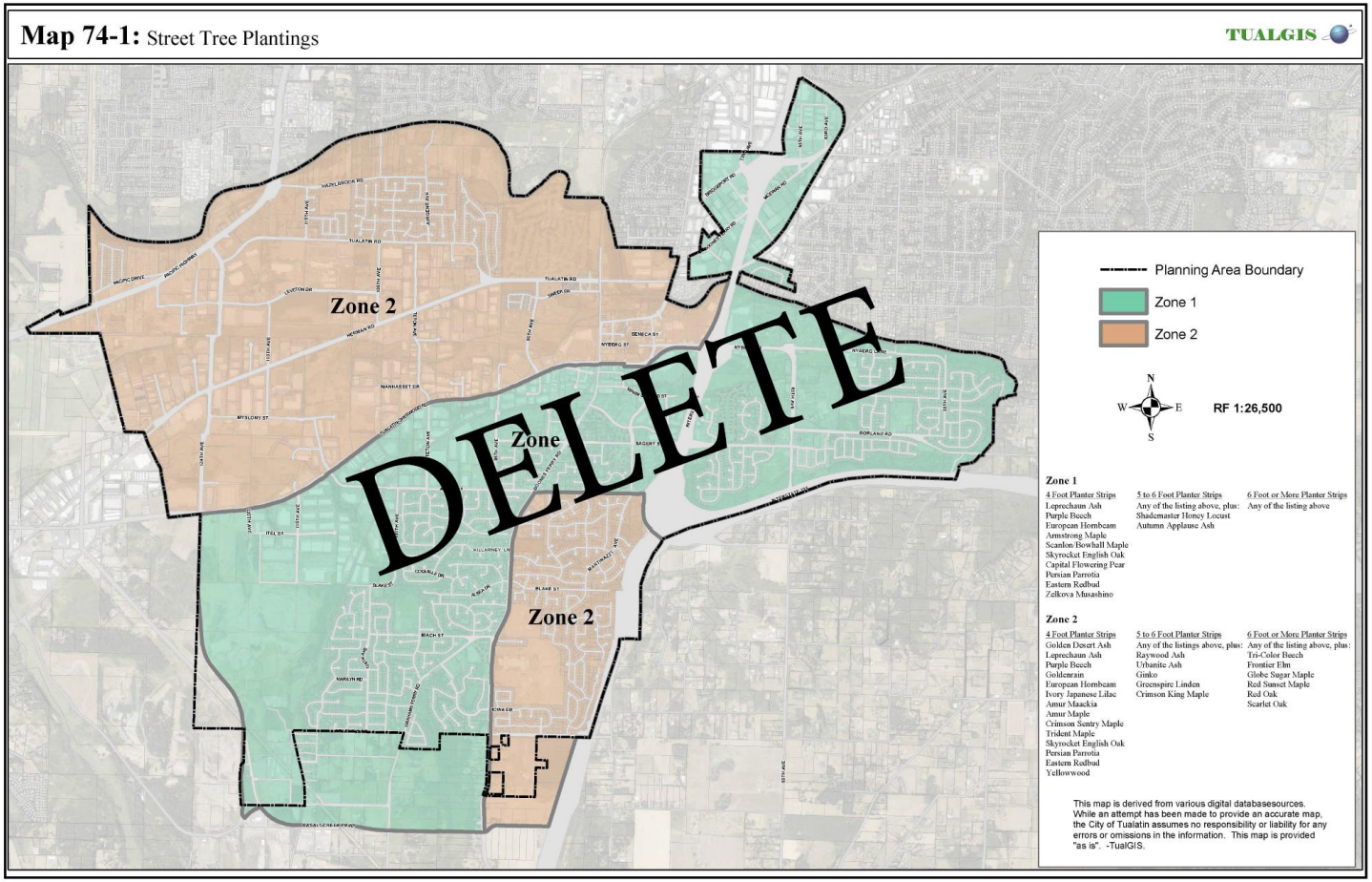
Map Change: Map 72-2



Map Change: Figure 3-4



Map Change: Map 74-1



Applicable Criteria

- Statewide Planning Goals
- Oregon Administrative Rules
- Metro Urban Growth Management Functional Plan
- TDC 33.070, Plan Amendments

Conclusion

- The findings demonstrate that the proposal meets the applicable criteria.
- Staff recommends the Tualatin Planning Commission forwarding a recommendation of approval of the proposed amendments (PTA 19-0003 and PMA 19-0003) to the City Council.
- Questions?

Item Attachment Documents:

2. Consideration of Amendments to the Tualatin Community Plan (PTA-19-0004) reflecting the 2019 updates to the Tualatin Sewer Master Plan.

CITY OF TUALATIN
Staff Report

City of Tualatin

TO: Tualatin Planning Commissioners

FROM: Tabitha Boschetti, AICP, Assistant Planner
Steve Koper, AICP, Planning Manager

DATE: 10/17/2019

SUBJECT: Sewer Master Plan Update (PTA-19-0004)

ISSUE BEFORE TPC:
The Planning Commission is asked to provide a recommendation to the Tualatin City Council on a Plan Text Amendment proposing to update the Tualatin Comprehensive Plan to reflect the adopted 2019 Sewer Master Plan.

RECOMMENDATION:
Staff respectfully requests that the Planning Commission forward a recommendation of approval to the City Council of the proposed amendments (PTA-19-0004).

EXECUTIVE SUMMARY:
On August 12, 2019, the City Council adopted the Sewer Master Plan (Resolution No. 5457-19). At that time, the Council directed staff to update the Community Plan consistent with the updated Sewer Master Plan.

The proposed amendments (PTA-19-0004) would update Chapter 13 of the Tualatin Community Plan to be consistent with the 2019 Sewer Master Plan. The 2019 Master Plan, Community Plan Chapter 13, and Map 13-1: Sewer Plan, identify and detail existing and future sanitary sewer infrastructure, and associated standards and requirements, needed to serve the existing and future population and economy of the City of Tualatin.

OUTCOMES OF DECISION:

A recommendation of approval of the proposed amendments (PTA-19-0004) to the City Council would support updating the Tualatin Comprehensive Plan consistent with the recently-adopted Sewer Master Plan (2019).

ALTERNATIVES TO RECOMMENDATION:

The Planning Commission may alternatively:

- Recommend approval of the proposed amendments (PTA 19-0004) to the City Council with further amendments.
- Continue the consideration of a recommendation of the proposed amendments (PTA-19-0004) to a later date.
- Recommend denial of the proposed amendments (PTA 19-0004) to the City Council.

FINANCIAL IMPLICATIONS:

N/A

ATTACHMENTS:

- Attachment 1: Findings and Analysis
- Exhibit A: Proposed Community Plan Chapter 13 Text
- Exhibit B: Sewer Master Plan (2019)
- Exhibit C: Map 13-1: Sewer Plan (existing)

City of Tualatin
www.tualatinoregon.gov

October 17, 2019

Analysis and Findings for
PTA 19-0004

Case #:	PTA 19-0004
Project:	Sewer Master Plan Update

TABLE OF CONTENTS

I. INTRODUCTION

A. Applicable Criteria

Applicable Statewide Planning Goals; Division 11 of the Oregon Administrative Rules Chapter 660; Metro Chapter 3.02 (Waste Water Management Plan); City of Tualatin Comprehensive Plan Chapter 13; City of Tualatin Development Code, Section 33.070: Plan Amendments.

B. Project Description

On August 12, 2019, the City Council adopted the Sewer Master Plan (No. 5457-19). At that time, the Council directed staff to update the Community Plan consistent with the Master Plan. The proposed Plan Text Amendment (PTA-19-0004) would update Chapter 13 (Sewer Service) of the Community Plan consistent with the 2019 Sewer Master Plan. The 2019 Master Plan, Community Plan Chapter 13, and Map 13-1: Sewer Plan, identify and detail existing and future sanitary sewer infrastructure, and associated standards and requirements, needed to serve the existing and future population and economy of the City of Tualatin

C. Exhibit List

(a) Amended Tualatin Development Code Text for Sewer Master Plan (2019)
(b) Sewer Master Plan (2019)
(c) Map 13-1: Sewer Plan (existing)

D. Proposed Amendments

The following Plan Text Amendments have been proposed (Figure 1). The full text amendments are provided in Exhibit A.

Figure 1: Summary of Proposed Amendments

Section	Proposed Action
TDC 13.010(9)	Update with reference to current Master Plan
TDC 13.015	Update with reference to current Master Plan
TDC 13.020	Replace outdated information about the hydraulic model underpinning the Sewer Master Plan
TDC 13.030	Replace outdated information about the hydraulic model underpinning the Sewer Master Plan
TDC 13.050	Replace outdated information about Clean Water Services data
TDC 13.055	Remove outdated forward-looking information regarding federal action in 2003
TDC 13.060	Remove outdated information about a temporary pump station
TDC 13.070	Remove outdated references to 2010 Master Plan and Concept Plan areas
TDC 13.080	Replace project list and cost estimates with information from 2019 Sewer Master Plan Tables 4-1 and 4-2

II. FINDINGS

A. The following Oregon Statewide Planning Goals are applicable to the proposed amendments:

Goal 1 – Citizen Involvement
To develop a citizen involvement program that insures the opportunity for citizens to be involved in all phases of the planning process.

Finding:
The Sewer Master Plan was adopted by City Council in August 2019 after an 18-month public involvement process involving a project advisory committee. The proposed amendments conform to Goal 1.

Goal 2 – Land Use Planning
To establish a land use planning process and policy framework as a basis for all decision and actions related to use of land and to assure an adequate factual base for such decisions and actions.

[…]

Finding:

The proposed amendments have been reviewed pursuant to the City's established land use planning process and procedures. The existing land use plan references the previous version of the Sewer Master Plan, and it is appropriate to incorporate changes into the Comprehensive Plan. The proposed amendments conform to Goal 2.

Goal 6 – Air, Water and Land Resources Quality

Finding:

A functioning wastewater management system is in the best interest of water quality and the protection of other natural resources. The Sewer Master Plan has been developed in coordination with the applicable regional agencies, including Clean Water Services. The proposed amendments conform to Goal 6.

Goal 11 – Public Facilities and Services

Finding:

The Sewer Master Plan is intended to serve the needs of present and future development. No changes are proposed to Tualatin Development Code Map 13-1: Sewer Plan (Exhibit C); changes are proposed to the supporting text references and the scope of future projects in support of the Sewer System Master Plan map. No extension of sewer is proposed beyond the Tualatin Urban Planning Area, which is within the Urban Growth Boundary. The proposed amendments conform to Goal 11.

B. The following Oregon Administrative Rules (OAR) are applicable to the proposed amendments:

Chapter 660-011-0000
Public Facilities Planning

660-011-0010
The Public Facility Plan

(1) The public facility plan shall contain the following items:

(a) An inventory and general assessment of the condition of all the significant public facility systems which support the land uses designated in the acknowledged comprehensive plan;
(b) A list of the significant public facility projects which are to support the land uses designated in the acknowledged comprehensive plan. Public facility project descriptions or specifications of these projects as necessary;
(c) Rough cost estimates of each public facility project;
(d) A map or written description of each public facility project's general location or service area;
(e) Policy statement(s) or urban growth management agreement identifying the provider of each public facility system. If there is more than one provider with the authority to provide the system within the area covered by the public facility plan, then the provider of each project shall be designated;
(f) An estimate of when each facility project will be needed; and
(g) A discussion of the provider's existing funding mechanisms and the ability of these and possible new mechanisms to fund the development of each public facility project or system.

[…]

Finding:
The Sewer System Master Plan Map (Map 13-1), will remain unchanged. For all projects that are being updated in the Master Plan, the plan amendment includes rough cost estimates of each public facility project (TDC 13.080). These standards are met.

C. The following Chapter and Titles of Metro Code are applicable to the proposed amendments:

Chapter 3.02, Waste Water Management Plan

[…]

3.02.003 Conformity to the Regional Plan

(a) Management agencies shall not take any land use related action or any action related to development or provision of public facilities or services which are not in conformance with the Regional Plan.

(b) For purposes of this chapter "management agencies" shall mean all cities, counties and special districts involved with the treatment of liquid wastes within the Metro jurisdiction.

[…]

Finding:

The proposed set of amendments make no revision to Map 13-1: Sewer Plan and remains in conformance with the Regional Plan. This standard is met.

D. The following Chapters of the Tualatin Comprehensive Plan are applicable to the proposed amendments:

TDC 13.015. - Sanitary Sewer System Objectives.

(1) Plan and construct a City sewer system that protects the public health, protects the water quality of creeks, ponds, wetlands and the Tualatin River, provides cost-effective sewer service, meets the demands of users, addresses regulatory requirements and supports the land uses designated in the Tualatin Community Plan.

Finding:

The Sewer Master Plan has been developed to address the land uses designated in the Tualatin Community Plan, including Concept Plans for Urban Planning Areas. Objective (1) is met.

(2) Provide a City sanitary sewer system in cooperation with Clean Water Services (CWS). The City is responsible for the collection system's smaller lines and the 65th Avenue pump station and CWS is responsible for the larger lines, pump stations and treatment facilities.

(3) Work with CWS to ensure the provisions of the intergovernmental agreement between the City and CWS are implemented.

Finding:

The City has developed the Sewer Master Plan working closely with Clean Water Services and working to ensure that terms of the existing intergovernmental agreement are met. Objectives (2) and (3) are met.

(4) Prohibit the extension of sewer service to areas outside the City limits, unless it is provided to an area inside the city limits of an adjacent city.

(5) Require developers to aid in improving the sewer system by constructing facilities to serve new development as well as adjacent properties.

Finding:

Sewer service is only to be provided within incorporated areas. Amendments to the Sewer Master Plan do not extend sewer services beyond the City limits, and do not change standards related to sewer system facilities associated with new development. By articulating needed projects, the proposed amendments help clarify what facilities will be necessary to serve future development. Objectives (4) and (5) are met.

(6) Improve the existing sewer system to provide adequate service during peak demand periods.

(7) Improve the existing sewer system to control and eliminate sanitary sewer overflows such as basement flooding to the extent possible.

Finding:

The Sewer Master Plan (2019) employs detailed analysis to ensure adequate service during peak demand periods and improvements toward controlling sanitary overflows. Objectives (6) and (7) are met.

(8) The "Report, Tualatin Sewer Master Plan," December 2002, is adopted by reference as a supporting technical document to the Tualatin Community Plan.

(9) The Northwest Tualatin Concept Plan 2005 is adopted by reference as a supporting technical document to the Tualatin Community Plan.

(10) The Southwest Tualatin Concept Plan 2010 is adopted by reference as a supporting technical document to the Tualatin Community Plan.

Finding:

The Concept Plans enumerated in Objectives (8) through (10) are reflected in the existing Map 13-1: Sewer Plan. No changes to that map are proposed. The subject text amendments proposes to remove these statements from the objectives section as they are not true objectives and any analysis related to these former plan areas is now incorporated into the Sewer Master Plan (2019) or Map 13-1. Objectives (8) through (10) are met.

(11) Review and update the "Report, Tualatin Sewer Master Plan," December 2002, on a regular basis in coordination with CWS.

(12) Perform a cost of service rate study and study funding methods to ensure sufficient City funds exist to construct planned improvements.

(13) Work with CWS to update CWS's and the City's plans and regulations once new sanitary sewer overflow (SSO) and capacity, management, operation and maintenance (CMOM) regulations are published in the Federal Register.

Finding:

The Sewer Master Plan (2019) is an update of the 2002 Master Plan and has been conducted in coordination with CWS. Objectives (11) and (13) are met. The subject text amendment will generalize Objective (11), indicating that further updates are to occur on a regular basis. A cost study will be conducted as a separate project based on information contained within the Sewer Master Plan regarding project cost; while not yet implemented, the proposed amendments are thereby consistent with Objective (12).

E. The following Chapters of the Tualatin Development Code are applicable to the proposed amendments:

Chapter 33: Applications and Approval Criteria

Section 33.070 Plan Amendments
[…]
(2) Applicability. Quasi-judicial amendments may be initiated by the City Council, the City staff, or by a property owner or person authorized in writing by the property owner. Legislative amendments may only be initiated by the City Council.

Finding:
A Plan Text Amendment is proposed. This proposal is legislative in nature and therefore has been processed consistent with the Type IV-B procedures in Chapter 32. This criterion is met.

[…]

(5) Approval Criteria.
a.) Granting the amendment is in the public interest.
b.) The public interest is best protected by granting the amendment at this time.

Finding:

The amendment is updating the Community Plan consistent with the Sewer Master Plan which was adopted by the City Council in August 2019. The existing and future sewer infrastructure identified in the Master Plan is needed to support existing and future development in Tualatin and is therefore in the public interest. This amendment is also timely, given that Council has already adopted the Sewer Master Plan and directed staff to further implement its contents through the Comprehensive Plan. Criteria (a) and (b) are met.

c.) The proposed amendment is in conformity with the applicable objectives of the Tualatin Community Plan.

The applicable objectives of the Tualatin Community Plan have been considered, and are discussed above in Section D. Criterion (c) is met.

d.) The following factors were consciously considered:

- **i. The various characteristics of areas in the City.**
- **ii. The suitability of the area for particular land uses and improvements.**
- **iii. Trends in land improvement and development.**
- **iv. Property values.**
- **v. The needs of economic enterprises and the future development of the area; needed right-of-way and access for and to particular sites in the area;**
- **vi. Natural resources of the City and the protection and conservation of said resources.**
- **vii. Prospective requirements for the development of natural resources in the City.**
- **viii. The public need for healthful, safe, aesthetic surroundings and conditions.**

ix. Proof of change in a neighborhood or area, or a mistake in the Plan Text or Plan Map for the property under consideration are additional relevant factors to consider.

Finding:
Criteria i-vii were consciously considered relative to the proposed amendments, which would not have a detrimental impact thereto. Criterion ix is not applicable. Criterion (d) is met.

e.) If the amendment involves residential uses, then the appropriate school district or districts must be able to reasonably accommodate additional residential capacity by means determined by any affected school district.

Finding:
The amendment does not involve an increase in the City's residential capacity. Criterion (e) does not apply.

f.) Granting the amendment is consistent with the applicable State of Oregon Planning Goals and applicable Oregon Administrative Rules, including compliance with the Transportation Planning Rule TPR (OAR 660-012-0060).

Finding:
Section C, above, demonstrates compliance with the applicable Oregon Plan Goals, Administrative Rules, and the TPR. Criterion (f) is met.

g.) Granting the amendment is consistent with the Metropolitan Service District's Urban Growth Management Functional Plan.

Finding:
The proposed amendments do not affect any portion of the Urban Growth Functional Management Plan. Criterion (g) is met.

h.) Granting the amendment is consistent with Level of Service F for the p.m. peak hour and E for the one-half hour before and after the p.m. peak hour for the Town Center 2040 Design Type (TDC Map 9-4), and E/E for the rest of the 2040 Design Types in the City's planning area.

Finding:
The proposed amendments do not involve an increase in vehicular trips. Criteria (h) is met.

i.) Granting the amendment is consistent with the objectives and policies regarding potable water, sanitary sewer, and surface water management pursuant to TDC 12.020, water management issues are adequately addressed during development or redevelopment anticipated to follow the granting of a plan amendment.

Finding:
The proposed amendments are consistent with all applicable public facilities plans. Criterion (i) is met.

j.) The applicant has entered into a development agreement. This criterion applies only to an amendment specific to property within the Urban Planning Area (UPA), also known as the Planning Area Boundary (PAB), as defined in both the Urban Growth Management Agreement (UGMA) with Clackamas County and the Urban Planning Area Agreement (UPAA) with Washington County. TDC Map 9-1 illustrates this area.

Finding:
The proposed amendments are not property specific and this criterion does not apply.

III. CONCLUSION AND RECOMMENDATION

Based on the application and the above analysis and findings, the proposed Plan Text Amendment complies with applicable Oregon Planning Goals, Oregon Administration Rules, Metro Code, and TDC. Accordingly, staff recommends that the Planning Commission forward a recommendation of approval of the proposed amendments (PTA-19-0004) to the City Council.

Amended Tualatin Development Code Text
For Sewer Master Plan (2019)

Contents

TDC 13.010. - Introduction.

(1) In 1979, the City of Tualatin adopted the Tualatin Community Plan. R. A. Wright Engineering Company prepared the sanitary sewer service element. In 1982, the Tualatin Community Plan was reviewed due to the annexation of approximately 900 acres west of the city limits. City staff reviewed the sanitary sewer service element. In 1983 the City Council amended the Plan, including the sewer service element. The Plan was changed from covering only the City limits to covering the City limits and the area out to the Urban Growth Boundary (UGB) (an "Active Plan"). Generally, the sewer service changes were minor as they incorporated information based on the new Planning Districts placed on the lands inside the UGB.

(2) In accordance with the Urban Planning Area Agreement between the City and Washington County and an Intergovernmental Agreement between Clean Water Services (CWS) and the City, the City is responsible for collecting the sewage and CWS is responsible for the major conveyance lines and treatment. CWS's Durham Advanced Waste Water Treatment Plant treats most of the sewage generated in the City limits. Waste generated in the City limits north of the Tualatin River and east of I-5 is treated at the City of Portland's Tryon Creek Waste Water Treatment Plant.

(3) The purpose of the 1982 review was to determine what existing lines needed reinforcing, what new lines were needed to meet the requirements of an expanding community and to determine what costs and financing methods were needed to implement the proposed improvements.

(4) The study area was the same as the Tualatin Community Plan (the "Active Plan" out to the UGB).

(5) The system adopted in 1983 was intended to serve the area within the UGB at saturation densities. It was anticipated that some areas might experience limited surcharging during periods of peak user and infiltration flow.

(6) In 2002, the City contracted with CH2M Hill to update the City's sewer master plan ("Report, Tualatin Sewer Master Plan," December 2002). The update accurately reflected Tualatin's growth and refined CWS's recently completed county-wide master plan system evaluation ("2000 Sanitary Sewer System

Master Plan Update"). The City's "Report, Tualatin Sewer Master Plan," December 2002 (the "Master Plan") was the basis for amending the Tualatin Development Code (TDC), Chapter 13 in 2003. The purposes of the City's "Master Plan" were to:

(a) Further develop the planning done by CWS for the Tualatin area as part of its county-wide planning effort in its 2000 update. Refine the evaluation, focus on Tualatin and address the City's specific planning projections.

(b) Evaluate and recommend current and future infrastructure needs to allow the sewer system to keep up with growth and provide planning level costs.

(c) Control and eliminate sanitary sewer overflows (SSOs), such as basement flooding, to the extent possible.

(d) Protect public health.

(e) Protect water quality of neighborhood creeks, ponds and the Tualatin River.

(f) Address regulatory requirements.

(g) Develop a plan that will result in cost-effective sewer service that meets the demands of residential, commercial and industrial customers.

(7) The 2002 "Master Plan" study area was the same as the Tualatin Community Plan, plus it included the Southwest Tualatin Concept Plan Area.

(8) Northwest Tualatin Concept Plan 2005 identifies sewer service needs for the study area. This information is new and updates the 2003 Master Plan.

(9) In 2019, the City approved an updated Sewer Master Plan. The City also adopted the Basalt Creek Concept Plan; the 2019 Sewer Master Plan includes the Basalt Creek Plan Area.

TDC 13.015. - Sanitary Sewer System Objectives.

(1) Plan and construct a City sewer system that protects the public health, protects the water quality of creeks, ponds, wetlands and the Tualatin River, provides cost-effective sewer service, meets the demands of users, addresses regulatory requirements and supports the land uses designated in the Tualatin Community Plan.

(2) Provide a City sanitary sewer system in cooperation with Clean Water Services (CWS). The City is responsible for the collection system's smaller lines and the 65th Avenue pump station and CWS is responsible for the larger lines, pump stations and treatment facilities.

(3) Work with CWS to ensure the provisions of the intergovernmental agreement between the City and CWS are implemented.

(4) Prohibit the extension of sewer service to areas outside the City limits, unless it is provided to an area inside the city limits of an adjacent city.

(5) Require developers to aid in improving the sewer system by constructing facilities to serve new development as well as adjacent properties.

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~~(9) The Northwest Tualatin Concept Plan 2005 is adopted by reference as a supporting technical document to the Tualatin Community Plan.~~

~~(10) The Southwest Tualatin Concept Plan 2010 is adopted by reference as a supporting technical document to the Tualatin Community Plan.~~

(~~11~~ 8) Review and update the ~~"Report,~~ Tualatin Sewer Master Plan~~," December 2002,~~ on a regular basis in coordination with CWS.

(~~12~~ 9) Perform a cost of service rate study and study funding methods to ensure sufficient City funds exist to construct planned improvements.

(~~13~~ 10) Work with CWS to update CWS's and the City's plans and regulations once new sanitary sewer overflow (SSO) and capacity, management, operation and maintenance (CMOM) regulations are published in the Federal Register.

TDC 13.020. - Design Criteria.

The design of the sewage collection system was established in 1979 and 1983 when the initial system was planned and updated. Since 1983 the planned system has, essentially, been constructed.

The 2019 Sewer Master Plan updates the 2002 Sewer Master Plan for the City of Tualatin. This includes updating the 2012 hydraulic model prepared by CWS, reviewing and updating land use assumptions to match City planning projections, updating existing and future system hydraulic capacity deficiencies, developing a concept plan for service to two expansion areas, and reviewing initial project concepts with the updated hydraulic model to develop an improvement list for future land scenarios. Modeling was conducted for current conditions (2017) and planning years 2025, 2035, and buildout.

~~The 2002 "Master Plan" used computer modeling to simulate the interactions that occur under a variety of scenarios within the collection system. To plan for future conditions in 2005 and 2010, population growth and land use patterns were projected. They were used with available potable water usage data to estimate future wastewater flow patterns and volumes. The model was constructed using HYDRA Version 6.1 to be consistent with CWS's modeling. The model projected conditions in 2005 and 2010.~~

~~Sanitary sewer flow estimates were developed for 2005 and 2010 by projecting diurnal flow patterns for residential, commercial and industrial areas. The infiltration and inflow were estimated using the 5-year return interval 24-hour duration winter storm event.~~

~~Sewer system capacity deficiencies were identified and assessed based on the design storm conditions required by CWS's National Pollution Discharge Elimination System Permit (NPDES) and the following three population levels:~~

~~2002 estimated population of 24,352 (City of Tualatin estimate)~~

~~2005 estimated population of 25,787 (City of Tualatin estimate)~~

~~2010 estimated population of 29,500 (City of Tualatin estimate).~~

TDC 13.030. - Domestic Flows.

(1) Using parcel (tax lot) based data for land use, residential flow volumes were calculated by totaling the flow volumes for all residential parcels and dividing that total volume by the most recent population estimates for the City. Diurnal flow and infiltration and inflow (I/I) data were also used. This resulted in an estimated residential water use of 91~~81~~ gallons per capita per day (gpcd). This value was used for all planning years for parcels currently zoned residential and developed. New residential development flows were calculated for 100 gpcd, based on current City development code requirements.

~~(2) The peaking factor was addressed in the 1983 study, but was not specifically addressed in the 2002 study because it was included in the diurnal flow data and I/I data.~~

TDC 13.050. - Infiltration/Inflow.

The infiltration and inflow (I/I) data for the "Master Plan" was estimated based on the methodology used by Clean Water Services during the 2012 Durham model calibration task.~~in their service area wide "2000 Sewer Master Plan Update.~~" A portion of the 5-year, 24-hour storm was routed through the service area and added to the average-day diurnal sanitary flows and base infiltration flows developed from monitoring data.

TDC 13.055. - Sanitary Sewer Overflows.

In accordance with its National Pollutant Discharge Elimination System (NPDES) Permit for the Durham Waste Water Treatment Plant, Clean Water Services (CWS) must prohibit sanitary sewer overflows (SSO) for wet weather conditions up to and including the 5-year return interval, 24-hour duration winter storm event when the new SSO regulations become law in late 2003 or in 2004. The "Master Plan" addressed general capacity management issues, and uses the 5-year, 24-hour winter storm as the wastewater flow criteria~~, but did not address the specific requirements of the Federal government's yet to be adopted SSO or capacity, management, operation and maintenance (CMOM) regulations. The City will work with CWS to address the new regulations once they are published in the Federal Register (expected in 2003)~~.

TDC 13.060. - Existing System.

(1) The City of Tualatin's sewage waste is treated at Clean Water Services' Durham Advanced Waste Water Treatment Plant. The waste is collected and piped to the plant via a network of collectors, trunks and interceptors. The main interceptor transporting waste from Tualatin is the Lower Tualatin Interceptor which is primarily fed by gravity sewers. Five areas are served by pressure mains and pump stations. A brief description of the existing system follows and it is shown on Map 13-1.

(2) Except for the five areas discussed below, the City is served by gravity lines. The main interceptors in this system are the Lower Tualatin Interceptor which conveys sewage from the City to the Durham Advanced Waste Water Treatment Plant, the Nyberg Trunk Line, which runs from the Lower Tualatin Interceptor east under I-5 serving the area east of I-5 and south of the river, the Bluff Cipole Trunk Line and Lateral which extends to the west from the Lower Tualatin Interceptor and the Tualatin-Sherwood Trunk which serves the area west of 99W and north of SW Tualatin Road. The Bluff Cipole Trunk Line is the main interceptor serving the western and southern portions of the Tualatin Planning Area. The five areas currently served by pump stations are as follows:

(a) The area east of I-5 and north of the Tualatin River is served by a pump station located at 65th and Childs Road. The pump station discharges into the City of Lake Oswego sanitary sewer

system. This area is served by Lake Oswego through a contract agreement with the City of Tualatin.

(b) The area along Nyberg Street and Borland Road east of I-5 is served by five~~six~~ pump stations. The pump stations pump sewage to the Nyberg Interceptor and then into the Lower Tualatin Interceptor. ~~One of the pump stations is temporary. It is at the south end of Sequoia Ridge Subdivision. It collects sewage through gravity flow from the Sequoia Ridge and Venetia Subdivisions and can collect from the properties east of Venetia. It pumps up the hill to a line in SW Borland Road. This station will be removed when the Sagert/Leiser Properties (2 1E 30B, 300, 600, 700) are developed. Then its sewage will gravity flow to the west to the pump station on the west side of SW 65th Avenue north of I-205 and be pumped up the hill to the north.~~

(c) The area east of I-5 and south of Sagert Street is served by a pump station at the intersection of 65th and I-205. This pump station discharges into the gravity line on SW 65th at the intersection of 65th and Borland.

(d) The south portion of the area west of SW Boones Ferry Road and east of SW Grahams Ferry Road is served by a pump station at the south end of Victoria Woods Subdivision which discharges into the Bluff Cipole Lateral.

(e) The area east of SW Cipole Road, north of SW Herman Road and south of 99W is served by a pump station at SW Cipole Road and Cummins Creek.

TDC 13.070. - Proposed System.

(1) The proposed sewage collection system ~~for 2010 is essentially the same as the 1983 system and~~ is illustrated in Map 13-1.

(2) The majority of the trunk and interceptor lines ~~planned in the 1983 sewer service element~~ were constructed, but some are~~were~~ not of sufficient capacity. The "Master Plan" reviewed the system and recommended improvements ~~to 2010~~. The "Master Plan" focused on sewer system capacity deficiencies. Consistent with CWS's sewer design criteria, it compared peak hydraulic grade lines (HGL's) for each segment of the system with pipe slopes and ground surface elevations. City staff also identified locations requiring maintenance or replacement due to degradation and aging of the system.

(3) Because the system is essentially built and several trunk and interceptor lines are too small, the "Master Plan's" recommendations primarily were to increase trunk and interceptor line sizes.

(4) New collection system pipes and at least one pump station will be needed to serve the Southwest Tualatin Concept Plan Area. The actual configuration will depend on individual development plans, land use type and location, site grading and other factors not known in 2010. The Southwest Tualatin Concept Plan and the Basalt Creek Planning areas have conceptual sewer and pump station layouts that will be dependent on development.

TDC 13.080. - Project List and Cost Estimates.

Projects and cost estimates, including engineering and administration, for the major improvements in Tualatin's sewage collection system are summarized in Table 13-1. No attempt has been made to adjust prices to a future date. The cost figures include only City costs, not Clean Water Services

Table 13-1
Sewer Line Improvements

~~Timing (est.), Location and Description~~	~~Size in Inches~~	~~Quantity in Feet~~	~~City Cost in 2002 Dollars (millions)~~
~~2003. Bluff/Cipole Trunk [2]. Lower Tualatin Interceptor to Herman Road. Increase 18-24" line to 36-42".~~	~~36-42~~	~~8,075~~	~~0.153~~
~~2003. Boones Ferry Road Trunk [1]. Upper Boones Ferry Road to Lower Tualatin Interceptor. Increase 8-12" line to 12-15".~~	~~12-15~~	~~1,786~~	~~0.330~~
~~2003. Boones Ferry Road Lateral [3]. In Martinazzi Avenue south of Boones Ferry Road. Increase 8" line to 10".~~	~~10~~	~~286~~	~~0.042~~
~~2004. 65th Avenue Lateral [3]. 65th between Nyberg Road and Borland Road. Increase 8" line to 18".~~	~~18~~	~~165~~	~~0.031~~
~~2004. Nyberg Trunk [2]. Mobile Place to Tualatin-Sherwood Road. Increase 18" line to 24-30".~~	~~24-30~~	~~6,566~~	~~1.624~~
~~2008. Bluff/Cipole Lateral [1]. Bluff/Cipole Trunk to Avery Street. Increase 12-21" line to 18-36".~~	~~18-36~~	~~5,226~~	~~0.391~~
~~2009. 103d Avenue [3]. Grahams Ferry Road to the stub at the south end of 103d. Increase 8" line to 10-12".~~	~~10-12~~	~~278~~	~~0.045~~
~~2010. Tualatin-Sherwood Road Trunk [2]. 115th Avenue to Cipole Road.~~	~~24~~	~~6,300~~	~~1.406~~
~~2013. Northwest Tualatin Concept Plan sewer.~~	~~8~~	~~1,509~~	~~0.232*~~
~~[1]Projects jointly funded by the City of Tualatin Concept Plan sewer.~~			
~~[2]Projects funded solely by Clean Water Services.~~			
~~[3]Projects funded solely by the City of Tualatin.~~			
~~[4]Clean Water Services is responsible for this project, although the City may elect to accelerate the schedule and split the cost.~~			

~~*Costs in 2005 dollars~~

#	Project Title	Size (in)	Length (ft)	City Cost (in 2019 dollars)
SS-1	Basalt Creek Pump Stations and Force Mains	n/a	n/a	-
SS-2	Basalt Creek Gravity Sewer	8	34,250	-
SS-3	SW Tonquin Loop Sewer	10	2,170	54,000
SS-4	W Tualatin Pump Station and Force Main	6	1,720	-
SS-5	Southwest Tualatin Gravity Sewer	8	5,175	-
SS-6	North Martinazzi Trunk	15	3,950	1,202,000
SS-7	Tualatin Reservoir Trunk	24	4,390	212,000
SS-8	103rd Avenue Sewer	15	4,230	1,157,000
SS-9	Fuller Drive Sewer	12	3,230	1,477,000
SS-10	Teton Trunk	15	1,235	197,000
SS-11	South Martinazzi Trunk	15	3,450	-
SS-12	Sherwood Trunk	15	2,270	725,000
SS-13	Cipole/Bluff Trunk	18	2,265	-
SS-14	Dakota & Mandon Sewer Lining	n/a	10,160	635,000
SS-15	Nyberg Trunk Investigation	n/a	n/a	No estimate

FINAL DRAFT

Tualatin Sewer Master Plan

Prepared for

CITY OF TUALATIN OREGON

Prepared by

JACOBS

August 2019

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Figures

Acronyms and Abbreviations

AWWTF	Advanced Wastewater Treatment Facility
CCI	construction cost index
CCTV	closed-circuit television
cfs	cubic feet per second
CIPP	cured-in-place piping
CWS	Clean Water Services
DEQ	Oregon Department of Environmental Quality
DWF	dry weather flow
EDU	equivalent dwelling unit
ENR	Engineering News-Record
EPA-SWMM	Environmental Protection Agency Storm Water Management Model
ft	feet
ft/sec	feet per second
GIS	geographical information system
gpd	gallons per day
gpm	gallons per minute
HGL	hydraulic grade line
hp	horsepower
I/I	infiltration and inflow
In.	inches
kW	kilowatt
mgd	million gallons per day
NPDES	National Pollutant Discharge Elimination System
PS	pump station
PVC	polyvinyl chloride
RDII	Rainfall-derived infiltration and inflow
SCADA	supervisory control and data acquisition
SDC	system development charge
SSO	sanitary sewer overflow
UGB	urban growth boundary
WWF	wet weather flow

Executive Summary

Introduction

This master plan evaluates the service capacity of the City of Tualatin sanitary sewer system under current and future conditions and recommends improvements to protect human health and the environment as the community continues to grow.

The current City of Tualatin population is approximately 26,300; the estimated buildout (2038) population is 30,650. The current service area is approximately 5,957 acres. The Basalt Creek Planning Area will add 355 acres to the service area by 2025. The total Tualatin sewer system service area will then be 6,312 acres.

Snapshot of Tualatin Sewer Master Plan Update

Hydraulic modeling was performed to identify potential capacity deficiencies. The modeling results for existing conditions indicate no risk of sanitary sewer overflows but limited capacity in several basins. Future model scenarios with added developments show risks of multiple overflows.

To address these risks, the following improvements are recommended (pipe lengths approximate):

- Upsize 22,800 feet of pipe by 2030.
- Install 2,170 feet of new pipe by 2021.
- Install 39,430 feet of new 8-inch gravity sewer in planning areas, funded by developers.
- Construct six pump stations within planning areas, funded by CWS.
- Conduct city-wide flow monitoring as well as three site-specific flow studies to determine necessity of pipe lining and pipe upsize projects.
- Based on flow studies, install lining in 10,000 feet of pipe by 2038.

The cost estimate for the recommended pipeline improvements for which the City of Tualatin will fund is approximately $2 million.

Intergovernmental Agreement with Clean Water Services

Tualatin's sewage is treated at the Durham Advanced Wastewater Treatment Facility (AWWTF) per intergovernmental agreement with Clean Water Services (CWS), which owns and operates the treatment facility.

CWS assumes ownership and maintenance responsibility for gravity sewers 24 inches and larger, as well as all pump stations and force mains. CWS also funds capital construction costs for sewers exceeding 12 inches in diameter. Refer to Section 2.2.1 for more details about funding responsibility.

Scope of the Master Plan Update

The scope of the master plan is to produce an update of the 2002 Sewer Master Plan for the City of Tualatin. This includes updating the 2012 hydraulic model prepared by CWS, reviewing and updating land use assumptions to match City planning projections, updating existing and future system hydraulic capacity deficiencies, developing a concept plan for service to two expansion areas, and reviewing initial project concepts with the updated hydraulic model to develop an improvement list for future land scenarios. Modeling was conducted for current conditions (2017) and planning years 2025, 2035, and buildout.

Goals of the Master Plan Update

This report updates the City of Tualatin sanitary sewer master plan, which was most recently revised in 2002. The goals of the plan are as follows:

- Evaluate and recommend current and future infrastructure needs to allow the sewer system to accommodate growth, and provide planning level costs.
- Identify and assess existing deficiencies within the sanitary sewer system.
- Further develop the planning done by CWS for the Tualatin area. Refine the evaluation, focus on Tualatin, and address the City's specific planning projections.
- Protect public health and preserve water quality of neighborhood creeks, ponds, and the Tualatin River by reducing or eliminating sanitary sewer overflows.
- Meet regulatory requirements set by the Oregon Department of Environmental Quality by preventing sanitary sewer overflows.
- Develop a plan that will result in cost-effective sewer service that meets the demands of residential, commercial, and industrial customers.

Existing System

The existing City of Tualatin wastewater collection system consists of more than 94 miles of pipeline in an approximately 9.8-square-mile area. The City has eight existing sewer basins and two planning areas, as shown in Figure ES-1. Information about the existing system is summarized in Table ES-1 by drainage basin.

Table ES-1. Basin Summary

Basin	Area (acres)	% Developed	Peak Flow (gpm)	EDUs[a]	Total Pipe Length[b] (feet)	Number of Manholes	Number of Pump Stations
Upper Tualatin	733	75%	620[c]	2,230	49,650	208	0
Cipole/Bluff	1,424	70%	2,300	8,280	83,700	402	2
Sherwood	368	90%	860	3,100	48,260	212	0
Teton	505	80%	970	3,490	47,600	276	0
Tualatin Reservoir	1,190	65%	1,740	6,260	82,200	522	1
Martinazzi	635	85%	1,170	4,210	62,900	366	0
Nyberg	911	85%	1,820	6,550	76,430	424	5
Durham	214	95%	470	1,690	15,200	89	0

[a] This study assumes 1 equivalent dwelling unit (EDU) = 400 gpd, including I/I contribution.

[b] Total Pipe Length only includes pipes at least 8 inches in diameter.

[c] This does not include flow in the Upper Tualatin Interceptor from sources outside Tualatin.

gpm = gallons per minute.

Tualatin's sewer system drains into CWS-owned interceptors, which convey the sewage to the Durham AWWTF, which also treats sewage from several neighboring cities including Beaverton, Tigard, Sherwood, Durham, and King City. Durham AWWTF is owned and operated by CWS.

Planning Projections

To plan for conditions in 2025, 2035, and buildout, planning projections were developed regarding population growth and land use patterns in the Tualatin area. Four flow meters were placed by CWS throughout Tualatin's service area, and readings were taken from October 2011 through March 2012. These data were used in conjunction with available potable water usage data to estimate future wastewater flow patterns and volumes. Based on recent growth trends and City of Tualatin projections of the growth rates and potential future service areas joining the existing collection system, two planning areas were added to the service area for the 2025 planning scenario. Projections also

accounted for the effects of infill residential, commercial, and industrial developments planned for the area.

Hydraulic Modeling of Sewer System

Computer modeling was conducted to simulate the hydraulic interactions that occur under each land use scenario within the City's collection system network. The modeled collection system, which is illustrated in Figure ES-1, included more than 8,000 separate pipeline segments.

The hydraulic model was built and run to evaluate collection system performance under 2017, 2025, 2035, and buildout population and land use conditions. Flows from the Basalt Creek and Southwest Tualatin Planning Areas were added into the model in the 2025 and all subsequent scenarios. The model was constructed using InfoSWMM to be consistent with the software that CWS used to model its collection system in the Durham basin.

System Deficiencies

Table ES-2 summarizes the estimated City of Tualatin pipe capacity deficiencies in linear feet for each basin for existing and future conditions. Note that not all deficiencies lead to a recommended project; refer to Section 3.1.6 for a more detailed discussion about deficiencies.

Table ES-2. Estimated Pipeline Deficiencies by Basin

Basin Name	**Existing Conditions** feet [*% total]*	**2025 Conditions** feet [*% total]*	**2035 Conditions** feet [*% total]*	**Buildout Conditions** feet [*% total]*
Upper Tualatin	-	-	-	-
Cipole/Bluff	-	-	2,865 *[3.4%]*	4,455 *[5.3%]*
Sherwood	-	900 *[1.9%]*	2,715 *[5.6%]*	4,150 *[8.6%]*
Teton	565 *[1.2%]*	1,180 *[2.5%]*	1,670 *[3.5%]*	1,815 *[3.8%]*
Tualatin Reservoir	1,895 *[2.3%]*	7,350 *[8.9%]*	9,680 *[11.8%]*	11,605 *[14.1%]*
Martinazzi	-	6,245 *[9.9%]*	7,220 *[11.5%]*	8,050 *[12.8%]*
Nyberg	-	-	-	2,535 *[3.3%]*
Durham	-	-	-	-

Recommended Improvements

An analysis of the model was performed to generate a list of recommended improvements. The list includes upgrades to the existing system required to serve flows from the Basalt Creek and Southwest Tualatin Planning Areas. The recommended improvements are listed in Table ES-3 with project drivers and proposed years of completion. The projects are listed in order of anticipated completion date. Existing deficiencies resulted in no capital improvement projects. Projected future deficiencies resulted in nine sewer improvement projects. This plan also includes three projects constructing new sewer assets in the City. The project locations are illustrated in Figure ES-2.

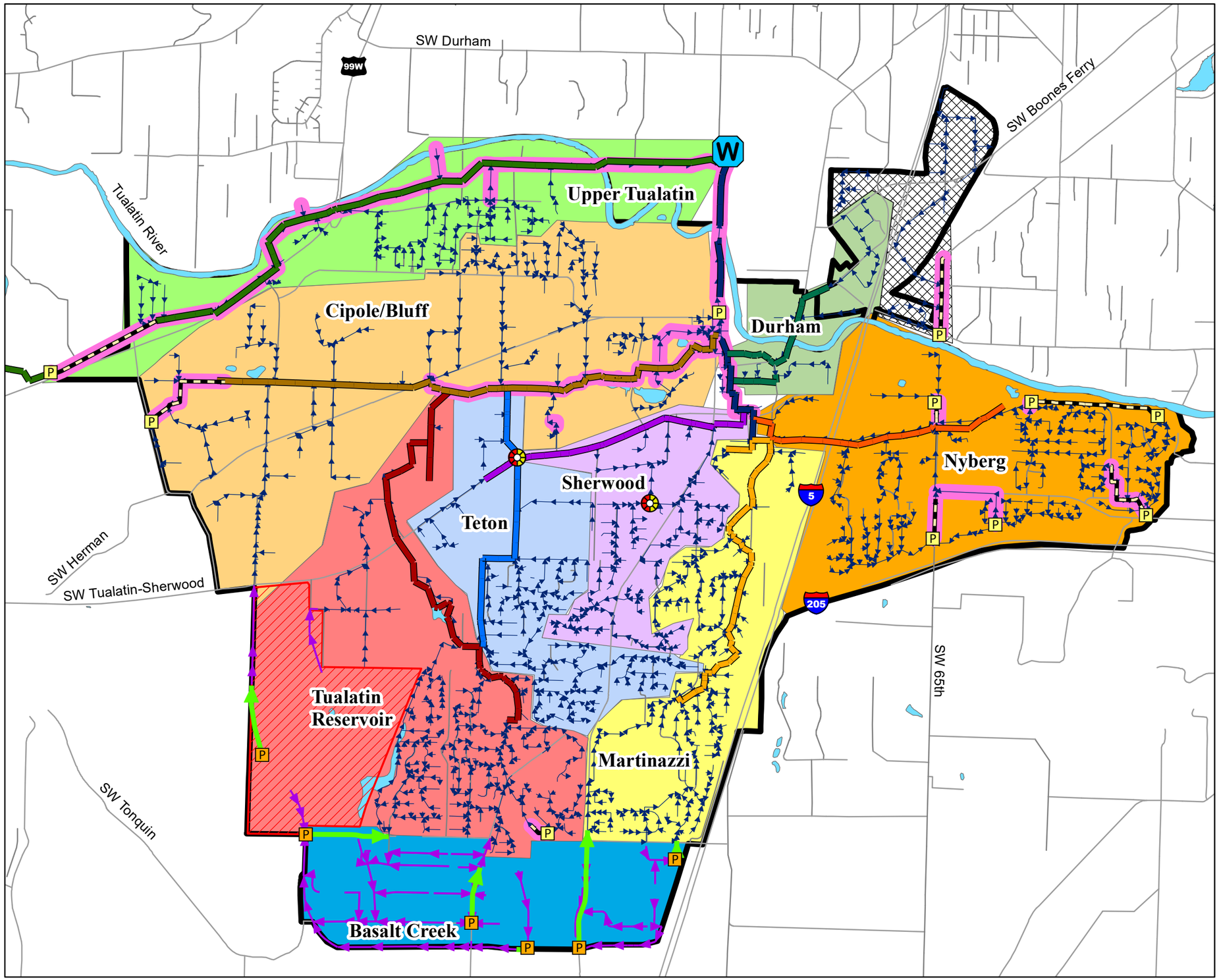
Financial Plan

The list of recommended improvement projects and responsible funding parties are indicated in Table ES-3. The capital improvements plan schedule is shown in Table ES-4. This information can be used

to inform the rate study being performed as a separate project. Tualatin's expected share of the cost is also shown in Table ES-4.

The City may also wish to review sewer rates and system development charges with CWS on a consistent basis to ensure operating revenues are sufficient to cover operating expenses, future capital projects, and outstanding debt service.

Additionally, ongoing rehabilitation and replacement projects to repair structural deficiencies as they develop should be considered for inclusion in capital budget planning.



LEGEND

- Durham AWWTF
- UGB
- Serves Lake Oswego
- Southwest Tualatin Concept Area
- Existing Sanitary Sewer
- Existing Pump Station
- Existing Force Main
- Future Sanitary Sewer
- Future Force Main
- Future Pump Station
- Flow-Split Structure
- CWS Owned Pipe
- Interceptor*

*Interceptor is shown as deeper color of corresponding basin.

N

0 1,100 2,200 4,400 Feet

FIGURE ES-1
Tualatin Sanitary System Overview
City of Tualatin Sewer Master Plan

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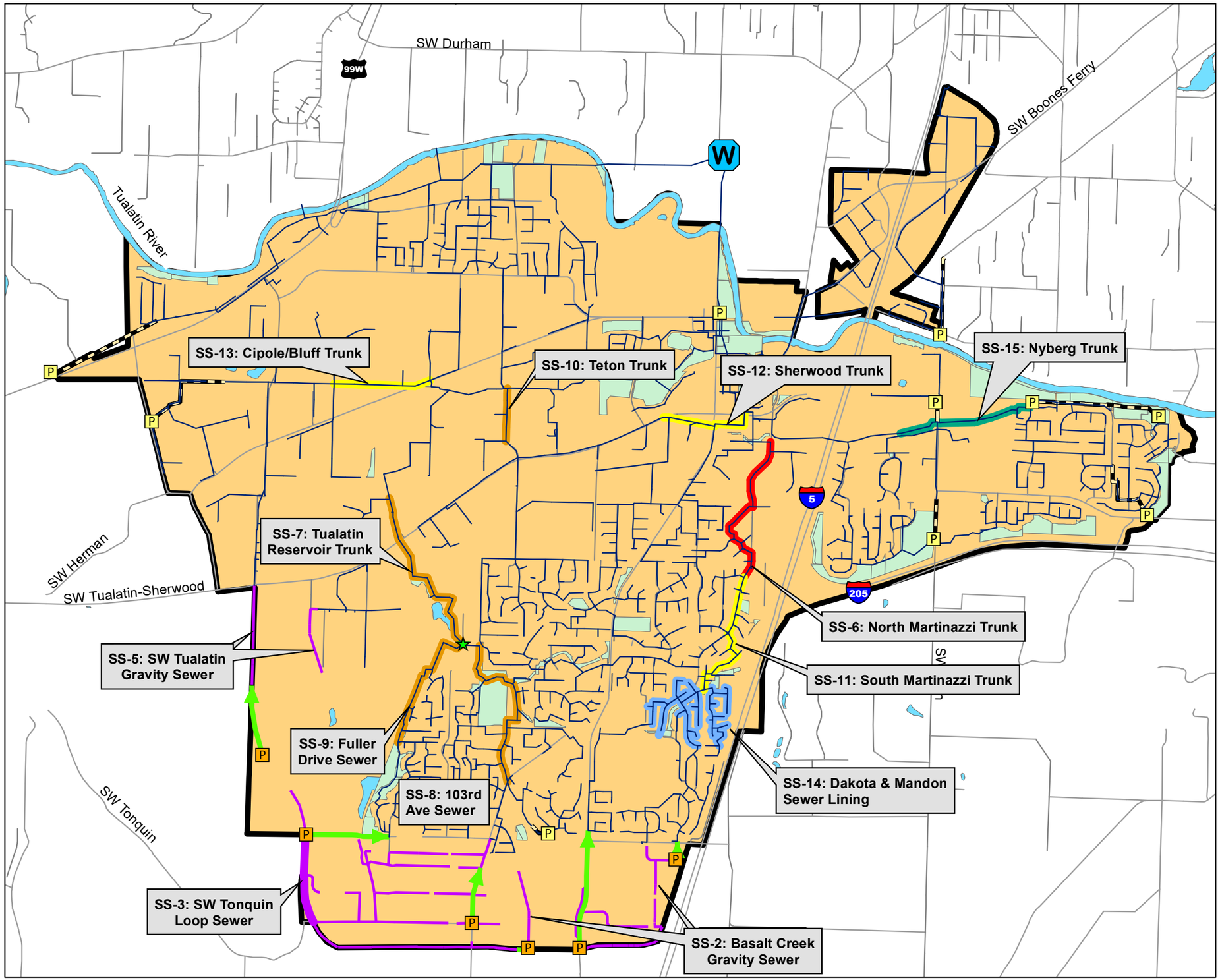

LEGEND

- Durham AWWTF
- Existing Pump Station
- UGB
- City Greenway
- Existing Sewer
- Existing Force Main

Sewer Upgrades:

- Near-Term (0-10 years)
- Intermediate (10-20 years)
- Long-Term (20+ years)
- Lining Project (Long-term)
- Flow Study (0-10 years)
- Indicates split between SW Fuller and Tualatin Reservoir Projects

Planning Area Projects:

- Proposed Sewer (City funded)
- Proposed Sewer (Dev. funded)
- Proposed Pump Station
- Proposed Force Main

N

0 1,100 2,200 4,400 Feet

FIGURE ES-2
Recommended Improvements
City of Tualatin Sewer Master Plan

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Table ES-3. List of Recommended Improvements

Project No.	Project Name	Project Driving Force	Recommended Action	Responsible Funding Party	Remaining Capacity (EDUs)	Deficiency Priority[b]	Length (feet)	Existing Pipe Size (inches)	New Pipe Size (inches)	Project Figure No.
SS-1	Basalt Creek Pump Stations and Force Mains	Basalt Creek development	New Pump Stations	CWS	N/A	N/A	N/A	N/A	N/A	4-1
SS-2	Basalt Creek Gravity Sewer	Basalt Creek development	New Pipe	Developer	N/A	N/A	34,250	N/A	8	4-1
SS-3	SW Tonquin Loop Sewer	Northwest Basalt Creek development	New Pipe	Tualatin/Developer	N/A	N/A	2,170	N/A	10	4-1
SS-4	Southwest Tualatin Pump Station and Force Main	Southwest Tualatin development	New Pump Station	CWS	N/A	N/A	1,720	N/A	6	4-1
SS-5	Southwest Tualatin Gravity Sewer	Southwest Tualatin development	New Pipe	Developer	N/A	N/A	5,175	N/A	8	4-1
SS-6	North Martinazzi Trunk	Eastern Basalt Creek development + city infill	Pipe Upsize	CWS	0–50	1	3,950	10–12	15	4-2
SS-7	Tualatin Reservoir Trunk	Western Basalt Creek development	Pipe Upsize	CWS	50–100	2	4,390	10–15	24	4-3
SS-8	103rd Avenue Sewer	West-central Basalt Creek development	Pipe Upsize	CWS/Tualatin	0–50	3	4,230	8	15	4-4
SS-9	Fuller Drive Sewer	Western Basalt Creek development	Pipe Upsize	Tualatin	150–200	3	3,230	10	12	4-5
SS-10	Teton Trunk	Future industrial flows	Pipe Upsize	CWS/Tualatin	0–50	2	1,235	10–12	15	4-6
SS-11	South Martinazzi Trunk	Eastern Basalt Creek development	Pipe Upsize	CWS	200–300	3	3,450	12	15	4-7
SS-12	Sherwood Trunk	City infill + future industrial flows	Pipe Upsize	CWS/Tualatin	400	3	2,270	10–12	15	4-8
SS-13	Cipole/Bluff Trunk	City infill + future industrial flows	Flow Monitoring	CWS/Tualatin	400	3	2,265	15	18	4-9
SS-14	Dakota & Mandon Lining	High I/I levels	Flow Monitoring + Sewer Lining	CWS/Tualatin	600	N/A	10,160	8–12	N/A	4-10
SS-15	Nyberg Trunk	Frequent surcharge location	Flow Monitoring	CWS/Tualatin	0-50	N/A	3,210	18	N/A	4-11

a This project has been designed outside of this master plan; refer to relevant construction plans (not provided in this plan) in lieu of project figures.
[b] See Table 3-4 for Deficiency Priority Definitions.
N/A = not applicable.

Table ES-4. Capital Improvement Plan Schedule

Project Name	Total Project Cost[a]	City of Tualatin Share[b]	2020/21	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2034/35	2035/36	2037/38	2039/40
SS-1: Basalt Creek Pump Stations and Force Mains	$4,160,000	-	*CWS*	*CWS*	*CWS*	*CWS*	*CWS*			*CWS*	*CWS*							
SS-2: Basalt Creek Gravity Sewer (Developer Funded)	$7,676,000	-																
SS-3: SW Tonquin Loop Sewer	$606,000	$54,000	$27,000	$27,000														
SS-4: SW Tualatin Pump Station and Force Main	$734,000	-						*CWS*	*CWS*									
SS-5: SW Tualatin Gravity Sewer (Developer Funded)	$836,000	-																
SS-6: North Martinazzi Trunk	$2,959,000	$1,202,000	$601,000	$601,000														
SS-7: Tualatin Reservoir Trunk	$3,354,000	$212,000			$127,200	$84,800												
SS-8: 103rd Avenue Sewer	$1,928,000	$1,157,000			$462,800	$694,200												
SS-9: Fuller Drive Sewer	$1,477,000	$1,477,000					$738,500	$738,500										
SS-10: Teton Trunk	$398,000	$197,000							$137,900	$59,100								
SS-11: South Martinazzi Trunk	$2,592,000	-						*CWS*	*CWS*	*CWS*	*CWS*							
SS-12: Sherwood Trunk	$1,550,000	$725,000								$290,000	$435,000							
SS-14: Dakota & Mandon Sewer Lining	$1,264,000	$632,000														$316,000	$316,000	
Total for Site-Specific Projects Per Fiscal Year			$628,000	$628,000	$590,000	$779,000	$738,500	$738,500	$137,900	$349,100	$435,000	$-	$-	$-	$-	$316,000	$316,000	$-
Data Collection							$100,000							$125,000				
Sanitary Master Plan												$500,000	$500,000					
Condition Assessment									$125,000	$125,000					$250,000			
Pipe Rehabilitation and Replacement									$80,000	$90,000	$100,000	$110,000	$130,000	$150,000	$170,000	$200,000	$230,000	$260,000
Total for Non-Site-Specific Projects Per Fiscal Year			$-	$-	$-	$-	$100,000	$-	$205,000	$215,000	$100,000	$610,000	$630,000	$275,000	$420,000	$200,000	$230,000	$260,000
Total Per Fiscal Year			$628,000	$628,000	$590,000	$779,000	$838,500	$738,500	$342,900	$564,100	$535,000	$610,000	$630,000	$275,000	$420,000	$516,000	$546,000	$260,000

Note: SS-13 and SS-15 are not listed in the site-specific project list because they are accounted for in the Data Collection line item as an investigative study.

[a] All costs shown are in 2017 dollars. Estimates are Association for the Advancement of Cost Engineering Class 5: accuracy range -50% to +100%.

[b] Cost share is determined based on information shown in Table 2-2. Projects that are funded by CWS or Developer are noted as such. Costs under Fiscal Year headers reflect City of Tualatin costs only. See Table 2-2 for description of CWS cost sharing.

SECTION 1

Introduction

The City of Tualatin is a southwestern suburb of the Portland Metropolitan Area with a current population of approximately 26,300 and an estimated buildout population of 30,650. The City's sewage is treated at the Durham Advanced Wastewater Treatment Facility (AWWTF), which also receives sewage from several neighboring cities including Beaverton, Tigard, Sherwood, Durham, and King City. Durham AWWTF is owned and operated by Clean Water Services (CWS), with whom the aforementioned cities all participate in an intergovernmental agreement detailing the arrangement. This report updates the City of Tualatin sanitary sewer master plan, which was most recently revised in 2002.

1.1 Scope

The scope of the master plan is to produce an update of the 2002 Sewer Master Plan for the City of Tualatin. This includes updating the 2012 hydraulic model prepared by CWS, reviewing and updating land use assumptions to match City planning projections, updating existing and future system hydraulic capacity deficiencies, developing a concept plan for service to two expansion areas, and reviewing initial project concepts with the updated hydraulic model to develop an improvement list for future land scenarios. Modeling was conducted for current conditions (2017) and planning years 2025, 2035, and buildout.

1.2 Purpose

The goals of the master plan are as follows:

- Evaluate and recommend current and future infrastructure needs to allow the sewer system to accommodate growth, and provide planning level costs.
- Identify and assess existing and future deficiencies within the sanitary sewer system.
- Further develop the planning done by CWS for the Tualatin area. Refine the evaluation, focus on Tualatin, and address the City's specific planning projections.
- Protect public health and preserve water quality of neighborhood creeks, ponds, and the Tualatin River by reducing or eliminating sanitary sewer overflows (SSOs).
- Meet regulatory requirements set by the Oregon Department of Environmental Quality (DEQ) by preventing SSOs.
- Develop a plan that will result in cost-effective sewer service that meets the demands of residential, commercial, and industrial customers.

1.3 Approach

This sewer master plan was developed in the following steps:

1. Review existing information: CWS's hydraulic model of the Durham basin (which encompasses the Tualatin system), previous planning reports, as-built construction drawings of the City of Tualatin sewer system, geographical information system (GIS) mapping, and sewer system databases.
2. Develop land use, wastewater generation, and service area parameters. Use design storm as specified by the 2012 CWS Durham basin collection model calibration.

3. Using the planning projections developed in the previous step, expand the 2012 CWS collection model to include all pipes in the City of Tualatin and upstream of the City. Develop the model using tax lots (parcels) as the fundamental areal unit. Combine information from the CWS and City of Tualatin data sources.
4. Estimate and incorporate flows from Basalt Creek and SW Industrial Planning Areas using most likely locations for tie-ins with the existing sanitary system.
5. Run the model to simulate wastewater flows for population and land use conditions in planning years, 2017, 2025, 2035, and buildout. Using CWS's hydraulic grade line (HGL) criteria, identify sewer system deficiencies. Determine the amount of upstream growth, in equivalent dwelling units (EDUs), that can occur before the deficiency develops.
6. Develop improvements to remedy the identified deficiencies. Model the improvements to confirm that they will limit SSOs and meet selected performance criteria. Develop cost estimates, evaluate benefits, and prioritize the improvements.
7. Develop capital projects implementation plan including cost estimates and approximate project years based on priority and estimated growth.

1.4 Assumptions

Table 1-1 summarizes the assumptions of this master plan.

Table 1-1. Summary of Assumptions*

Subject	Assumption
Planning Areas	Full flows from the two planning areas are assumed for modeling purposes by the 2025 scenario. See Section 2.4.1 for more detailed development schedule of planning areas.
Population Projections	Annual growth rate produced by analyzing data from U.S. Census Bureau and the Portland State University Population Center for 2006–2011. Basalt Creek population (from the Basalt Creek Conceptual Plan) is added by 2025.
Dry Weather Flow	Assumed to equal water use indicated by water billing records during winter months. Diurnal patterns generated by four flow meters placed by CWS that recorded data from October 2011 through March 2012.
Wet Weather Flow (Infiltration and Inflow [I/I])	Assumed to be described by RTK unit hydrograph methodology with parameters found during the 2012 CWS Durham model calibration task. Sewersheds defined by placing 100-foot buffers on all existing pipes.
Industrial Flow	Assumed that water use indicated by billing records equals sewer flow and that flows follow applicable diurnal patterns for the four established flow meter basins. Assumed a 10 percent increase in flow for each future scenario.

* See Appendix B for discussion of modeling assumptions and calibration results.

SECTION 2

Land Use and Sanitary Flow

2.1 Study Area

This master plan addresses collection system services within the City of Tualatin boundary as well as future planning areas such as the Basalt Creek and Southwest Tualatin Concept Planning Areas. The Stafford Hills area is an urban reserve area lying southeast of Tualatin, but planners are uncertain of how the sewer in this area will interact with surrounding cities. Flows from this area are not considered in the modeling for this plan.

2.2 Existing Collection System

2.2.1 Sewer Overview

The existing City of Tualatin wastewater collection system consists of more than 94 miles of pipeline in an approximately 9.8-square-mile area. The system currently serves about 26,300 people. Table 2-1 shows an inventory of collection system pipes.

Table 2-1. Collection System Pipe Inventory

Pipe Diameter (inches)	Total Length (linear feet)
4[a,b]	2,730
6[a,b]	17,250
8	372,840
10	44,840
12	16,650
14	330
15	8,670
18	15,530
21	4,590
24[c]	3,510
27[c]	10
30[c]	2,830
36[c]	8,040

[a] Gravity pipes smaller than 8 inches are laterals and are not evaluated for capacity.

[b] Includes gravity and force mains.

[c] Pipes 24 inches and larger are entirely owned and maintained by CWS.

City of Tualatin sewage is treated at the Durham AWWTF, which is owned and operated by the CWS. CWS assumes ownership and maintenance responsibility for any gravity sewer mains 24 inches and larger, as well as all pump stations and force mains. CWS funds capital construction costs for sewers exceeding 12 inches in diameter as shown in Table 2-2. Note that the criteria for CWS ownership and

funding responsibility are not the same: CWS funds capital projects for pipes over 12 inches but only owns pipes 24 inches and larger.

Table 2-2. Funding Responsibility and CWS Capital Cost Share Details

Project Description	Funding Responsibility
New lines ≤ 12”	Locally Funded, SDC eligible.
New lines > 12”	CWS funded, SDC eligible.
Replace existing lines ≤ 12”	Locally funded from monthly rates. If project is I/I abatement, then cost is shared 50/50.*
Replace existing lines > 12”	CWS funded from monthly rates.
Upsize from lines ≤ 12” to lines ≤ 12”	Locally funded, SDC eligible in proportion to new capacity provided.
Upsize from lines ≤ 12” to lines > 12”	Local share is determined by cost to upsize to 12”. CWS funds remainder of cost. SDC eligible in proportion to new capacity provided.
Upsize from lines > 12” to lines > 12”	CWS funded, SDC eligible in proportion to new capacity provided.

*Note: To be considered an eligible I/I abatement project, all private laterals within the project boundary must be inspected and replaced if deficient.

SDC = system development charge.

The City’s existing collection system is shown in Figure 2-1. This figure shows the City’s eight existing sewer basins and two planning areas, as well as which pipes are owned by CWS. There are a small number of pipes in the northeast corner of the City that do not contribute flow to Tualatin’s sewer system. Even though these pipes flow to Lake Oswego’s sewer, they are owned and maintained by the City of Tualatin. Table 2-3 contains summary information for each of the basins, including peak flow and EDUs. This report defines 1 EDU as the peak instantaneous flow associated with a single-family household including I/I contributions, which is 400 gallons per day (gpd).

Table 2-3. Basin Summary

Basin	Area (acres)	% Developed	Peak Flow (gpm)	EDUs[a]	Total Pipe Length[b] (feet)	Number of Manholes	Number of Pump Stations
Upper Tualatin	733	75%	620[c]	2,230	49,650	208	1
Cipole/Bluff	1,424	70%	2,300	8,280	83,700	402	2
Sherwood	368	90%	860	3,100	48,260	212	0
Teton	505	80%	970	3,490	47,600	276	0
Tualatin Reservoir	1,190	65%	1,740	6,260	82,200	522	1
Martinazzi	635	85%	1,170	4,210	62,900	366	0
Nyberg	911	85%	1,820	6,550	76,430	424	6
Durham	214	95%	470	1,690	15,200	89	0

[a] This study assumes 1 EDU = 400 gpd.

[b] Total Pipe Length only includes pipes at least 8 inches in diameter.

[c] This does not include flow in the Upper Tualatin Interceptor from sources outside Tualatin.

gpm = gallons per minute.

The City experienced rapid growth in the 1980s and 1990s, and much of the collection system was constructed in anticipation of, and response to, that growth. Portions of the system are much older, dating from the 1960s and earlier. As-built construction drawing dates were used to examine the age of

the City's collection system. Figure 2-2 shows the City's network of collection system pipelines color coded by age. Table 2-4 shows pipe age information for the eight existing basins.

Table 2-4. Pipe Age Summary for Pipes at Least 8 Inches in Diameter

Basin	Pre-1970 lineal feet (%)	1970-79 lineal feet (%)	1980-89 lineal feet (%)	1990-99 lineal feet (%)	2000-09 lineal feet (%)	2010-Present lineal feet (%)	All Pipes* lineal feet
Upper Tualatin	0 (0%)	2,615 (8%)	8,025 (24%)	17,612 (53%)	1,336 (4%)	514 (2%)	33,300
Cipole/Bluff	2,540 (3%)	12,292 (14%)	30,575 (34%)	12,504 (14%)	22,317 (25%)	3,271 (4%)	89,440
Sherwood	12,629 (26%)	19,698 (41%)	8,851 (18%)	2,777 (6%)	3,867 (8%)	147 (<1%)	48,090
Teton	0 (0%)	36,061 (76%)	8,208 (17%)	1,241 (3%)	2,007 (4%)	0 (0%)	47,800
Tualatin Reservoir	0 (0%)	0 (0%)	12,716 (16%)	27,241 (33%)	38,795 (47%)	3,041 (4%)	82,790
Martinazzi	0 (0%)	35,942 (58%)	8,586 (14%)	15,473 (25%)	1,721 (3%)	75 (<1%)	62,320
Nyberg	820 (1%)	21,152 (28%)	34,134 (45%)	12,394 (16%)	5,933 (8%)	1,597 (2%)	76,290
Durham	531 (3%)	7,381 (46%)	844 (5%)	2,957 (18%)	885 (5%)	2,465 (15%)	16,610

*Total lineal feet for all pipes includes pipes with missing as-built data.

2.2.2 Pump Station Overview

There are currently nine pump stations operating within the City that serve Tualatin residents and are owned, operated, and maintained by CWS, as well as an unknown number of privately owned pump stations. Information about all the CWS-operated pump stations in the City is summarized in Table 2-5. The information in Table 2-5 is obtained from pump station fact sheets provided by CWS. Childs Pump Station is included in the table because it serves Tualatin residents and is owned and operated by CWS, but the force main and surrounding sewer contribute flow to Lake Oswego's collection system.

The force main velocity is provided for each of the pump stations operating at its firm capacity. Firm capacity is defined as the pump station capacity with the largest pump out of service. CWS Design & Construction Standards indicate that force main velocities should fall in the range of 3.5 to 8 feet per second.

Excluding privately owned pump stations, CWS funds all capital projects for pump stations and force mains within the Durham AWWTF basin.

Figure 2-3 shows a map of all the existing and proposed future pump station service basins located within Tualatin.

Table 2-5. CWS-Operated Pump Stations within Tualatin

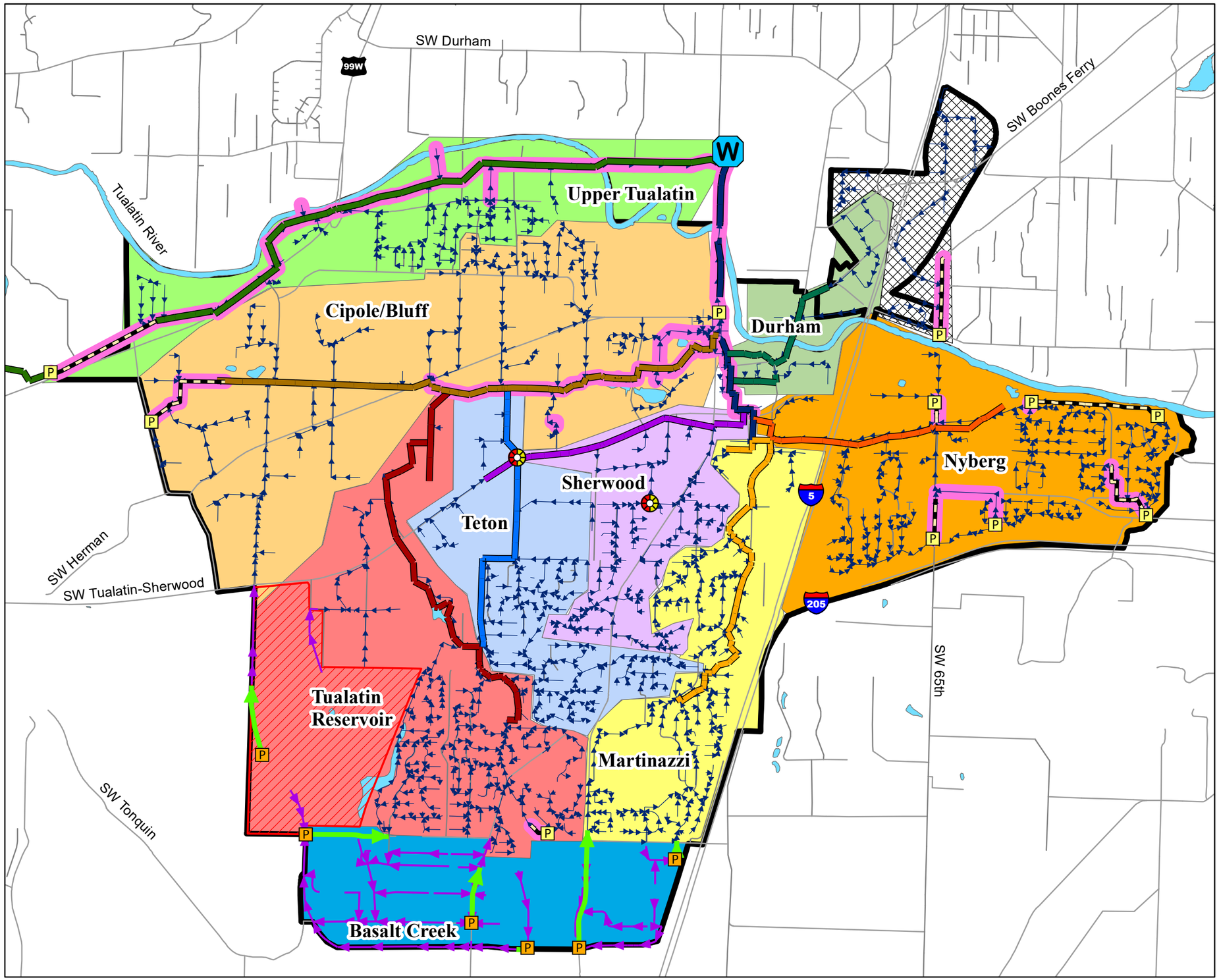
Pump Station Name	No. of Pumps	Base Elev. (feet)	Rim Elev. (feet)	Lead Pump On Elev. (feet)	Lag Pump On Elev. (feet)	Firm Capacity (gpm)	Modeled Peak Flow (gpm)	Remaining EDUs[a]	Force Main Size (inches)	Force Main Velocity @ Capacity (feet/ second)	Pump Size (hp)	Wet Well Capacity (gallons)	Time to Overflow (minutes)	Emergency Power	Volts/ Phase	Approximate Discharge Location
Borland	2	131.80	142.30	135.30	136.30	300	145	558	4	7.7	20	2,500	120	Standby Generator 100 kW	230/3	Near intersection of SW 50th Ave. & SW Greenwood Ct.
Childs[b]	2	101.92	119.30	108.00	108.50	218	N/A	N/A	6	2.5	10	N/A	85	Standby Generator 30 kW	240/3	At intersection of Lakeview Blvd. & SW 65th Ave.
Cipole	2	98.70	126.00	105.60	106.60	387	270	421	8	2.5	7.5	9,400	162	Standby Generator 25 kW	208/3	150 ft NE of Pioneer Metal Finishing
Fox Hill	2	91.76	121.06	105.00	106.00	200	162	136	6	2.3	5	7,700	780	Standby Generator 20 kW	230/3	Near intersection of SW Omaha Ct. & SW 57th Ave.
Lower Tualatin	5	81.40	120.8 (ground)	N/A	N/A	15,280	15,055	810	2 x 20	7.8	135	154,100	12	Durham AWWTF Substation	480/3	Manhole in Durham Park 450 ft north of pedestrian bridge.
Nyberg	2	102.00	123.00	106.50	107.50	450	128	1159	6	5.1	7.5	675	222	Standby Generator 40 kW	240/3	In front of DaVita Meridian, east of SW 65th Ave.
Orchard Hill	2	97.00	120.50	102.00	103.00	450	120	1188	8	2.9	10	8,000	450	Standby Generator 35 kW	230/460/3	Near intersection of SW Omaha Ct. & SW 57th Ave.
Saum Creek[c]	2	143.50	164.00	149.50	150.00	310	210	360	6	3.5	20	635	127	Standby Generator 40 kW	460/3	On SW 65th Ave. 200 ft south of intersection w/ SW Borland Rd.
Victoria Woods	2	249.00	261.00	252.50	253.50	200	108	331	4	5.1	5	5,200	420	Standby Generator 25 kW	230/1	Near intersection of SW Miami Dr. & SW Lumbee Ln.

[a] Remaining EDUs calculated by subtracting modeled peak flow from firm capacity and assuming 1 EDU = 400 gpd capacity.

[b] Childs Pump Station serves Tualatin residents, but the force main discharges to Lake Oswego owned sewer. CWS owns and maintains the Childs Pump Station and force main.

[c] The Saum Creek Pump Station is being upgraded with larger impellers for increased capacity as part of the Sagert Farms sewer project.

Elev. = elevation; hp = horsepower; kW = kilowatts.



LEGEND

- Durham AWWTF
- UGB
- Serves Lake Oswego
- Southwest Tualatin Concept Area
- Existing Sanitary Sewer
- Existing Pump Station
- Existing Force Main
- Future Sanitary Sewer
- Future Force Main
- Future Pump Station
- Flow-Split Structure
- CWS Owned Pipe
- Interceptor*

*Interceptor is shown as deeper color of corresponding basin.

N

0 1,100 2,200 4,400 Feet

FIGURE 2-1
Tualatin Sanitary System Overview
City of Tualatin Sewer Master Plan

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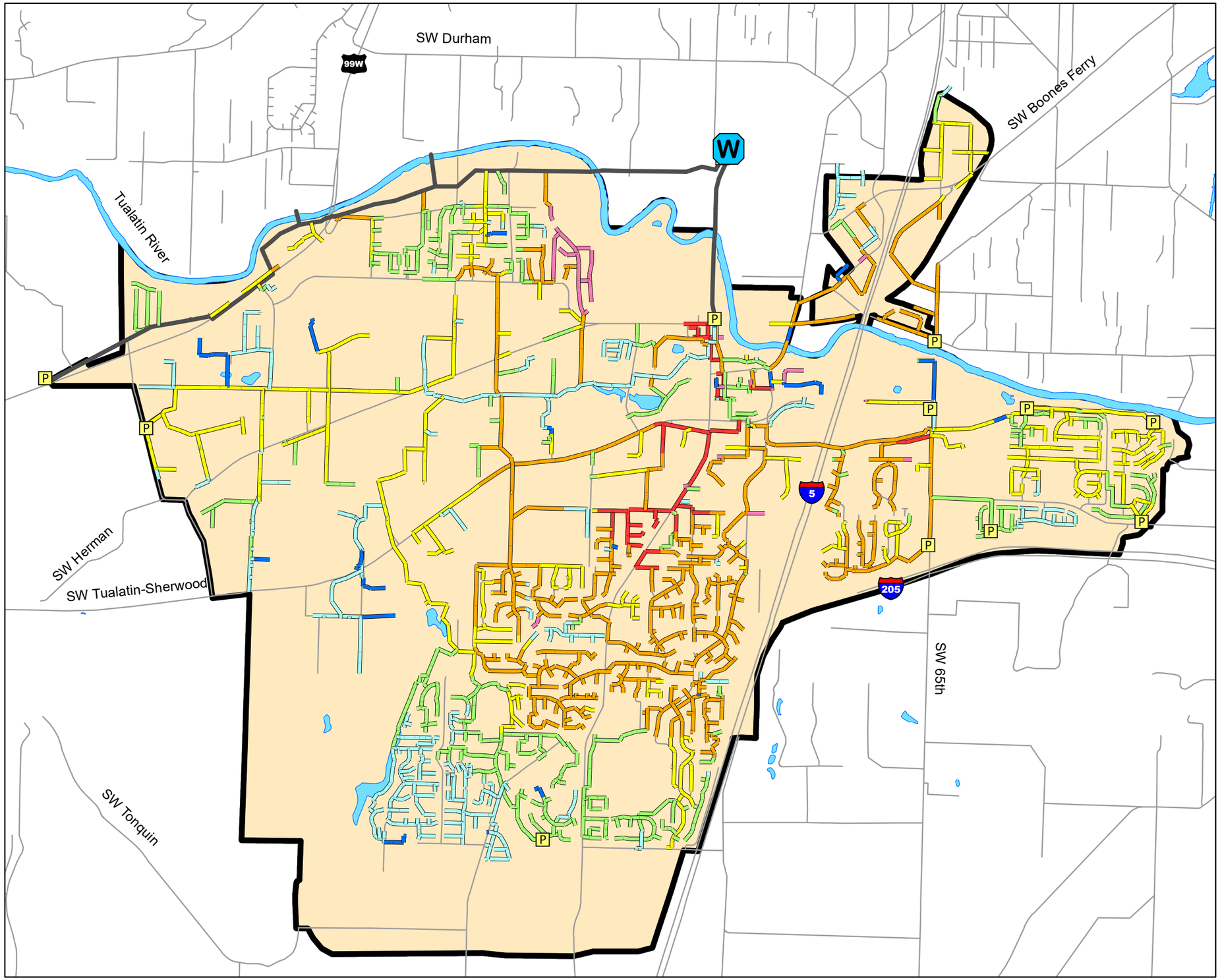


LEGEND

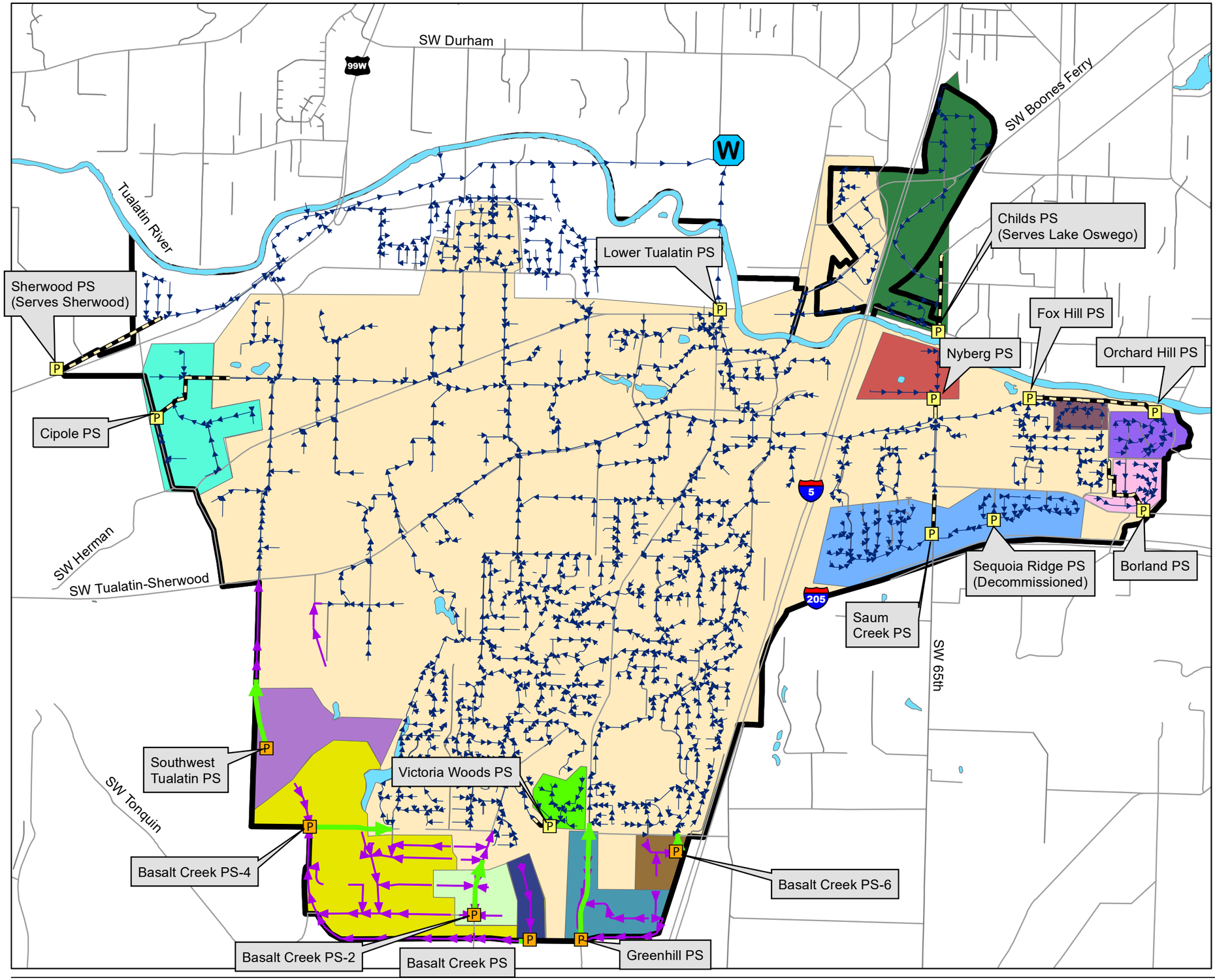
- Pre-1970
- 1970s
- 1980s
- 1990s
- 2000s
- 2010-Present
- No Data
- Outside Jurisdiction
- P Pump Station
- Planning Area
- W Durham AWWTF

N

0 1,100 2,200 4,400 Feet

FIGURE 2-2
Collection System Pipe Age
City of Tualatin Sewer Master Plan

JACOBS



LEGEND

- Durham AWWTF
- UGB
- Existing Sanitary Sewer
- Existing Pump Station
- Existing Force Main
- Future Sanitary Sewer
- Future Force Main
- Future Pump Station

N

0 1,100 2,200 4,400 Feet

FIGURE 2-3
Pump Station Basins
City of Tualatin Sewer Master Plan

JACOBS

2.3 Population

Estimated residential populations are shown in Table 2-6.

Table 2-6. City of Tualatin Population Estimates and Projections

Planning Year	Population
2017	26,300
2025	28,540
2035	30,510
Buildout (2038)	30,650

The population estimates in Table 2-6 are consistent the estimates used in the *Amended July 2013 City of Tualatin Water Master Plan* and the *Basalt Creek Conceptual Plan*. The City's annual growth rate was produced by analyzing census data from the U.S. Census Bureau and the Portland State University Population Center for 2006 through 2011. The annual population growth during that 5-year period was 0.46 percent. This growth was used to project population until buildout.

2.4 Land Use

The study area encompasses 6,312 acres, which includes the City of Tualatin and the 355-acre Basalt Creek Planning Area. Figure 2-4 provides the zoning classifications for the study area as well as the tentative zoning for the future planning areas. The zoning classifications are used in conjunction with population projections and known future developments to determine appropriate flow projections for future modeling scenarios. Existing and future scenario EDUs for each basin are shown in Table 2-7. This report defines 1 EDU as 400 gpd peak instantaneous flow, which was determined by considering typical peak per capita wastewater generation and wet weather contributions for typical lot sizes.

Table 2-7. Basin Existing and Future EDUs*

Basin	Existing EDUs	2025 EDUs	2035 EDUs	Buildout EDUs
Upper Tualatin	2,230	2,300	2,380	2,450
Cipole/Bluff	8,280	9,900	11,480	12,670
Sherwood	3,100	3,490	3,820	3,920
Teton	3,490	4,000	4,250	4,430
Tualatin Reservoir	6,260	12,240	12,560	12,710
Martinazzi	4,210	5,360	5,720	5,800
Nyberg	6,550	6,520	6,480	7,090
Durham	1,690	1,940	2,270	2,450
Entire UGB	35,810	45,750	48,960	51,520

*EDUs calculated from peak flow assuming 1 EDU = 400 gpd.

2.4.1 Planning Areas

Two planning areas were added to the service area for the 2025 planning scenario as summarized in Table 2-8. The Southwest Tualatin Concept planning area is also identified in the *City of Tualatin Water Master Plan.* The two planning areas are shown in Figure 2-1.

Table 2-8. Planning Areas

Planning Area	Area (acres)	Peak Flow (gpm)	EDUs
Southwest Tualatin Concept Area	490	1,180	4,250
Basalt Creek Planning Area	355	810	2,900

The residential portion of the Basalt Creek Planning Area is expected to develop within 10 years, while the commercial and industrial portions may be closer to 20 years out. For the Southwest Tualatin Concept Area, the north and south ends of the area are expected to develop by around 5 years. The central portion (currently Tigard Sand and Gravel) is not expected to develop for 10 to 20 years. For modeling purposes, full flows from both planning areas are assumed for the 2025 and all subsequent scenarios.

2.4.2 Other Jurisdictions

Sanitary sewer flows from the City of Sherwood, King City, and Tigard are conveyed by the Upper Tualatin Interceptor to the Durham AWWTF. This report does not consider deficiencies of the Upper Tualatin Interceptor because it is owned and operated by CWS, but the interceptor is an important part of the Tualatin sewer model because of how it interacts with the connecting sewer. Sanitary sewer flows from these areas were taken directly from CWS's collection systems model. The growth and density projections for these areas provided in CWS's Durham basin collection model calibration were not re-evaluated for the purposes of this plan. Refer to Section 3.1.2 and Table 3-1 for a characterization of these flows.

2.5 Wastewater Generation

Sanitary sewer flow estimates were developed for current conditions (2017) and planning years 2025, 2035, and buildout. The diurnal flow patterns for residential, commercial, and industrial areas were produced by four flow meters placed throughout Tualatin's service area, which recorded data from October 2011 through March 2012. Additionally, the potential effects of I/I during CWS's design storm were calculated.

2.5.1 Dry Weather Flow

Dry weather flow is defined as daily average flow for a period without precipitation during high seasonal groundwater conditions. This includes groundwater infiltration in portions of the collection system that are lower elevation than the groundwater level. It is assumed that no rainfall-derived infiltration and inflow (RDII) contributes to these flows, and that it generally fluctuates on an observed diurnal pattern that depends on land use (discussed in Section 2.5.4). In contrast to dry weather flow, wet weather flow is defined as the average daily flow during a period of significant rainfall, which includes dry weather flow and RDII.

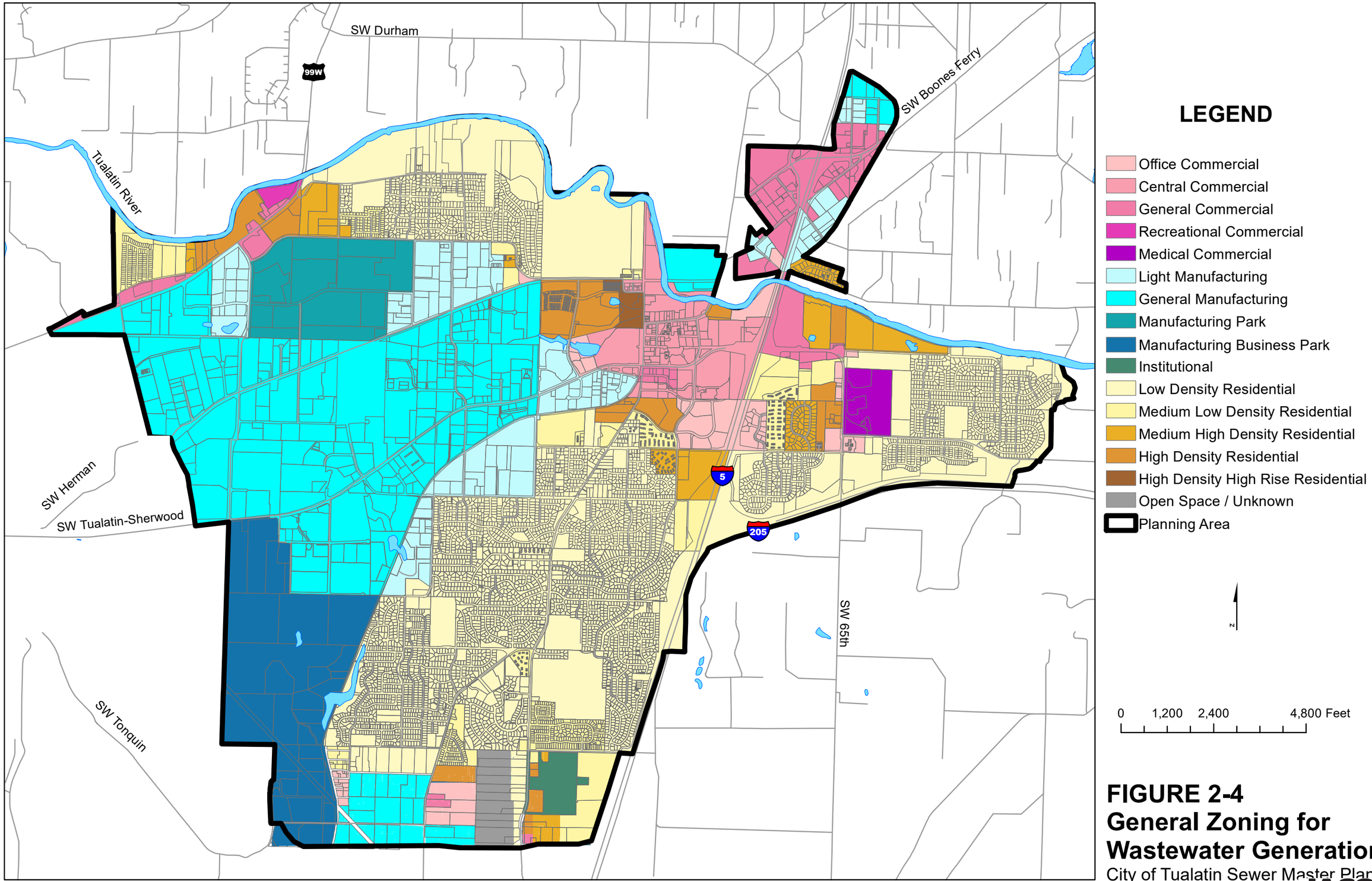


FIGURE 2-4
General Zoning for Wastewater Generation
City of Tualatin Sewer Master Plan

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To construct the collection system model, dry weather flow must be distributed into the pipe network. Since flow monitoring data are only available for a few locations, indirect methods were used to assign flows at the parcel level. Because lawn irrigation is unlikely during winter, water use indicated by billing records is assumed to equal wastewater generation.

For the existing condition, each parcel was assigned an associated manhole that indicates where the flow from that parcel would be loaded into the model. The flow at each monitor was proportioned among each loading manhole based on the ratio of water demand (determined from billing records) assigned to that manhole to the total water demand in that sewershed.

2.5.2 Infiltration and Inflow

I/I is defined as the combined contribution of groundwater infiltrating the sewer through pipe or manhole defects and inflow associated with inappropriate stormwater connections. I/I occurring during and after a rainstorm (RDII) is a major component of wet weather flow. Virtually every sewer system will experience I/I. Historically, small amounts of I/I are expected and tolerated. However, I/I may be considered excessive when it is the cause of overflows or bypasses, or the cost to transport and treat exceeds the cost to eliminate it.

I/I is typically quantified by a peaking factor, which is the ratio of wet weather flow to dry weather flow. Higher peaking factors are indicative of more I/I within the sewer system. Table 2-9 shows the basin peaking factors measured at the four flowmeter locations within the City during the wet season.

Table 2-9. Flow Monitor Basin Wet Weather Peaking Factors

Flow Monitor Basin	Flow Monitor Location	Measured Peak Dry Weather Flow (gpm)	Measured Peak Wet Weather Flow (gpm)	Peaking Factor
11679	Manhole SSF-0527 (Roamer's Rest)	2,000	2,500	1.25
11719	Manhole SSF-0509 (Cook Park)	5,000	12,800	2.56
22276	Manhole SSF-1923 (Tualatin Commons)	1,900	4,050	2.13
AWWTF	At Durham AWWTF influent	28,000	82,000	2.93

CWS's collection model utilized the U.S. Environmental Protection Agency Storm Water Management Model (EPA-SWMM) RTK unit hydrograph methodology to develop the system response to I/I. The model task for this plan uses the same methodology. Refer to Appendix B for more detailed discussion.

The unit hydrograph defines the amount of runoff (percentage of the volume created from the sewershed and precipitation depth) which enters the system and the travel time. The unit hydrograph is broken into initial, intermediate, and long-term hydrograph response, which are combined to form a composite unit hydrograph. Each of the three-unit hydrographs is defined by three parameters (RTK) which are adjusted during model calibration until field and model flows match within a reasonable tolerance.

Unit hydrographs developed from flow monitoring data for each meter basin during the 2012 CWS collection model calibration were applied to existing and future watershed areas to develop I/I system response during the design storm. Existing system unit hydrographs were assigned to future development areas based on the flowmeter areas shown in Figure 2-5.

Existing sewersheds from the 2012 CWS collection model calibration were defined by placing 100 feet buffers on all existing pipelines.

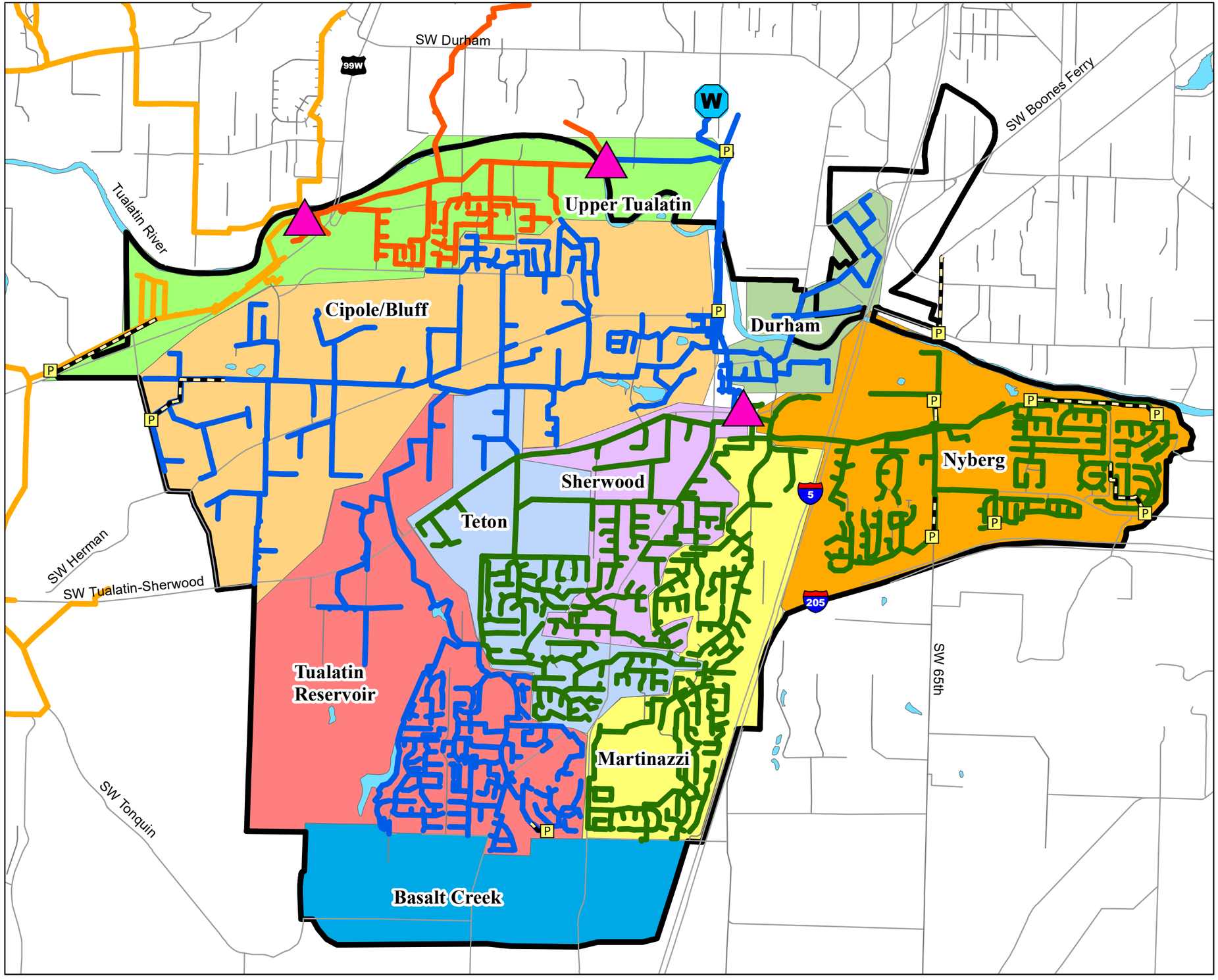
2.5.3 Future Conditions

Buildout flows are calculated based on population trends and applying calibrated unit flow factors based on zoning classifications to all existing and future tax lots in the study area. Intermediate scenarios are calculated as scaled percentages of the buildout scenario to match population estimates. Planned developments were incorporated into the land use scenarios based on when they are expected to develop. Wastewater loadings from the Basalt Creek Planning Area and Southwest Tualatin Concept Area are assumed in the 2025 scenario. Future industry flows increased by 10% for each modeling scenario, as explained in Section 2.5.5.

2.5.4 Diurnal Flow Patterns

Sanitary flows are generally assumed to follow a repeating, 24-hour pattern, called a diurnal flow pattern. The most prominent influence on a diurnal flow pattern is land use. Residential use tends to create two peaks: one in the morning and one in the evening. Commercial and industrial patterns tend to be relatively constant during business hours and very low at other times of day.

As part of CWS's collection modeling, flow meter and supervisory control and data acquisition (SCADA) data were provided by CWS at 31 locations in the Durham basin. Flow readings were taken from October 2011 through March 2012, and historical flow data were available at several meter locations. Four of those flow meters were inside the City of Tualatin study area and were used to generate the diurnal flow patterns that were used for modeling in this study. Figure 2-5 is a map showing the four flowmeter basins that each have their own set of wastewater generation criteria. Figure 2-6 shows the four diurnal curves over a 24-hour period.



LEGEND

- Flow Monitor
- Durham AWWTF
- Pump Station
- AWWTF Monitoring Basin
- Monitoring Basin 11679
- Monitoring Basin 11719
- Monitoring Basin 22276
- Force Main
- UGB

N

0 1,100 2,200 4,400 Feet

FIGURE 2-5
Flow Monitoring Basins
City of Tualatin Sewer Master Plan

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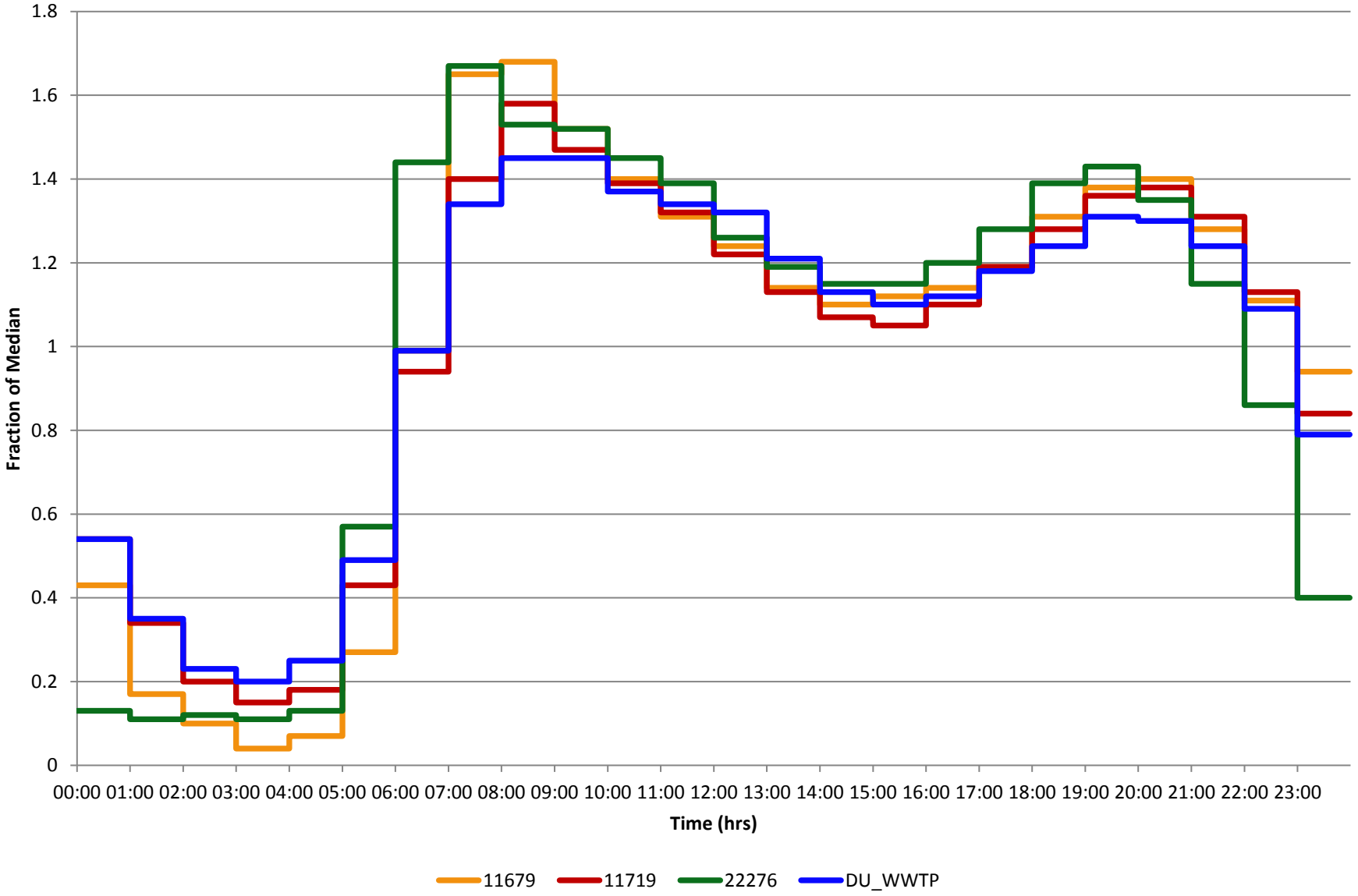
FIGURE 2-6
Diurnal Patterns by Flowmeter



2.5.5 Wet Industry Flows

Certain industrial sites in the City of Tualatin currently produce or are expected to produce large quantities of wastewater flow. Table 2-10 lists the largest flow producers. These daily average flows were used in the planning projections. Specific meter data for each industrial user were not available. For the purpose of this study, it was assumed that water use billing records translated directly to sewer flow, and the flows follow the applicable diurnal pattern established in Section 2.5.4. Modeled flows were increased by 10 percent for each future scenario to maintain consistency with the CWS Durham basin model. Table 2-11 shows the percentage of peak basin flow attributable to these industries for each basin that contains industrial areas.

Table 2-10. Wet Industry Contributors and Flow Projections

Industry Name	Basin Name	2017 Flow (gpm)	2025 Flow (gpm)	2035 Flow (gpm)	Buildout Flow (gpm)
Ergon/Anthro Corporation	Teton	15.0	16.5	18.2	20.0
Cal Weld	Cipole/Bluff	3.4	3.8	4.2	4.6
Columbia Corrugated Box	Cipole/Bluff	11.0	12.1	13.3	14.7
Fujimi Corporation	Cipole/Bluff	5.4	6.0	6.5	7.2
JAE Oregon, Inc.	Cipole/Bluff	30.2	33.2	36.6	40.2
Kaiser Permanente	Cipole/Bluff	5.8	6.3	7.0	7.7
Meridian Park Hospital	Nyberg	19.5	21.5	23.6	26.0
Lam Research Corporation	Cipole/Bluff	32.6	35.9	39.5	43.4
Pacific Foods	Cipole/Bluff	1.2	1.3	1.5	1.6
Pacific Nutritional Foods	Cipole/Bluff	3.2	3.6	3.9	4.3
Pioneer Metal Finishing	Cipole/Bluff	3.2	3.5	3.8	4.2
Powder Tech and Valmont Coating	Cipole/Bluff	15.2	16.7	18.4	20.2
Providence Bridgeport Immediate Care	Durham	19.9	21.9	24.1	26.5
Superior Metal Finishing	Cipole/Bluff	7.2	7.9	8.7	9.6
Sure Power Industries	Teton	8.2	9.0	9.9	10.9
Tufcoat	Cipole/Bluff	14.1	15.5	17.0	18.7
Union Wine	Cipole/Bluff	30.6	33.6	37.0	40.7

Table 2-11. Percentage of Peak Basin Flow from Industrial Sources

Basin Name	2017	2025	2035	Buildout
Teton	2.4%	2.3%	2.3%	2.3%
Nyberg	1.2%	1.2%	1.3%	1.3%
Cipole/Bluff	7.0%	6.6%	5.5%	5.5%
Durham	4.3%	4.0%	3.7%	3.5%

CWS maintains a database of permitted flows from wet industries within the Durham basin. Table 2-12 shows the list of wet industries and their permitted flows within Tualatin. The permitted flows represent maximum instantaneous discharge into the sewer, so they may be significantly higher or lower than the flow indicated by monthly water use records. For this study, it was decided that wet industry flow

should be represented in the model by water use records rather than instantaneous permitted flows. The list of industries in Table 2-12 may vary from Table 2-10 as the latter includes some commercial properties as well.

Table 2-12. Wet Industry Permitted Flows

Industry Name	Basin Name	Permitted Flow (MGD)
Anodize Solutions	Cipole/Bluff	0.010625
Ardent Mills, LLC	Teton	0.0075
Brew Dr. Kombucha	Cipole/Bluff	0.0075
Cal Weld	Cipole/Bluff	0.001
Columbia Corrugated Box	Cipole/Bluff	0.001425
Dayton Natural Meats	Cipole/Bluff	0.008125
Ergotron/Anthro Corporation	Teton	0.003555
Fujimi Corporation	Cipole/Bluff	0.265
JAE Oregon, Inc.	Cipole/Bluff	0.01
Lam Research Corporation	Cipole/Bluff	0.01675
Pacific Foods of Oregon	Cipole/Bluff	0.085345
Pacific Nutritional Foods	Cipole/Bluff	0.343516
Pioneer Metal Finishing	Cipole/Bluff	0.07625
Union Wine Company	Cipole/Bluff	0.028694
Union Wine Company-Packaging	Cipole/Bluff	0.001807

2.5.6 Design Storm

Sanitary sewer system deficiencies are typically the result of I/I associated with large storm events. Based on the November *2010 Internal Management Directive, Sanitary Sewer Overflows (SSOs)* published by DEQ and *Oregon Administrative Rules* Chapter 340-Division 041 (OAR 340-041-0009), all SSOs are prohibited. However, DEQ may withhold enforcement action for those SSOs that occur from larger storm events; for example, a winter storm that corresponds to a 1-in-5-year frequency and a summer storm that corresponds to a 1-in-10-year frequency. CWS has elected to apply the 1-in-5-year frequency storm event to determine system deficiencies and improvements.

In 2012, CWS developed a 5-year design storm specifically for the Durham basin. The analysis considered the largest storm events over a 50-year period and evaluated the frequency of overflow within the system caused by each storm event. The final design storm was a composite of historical events that generated the 1-in-5-year frequency of system flow rates. The 5-year design storm is a 3.6-inch, 72-hour event, as shown in Figure 2-7. For consistency, the same design storm is used in this plan.

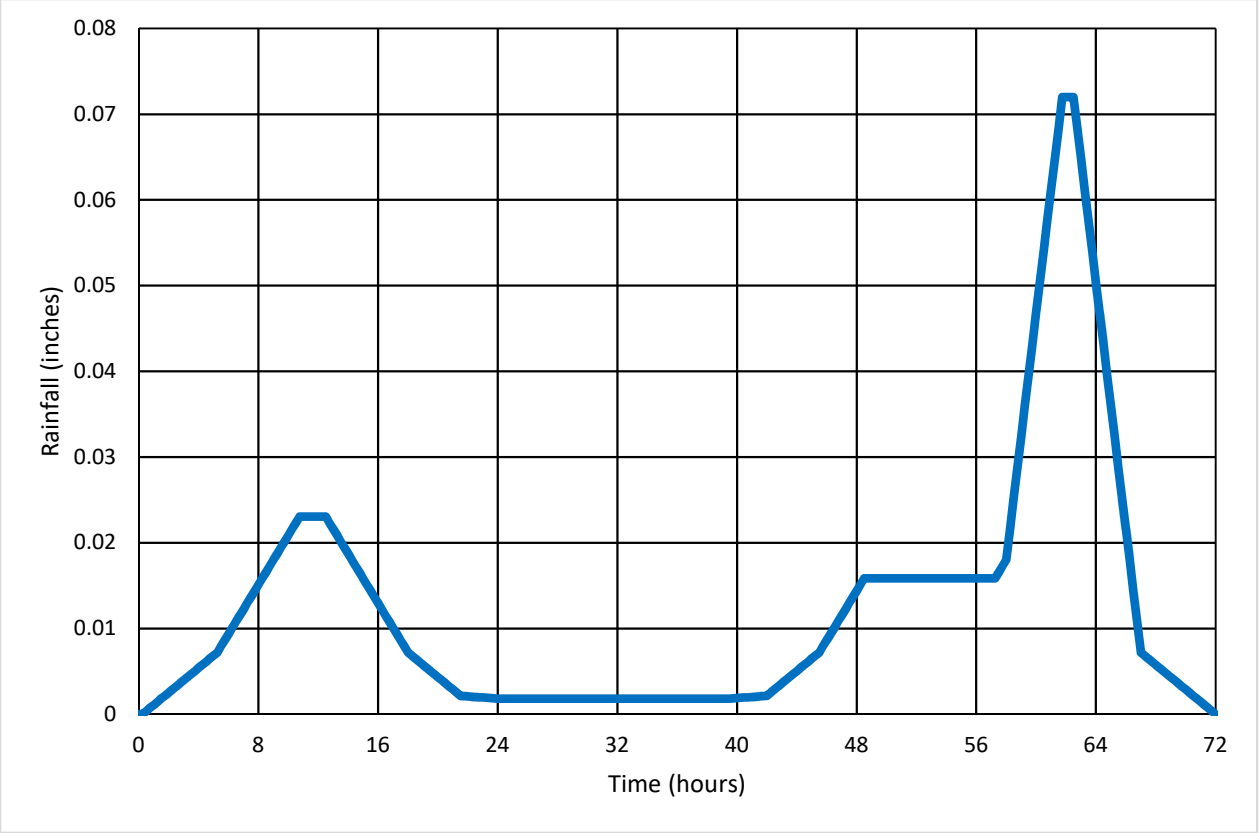


Figure 2-7. 5-Year Design Storm

2.5.7 Summary

Table 2-13 summarizes the model input and data sources used for existing and future scenarios. Appendix C shows summary model input information, including dry weather flow values for loading manholes, I/I input data, flow patterns, and unit hydrograph parameters.

Table 2-13. Model Data Summary

Model Input	Data Source for Existing Scenario	Data Source for Future Scenarios
Diurnal Curves	Flow monitors	Does not change
Design Storm	Historic rainfall, design criteria	Does not change
Dry Weather Flow	Flow monitors, diurnal curves, water use records	Population growth, land use
Wet Weather Flow (I/I)	Flow monitors, diurnal curves, RTK unit hydrograph	Add new developments
Wet Industry Flows	Water use records	Add 10% every 10 years

2.6 Regulatory Requirements

2.6.1 Current Regulations

DEQ currently regulates SSOs in coordination with National Pollutant Discharge Elimination System (NPDES) permits and according to bacteria specifications of state water quality regulations. Overflows include flows bypassed at the AWWTF, overflows to streams, flooded manholes, and basement backups. The recommended improvements provided in this report manage the risk of SSOs occurring.

2.6.2 Regulatory Responsibilities

The City of Tualatin sanitary sewer system conveys sewage to the Durham AWWTF for treatment. The Durham AWWTF is owned and operated by CWS. As the NPDES permit holder for the Durham AWWTF, CWS is responsible for meeting the requirements of that permit and current SSO regulations. As a Co-implementer of the permit, The City of Tualatin is responsible for regulatory requirements directly pertaining to its wastewater collection system, as established by CWS, which serves as the lead agency.

SECTION 3

Hydraulic Modeling

3.1 Approach

A hydraulic model was constructed based on information contained in GIS and calibrated for consistency with the CWS Durham basin model. The hydraulic model was run to evaluate collection system performance under existing (2017), 2025, 2035, and buildout population and land use conditions. Refer to Section 2 for a description of the population, land use, wastewater flow patterns and volumes, I/I, and the design storm that were used to build the model. A hyetograph of the design storm is shown in Figure 2-7.

3.1.1 Combined CWS and Tualatin Data

To develop the Tualatin collection system model, Jacobs combined information from CWS's hydraulic model of the Durham AWWTF service area (developed in 2012 and updated in 2016) with information from Tualatin's collection system 2002 model, GIS maps provided by the City of Tualatin, and as-built drawings. CWS's model primarily included pipes larger than 10 inches in diameter. Tualatin's collection system 2002 model and GIS maps contained all existing pipes within the City's sewer service area, and so all pipes 8 inches or larger in diameter were modeled in the planning area.

The model was constructed using InfoSWMM Suite 11.0, SP 1, Update #10, to be consistent with the software that CWS used to model its collection system in Durham. InfoSWMM is an integrated ArcGIS (version 10.0).

Appendix B contains detailed information regarding the 2012 and 2016 calibration tasks for the Durham AWWTF service area hydraulic model.

3.1.2 Accounting for Flows from Outside the UGB

The Tualatin model covers the City's projected sewer service area, and takes into account how flows from outside City limits affect the collection system. These flows are conveyed by the CWS-owned Upper Tualatin Interceptor, but there can be impacts where Tualatin's sewer connects with the interceptor. To capture these effects in the model, this study incorporates flows from outside Tualatin by using the same flows developed during CWS's collection system modeling. Table 3-1 shows the peak flow, source, and tie-in location for each of the flows from outside City limits.

Table 3-1. Flows from Outside the UGB

Source Township	Tie-in Location	Existing Peak Flow (gpm)	2025 Peak Flow (gpm)	2035 Peak Flow (gpm)	Buildout Peak Flow (gpm)
Sherwood	Sherwood Pump Station*	2,455	4,255	5,810	16,300
King City	Upper Tualatin Interceptor	2,055	4,680	6,970	9,990
Tigard	Upper Tualatin Interceptor	2,320	2,500	2,500	2,525

* There is a planned future connection from Sherwood that will bypass the Sherwood Pump Station. CWS is currently investigating whether the project is three to six years away.

3.1.3 Flow-split Structures

Two flow-split manholes are represented in the updated model. Flow-split structures were identified by reviewing as-built drawings when available. Manholes containing one inlet at a higher invert elevation than two outlet pipes at lower invert elevations were considered flow-split manholes. These flow-split structures are maintained by the City. The location of each flow-split structure is shown in Table 3-1 and in Figure 2-2.

Table 3-2. City of Tualatin Flow-split Structures

CWS ID	Location
20760	SW Teton Avenue & SW Tualatin-Sherwood Road
96404	SW Sagert Street west of SW Apache Drive

3.1.4 Conceptual Future Development Pipeline Layout

There are two areas in the planning area for this study that will be developed by 2025: Southwest Tualatin Concept Area and Basalt Creek Planning Area.

3.1.4.1 Southwest Tualatin Concept Area

For the Southwest Tualatin Concept Area, this plan proposes a conceptual sewer layout that includes several developer-funded 8-inch gravity lines and a pump station in the central region. The southern region of the area is serviced by a proposed gravity line that will drain into the Basalt Creek Pump Station 4. The northeastern portion is serviced by a proposed gravity line that connects to existing sewer along SW Itel Street. The central and northwestern portions are serviced by a proposed gravity line connecting to an existing sewer along SW 124th Avenue, which also serves the central region via the proposed Southwest Tualatin Pump Station. The proposed sewer layout may change once more is understood about how the area will develop. It is expected that the area will require significant fill and grade changes to deal with the existing gravel pits.

3.1.4.2 Basalt Creek Planning Area

The sanitary sewer conceptual design for the Basalt Creek Planning Area is shown in Figure 3-1. The Wilsonville portion of the area is shown for convenience, but it should be noted that it does not have any effects on Tualatin's sewer. The conceptual design includes construction of five pump stations to serve the Tualatin/CWS service area. The sanitary system uses gravity as much as possible, follows existing and proposed roadways and trails, and was designed to avoid streams and natural areas. The conceptual sewer system connects to the existing Tualatin system at SW 112th Avenue between SW Cowlitz Drive and SW Nootka Street, at SW Grahams Ferry Road and SW Helenius Street, at SW Boones Ferry Road and SW Norwood Road, and at SW Vermillion Drive and SW Norwood Road. Flows from all planning areas were included in the model to represent future development.

Table 3-3 shows the locations where the Basalt Creek conceptual sewer ties in with Tualatin's existing system.

Table 3-3. Basalt Creek Planning Area Tie-in Locations

City Manhole ID	Location Description	Estimated Peak Flow (gpm)
SSF-2261	Near SW 112th Avenue & SW Helenius Street	390
SSF-2281	Near SW Grahams Ferry Road & SW Helenius Street	160
SSF-1408	On SW Boones Ferry Road, 250 feet north of SW Norwood Road	180
SSF-0118	Near SW Norwood Road & SW Vermillion Drive	75

Proposed Pump Station 4 will serve the Basalt Creek Planning Area and the SW Industrial Planning Area.

Properties east of Basalt Creek and west of SW Boones Ferry Road will be required to install grinder pumps to connect to the gravity sewer line in Boones Ferry Road.

Southwest region is less likely to develop. Construction of SW sewer line and Pump Station 3 would only be required if and when development occurs.

Properties east of Basalt Creek and west of SW Boones Ferry Road will be required to install grinder pumps to connect to the gravity sewer line in Boones Ferry Road.

VICINITY MAP

Sherwood
Tualatin
Wilsonville

Legend

- Proposed Pump Stations
- Proposed Force Mains
- Proposed District Service System
- CWS Service Boundary
- Proposed Wilsonville Service System
- Wilsonville Service Boundary
- Deep Bore Segment (over 25' deep)
- Jurisdictional Boundary
- Planned SW Kinsman Rd Extension Sewer
- Existing District/Tualatin Pump Stations
- Existing District/Tualatin Gravity System
- Existing District/Tualatin Force Mains
- Existing Wilsonville System
- Proposed Arterial Roads
- Proposed Collector Roads
- Proposed Local Roads
- Proposed Bike/Ped Off-Street
- Proposed Trails (by Others)
- Existing Railroad
- Existing Roads
- Existing Bike/Ped On-Street
- Tax Lots
- Planning Area

City Boundaries

- Sherwood
- Tualatin
- Wilsonville

N

0 250 500 1,000
Feet

FIGURE 3-1
Basalt Creek Conceptual Sewer Layout

City of Tualatin Sewer Master Plan

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The conceptual pipes in the planning areas are not modeled, but flows are accounted for by incorporating estimated flows into the existing Tualatin sewer at the tie-in locations. Both conceptual sewer layouts are shown in Figure 2-1.

3.1.5 Storm Routing

Total collection system flows were modeled to include sanitary flow from industrial and residential users imposed on a diurnal curve and design storm event responses with I/I contributions from each sanitary basin for the existing system, 2025, 2035, and buildout conditions.

3.1.6 Deficiency Rankings

Sewer system capacity deficiencies were identified by comparing the peak HGL for each segment of the system with pipe slopes and ground surface elevations. HGL is defined as the surface of water flowing in an open channel or a pipe flowing partially full. If a pipe is pressurized, the HGL is the level water would rise to in a small, vertical tube connected to the pipe. In analysis, this is compared to other elevations such as the ground surface elevation or the floor of a basement. If, for example, pressure in the pipeline raises the water elevation to the ground surface elevation, then it could possibly cause an SSO. See the schematic of HGL categories provided in Figure 3-2.

The deficiencies were categorized according to the method used by the 2012 CWS Durham basin collection model calibration. Table 3-4 describes each of the categories ranked by priority and shows whether or not the category leads to a recommended improvement. As shown in the table, the categories are ranked by priority based on how high the HGL rises and the significance of the HGL increase. Significant increase in HGL is defined as a condition where the slope of the HGL is greater than five times the physical pipe slope. Priorities 1 and 2 describe scenarios where overflows are very likely and immediate improvements are recommended. Overflows are less likely in priorities 3 to 5 but are still possible; therefore, an improvement is still recommended. Priorities 6 to 8 describe minor deficiencies for which CWS does not recommend an improvement.

Some pipe segments may experience a backwater condition as well as one of the deficiency categories below. Backwater generally occurs due to downstream capacity limitations, and is used as another indicator of where improvement projects may be necessary.

Table 3-4. Capacity Deficiency Rankings Based on Analysis of Peak HGL

Priority	Deficiency Category	CWS Description	HGL Freeboard*	Improve?
1	LS	HGL rises above ground with significant HGL increase (HGL elevation > ground elevation)	Less than zero feet (above ground surface)	Yes
2	LH	HGL rises above ground (HGL elevation > ground elevation)	Less than zero feet (above ground surface)	Yes
3	HS	High HGL with significant HGL increase	Between 0 and 3 feet	Yes
4	HH	High HGL	Between 0 and 3 feet	Yes
5	IS	Intermediate HGL with significant HGL increase	Between 3 and 10 feet	Yes
6	IH	Intermediate HGL	Between 3 and 10 feet	No
7	DS	Deep HGL with significant HGL increase	Greater than 10 feet	No
8	DH	Deep HGL	Greater than 10 feet	No

*Difference in elevation between ground surface and HGL.

Source: CWS *2009 Sanitary Sewer Master Plan Update.*

3.1.7 Lift Stations, Siphons, Diversions, Force Mains, and New Development Collection Systems

Pump stations were modeled to be consistent with their operating points for the existing conditions scenario. For all future scenarios, the pump stations were modeled as ideal pumps, which assumes that the pump effluent is equal to the wet well influent. CWS operates and maintains all pump stations and force mains within the Tualatin service area.

Two diversions are included in the model, and are described in Table 3-1.

Although new collection system pipes will be required to serve the Southwest Tualatin Concept Area and the Basalt Creek Planning Area, these pipes were not included in the InfoSWMM model. The actual configuration will depend on individual development plans, land use type and location, site grading, and other factors not currently known. Instead, point flows were estimated and injected into the existing system to evaluate the impacts of these new growth areas on the existing infrastructure. The conceptual sewer design layout for the Basalt Creek Planning area is shown in Figure 3-1.

3.2 Model Results

Multiple model runs were performed to identify locations where system capacity does not meet the HGL criteria. Table 3-5 shows the modeling results summary for each basin. Figures 3-3 through 3-6 show the graphical modeling results with deficiency categories for each of the land use scenarios. These figures demonstrate where SSOs are likely to occur based on the HGL criteria outlined in Table 3-2. Figure 3-7 shows the estimated remaining capacity in EDUs for each modeled pipe segment. Note that this remaining capacity is calculated by subtracting peak flow from the pipe segment's full pipe capacity. This method does not account for allowable surcharge in the sewer, and is, therefore, a conservative estimate of how much additional flow can be carried by the sewer without deficiencies.

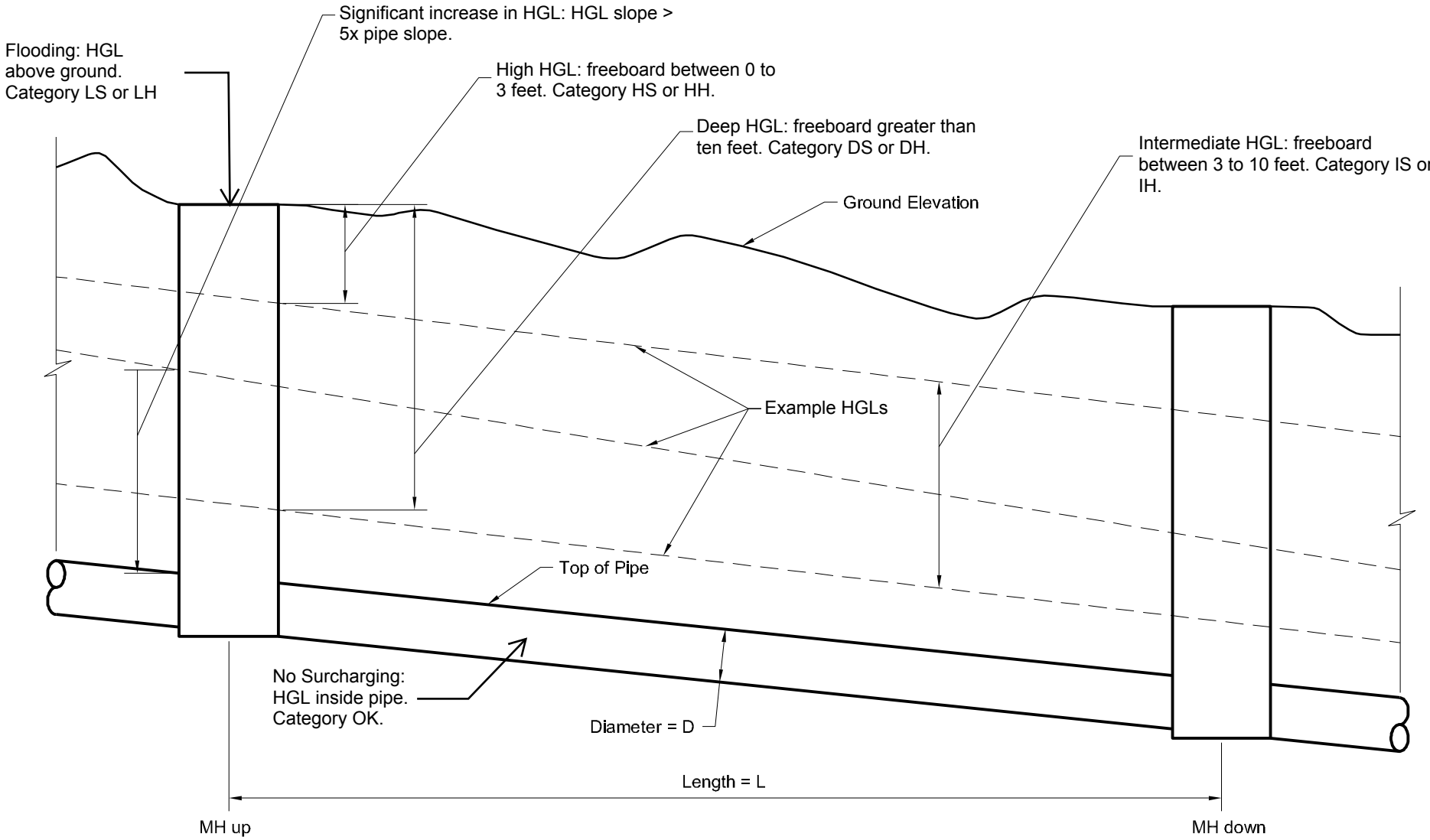
Table 3-5. Modeling Results Summary by Basin

	Existing Conditions		2025 Conditions		2035 Conditions		Buildout Conditions	
Basin Name	**Peak Flow (gpm)**	**Deficient Pipe[a] (ft) *[%]***	**Peak Flow (gpm)**	**Deficient Pipe[a] (ft) *[%]***	**Peak Flow (gpm)**	**Deficient Pipe[a] (ft) *[%]***	**Peak Flow (gpm)**	**Deficient Pipe[a] (ft) *[%]***
Upper Tualatin[b]	620	-	640	-	660	-	680	-
Cipole/Bluff	2,300	-	2,750	-	3,190	2,865 *[3.4%]*	3,520	4,455 *[5.3%]*
Sherwood	860	-	970	900 *[1.9%]*	1,060	2,715 *[5.6%]*	1,090	4,150 *[8.6%]*
Teton	970	565 *[1.2%]*	1,110	1,180 *[2.5%]*	1,180	1,670 *[3.5%]*	1,230	1,815 *[3.8%]*
Tualatin Reservoir	1,740	1,895 *[2.3%]*	3,400	7,350 *[8.9%]*	3,490	9,680 *[11.8%]*	3,530	11,605 *[14.1%]*
Martinazzi	1,170	-	1,490	6,245 *[9.9%]*	1,590	7,220 *[11.5%]*	1,610	8,050 *[12.8%]*
Nyberg	1,820	-	1,810	-	1,800	-	1,970	2,535 *[3.3%]*
Durham	470	-	540	-	630	-	680	-

[a] As explained in Section 3.1.6, not all deficiencies warrant improvement projects. See Section 4 for recommended projects.

[b] Does not include flows in Upper Tualatin Interceptor from sources outside Tualatin and does not include any deficiencies associated with the Upper Tualatin Interceptor.

Refer to Appendix D detailed hydraulic modeling results showing junction freeboard, conduit peak flows, remaining capacities, and HGL categories for each model scenario.



Note: See Table 3-4 for HGL Category Descriptions and Priority Rankings.

FIGURE 3-2

SCHEMATIC ILLUSTRATION OF THE HYDRAULIC GRADE LINE CATEGORIES

SEWER MASTER PLAN

CITY OF TUALATIN

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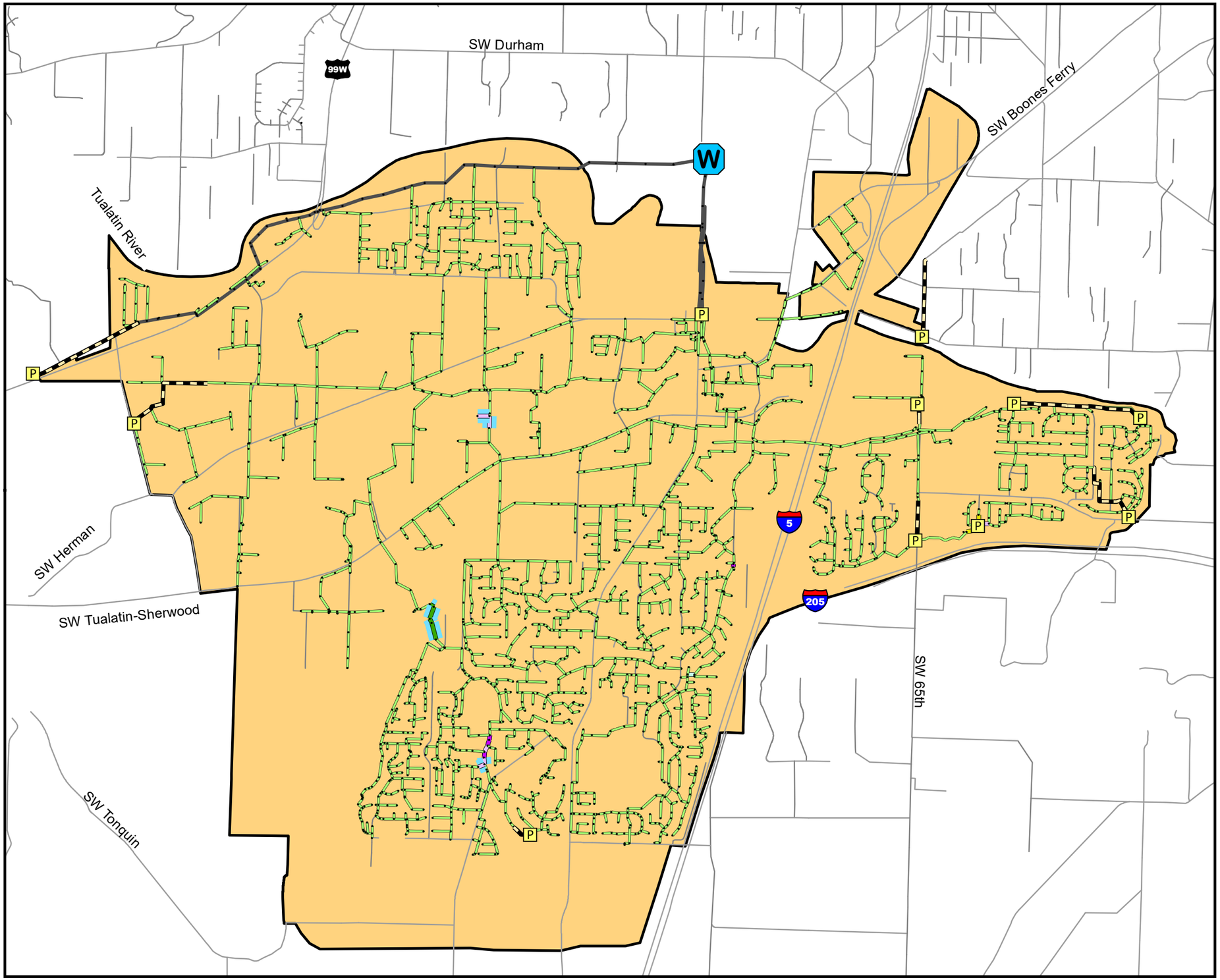

LEGEND

- W Durham AWWTF
- P Pump Station
- UGB
- CWS Interceptor (Not Evaluated in this Plan)
- Force Main

Category	Priority	Description
LS	1	Flooding, steep HGL
LH	2	Flooding
HS	3	0-3' freeboard, steep HGL
HH	4	0-3' freeboard
IS	5	3-10' freeboard, steep HGL
IH	6	3-10' freeboard
DS	7	10'+ freeboard, steep HGL
DH	8	10'+ freeboard
OK	9	No surcharging
Backwater	N/A	Capacity limited downstream

Note: This study recommends upgrades for defiencies of priorities 1, 2, or 3. Backwater condition is not prioritized but can be another indication of where upgrades are needed.

N

0 1,100 2,200 4,400 Feet

FIGURE 3-3
Existing System Deficiencies

City of Tualatin Sewer Master Plan

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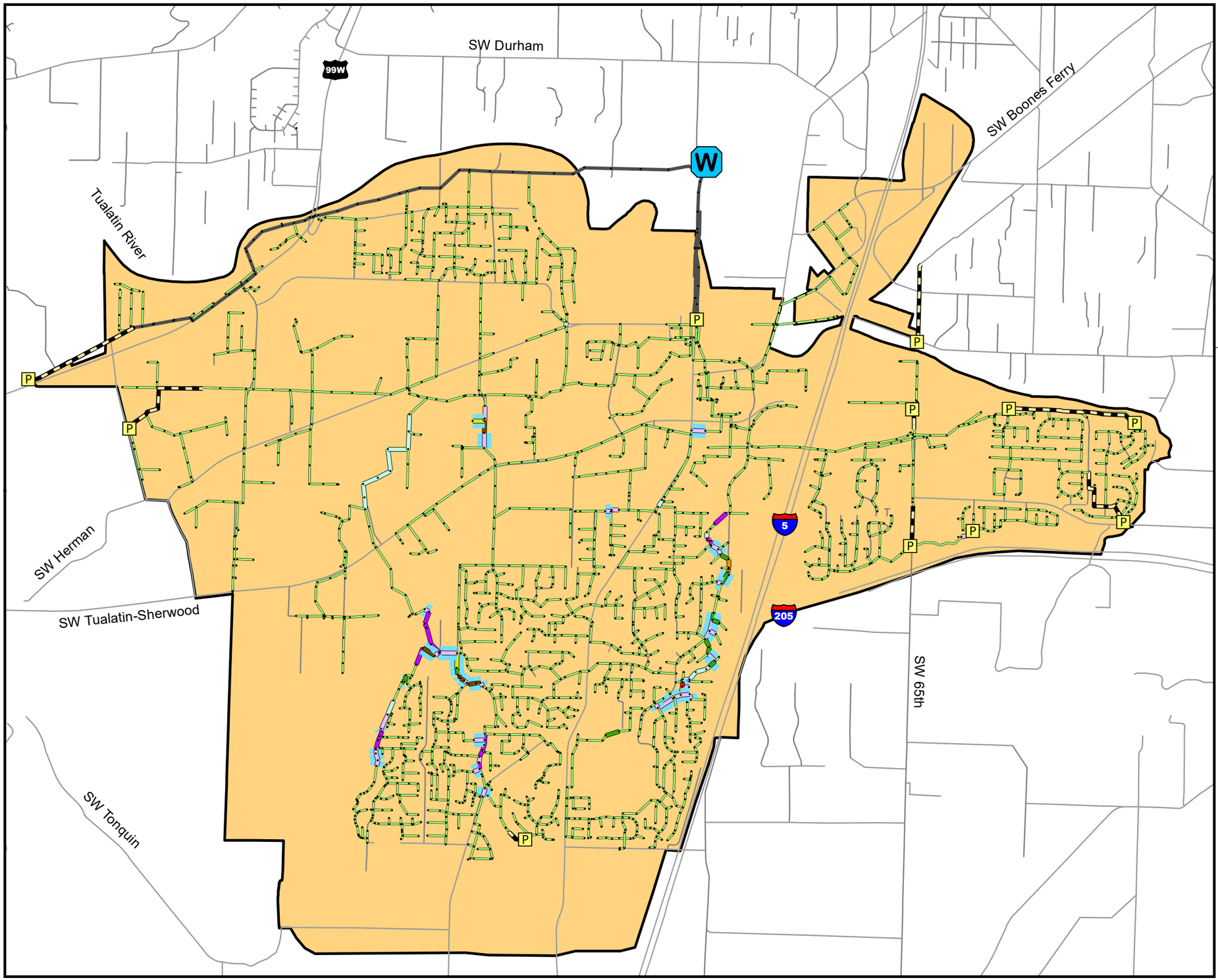

LEGEND

- W Durham AWWTF
- P Pump Station
- UGB
- CWS Interceptor (Not Evaluated in this Plan)
- Force Main

Category	Priority	Description
LS	1	Flooding, steep HGL
LH	2	Flooding
HS	3	0-3' freeboard, steep HGL
HH	4	0-3' freeboard
IS	5	3-10' freeboard, steep HGL
IH	6	3-10' freeboard
DS	7	10'+ freeboard, steep HGL
DH	8	10'+ freeboard
OK	9	No surcharging
Backwater	N/A	Capacity limited downstream

Note: This study recommends upgrades for deficiencies of priorities 1, 2, or 3. Backwater condition is not prioritized but can be another indication of where upgrades are needed.

N

0 1,100 2,200 4,400 Feet

FIGURE 3-4
2025 System Deficiencies

City of Tualatin Sewer Master Plan

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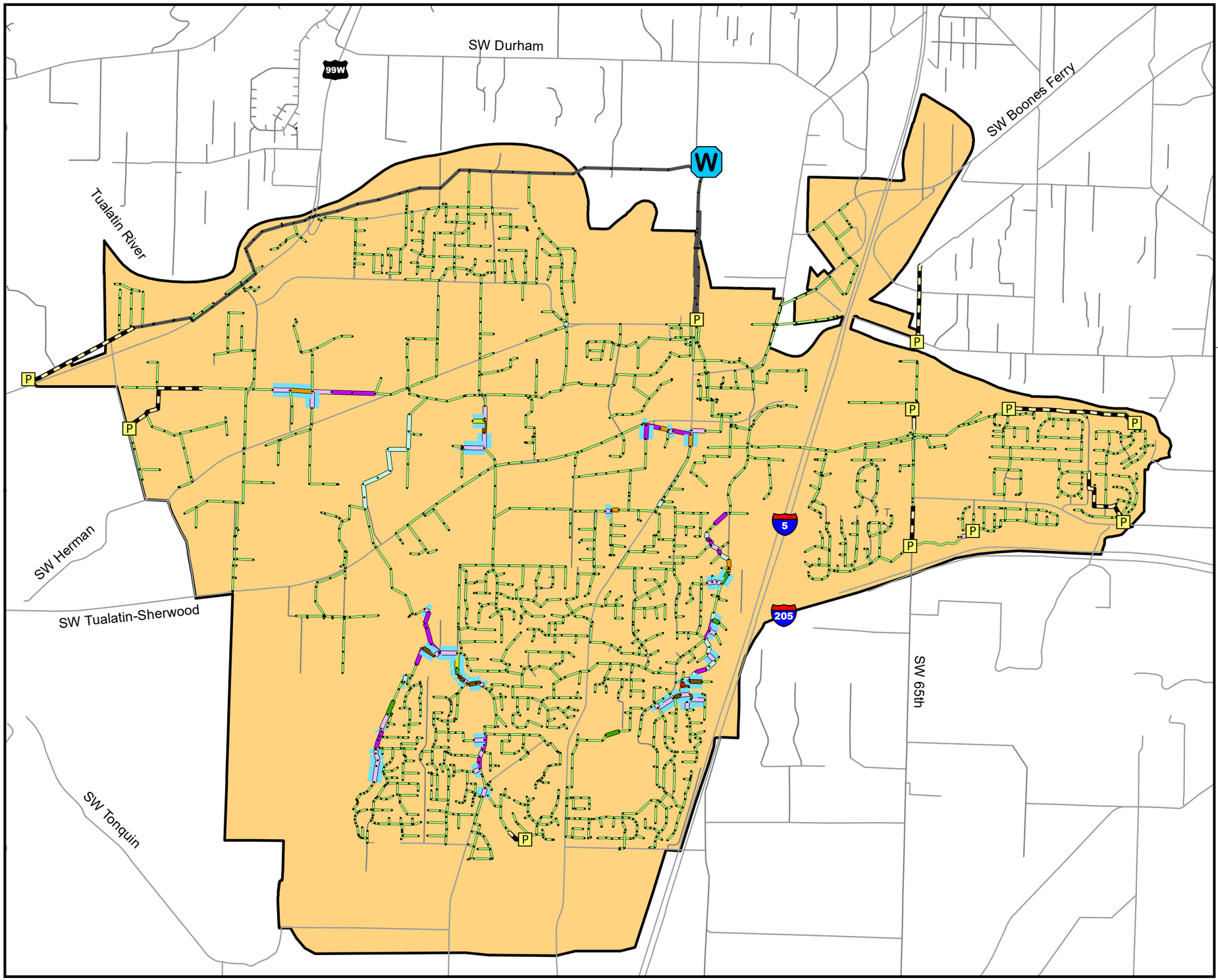

LEGEND

- W Durham AWWTF
- P Pump Station
- UGB
- CWS Interceptor (Not Evaluated in this Plan)
- Force Main

Category	Priority	Description
LS	1	Flooding, steep HGL
LH	2	Flooding
HS	3	0-3' freeboard, steep HGL
HH	4	0-3' freeboard
IS	5	3-10' freeboard, steep HGL
IH	6	3-10' freeboard
DS	7	10'+ freeboard, steep HGL
DH	8	10'+ freeboard
OK	9	No surcharging
Backwater	N/A	Capacity limited downstream

Note: This study recommends upgrades for deficiencies of priorities 1, 2, or 3. Backwater condition is not prioritized but can be another indication of where upgrades are needed.

N

0 1,100 2,200 4,400 Feet

FIGURE 3-5
2035 System Deficiencies

City of Tualatin Sewer Master Plan

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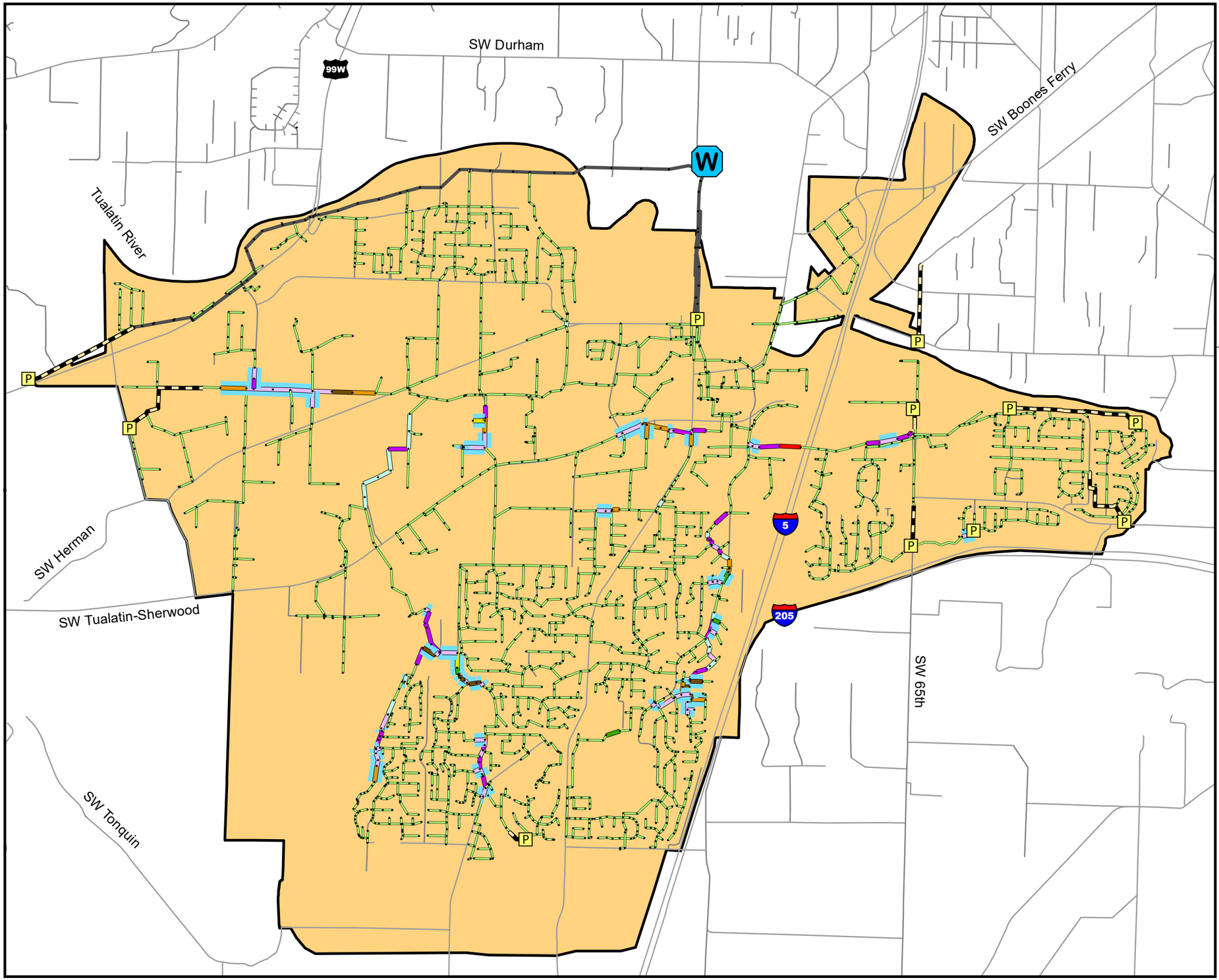

LEGEND

- W Durham AWWTF
- P Pump Station
- UGB
- CWS Interceptor (Not Evaluated in this Plan)
- Force Main

Category	Priority	Description
LS	1	Flooding, steep HGL
LH	2	Flooding
HS	3	0-3' freeboard, steep HGL
HH	4	0-3' freeboard
IS	5	3-10' freeboard, steep HGL
IH	6	3-10' freeboard
DS	7	10'+ freeboard, steep HGL
DH	8	10'+ freeboard
OK	9	No surcharging
Backwater	N/A	Capacity limited downstream

Note: This study recommends upgrades for deficiencies of priorities 1, 2, or 3. Backwater condition is not prioritized but can be another indication of where upgrades are needed.

N

0 1,100 2,200 4,400 Feet

FIGURE 3-6
Buildout System Deficiencies

City of Tualatin Sewer Master Plan

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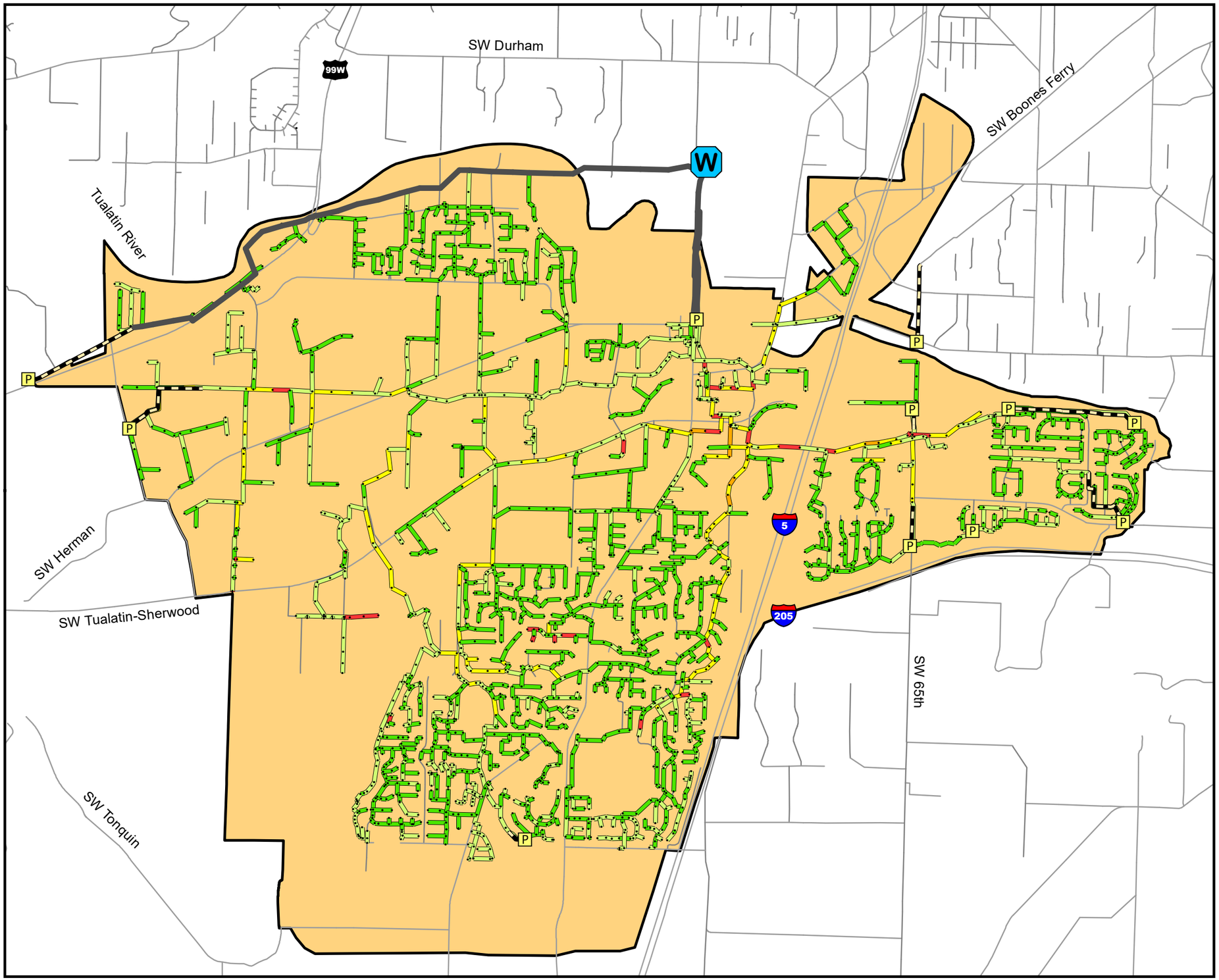

LEGEND

- Durham AWWTF
- Pump Station
- UGB

Remaining Capacity:

- 0 EDUs
- ≤100 EDUs
- ≤ 800 EDUs
- ≤ 2,000 EDUs
- > 2,000 EDUs
- CWS Interceptor (Not Evaluated in this Plan)
- Force Main

Note: This plan assumes one EDU is equivalent to 400 gallons per day peak flow.

N

0 1,100 2,200 4,400 Feet

FIGURE 3-7
Modeled Remaining Capacity
City of Tualatin Sewer Master Plan

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SECTION 4

Recommended Projects and Capital Improvement Plan

4.1 Development of Sanitary Sewer Projects

Based on the deficiency rankings and modeling results discussed in Section 3, Jacobs developed a list of pipeline replacement projects to address existing collection system capacity deficiencies, maintenance, and future capacity needs. The hydraulic model was used to size the pipelines for the proposed improvements. Extra model runs were performed to verify the improvements satisfy the hydraulic requirements.

It was assumed for sizing analysis that sewers would be replaced at existing grades and alignment. In some shallow sewers, increasing the pipe diameter can lead to issues with minimum cover restrictions. It is recommended that Class V restrained concrete pipe be used instead of PVC where minimum cover requirements are not met. These instances are noted in the project description and cost estimates.

The projects discussed in this section are summarized in Table 4-1. The project locations within the existing Tualatin UGB are shown in Figure 4-1 (figures provided at the end of this section). Figures 4-2 through 4-10 show project cut sheets containing detailed information for each pipe upgrade project.

System development charges (SDCs) are fees that are collected by the City when new development occurs. These funds can then be used to fund projects that construct new or improve upon existing utilities if the project is driven by new development. Because many of the projects recommended in this plan are driven by future development, they may be eligible for SDC funding/reimbursement. Projects that are SDC eligible are noted in the project descriptions and cost estimate tables.

Due to topography and slopes of existing and improved pipes, improvement projects to address capacity deficiencies occasionally leave existing downstream pipe segments of smaller diameter than the improved segments. Standard engineering practice is that downstream pipe segments do not decrease in size. In such cases an alternatives analysis assessing condition, maintenance, cost, risk, and future flows should be conducted to determine whether the smaller diameter pipes should be upsized as part of the project.Projects where this occurs are documented to show which pipes are hydraulically deficient and which pipes require upsizing only for size consistency. In the project descriptions, this is done with the subheadings “Deficient Pipes” and “Downstream Pipes.” Deficient and Downstream Pipes are also distinguished by a different color in project cut sheets and the detailed cost estimates in Appendix A.

Table 4-1. List of Recommended Improvements

Project No.	Project Name	Project Driving Force	Recommended Action	Responsible Funding Party	Remaining Capacity (EDUs)	Deficiency Priority	Length (feet)	Existing Pipe Size (inches)	New Pipe Size (inches)	Project Figure No.
SS-1	Basalt Creek Pump Stations and Force Mains	Basalt Creek development	New Pump Stations	CWS	N/A	N/A	N/A	N/A	N/A	4-1
SS-2	Basalt Creek Gravity Sewer	Basalt Creek development	New Pipe	Developer	N/A	N/A	34,250	N/A	8	4-1
SS-3	SW Tonquin Loop Sewer	Northwest Basalt Creek development	New Pipe	Tualatin/Developer	N/A	N/A	2,170	N/A	10	4-1
SS-4	Southwest Tualatin Pump Station and Force Main	Southwest Tualatin development	New Pump Station	CWS	N/A	N/A	1,720	N/A	6	4-1
SS-5	Southwest Tualatin Gravity Sewer	Southwest Tualatin development	New Pipe	Developer	N/A	N/A	5,175	N/A	8	4-1
SS-6	North Martinazzi Trunk	Eastern Basalt Creek development + city infill	Pipe Upsize	CWS	0–50	1	3,950	10–12	15	4-2
SS-7	Tualatin Reservoir Trunk	Western Basalt Creek development	Pipe Upsize	CWS	50–100	2	4,390	10–15	24	4-3
SS-8	103rd Avenue Sewer	West-central Basalt Creek development	Pipe Upsize	CWS/Tualatin	0–50	3	4,230	8	15	4-4
SS-9	Fuller Drive Sewer	Western Basalt Creek development	Pipe Upsize	Tualatin	150–200	3	3,230	10	12	4-5
SS-10	Teton Trunk	Future industrial flows	Pipe Upsize	CWS/Tualatin	0–50	2	1,235	10–12	15	4-6
SS-11	South Martinazzi Trunk	Eastern Basalt Creek development	Pipe Upsize	CWS	200–300	3	3,450	12	15	4-7
SS-12	Sherwood Trunk	City infill + future industrial flows	Pipe Upsize	CWS/Tualatin	400	3	2,270	10–12	15	4-8
SS-13	Cipole/Bluff Trunk	City infill + future industrial flows	Flow Monitoring	CWS/Tualatin	400	3	2,265	15	18	4-9
SS-14	Dakota & Mandon Lining	High I/I levels	Flow Monitoring + Sewer Lining	CWS/Tualatin	600	N/A	10,160	8–12	N/A	4-10
SS-15	Nyberg Trunk	Frequent surcharge location	Flow Monitoring	CWS/Tualatin	0-50	N/A	3,210	18	N/A	4-11

N/A = not applicable.

4.2 Description of Recommended Projects

Figures 4-2 through 4-12 show detailed information for each project identified in this report. This includes a description of the deficiency, remaining capacity, project area, sewer asset IDs, recommended sizes, design flows, and schedule.

4.2.1 SS-1: Basalt Creek Pump Stations and Force Mains

The conceptual sanitary sewer design for Basalt Creek includes the construction of six new pump stations, each with 6-inch force mains. One pump station is in the Wilsonville portion of the planning area and will be constructed by Wilsonville. CWS will own and operate the five remaining pump stations in the planning area, and will also be responsible for construction costs. Because these projects are entirely driven by new development, they are eligible for SDC reimbursement. The locations of all six pump stations are shown in Figure 3-1, and are described below:

- Greenhill Pump Station—Near Boones Ferry and SW Greenhill in the east-central portion of the planning area. The 6-inch force main runs roughly 4,000 feet north and discharges into existing manhole SSF-1408.
- Grahams Ferry Pump Station—Near Grahams Ferry and SW Tonquin in the west-central area of the planning area. The 6-inch force main runs 520 feet north and discharges into an 8-inch line to be installed by developers.
- Pump Station 3—In the Wilsonville portion of the Basalt Creek Planning Area near Grahams Ferry and SW Clutter Road in the southern portion of the planning area. Flows from this area connect to the City of Wilsonville sanitary sewer.
- Pump Station 4—Near SW Waldo and SW Tonquin in the northwest corner of the planning area. The 6-inch force main runs 1,970 feet north and discharges into existing manhole SSF-2261.
- Basalt Creek Pump Station—In between Grahams Ferry and Boones Ferry in the central portion of the planning area. The short 6-inch force main runs 260 feet east and discharges into an 8-inch line to be installed by developers.
- Pump Station 6—Near SW Norwood and I-5 in the northeast corner of the planning area. The 6-inch force main runs 440 feet north and discharges into existing manhole SSF-0017.

4.2.2 SS-2: Basalt Creek Gravity Sewer

The *Basalt Creek Conceptual Plan* includes approximately 34,250 feet of 8-inch gravity pipe within the planning area. These projects will be funded by developers, and scheduling will be coordinated with the City and CWS. It is expected that the residential portion of the planning area will develop within the next 10 years, while the commercial and industrial portions may develop in the next 20 years. More information on the conceptual sewer layout can be found in the *Basalt Creek Conceptual Plan* as well as Section 3.1.4.2.

4.2.3 SS-3: SW Tonquin Loop Sewer

Most of the sanitary sewer in the Basalt Creek Planning Area will be 8-inch pipes installed by developers. The exception is a 2,170-foot section of 10-inch pipe, which will be SDC reimbursable by the City. This pipe is directly upstream of Pump Station 4. The construction timeline of this pipe depends on both the construction of this pump station and development progress in the western portion of the planning area. Because this project is entirely driven by new development, it is eligible for SDC reimbursement.

4.2.4 SS-4: Southwest Tualatin Pump Station and Force Main

The proposed conceptual sanitary sewer design for the Southwest Tualatin Concept Area includes the construction of a new pump station with a 6-inch force main. The pump station serves the central area of the concept area, where the terrain is mostly bowl-shaped and includes existing gravel pits. The proposed force main runs approximately 1,720 feet north and discharges into a proposed 8-inch gravity line, which will drain to the existing sanitary sewer along SW 124th Avenue. CWS will fund the construction for the pump station and force main and will assume ownership and maintenance responsibility. Because this project is entirely driven by new development, it is eligible for SDC reimbursement.

4.2.5 SS-5: Southwest Tualatin Gravity Sewer

The proposed conceptual sewer layout for the Southwest Tualatin Concept Area also includes three 8-inch sewer lines to serve the area. It is expected that all gravity sewer in the planning area will be funded by developers and scheduling will be coordinated with the City and CWS. The southern region of the area is serviced by a proposed gravity line that will drain into the Basalt Creek Pump Station 4. The northeastern portion is serviced by a proposed gravity line that connects to existing sewer along SW Itel Street. The northwestern sewer section connects to existing sewer along SW 124th Avenue, and receives flow from the surrounding area as well as the proposed Southwest Tualatin Pump Station.

4.2.6 SS-6: North Martinazzi Trunk

4.2.6.1 Deficient Pipes

The Martinazzi Trunk will need to undergo several phases of improvements to handle the flows associated with City infill and the development of Basalt Creek. All-told, around 5,710 feet of pipe will need to be upgraded from existing 10- or 12-inch pipes to 15-inch pipes. The north section, from SW Sagert Street to SW Chelan Street, is the most critical due to capacity limitations and potential overflow locations. In the GIS database, this project begins at SSL-00540 and extends south to SSL-00448, with a total pipe length of 2,265 feet. This phase of the Martinazzi Trunk project needs to be completed before any significant development occurs in the eastern portions of the Basalt Creek Planning Area. Estimated remaining capacity in the sewer currently is less than 50 EDUs. Because this project is entirely driven by new development, it is eligible for SDC reimbursement.

Because this project is upgrading pipes from 12-inch to 15-inch diameters, CWS will be responsible for the project funding. There is only a 30-foot run of 10-inch pipe for which the City will partially fund the upgrade cost. Constructability issues related with this project include shallow pipe segments, neighborhood disruption, traffic disruption, and neighborhood disruption.

4.2.6.2 Downstream Pipes

1,690 feet of 10-inch pipe directly downstream of this project will also need to be upsized to 15 inches to adhere to design standards. This section of pipe does not need to be upsized based on hydraulic requirements alone. This section of pipe begins at SSL-006005 and ends at SSL-00599. This adds roughly $500,000 to the total project cost.

4.2.7 SS-7: Tualatin Reservoir Trunk

4.2.7.1 Deficient Pipes

A section of the Tualatin Reservoir Trunk is currently almost at capacity and will receive flows from developments in the western and central areas of the Basalt Creek Planning Area. This sewer runs along the north side of the Tualatin Reservoir near SW 108th Avenue and SW Industrial Way. Due to capacity limitations and shallow manholes, SSOs are likely unless the sewer diameter is increased from 15 inches

to 24 inches before these areas are developed. Estimated remaining capacity in this sewer is between 50 and 100 EDUs. This project spans from SSL-01214 to SSL-01625 in the GIS database. Because this project is entirely driven by new development, it is eligible for SDC reimbursement.

All but roughly 370 feet of this sewer is already 15-inch diameter, so the cost of this project will be mostly funded by CWS. The City will pay a portion of the upgrade cost for the 370 feet of 10-inch pipe. This project includes a section of pipe that crosses under a railroad.

4.2.7.2 Downstream Pipes

2,730 feet of 15-inch pipe directly downstream of this project will also need to be upsized to 24 inches to adhere to design standards. This section of pipe does not need to be upsized based on hydraulic requirements alone. This section of pipe begins at SSL-01622 and ends at SSL-02260. This adds roughly $1,000,000 to the total project cost.

4.2.8 SS-8: 103rd Avenue Sewer

4.2.8.1 Deficient Pipes

The existing 8-inch sewer running under this stretch of SW 103rd Avenue is currently at capacity and will receive flow from Pump Station 2 in the Basalt Creek Planning Area, which serves the area expected to develop along SW Grahams Ferry Road. While there is no remaining capacity in the pipes, there is a large amount of freeboard available for surcharging without SSOs. This roughly 1,300 feet section of 8-inch sewer will need to be upgraded to 15 inches to prevent overflows before the previously described area of Basalt Creek is significantly developed. This project runs from GIS sewer IDs SSL-01927 to SSL-01361. Because this project is entirely driven by new development, it is eligible for SDC reimbursement.

Because this project upgrades 8-inch pipes to 15-inch pipes, the City will fund the cost to upsize to 12-inch pipes and CWS will fund the remaining project cost. Sewer work in this area will potentially be disruptive to the surrounding neighborhood.

4.2.8.2 Downstream Pipes

2,920 feet of 10- and 12-inch pipe directly downstream of this project will also need to be upsized to 15 inches to adhere to design standards. This section of pipe does not need to be upsized based on hydraulic requirements alone. This section of pipe begins at SSL-01609 and ends at SSL-01215. This adds roughly $700,000 to the total project cost.

4.2.9 SS-9: Fuller Drive Sewer

4.2.9.1 Deficient Pipes

This 1,500-foot section of the Fuller Drive Sewer is currently near capacity and will receive flow from the western and central portions of the Basalt Creek Planning Area. The estimated remaining capacity in the 10-inch pipes is currently around 200 EDUs. Though there is not much capacity in the pipes, SSOs are not likely until the western portion of Basalt Creek is nearly fully developed. Before that level of development is reached, this sewer should be upsized to 12-inch diameter. This project spans from SSL-01690 to SSL-01517 in the GIS database. Because this project is entirely driven by new development, it is eligible for SDC reimbursement.

This project upgrades 10-inch pipes to 12-inch, so it is too small to receive CWS funding. This project will be funded entirely by the City. There are no expected constructability issues associated with this project.

4.2.9.2 Downstream Pipes

1,710 feet of 10-inch pipe directly downstream of this project will also need to be upsized to 12 inches to adhere to design standards. This section of pipe does not need to be upsized based on hydraulic

requirements alone. This section of pipe begins at SSL-01518 and ends at SSL-01481. This adds roughly $500,000 to the total project cost.

4.2.10 SS-10: Teton Trunk

The sewer under SW Teton Avenue between Manhasset Drive and Spokane Court is currently at capacity and is expected to see increasing flows from Cal Weld, a wet industry identified in Table 2-10. It is estimated that flows will become critical in 10 to 15 years or sooner if any other industries tie into this sewer before then. This roughly 1,250-foot project will upsize the existing sewer to 15-inch-diameter pipes to prevent SSOs. This project begins at GIS sewer ID SSL-02383 and ends after SSL-01921.

This project upgrades a combination of 10-inch and 12-inch pipes to 15-inch pipes, so the City will fund the cost to upsize to 12-inch pipes and CWS will fund the remaining project cost. There are no expected constructability issues associated with this project.

4.2.11 SS-11: South Martinazzi Trunk

This project finishes upgrades to the Martinazzi Trunk, and picks up right where the North Phase leaves off at SW Chelan Street, running south until it almost reaches SW Dakota Drive. A few pipes along this stretch are currently near capacity, but most of the sewer is equipped to handle the current load plus around 500 EDUs. SSOs are not likely to occur here until the City experiences significant infill and the eastern portion of Basalt Creek is nearly fully developed. That level of development may be expected in about 10 to 15 years. Like the north phase, this sewer should be upsized from 12-inch to 15-inch pipes. This project phase runs from GIS sewer IDs SSL-00678 to SSL-00449. Because this project is entirely driven by new development, it is eligible for SDC reimbursement.

This project phase upgrades 12-inch pipes to 15-inch pipes, so CWS will be solely responsible for project funding. Constructability factors associated with this project include shallow pipe segments and some traffic disruption.

4.2.12 SS-12: Sherwood Trunk

4.2.12.1 Deficient Pipes

The Sherwood Trunk between SW 89th Avenue and SW Tonka Street is currently near capacity and is expected to experience steady flow increases associated with City infill and increased wet industry flows in the Teton basin. The sewer has capacity to serve current flows and accommodate around 400 future EDUs. The future planning areas do not have a strong effect on this sewer, and a deep HGL means that SSOs are not likely for another 10 to 15 years. It is recommended that before 2030 this sewer is upsized from 10-inch and 12-inch diameters to 15-inch diameter. This project runs from GIS sewer ID SSL-00212 to SSL-01573. Because this project is entirely driven by new development, it is eligible for SDC reimbursement.

For the 10-inch pipes that will be upsized to 15-inch pipes, the City will fund the cost to upsize to 12-inch pipes and CWS will fund the remaining project cost. This project involves several shallow pipe segments, a railroad crossing, and will disrupt traffic.

4.2.12.2 Downstream Pipes

320 feet of 12-inch pipe directly downstream of this project will also need to be upsized to 15 inches to adhere to design standards. This section of pipe does not need to be upsized based on hydraulic requirements alone. This section of pipe is SSL-00204 in the GIS database. This adds roughly $100,000 to the total project cost.

4.2.13 SS-13: Cipole/Bluff Trunk

This sewer currently has capacity for existing flows and can accommodate flow from roughly 500 future EDUs. When this level of development occurs in the west portion of the City, the sewer will experience a hydraulic backup and surcharged manholes, but there is little risk of overflows occurring because the sewer is sufficiently deep. Increasing the diameter of five 15-inch-diameter pipes to 18 inches would relieve the backup, but this would be very difficult because the sewer runs under a sensitive wetlands area. There are no clear alternative routes that would avoid the wetlands area. It is recommended that the City monitor development levels in the area and conduct flow monitoring studies before 2035 to verify if disturbing the wetland area is justified. If it is decided to upgrade the trunk, the project will be SDC reimbursable because it is driven by new development.

4.2.14 SS-14: Dakota & Mandon Sewer Lining

Based on conversations with City of Tualatin staff, this area was identified as having high levels of I/I. Reducing I/I by lining the sewer can free up a significant amount of capacity in downstream pipes. It is recommended that flow monitoring be conducted in the project area, and based on the results of that study the problematic pipes be lined using the cured-in-place piping (CIPP) technique. Manholes experiencing I/I should also receive a coat of cementitious lining. There are no construability issues associated with this project.

4.2.15 Non-site-specific Projects

Effective management of sanitary sewer collection system requires an ongoing emphasis on data collection, investigative studies, and proper maintenance of buried pipes. In addition to the projects recommended to prevent capacity deficiencies, this master plan recommends that the City allocate funds for these types of projects. This includes flow monitoring studies during dry and wet weather periods, CCTV investigations of buried pipe, and general pipe maintenance and cleaning. Specifically, the City should conduct city-wide flow monitoring within the next ten years so that future sewer models can be built with more recent and reliable data. Funding for these projects is shown in the capital improvement plan schedule (Table 4-4 in Section 4.4). It should be noted that CWS may provide funding for flow monitoring as part of their regional responsibility.

4.2.16 SS-15: Nyberg Trunk Investigation

The City has identified the Nyberg Trunk as a source of concern for potential SSOs. Although the sanitary model did not identify the trunk as deficient for existing or future conditions (excluding buildout), a cursory review of capacity and expected flow was performed to assess the trunk. The Nyberg Trunk receives flow from five pump stations, so a reasonable worst-case scenario would be to assume that all five pump stations run simultaneously and drain into the trunk. The combined flow from all five pump stations operating at their firm capacity is 1,710 gpm. Most of the Nyberg Trunk sewer has capacity for over 2,000 gpm, but a few short pipe segments do have a capacity lower than 1,710 gpm. The lowest capacity for a single sewer segment is 1,260 gpm. This means that the Nyberg Trunk may experience periodic surcharging during high-flow conditions. Figure 4-11 shows the modeled HGL profile for the Nyberg Trunk. The profile shows near-surcharge conditions at manhole SSF-0887, but no immediate risk of SSOs in the area. City maintenance staff have identified possible sewer defects in this area that would not be captured in the model, which may be causing more surcharging than the model shows. Based on this review, this plan recommends that the City conduct flow monitoring between manholes SSF-1093 and SSF-0884 to determine if a future sewer improvement is necessary. The cost for this flow study is included in the capital improvement plan schedule (Table 4-4 in Section 4.4) under the “Data Collection” line item.

4.3 Cost Estimates

4.3.1 Proposed Improvement Alternatives Cost Estimates

Order-of-magnitude cost estimates were developed for proposed improvement alternatives as summarized in Table 4-2. Appendix A contains detailed cost estimate calculations for each project and the cost basis used in this report.

There is no cost estimate for the Nyberg Trunk Investigation because a pipe upsize project for this area is not recommended in this report. Instead, it is recommended that the City conduct flow monitoring to see how much surcharging occurs in the sewer. It is expected that CWS will fund the flow monitoring study.

A constructability factor is included to capture any difficulties associated with a certain project. Examples of this include pipe segments where minimum cover is not met, railroad crossings, or heavily trafficked/sensitive areas. Below is a breakdown of the logic behind the constructability factor:

- Normal construction equals 1.0
- Heavily trafficked street adds 0.25
- Neighborhood disruption adds 0.25
- Shallow pipe segments add 0.35
- Railroad crossings adds 0.4
- Environmentally sensitive area adds 1.0

Table 4-2. Cost Estimates for Proposed Tualatin Collection System Improvements

Project No.	Project Name	Basin	Project Length	Constructability Factor	Total Project Cost[a]	Cost Funded by Tualatin	SDC Eligibility
SS-1	Basalt Creek Pump Stations and Force Mains	Basalt Creek	N/A	N/A	$4,160,000	-	100%
SS-2	Basalt Creek Gravity Sewer	Basalt Creek	34,250	N/A	$7,676,000	-	N/A
SS-3	SW Tonquin Loop Sewer	Basalt Creek	2,170	N/A	$606,000	$54,000	100%
SS-4	SW Tualatin Pump Station and Force Main	Tualatin Reservoir	1,720	N/A	$734,000	-	100%
SS-5	Southwest Tualatin Gravity Sewer	Tualatin Reservoir	5,175	N/A	$836,000	-	N/A
SS-6	North Martinazzi Trunk	Martinazzi	3,950	1.85	$2,959,000	$1,202,000	100%
SS-7	Tualatin Reservoir Trunk	Tualatin Reservoir	4,390	1.4	$3,354,000	$212,000	100%
SS-8	103rd Avenue Sewer	Tualatin Reservoir	4,230	1.25	$1,928,000	$1,157,000	100%
SS-9	Fuller Drive Sewer	Tualatin Reservoir	3,230	1.0	$1,477,000	$1,477,000	100%
SS-10	Teton Trunk	Teton	1,235	1.0	$398,000	$197,000	0%
SS-11	South Martinazzi Trunk	Martinazzi	3,450	1.6	$2,592,000	-	100%
SS-12	Sherwood Trunk	Sherwood	2,270	2.0	$1,550,000	$725,000	100%
SS-13	Cipole/Bluff Trunk[c]	Cipole/Bluff	2,265	2.25	$2,246,000	-	100%
SS-14	Dakota & Mandon Sewer Lining	Martinazzi	10,160	1.0	$1,265,000	$635,000	0%
	Totals	-	38,850	-	$22,535,000	$5,659,000	-

[a] All costs shown are in 2017 dollars. Estimates are AACE Class 5: accuracy range -50% to +100%.

[c] The Cipole/Bluff Trunk improvement cost is shown here, but this report recommends that the City perform investigative studies prior to 2035 to determine if the project warrants disturbing sensitive environmental areas. This is reflected in the CIP.

4.3.2 Unit Costs

Unit costs for new pipe used in this report are based off bid tabulations Jacobs has collected and analyzed within the past year. CIPP lining unit costs were taken from the *Survey of Bid Prices for Trenchless Technology Methods* (Trenchless Technology Center of Louisiana Tech University, 2002), and adjusted for inflation. Unit costs used in this study are shown in Table 4-3.

Table 4-3. Unit Costs[a,b]

Pipe Diameter	0–10 Feet Deep	10–15 Feet Deep	15–20 Feet Deep
10-inch	$181.19	$258.38	$374.16
12-inch	$192.56	$277.88	$393.66
15-inch	$208.81	$294.13	$409.91
18-inch	$234.81	$320.13	$435.91
21-inch	$267.31	$352.63	$468.41
24-inch	$284.38	$369.69	$485.47

[a] Does not include engineering, administration, legal, or contingency costs.

[b] All costs shown are in 2017 dollars.

Unit costs are for pipe-in-place, including manholes and service lateral connections, but do not include engineering, administration, or legal costs. Twenty-five percent of the calculated construction cost was added to account for these items. An additional 30 percent was added as contingency funding for any unanticipated costs that may arise through the course of the project.

4.4 Capital Improvement Schedule

The objective of the capital improvement plan schedule provided in Table 4-4 is to organize the recommended capital improvement projects into a logical sequential order that allows the City to address known problems over a 20-year planning period. Schedule and project sequencing was determined based on project priority and maintaining reasonable fiscal year costs for the City.

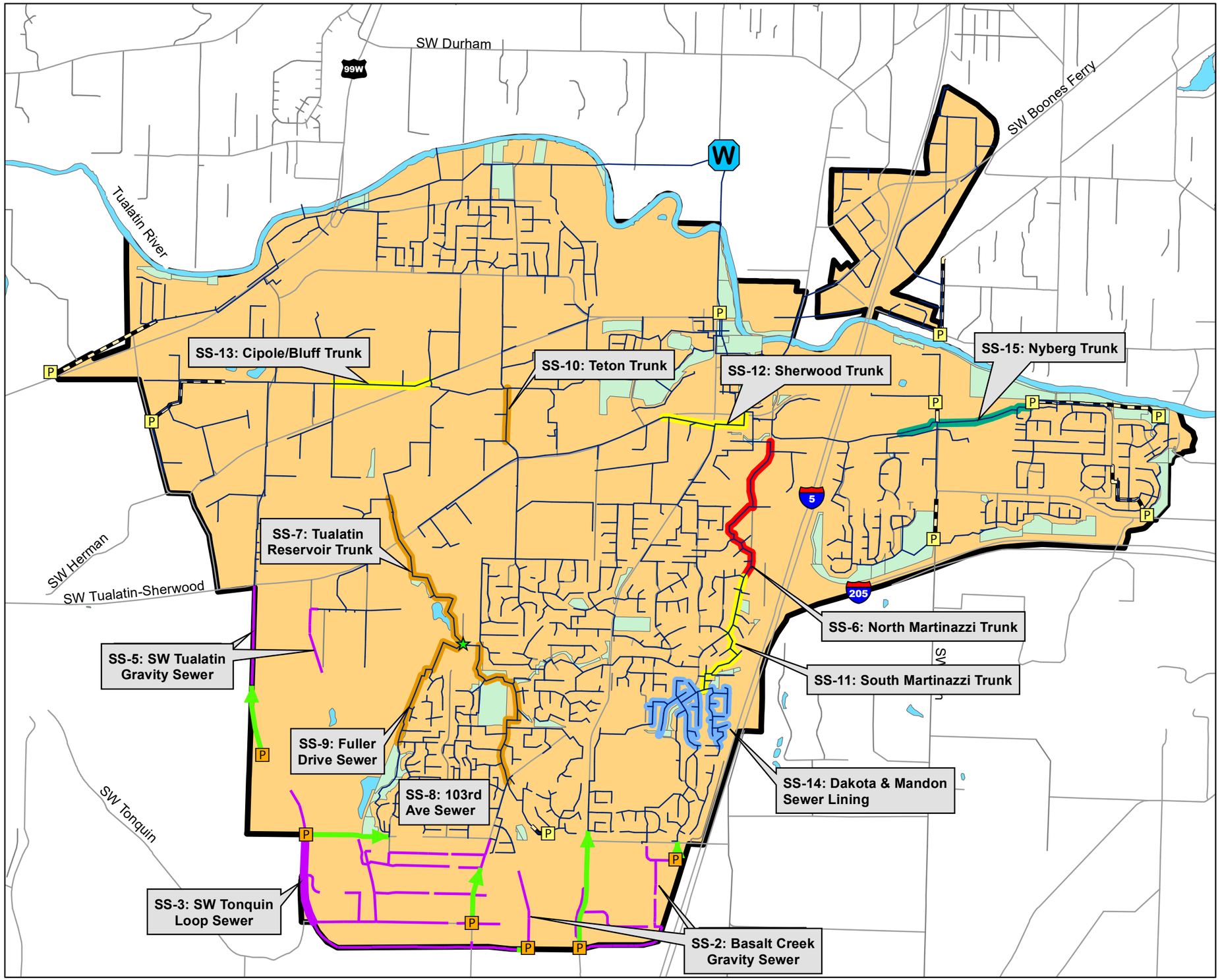
Table 4-4. Capital Improvement Plan Schedule

Project Name	Total Project Cost[a]	City of Tualatin Share[b]	2020/21	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2034/35	2035/36	2037/38	2039/40
SS-1: Basalt Creek Pump Stations and Force Mains	$4,160,000	-	*CWS*	*CWS*	*CWS*	*CWS*	*CWS*			*CWS*	*CWS*							
SS-2: Basalt Creek Gravity Sewer (Developer Funded)	$7,676,000	-																
SS-3: SW Tonquin Loop Sewer	$606,000	$54,000	$27,000	$27,000														
SS-4: SW Tualatin Pump Station and Force Main	$734,000	-						*CWS*	*CWS*									
SS-5: SW Tualatin Gravity Sewer (Developer Funded)	$836,000	-																
SS-6: North Martinazzi Trunk	$2,959,000	$1,202,000	$601,000	$601,000														
SS-7: Tualatin Reservoir Trunk	$3,354,000	$212,000			$127,200	$84,800												
SS-8: 103rd Avenue Sewer	$1,928,000	$1,157,000			$462,800	$694,200												
SS-9: Fuller Drive Sewer	$1,477,000	$1,477,000					$738,500	$738,500										
SS-10: Teton Trunk	$398,000	$197,000							$137,900	$59,100								
SS-11: South Martinazzi Trunk	$2,592,000	-						*CWS*	*CWS*	*CWS*	*CWS*							
SS-12: Sherwood Trunk	$1,550,000	$725,000								$290,000	$435,000							
SS-14: Dakota & Mandon Sewer Lining	$1,264,000	$632,000														$316,000	$316,000	
Total for Site-Specific Projects Per Fiscal Year			$628,000	$628,000	$590,000	$779,000	$738,500	$738,500	$137,900	$349,100	$435,000	$-	$-	$-	$-	$316,000	$316,000	$-
Data Collection							$100,000							$125,000				
Sanitary Master Plan												$500,000	$500,000					
Condition Assessment									$125,000	$125,000					$250,000			
Pipe Rehabilitation and Replacement									$80,000	$90,000	$100,000	$110,000	$130,000	$150,000	$170,000	$200,000	$230,000	$260,000
Total for Non-Site-Specific Projects Per Fiscal Year			$-	$-	$-	$-	$100,000	$-	$205,000	$215,000	$100,000	$610,000	$630,000	$275,000	$420,000	$200,000	$230,000	$260,000
Total Per Fiscal Year			$628,000	$628,000	$590,000	$779,000	$838,500	$738,500	$342,900	$564,100	$535,000	$610,000	$630,000	$275,000	$420,000	$516,000	$546,000	$260,000

Note: SS-13 and SS-15 are not listed in the site-specific project list because they are accounted for in the Data Collection line item as an investigative study.

[a] All costs shown are in 2017 dollars. Estimates are Association for the Advancement of Cost Engineering Class 5: accuracy range -50% to +100%.

[b] Cost share is determined based on information shown in Table 2-2. Projects that are funded by CWS or Developer are noted as such.



LEGEND

- Durham AWWTF
- Existing Pump Station
- UGB
- City Greenway
- Existing Sewer
- Existing Force Main

Sewer Upgrades:

- Near-Term (0-10 years)
- Intermediate (10-20 years)
- Long-Term (20+ years)
- Lining Project (Long-term)
- Flow Study (0-10 years)
- Indicates split between SW Fuller and Tualatin Reservoir Projects

Planning Area Projects:

- Proposed Sewer (City funded)
- Proposed Sewer (Dev. funded)
- Proposed Pump Station
- Proposed Force Main

N

0 1,100 2,200 4,400 Feet

FIGURE 4-1
Recommended Improvements
City of Tualatin Sewer Master Plan

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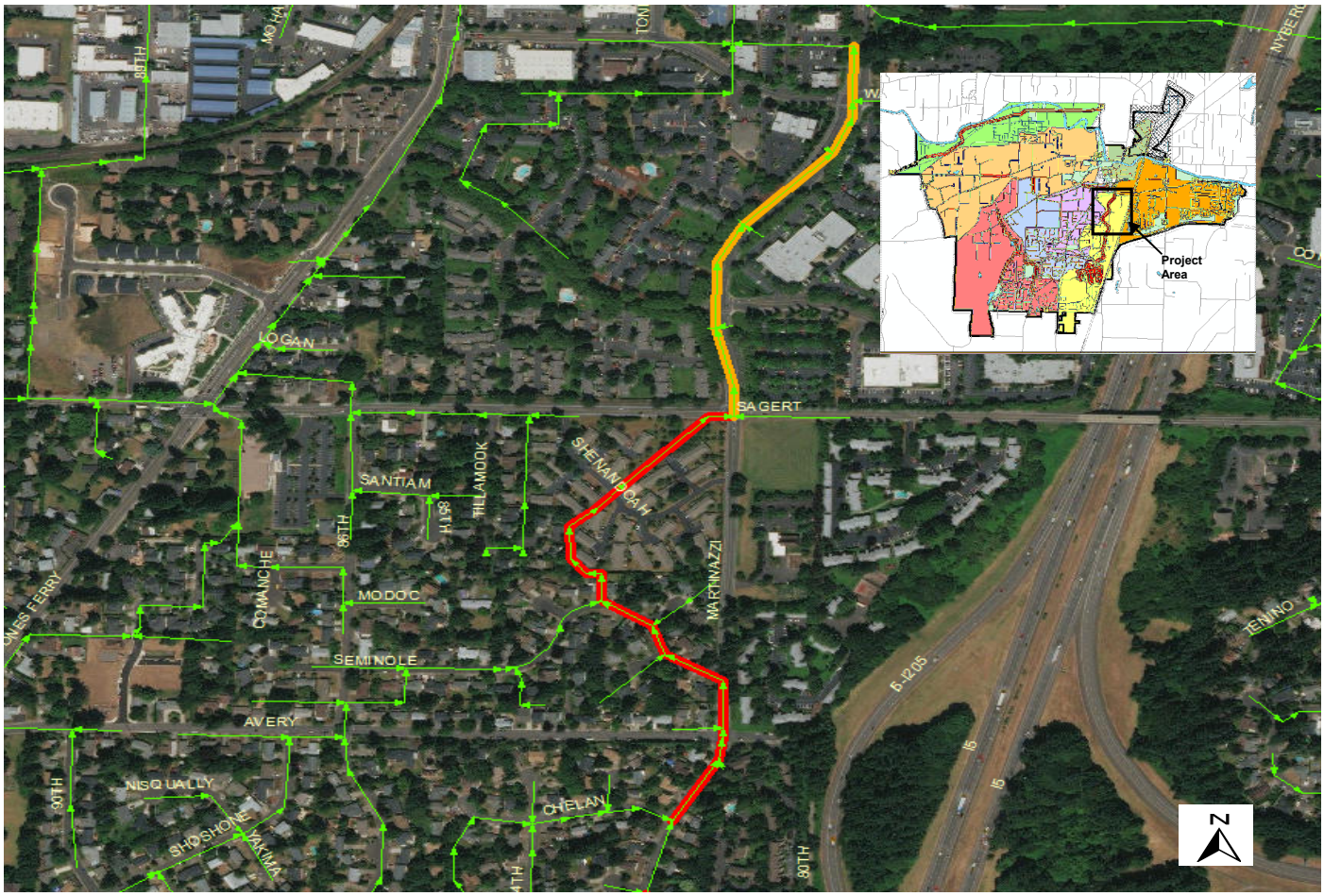


GIS ID	Existing Diameter (in)	Length (ft)	Slope	Design Capacity (gpm)	Design Diameter (in)
SSL-00448	12	297	0.016	2,800	15
SSL-00443	12	84	0.004	1,400	15
SSL-00548	10	31	0.005	1,600	15
SSL-00547	12	193	0.005	1,600	15
SSL-00551	12	227	0.005	1,600	15
SSL-00546	12	128	0.005	1,600	15
SSL-00550	12	197	0.005	1,600	15
SSL-00544	12	108	0.005	1,600	15
SSL-00552	12	51	0.005	1,600	15
SSL-00543	12	79	0.005	1,600	15
SSL-00549	12	133	0.005	1,600	15
SSL-00542	12	127	0.005	1,600	15
SSL-00541	12	136	0.0261	3,600	15
SSL-01572	12	390	0.005	1,600	15
SSL-00605	10	127	0.03	4,000	15
SSL-00604	10	241	0.048	5,000	15
SSL-00603	10	267	0.03	4,000	15
SSL-00602	10	178	0.03	4,000	15
SSL-01576	10	423	0.035	4,300	15
SSL-00601	10	161	0.06	5,700	15
SSL-00600	10	65	0.06	5,700	15
SSL-00599	10	225	0.068	6,000	15

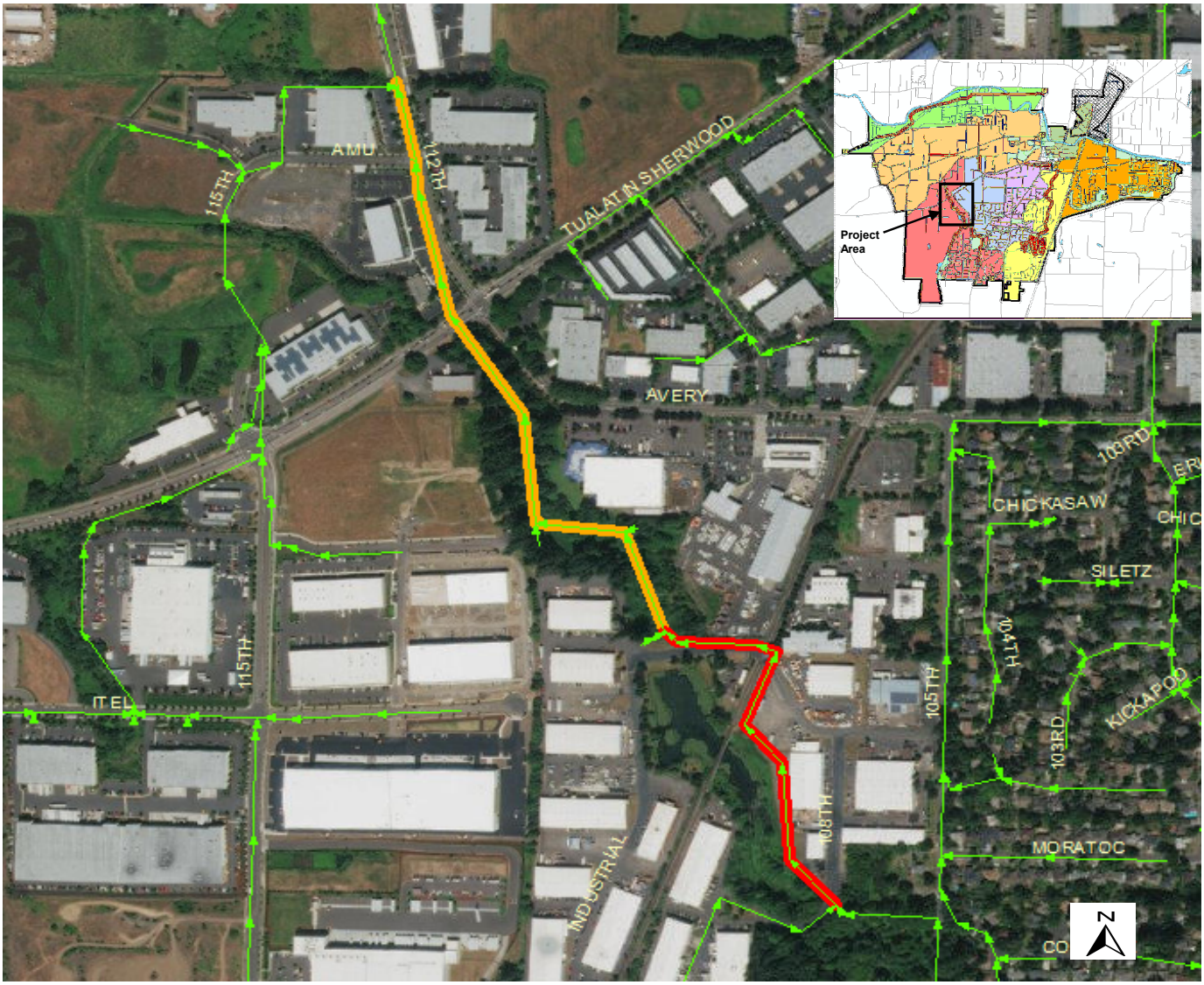
FIGURE 4-2

SS-6 North Martinazzi Trunk

Recommended Capital Improvements

JACOBS

Orange shading indicates where a risk analysis should be conducted to determine if pipe should be upsized to match upstream size.



GIS ID	Existing Diameter (in)	Length (ft)	Slope	Design Capacity (gpm)	Design Diameter (in)
SSL-01214	15	263	0.0024	2,300	24
SSL-01212	15	400	0.0021	2,200	24
SSL-01211	15	209	0.0022	2,200	24
SSL-01647	15	326	0.0024	2,300	24
SSL-01627	15	87	0.0084	4,300	24
SSL-01626	10	306	0.0257	7,600	24
SSL-01622	15	440	0.0075	4,200	24
SSL-01621	15	345	0.0075	4,200	24
SSL-01620	15	450	0.0075	4,200	24
SSL-01619	15	500	0.0073	4,100	24
SSL-01618	12	153	0.0174	6,500	24
SSL-01643	12	416	0.0174	6,500	24
SSL-02261	12	124	0.0174	6,500	24
SSL-02260	12	303	0.0174	6,500	24

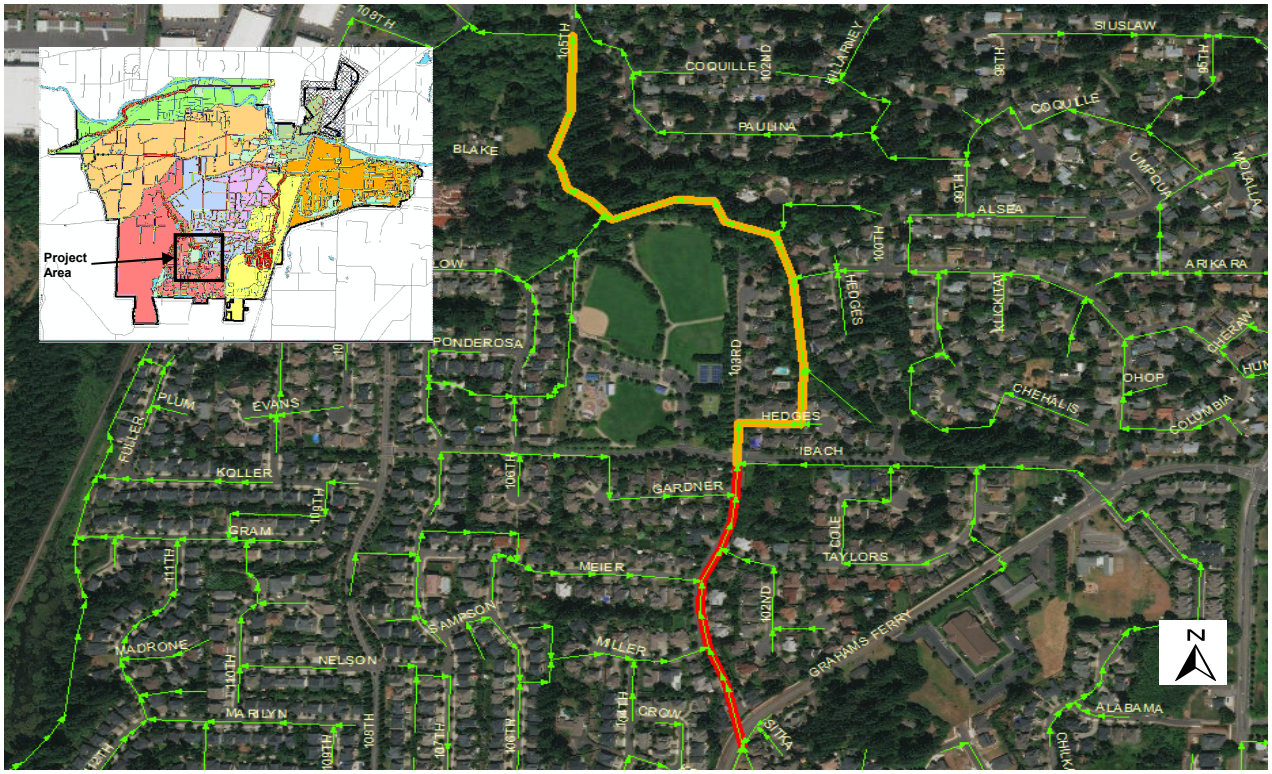
FIGURE 4-3

SS-7 Tualatin Reservoir Trunk

Recommended Capital Improvements

JACOBS®

Orange shading indicates where a risk analysis should be conducted to determine if pipe should be upsized to match upstream size.



GIS ID	Existing Diameter (in)	Length (ft)	Slope	Design Capacity (gpm)	Design Diameter (in)
SSL-01927	8	278	0.0041	1,400	15
SSL-01926	8	58	0.0125	2,500	15
SSL-01925	8	124	0.058	5,400	15
SSL-01348	8	166	0.0093	2,200	15
SSL-01349	8	135	0.0064	1,800	15
SSL-01351	8	163	0.0055	1,700	15
SSL-01360	8	126	0.0048	1,500	15
SSL-01357	8	122	0.0034	1,300	15
SSL-01361	8	142	0.004	1,400	15
SSL-01609	10	176	0.006	1,800	15
SSL-01159	10	242	0.011	2,400	15
SSL-01157	10	256	0.008	2,100	15
SSL-01161	10	398	0.015	2,800	15
SSL-01160	10	193	0.006	1,800	15
SSL-01233	10	26	0.012	2,500	15
SSL-01232	12	184	0.012	2,500	15
SSL-01230	12	106	0.013	2,600	15
SSL-01570	12	149	0.009	2,200	15
SSL-01229	12	257	0.005	1,500	15
SSL-01235	12	42	0.005	1,500	15
SSL-01236	12	68	0.005	1,500	15
SSL-01228	12	113	0.003	1,300	15
SSL-01227	12	111	0.004	1,400	15
SSL-01234	12	27	0.007	1,900	15
SSL-00172	12	22	0.008	2,100	15
SSL-01216	12	214	0.012	2,500	15
SSL-01215	14	333	0.003	1,300	15

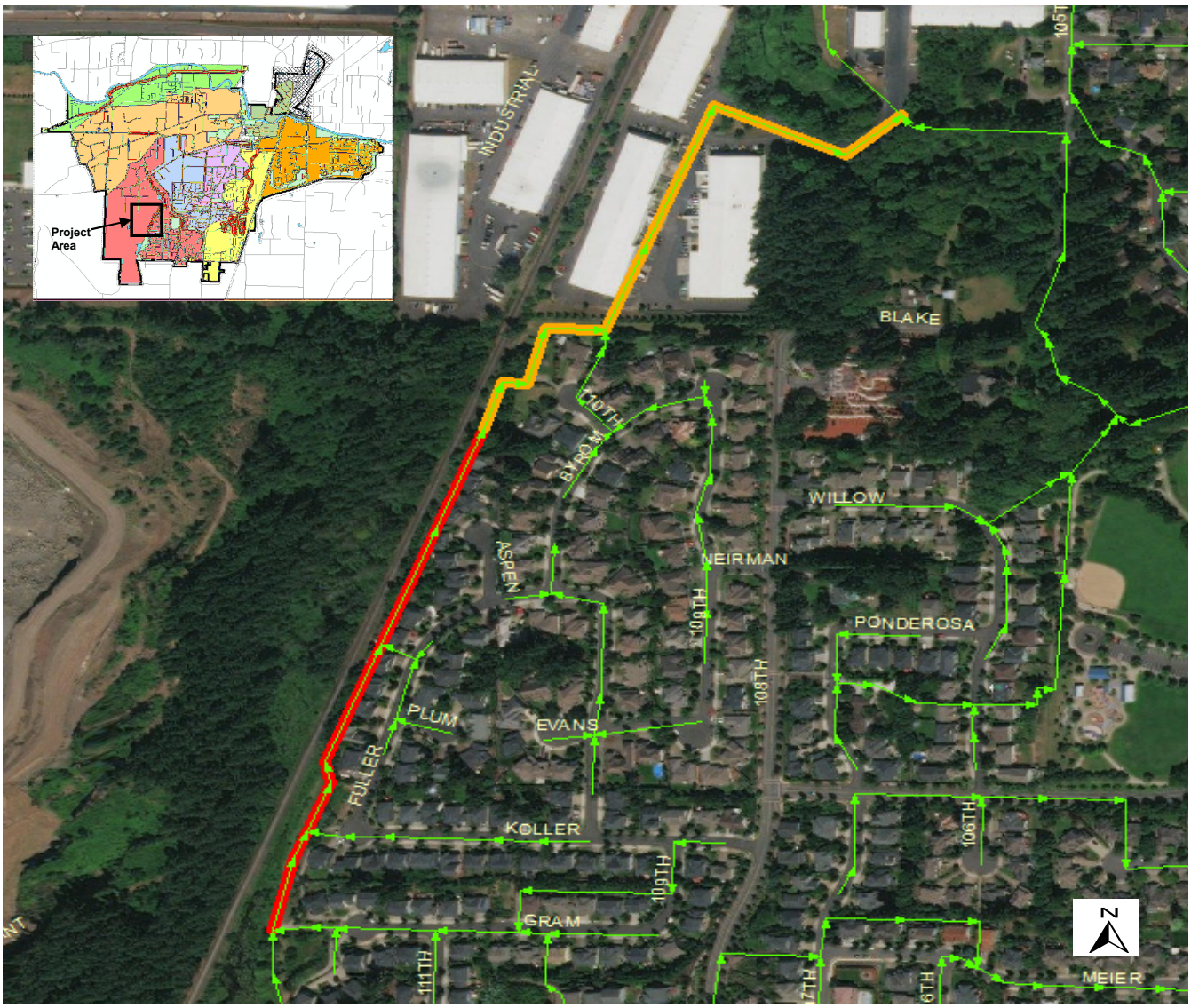
FIGURE 4-4

SS-8 103rd Ave. Sewer

Recommended Capital Improvements

JACOBS®

Orange shading indicates where a risk analysis should be conducted to determine if pipe should be upsized to match upstream size.



GIS ID	Existing Diameter (in)	Length (ft)	Slope	Design Capacity (gpm)	Design Diameter (in)
SSL-01690	10	213	0.0028	700	12
SSL-01689	10	78	0.0028	700	12
SSL-01688	10	152	0.0028	700	12
SSL-01687	10	59	0.0041	900	12
SSL-01686	10	356	0.0032	800	12
SSL-01516	10	361	0.0028	700	12
SSL-01517	10	299	0.0028	700	12
SSL-01518	10	136	0.0276	2,400	12
SSL-01519	10	60	0.0037	900	12
SSL-01520	10	160	0.005	1,000	12
SSL-01610	10	145	0.0038	900	12
SSL-01484	10	262	0.0368	2,800	12
SSL-01483	10	424	0.0045	1,000	12
SSL-01482	10	343	0.0104	1,500	12
SSL-01481	10	177	0.0041	900	12

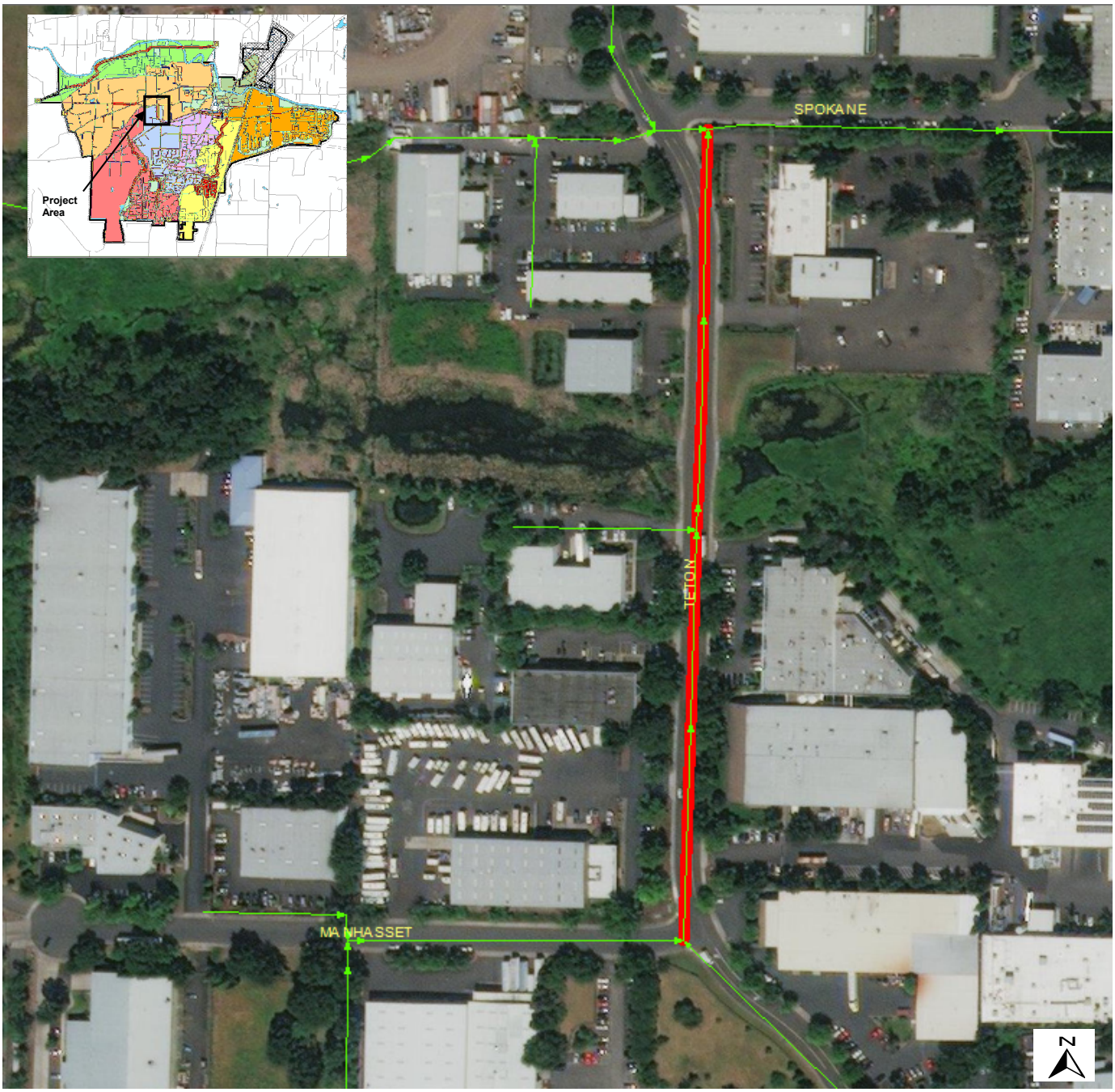
FIGURE 4-5

SS-9 Fuller Drive Sewer

Recommended Capital Improvements

JACOBS®

Orange shading indicates where a risk analysis should be conducted to determine if pipe should be upsized to match upstream size.



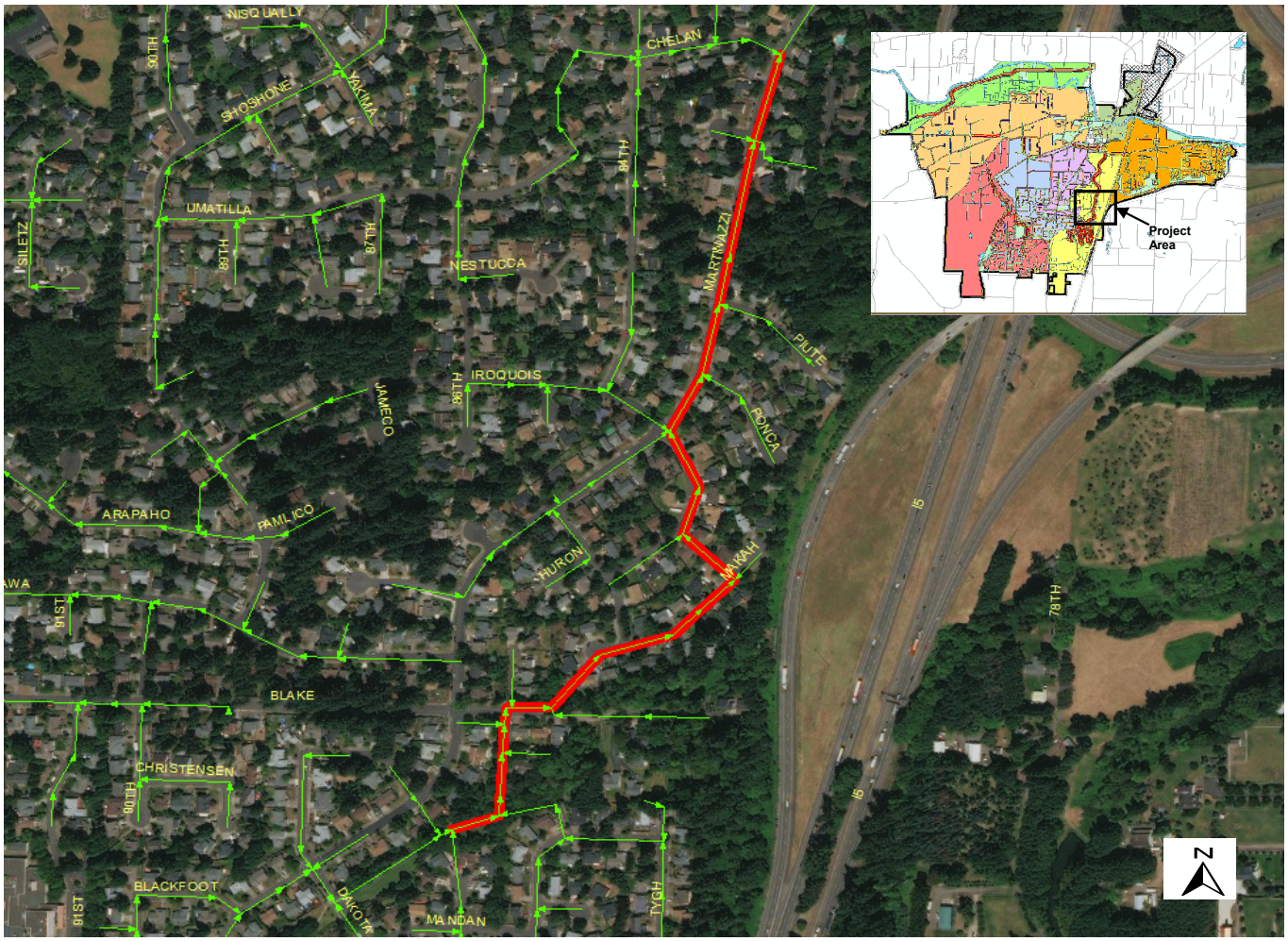
GIS ID	Existing Diameter (in)	Length (ft)	Slope	Design Capacity (gpm)	Design Diameter (in)
SSL-02383	10	330	0.012	2,400	15
SSL-01923	10	290	0.011	2,300	15
SSL-01919	10	40	0.011	2,300	15
SSL-01924	12	284	0.004	1,400	15
SSL-01921	12	287	0.0042	1,400	15

FIGURE 4-6

SS-10 Teton Trunk

Recommended Capital Improvements

JACOBS®



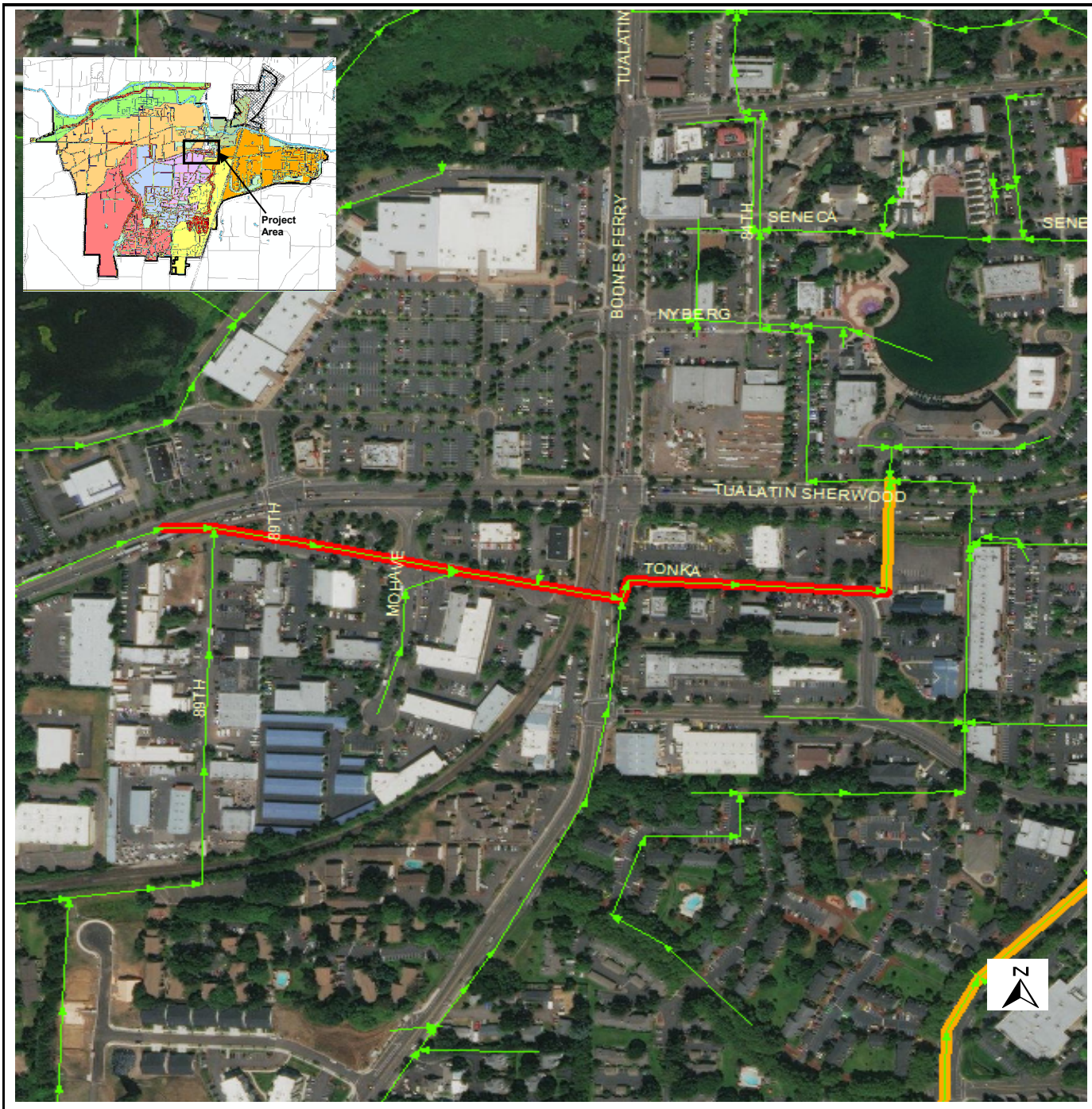
GIS ID	Existing Diameter (in)	Length (ft)	Slope	Design Capacity (gpm)	Design Diameter (in)
SSL-00678	12	160	0.0032	1,300	15
SSL-08379	12	75	0.0031	1,200	15
SSL-00677	12	140	0.0032	1,300	15
SSL-00674	12	103	0.0032	1,300	15
SSL-00672	12	63	0.0032	1,300	15
SSL-00671	12	18	0.0032	1,300	15
SSL-00675	12	132	0.0032	1,300	15
SSL-00666	12	240	0.0032	1,300	15
SSL-00665	12	256	0.0032	1,300	15
SSL-02235	12	131	0.0032	1,300	15
SSL-02236	12	147	0.0032	1,300	15
SSL-00664	12	233	0.0032	1,300	15
SSL-00464	12	172	0.0032	1,300	15
SSL-00460	12	219	0.0032	1,300	15
SSL-00453	12	224	0.004	1,400	15
SSL-00452	12	250	0.004	1,400	15
SSL-00451	12	178	0.004	1,400	15
SSL-01571	12	400	0.004	1,400	15
SSL-00449	12	308	0.004	1,400	15

FIGURE 4-7

SS-11 South Martinazzi Trunk

Recommended Capital Improvements

JACOBS®



GIS ID	Existing Diameter (in)	Length (ft)	Slope	Design Capacity (gpm)	Design Diameter (in)
SSL-00212	10	133	0.0046	1,500	15
SSL-01575	10	280	0.004	1,400	15
SSL-00213	10	370	0.004	1,400	15
SSL-00215	10	430	0.004	1,400	15
SSL-00197	12	56	0.004	1,400	15
SSL-00200	12	295	0.004	1,400	15
SSL-01573	12	379	0.004	1,400	15
SSL-00204	12	321	0.006	1,800	15

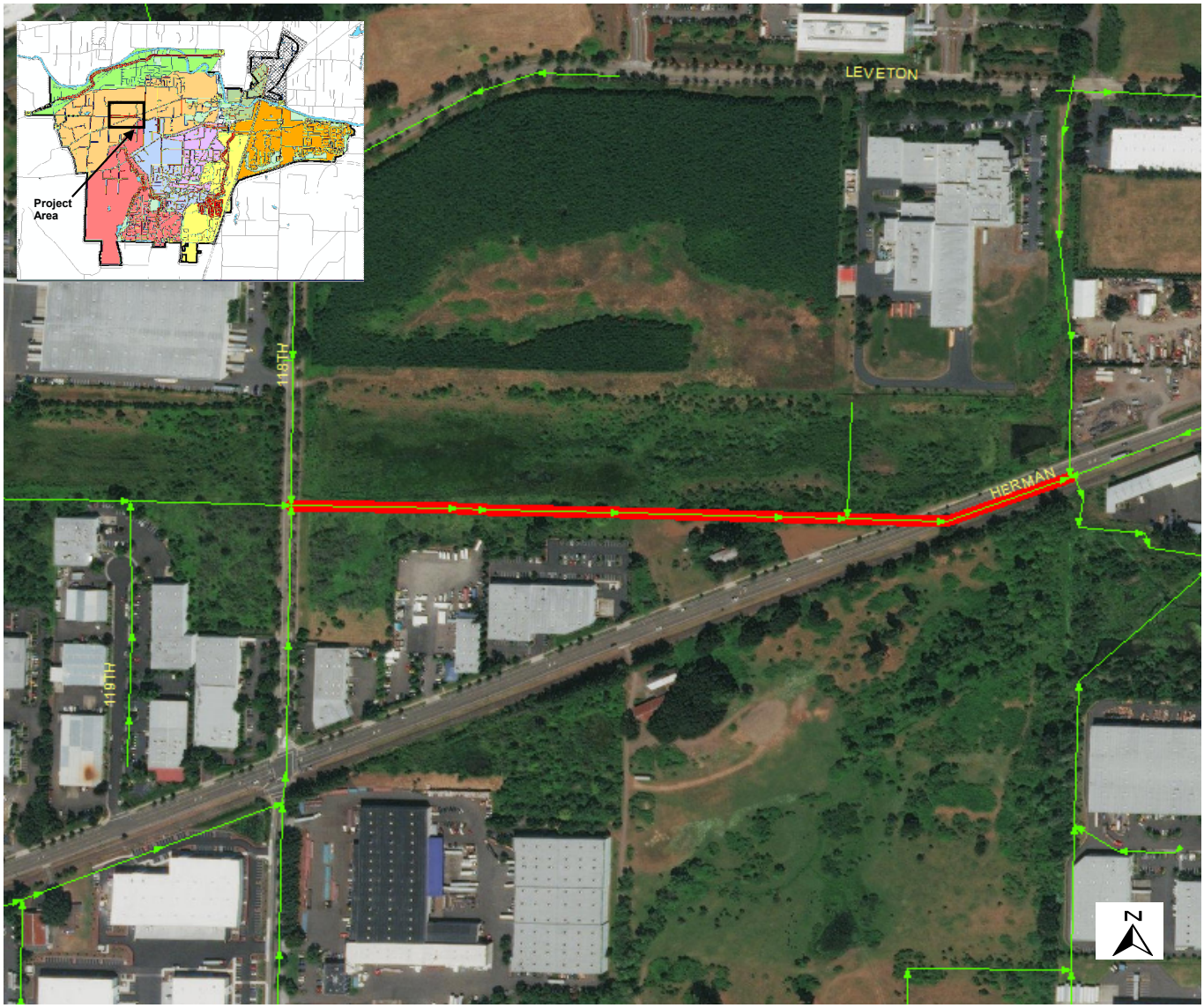
FIGURE 4-8

SS-12 Sherwood Trunk

Recommended Capital Improvements

JACOBS

Orange shading indicates where a risk analysis should be conducted to determine if pipe should be upsized to match upstream size.



Note: this project figure is provided for informational purposes, but this report recommends that the City perform investigative studies prior to 2035 to determine if flow conditions warrant disturbing the environmentally sensitive wetland area that would be disturbed by sewer pipe work.

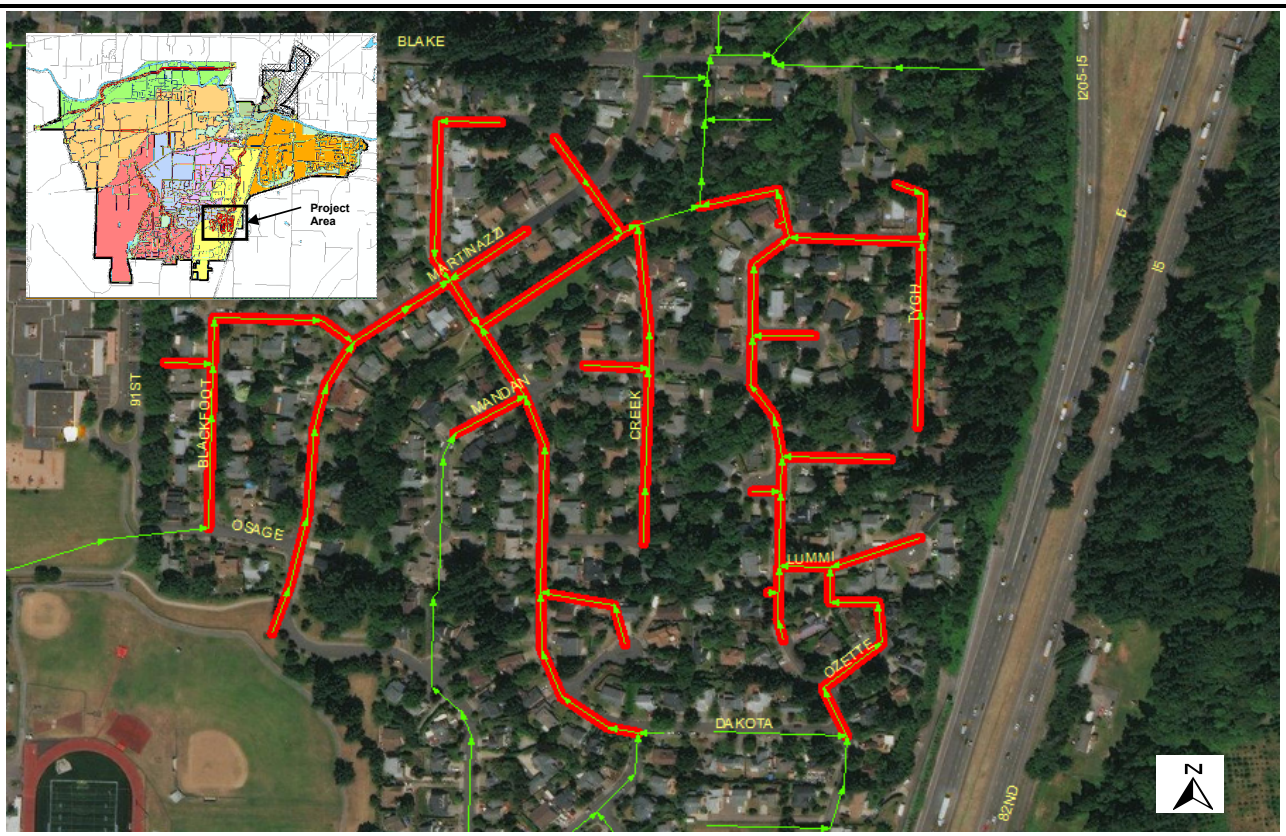
GIS ID	Existing Diameter (in)	Length (ft)	Slope	Design Flow (gpm)	Design Diameter (in)
SSL-01810	15	481	0.0015	1,200	18
SSL-08433	15	88	0.0015	1,200	18
SSL-01809	15	380	0.0015	1,200	18
SSL-01806	15	470	0.0015	1,200	18
SSL-01881	15	186	0.0015	1,200	18
SSL-01807	15	285	0.0015	1,200	18
SSL-01790	15	374	0.0015	1,200	18

FIGURE 4-9

SS-13 Cipole/Bluff Trunk

Recommended Capital Improvements

JACOBS®



GIS ID	Diameter (in)	Length (ft)		GIS ID	Diameter (in)	Length (ft)
SSL-00019	8	184		SSL-00859	8	115
SSL-00054	8	103		SSL-00860	8	328
SSL-00679	8	173		SSL-00861	8	119
SSL-00680	8	122		SSL-00862	8	110
SSL-00681	8	107		SSL-00863	8	174
SSL-00682	8	222		SSL-00864	8	153
SSL-00683	8	180		SSL-00865	8	172
SSL-00684	12	34		SSL-00866	8	287
SSL-00685	8	112		SSL-00867	8	122
SSL-00686	8	149		SSL-00868	8	101
SSL-00687	8	138		SSL-00869	8	87
SSL-00688	8	153		SSL-00870	8	267
SSL-00689	8	339		SSL-00871	8	182
SSL-00690	8	66		SSL-00872	8	126
SSL-00691	8	225		SSL-00873	8	134
SSL-00692	12	421		SSL-00874	8	86
SSL-00693	10	138		SSL-00875	8	100
SSL-00694	8	120		SSL-00876	8	54
SSL-00695	8	96		SSL-00877	8	118
SSL-00696	8	263		SSL-00878	8	184
SSL-00697	8	115		SSL-00881	8	131
SSL-00698	8	121		SSL-00900	8	76
SSL-00699	8	285		SSL-00901	8	144
SSL-00700	8	204		SSL-00902	8	124
SSL-00701	8	197		SSL-00903	8	138
SSL-00702	8	129		SSL-01363	8	232
SSL-00705	8	262		SSL-01467	8	50
SSL-00706	8	92		SSL-01603	8	204
SSL-00707	8	160		SSL-01616	8	365
SSL-00708	8	294		SSL-06396	8	120
SSL-00709	8	142		SSL-07198	8	13
SSL-00856	8	98		SSL-07199	8	24
SSL-00857	8	71				

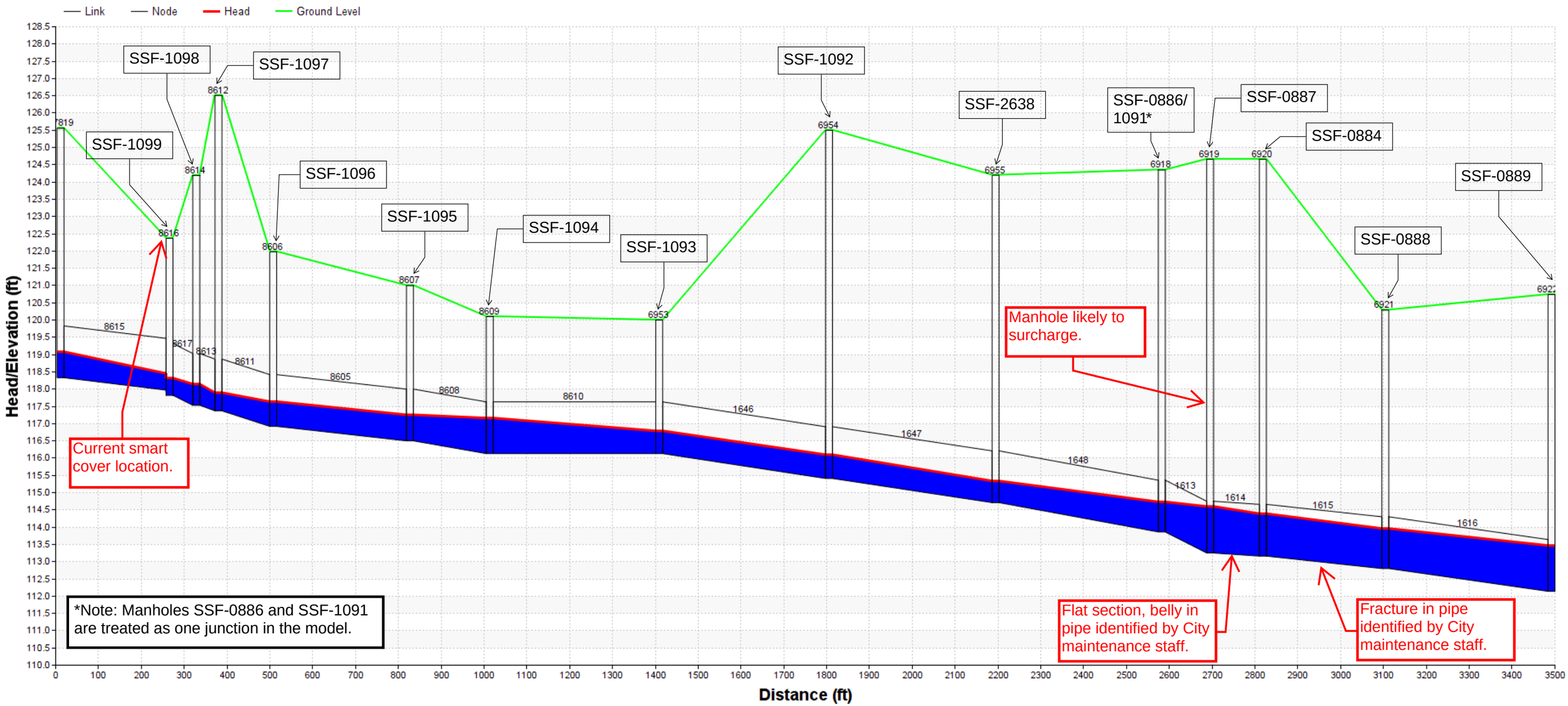
FIGURE 4-10

SS-14 Dakota & Mandon Area Sewer Lining

Recommended Capital Improvements

JACOBS

Figure 4-11
Modeled HGL Profile for Nyberg Trunk



Appendix A
Cost Basis & Cost Estimates

Project: **Tualatin Master Plan Update**
Date: **7/13/2017**
Created By: **Grant Clemens**

Recommended Improvements Cost Estimate

Constructability Factor

Name	Y/N ?	Score
Normal Construction	Y	1
Heavily Trafficked Street	Y	0.25
Neighborhood Disruption	Y	0.25
Shallow Pipe Segments	Y	0.35
Railroad Crossings	N	0.4
Environmentally Sensitive Area	N	1
Total Constructability Factor		**1.85**

North Martinazzi

Pipe Model ID	Original Diameter (in)	Improved Diameter (in)	Length (ft)	US Depth (ft)	DS Depth (ft)	Avg. Depth (ft)	Avg. Depth (rounded)	Unit Cost ($/lf)	Tualatin Cost Share	Total Cost
SSL-00448	12	15	297	11.0	16.3	13.7	14.0	$294.13	$0	$87,307
SSL-00443	12	15	84	16.3	6.2	11.2	11	$294.13	$0	$24,745
SSL-00548	10	15	31	6.2	5.1	5.6	6	$208.81	$5,969	$6,473
SSL-00547	12	15	193	5.1	5.6	5.3	5	$208.81	$0	$40,300
SSL-00551	12	15	227	14.2	12.4	13.3	13	$294.13	$0	$66,768
SSL-00546	12	15	128	12.4	11.4	11.9	12	$294.13	$0	$37,502
SSL-00550	12	15	197	11.4	10.3	10.9	11	$294.13	$0	$58,005
SSL-00544	12	15	108	10.3	11.1	10.7	11	$294.13	$0	$31,766
SSL-00552	12	15	51	11.1	12.1	11.6	12	$294.13	$0	$15,001
SSL-00543	12	15	79	12.1	12.6	12.3	12	$294.13	$0	$23,089
SSL-00549	12	15	133	12.6	8.7	10.6	11	$294.13	$0	$39,119
SSL-00542	12	15	127	8.7	7.7	8.2	8	$208.81	$0	$26,414
SSL-00541	12	15	136	7.7	8.5	8.1	8	$208.81	$0	$28,356
SSL-01572	12	15	390	8.5	9.7	9.1	9	$208.81	$0	$81,436
SSL-00540	12	15	83	9.7	14.2	11.9	12	$294.13	$0	$24,383
SSL-00605	10	15	127	14.2	11.7	12.9	13	$294.13	$35,363	$37,431
SSL-00604	10	15	241	11.7	10.6	11.1	11	$294.13	$66,950	$70,865
SSL-00603	10	15	267	10.6	11.3	11.0	11	$294.13	$74,194	$78,533
SSL-00602	10	15	178	11.3	11.3	11.3	11	$294.13	$49,463	$52,355
SSL-01576	10	15	423	11.3	9.4	10.4	10	$208.81	$81,463	$88,337
SSL-00601	10	15	161	9.4	8.5	9.0	9	$208.81	$31,008	$33,625
SSL-00600	10	15	65	8.5	7.9	8.2	8	$208.81	$12,476	$13,529
SSL-00599	10	15	225	7.9	15.2	11.6	12	$294.13	$62,523	$66,179
								Total Pipe Cost	$419,000	$1,032,000
								Total Pipe Cost x Constructability Factor (1.85)	$775,000	$1,909,000
								Construction Contingency (30%)	$233,000	$573,000
								Engineering/Design Cost (25%)	$194,000	$477,000
								Total Estimated Construction Cost	**$1,202,000**	**$2,959,000**

Beige colored pipe segments require upsizing for hydraulic conveyance

Orange colored pipe segments require upsizing only for downstream pipe consistency. Upsizing is not required for hydraulic conveyance.

Project: **Tualatin Master Plan Update**
Date: **7/13/2017**
Created By: **Grant Clemens**

Recommended Improvements Cost Estimate

Constructability Factor

Name	Y/N ?	Score
Normal Construction	Y	1
Heavily Trafficked Street	N	0.25
Neighborhood Disruption	N	0.25
Shallow Pipe Segments	N	0.35
Railroad Crossings	Y	0.4
Environmentally Sensitive Area	N	1
Total Constructability Factor		**1.4**

Tualatin Reservoir Trunk

Pipe Model ID	Original Diameter (in)	Improved Diameter (in)	Length (ft)	US Depth (ft)	DS Depth (ft)	Avg. Depth (ft)	Avg. Depth (rounded)	Unit Cost ($/lf)	Tualatin Cost Share	Total Cost
SSL-01214	15	24	263	16.0	13.9	15.0	15	$369.69	$0	$97,228
SSL-01212	15	24	400	13.9	15.1	14.5	15	$369.69	$0	$147,876
SSL-01211	15	24	209	15.1	14.7	14.9	15	$369.69	$0	$77,265
SSL-01647	15	24	326	14.7	13.1	13.9	14	$369.69	$0	$120,519
SSL-01627	15	24	87	13.1	15.3	14.2	14	$369.69	$0	$32,163
SSL-01626	10	24	306	15.3	8.8	12.1	12	$369.69	$85,031	$113,125
SSL-01625	10	24	65	8.8	7.7	8.3	8	$284.38	$12,516	$18,485
SSL-01622	15	24	440	7.7	10.1	8.9	9	$284.38	$0	$125,127
SSL-01621	15	24	345	10.1	10.0	10.0	10	$284.38	$0	$98,111
SSL-01620	15	24	450	10.0	10.3	10.1	10	$284.38	$0	$127,971
SSL-01619	15	24	500	10.3	15.4	12.8	13	$369.69	$0	$184,845
SSL-01618	12	24	153	15.4	15.0	15.2	15	$369.69	$0	$56,614
SSL-01643	12	24	416	15.0	14.7	14.8	15	$369.69	$0	$153,736
SSL-02261	12	24	124	14.7	14.7	14.7	15	$369.69	$0	$45,927
SSL-02260	12	24	303	14.7	22.1	18.4	18	$485.47	$0	$147,097
								Total Pipe Cost	$98,000	$1,546,000
								Total Pipe Cost x Constructability Factor (1.4)	$137,000	$2,164,000
								Construction Contingency (30%)	$41,000	$649,000
								Engineering/Design Cost (25%)	$34,000	$541,000
								Total Estimated Construction Cost	**$212,000**	**$3,354,000**

Beige colored pipe segments require upsizing for hydraulic conveyance

Orange colored pipe segments require upsizing only for downstream pipe consistency. Upsizing is not required for hydraulic conveyance.

Project: **Tualatin Master Plan Update**
Date: **7/13/2017**
Created By: **Grant Clemens**

Recommended Improvements Cost Estimate

Constructability Factor

Name	Y/N ?	Score
Normal Construction	Y	1
Heavily Trafficked Street	N	0.25
Neighborhood Disruption	Y	0.25
Shallow Pipe Segments	N	0.35
Railroad Crossings	N	0.4
Environmentally Sensitive Area	N	1
Total Constructability Factor		**1.25**

103rd Lateral

Pipe Model ID	Original Diameter (in)	Improved Diameter (in)	Length (ft)	US Depth (ft)	DS Depth (ft)	Avg. Depth (ft)	Avg. Depth (rounded)	Unit Cost ($/lf)	Tualatin Cost Share	Total Cost
SSL-01927	8	15	278	8.6	11.2	9.9	10	$208.81	$53,509	$58,024
SSL-01926	8	15	58	11.2	8.9	10.1	10	$208.81	$11,072	$12,007
SSL-01925	8	15	124	9.0	11.6	10.3	10	$208.81	$23,829	$25,840
SSL-01348	8	15	166	11.6	11.4	11.5	12	$294.13	$46,017	$48,708
SSL-01349	8	15	135	11.4	12.3	11.8	12	$294.13	$37,417	$39,605
SSL-01351	8	15	163	12.4	15.5	14.0	14	$294.13	$45,239	$47,884
SSL-01360	8	15	126	15.5	13.3	14.4	14	$294.13	$35,085	$37,137
SSL-01357	8	15	122	13.5	10.3	11.9	12	$294.13	$33,924	$35,907
SSL-01361	8	15	142	10.3	9.3	9.8	10	$208.81	$27,272	$29,574
SSL-01609	10	15	176	9.3	7.1	8.2	8	$208.81	$33,973	$36,840
SSL-01159	10	15	242	7.3	11.3	9.3	9	$208.81	$46,600	$50,532
SSL-01157	10	15	256	11.3	9.1	10.2	10	$208.81	$49,295	$53,455
SSL-01161	10	15	398	9.1	8.8	9.0	9	$208.81	$76,639	$83,106
SSL-01160	10	15	193	8.8	10.2	9.5	9	$208.81	$37,164	$40,300
SSL-01233	10	15	26	10.2	10.2	10.2	10	$208.81	$5,007	$5,429
SSL-01232	10	15	184	10.2	8.5	9.4	9	$208.81	$35,431	$38,421
SSL-01230	12	15	106	8.5	8.7	8.6	9	$208.81	$0	$22,092
SSL-01570	12	15	149	8.7	5.4	7.0	7	$208.81	$0	$31,175
SSL-01229	12	15	257	5.4	6.5	5.9	6	$208.81	$0	$53,748
SSL-01235	12	15	42	6.5	5.4	5.9	6	$208.81	$0	$8,770
SSL-01236	12	15	68	5.4	13.7	9.5	10	$208.81	$0	$14,136
SSL-01228	12	15	113	13.4	4.9	9.2	9	$208.81	$0	$23,637
SSL-01227	12	15	111	4.9	5.4	5.2	5	$208.81	$0	$23,220
SSL-01234	12	15	27	5.4	8.6	7.0	7	$208.81	$0	$5,638
SSL-00172	12	15	22	8.6	25.1	16.9	17	$409.91	$0	$8,813
SSL-01216	12	15	214	25.1	5.7	15.4	15	$294.13	$0	$62,944
SSL-01215	14	15	333	5.7	16.2	10.9	11	$294.13	$0	$97,945
								Total Pipe Cost	$597,000	$995,000
								Total Pipe Cost x Constructability Factor (1.25)	$746,000	$1,244,000
								Construction Contingency (30%)	$224,000	$373,000
								Engineering/Design Cost (25%)	$187,000	$311,000
								Total Estimated Construction Cost	**$1,157,000**	**$1,928,000**

Beige colored pipe segments require upsizing for hydraulic conveyance

Orange colored pipe segments require upsizing only for downstream pipe consistency. Upsizing is not required for hydraulic conveyance.

Project: **Tualatin Master Plan Update**
Date: **7/13/2017**
Created By: **Grant Clemens**

Recommended Improvements Cost Estimate

Constructability Factor

Name	Y/N ?	Score
Normal Construction	Y	1
Heavily Trafficked Street	N	0.25
Neighborhood Disruption	N	0.25
Shallow Pipe Segments	N	0.35
Railroad Crossings	N	0.4
Environmentally Sensitive Area	N	1
Total Constructability Factor		**1.0**

Bluff/Cipole Sewer

Pipe Model ID	Original Diameter (in)	Improved Diameter (in)	Length (ft)	US Depth (ft)	DS Depth (ft)	Avg. Depth (ft)	Avg. Depth (rounded)	Unit Cost ($/lf)	Tualatin Cost Share	Total Cost
SSL-01690	10	12	213	10.6	9.2	9.9	10	$192.56	$41,090	$41,090
SSL-01689	10	12	78	9.2	11.9	10.5	11	$277.88	$21,675	$21,675
SSL-01688	10	12	152	11.6	10.7	11.2	11	$277.88	$42,193	$42,193
SSL-01687	10	12	59	10.7	18.3	14.5	14	$277.88	$16,384	$16,384
SSL-01686	10	12	356	18.3	19.7	19.0	19	$393.66	$139,993	$139,993
SSL-01516	10	12	361	19.7	14.3	17.0	17	$393.66	$141,922	$141,922
SSL-01517	10	12	299	11.9	11.4	11.7	12	$277.88	$83,094	$83,094
SSL-01518	10	12	136	14.3	17.1	15.7	16	$393.66	$53,609	$53,609
SSL-01519	10	12	60	17.1	17.2	17.1	17	$393.66	$23,505	$23,505
SSL-01520	10	12	160	17.2	13.9	15.5	16	$393.66	$62,986	$62,986
SSL-01610	10	12	145	13.9	17.1	15.5	16	$393.66	$57,081	$57,081
SSL-01484	10	12	262	17.1	12.0	14.6	15	$277.88	$72,805	$72,805
SSL-01483	10	12	424	12.0	6.1	9.1	9	$192.56	$81,645	$81,645
SSL-01482	10	12	343	6.1	10.0	8.0	8	$192.56	$66,048	$66,048
SSL-01481	10	12	177	10.0	16.0	13.0	13	$277.88	$49,185	$49,185
								Total Pipe Cost	$953,000	$953,000
								Total Pipe Cost x Constructability Factor (1)	$953,000	$953,000
								Construction Contingency (30%)	$286,000	$286,000
								Engineering/Design Cost (25%)	$238,000	$238,000
								Total Estimated Construction Cost	**$1,477,000**	**$1,477,000**

Beige colored pipe segments require upsizing for hydraulic conveyance

Orange colored pipe segments require upsizing only for downstream pipe consistency. Upsizing is not required for hydraulic conveyance.

Project: **Tualatin Master Plan Update**
Date: **7/13/2017**
Created By: **Grant Clemens**

Recommended Improvements Cost Estimate

Constructability Factor

Name	Y/N ?	Score
Normal Construction	Y	1
Heavily Trafficked Street	N	0.25
Neighborhood Disruption	N	0.25
Shallow Pipe Segments	N	0.35
Railroad Crossings	N	0.4
Environmentally Sensitive Area	N	1
Total Constructability Factor		**1.0**

Teton Trunk

Pipe Model ID	Original Diameter (in)	Improved Diameter (in)	Length (ft)	US Depth (ft)	DS Depth (ft)	Avg. Depth (ft)	Avg. Depth (rounded)	Unit Cost ($/lf)	Tualatin Cost Share	Total Cost
SSL-02383	10	15	330	7.4	8.2	7.8	8	$208.81	$63,526	$68,886
SSL-01923	10	15	290	8.2	10.0	9.1	9	$208.81	$55,842	$60,555
SSL-01919	10	15	40	10.0	9.0	9.5	10	$208.81	$7,702	$8,352
SSL-01924	12	15	284	9.1	8.9	9.0	9	$208.81	$0	$59,402
SSL-01921	12	15	287	8.9	10.5	9.7	10	$208.81	$0	$59,920
								Total Pipe Cost	$127,000	$257,000
								Total Pipe Cost x Constructability Factor (1)	$127,000	$257,000
								Construction Contingency (30%)	$38,000	$77,000
								Engineering/Design Cost (25%)	$32,000	$64,000
								Total Estimated Construction Cost	**$197,000**	**$398,000**

Project: **Tualatin Master Plan Update**
Date: **7/13/2017**
Created By: **Grant Clemens**

Recommended Improvements Cost Estimate

Constructability Factor

Name	Y/N ?	Score
Normal Construction	Y	1
Heavily Trafficked Street	Y	0.25
Neighborhood Disruption	N	0.25
Shallow Pipe Segments	Y	0.35
Railroad Crossings	N	0.4
Environmentally Sensitive Area	N	1
Total Constructability Factor		**1.6**

South Martinazzi

Pipe Model ID	Original Diameter (in)	Improved Diameter (in)	Length (ft)	US Depth (ft)	DS Depth (ft)	Avg. Depth (ft)	Avg. Depth (rounded)	Unit Cost ($/lf)	Tualatin Cost Share	Total Cost
SSL-00678	12	15	160	10.1	10.6	10.4	10	$208.81	$0	$33,353
SSL-08379	12	15	75	10.6	10.6	10.4	10	$208.81	$0	$15,661
SSL-00677	12	15	140	10.6	6.8	8.7	9	$208.81	$0	$29,233
SSL-00674	12	15	103	6.9	17.1	12.0	12	$294.13	$0	$30,148
SSL-00672	12	15	63	17.3	19.3	18.3	18	$409.91	$0	$25,824
SSL-00671	12	15	18	19.3	19.3	19.3	19	$409.91	$0	$7,378
SSL-00675	12	15	132	19.3	14.7	17.0	17	$409.91	$0	$54,108
SSL-00666	12	15	240	14.7	12.7	13.7	14	$294.13	$0	$70,706
SSL-00665	12	15	256	12.7	14.5	13.6	14	$294.13	$0	$75,312
SSL-02235	12	15	131	14.5	14.6	14.6	15	$294.13	$0	$38,531
SSL-02236	12	15	147	14.6	10.5	12.6	13	$294.13	$0	$43,237
SSL-00664	12	15	233	10.5	21.5	16.0	16	$409.91	$0	$95,509
SSL-00464	12	15	172	5.6	14.0	9.8	10	$208.81	$0	$35,861
SSL-00460	12	15	219	21.5	13.2	17.4	17	$409.91	$0	$89,574
SSL-00453	12	15	224	13.2	11.3	12.2	12	$294.13	$0	$65,956
SSL-00452	12	15	250	11.3	11.5	11.4	11	$294.13	$0	$73,533
SSL-00451	12	15	178	11.5	14.5	13.0	13	$294.13	$0	$52,355
SSL-01571	12	15	400	14.5	11.4	12.9	13	$294.13	$0	$117,652
SSL-00449	12	15	308	11.4	11.0	11.2	11	$294.13	$0	$90,569
								Total Pipe Cost	$0	$1,045,000
								Total Pipe Cost x Constructability Factor (1.6)	$0	$1,672,000
								Construction Contingency (30%)	$0	$502,000
								Engineering/Design Cost (25%)	$0	$418,000
								Total Estimated Construction Cost	**$0**	**$2,592,000**

Project: **Tualatin Master Plan Update**
Date: **7/13/2017**
Created By: **Grant Clemens**

Recommended Improvements Cost Estimate

Constructability Factor

Name	Y/N ?	Score
Normal Construction	Y	1
Heavily Trafficked Street	Y	0.25
Neighborhood Disruption	N	0.25
Shallow Pipe Segments	Y	0.35
Railroad Crossings	Y	0.4
Environmentally Sensitive Area	N	1
Total Constructability Factor		**2**

Sherwood Rd Trunk

Pipe Model ID	Original Diameter (in)	Improved Diameter (in)	Length (ft)	US Depth (ft)	DS Depth (ft)	Avg. Depth (ft)	Avg. Depth (rounded)	Unit Cost ($/lf)	Tualatin Cost Share	Total Cost
SSL-00212	10	15	133	5.6	5.0	5.3	5	$208.81	$25,610	$27,772
SSL-01575	10	15	280	5.0	7.3	6.1	6	$208.81	$53,917	$58,467
SSL-00213	10	15	370	7.3	6.2	6.7	7	$208.81	$71,247	$77,260
SSL-00215	10	15	430	6.2	8.8	7.5	7	$208.81	$82,801	$89,788
SSL-00197	12	15	56	8.8	8.6	8.7	9	$208.81	$0	$11,714
SSL-00200	12	15	295	8.6	7.6	8.1	8	$208.81	$0	$61,599
SSL-01573	12	15	379	7.6	9.4	8.5	8	$208.81	$0	$79,181
SSL-00204	12	15	321	9.4	15.1	12.3	12	$294.13	$0	$94,357
								Total Pipe Cost	$234,000	$500,000
								Total Pipe Cost x Constructability Factor (2)	$468,000	$1,000,000
								Construction Contingency (30%)	$140,000	$300,000
								Engineering/Design Cost (25%)	$117,000	$250,000
								Total Estimated Construction Cost	**$725,000**	**$1,550,000**

Beige colored pipe segments require upsizing for hydraulic conveyance

Orange colored pipe segments require upsizing only for downstream pipe consistency. Upsizing is not required for hydraulic conveyance.

Project: **Tualatin Master Plan Update**
Date: **7/13/2017**
Created By: **Grant Clemens**

Recommended Improvements Cost Estimate

Constructability Factor

Name	Y/N ?	Score
Normal Construction	Y	1
Heavily Trafficked Street	N	0.25
Neighborhood Disruption	N	0.25
Shallow Pipe Segments	N	0.35
Railroad Crossings	N	0.4
Environmentally Sensitive Area	N	1
Total Constructability Factor		**1**

Dakota & Mandon Sewer Lining

Pipe Model ID	Original Diameter (in)	Improved Diameter (in)	Length (ft)	US Depth (ft)	DS Depth (ft)	Avg. Depth (ft)	Avg. Depth (rounded)	Unit Cost ($/lf)	Tualatin Cost Share	Total Cost
SSL-00019	8	NA	184	-	-	-	-	$79.64	$7,331.26	$14,663
SSL-00054	8	NA	103	-	-	-	-	$79.64	$4,086.73	$8,173
SSL-00679	8	NA	173	-	-	-	-	$79.64	$6,889.66	$13,779
SSL-00680	8	NA	122	-	-	-	-	$79.64	$4,873.17	$9,746
SSL-00681	8	NA	107	-	-	-	-	$79.64	$4,272.29	$8,545
SSL-00682	8	NA	222	-	-	-	-	$79.64	$8,848.00	$17,696
SSL-00683	8	NA	180	-	-	-	-	$79.64	$7,167.60	$14,335
SSL-00684	12	NA	34	-	-	-	-	$92.21	$1,580.94	$3,162
SSL-00685	8	NA	112	-	-	-	-	$79.64	$4,459.84	$8,920
SSL-00686	8	NA	149	-	-	-	-	$79.64	$5,952.29	$11,905
SSL-00687	8	NA	138	-	-	-	-	$79.64	$5,489.19	$10,978
SSL-00688	8	NA	153	-	-	-	-	$79.64	$6,092.46	$12,185
SSL-00689	8	NA	339	-	-	-	-	$79.64	$13,508.94	$27,018
SSL-00690	8	NA	66	-	-	-	-	$79.64	$2,634.49	$5,269
SSL-00691	8	NA	225	-	-	-	-	$79.64	$8,959.50	$17,919
SSL-00692	12	NA	421	-	-	-	-	$92.21	$19,394.53	$38,789
SSL-00693	10	NA	138	-	-	-	-	$86.27	$5,931.06	$11,862
SSL-00694	8	NA	120	-	-	-	-	$79.64	$4,778.40	$9,557
SSL-00695	8	NA	96	-	-	-	-	$79.64	$3,822.72	$7,645
SSL-00696	8	NA	263	-	-	-	-	$79.64	$10,471.07	$20,942
SSL-00697	8	NA	115	-	-	-	-	$79.64	$4,594.43	$9,189
SSL-00698	8	NA	121	-	-	-	-	$79.64	$4,818.62	$9,637
SSL-00699	8	NA	285	-	-	-	-	$79.64	$11,348.70	$22,697
SSL-00700	8	NA	204	-	-	-	-	$79.64	$8,129.25	$16,259
SSL-00701	8	NA	197	-	-	-	-	$79.64	$7,828.61	$15,657
SSL-00702	8	NA	129	-	-	-	-	$79.64	$5,150.72	$10,301
SSL-00705	8	NA	262	-	-	-	-	$79.64	$10,421.29	$20,843
SSL-00706	8	NA	92	-	-	-	-	$79.64	$3,663.44	$7,327
SSL-00707	8	NA	160	-	-	-	-	$79.64	$6,352.09	$12,704
SSL-00708	8	NA	294	-	-	-	-	$79.64	$11,707.08	$23,414
SSL-00709	8	NA	142	-	-	-	-	$79.64	$5,645.28	$11,291
SSL-00856	8	NA	98	-	-	-	-	$79.64	$3,906.34	$7,813
SSL-00857	8	NA	71	-	-	-	-	$79.64	$2,827.22	$5,654
SSL-00859	8	NA	115	-	-	-	-	$79.64	$4,591.25	$9,182
SSL-00860	8	NA	328	-	-	-	-	$79.64	$13,053.00	$26,106

SSL-00861	8	NA	119	-	-	-	-	$79.64	$4,754.51	$9,509
SSL-00862	8	NA	110	-	-	-	-	$79.64	$4,372.24	$8,744
SSL-00863	8	NA	174	-	-	-	-	$79.64	$6,944.61	$13,889
SSL-00864	8	NA	153	-	-	-	-	$79.64	$6,092.46	$12,185
SSL-00865	8	NA	172	-	-	-	-	$79.64	$6,831.12	$13,662
SSL-00866	8	NA	287	-	-	-	-	$79.64	$11,424.36	$22,849
SSL-00867	8	NA	122	-	-	-	-	$79.64	$4,848.09	$9,696
SSL-00868	8	NA	101	-	-	-	-	$79.64	$4,031.78	$8,064
SSL-00869	8	NA	87	-	-	-	-	$79.64	$3,480.27	$6,961
SSL-00870	8	NA	267	-	-	-	-	$79.64	$10,647.47	$21,295
SSL-00871	8	NA	182	-	-	-	-	$79.64	$7,251.22	$14,502
SSL-00872	8	NA	126	-	-	-	-	$79.64	$5,029.27	$10,059
SSL-00873	8	NA	134	-	-	-	-	$79.64	$5,320.35	$10,641
SSL-00874	8	NA	86	-	-	-	-	$79.64	$3,438.46	$6,877
SSL-00875	8	NA	100	-	-	-	-	$79.64	$3,972.05	$7,944
SSL-00876	8	NA	54	-	-	-	-	$79.64	$2,162.23	$4,324
SSL-00877	8	NA	118	-	-	-	-	$79.64	$4,698.76	$9,398
SSL-00878	8	NA	184	-	-	-	-	$79.64	$7,314.93	$14,630
SSL-00881	8	NA	131	-	-	-	-	$79.64	$5,224.38	$10,449
SSL-00900	8	NA	76	-	-	-	-	$79.64	$3,016.37	$6,033
SSL-00901	8	NA	144	-	-	-	-	$79.64	$5,726.91	$11,454
SSL-00902	8	NA	124	-	-	-	-	$79.64	$4,940.07	$9,880
SSL-00903	8	NA	138	-	-	-	-	$79.64	$5,502.33	$11,005
SSL-01363	8	NA	232	-	-	-	-	$79.64	$9,254.96	$18,510
SSL-01467	8	NA	50	-	-	-	-	$79.64	$1,985.82	$3,972
SSL-01603	8	NA	204	-	-	-	-	$79.64	$8,105.36	$16,211
SSL-01616	8	NA	365	-	-	-	-	$79.64	$14,523.15	$29,046
SSL-06396	8	NA	120	-	-	-	-	$79.64	$4,778.40	$9,557
SSL-07198	8	NA	13	-	-	-	-	$79.64	$517.66	$1,035
SSL-07199	8	NA	24	-	-	-	-	$79.64	$955.68	$1,911
								Total Pipe Cost	$408,000	$815,000
								Total Pipe Cost x Constructability Factor (1)	$408,000	$815,000
								Construction Contingency (30%)	$122,000	$245,000
								Engineering/Design Cost (25%)	$102,000	$204,000
								Total Estimated Construction Cost	**$632,000**	**$1,264,000**

Project: **Tualatin Master Plan Update**
Date: **7/13/2017**
Created By: **Grant Clemens**

Recommended Improvements Cost Estimate

Constructability Factor

Name	Y/N ?	Score
Normal Construction	Y	1
Heavily Trafficked Street	Y	0.25
Neighborhood Disruption	N	0.25
Shallow Pipe Segments	N	0.35
Railroad Crossings	N	0.4
Environmentally Sensitive Area	Y	1
Total Constructability Factor		**2.25**

Cipole/Bluff Trunk

Pipe Model ID	Original Diameter (in)	Improved Diameter (in)	Length (ft)	US Depth (ft)	DS Depth (ft)	Avg. Depth (ft)	Avg. Depth (rounded)	Unit Cost ($/lf)	Tualatin Cost Share	Total Cost
SSL-01810	15	18	481	10.0	9.3	9.6	10	$234.81	$0	$112,991
SSL-08433	15	18	88	9.3	9.3	9.3	9	$234.81	$0	$20,663
SSL-01809	15	18	380	9.3	10.0	9.7	10	$234.81	$0	$89,228
SSL-01806	15	18	470	10.0	13.3	11.7	12	$320.13	$0	$150,461
SSL-01881	15	18	186	13.3	13.3	13.3	13	$320.13	$0	$59,448
SSL-01807	15	18	285	13.3	11.6	12.4	12	$320.13	$0	$91,237
SSL-01790	15	18	374	11.6	12.4	12.0	12	$320.13	$0	$119,825
								Total Pipe Cost	$0	$644,000
								Total Pipe Cost x Constructability Factor (2.25)	$0	$1,449,000
								Construction Contingency (30%)	$0	$435,000
								Engineering/Design Cost (25%)	$0	$362,000
								Total Estimated Construction Cost	**$0**	**$2,246,000**

Project: **Basalt Creek Planning**
Date: **5/20/2016**
Created By: **Kelli Walters**

Sanitary Sewer Cost Estimate

Tualatin/CWS

Total

$ 9,589,887	Pipe Cost
$ 487,942	Rock Excavation
$ 2,638,379	Pump Station Capital Cost
$ 12,716,208	**Total Construction Cost**
$ 5,599,115	Pump Station O&M Cost (30 years)
$ 18,315,323	**Subtotal**
$ 4,578,831	Engr/Legal/Admin (25%)
$ 5,494,597	Contingency (30%)
$ 28,388,751	**Total Project Cost**

Pump Stations

PS No.	Nearest Intersection	Peak Flow (MGD)	A	B	C	D	Construction Cost
TUALATIN							
1	Boones Ferry/E-W Connector	0.283647	330627.00	1100000.00			$ 683,402
2	Grahams Ferry and Tonquin	0.148738	330627.00	1100000.00			$ 469,967
4	292nd Extension (NW corner)	0.567984	330627.00	1100000.00			$ 912,977
5	E-W Connector Central	0.085284	330627.00	1100000.00			$ 286,073
6	Norwood St	0.085255	330627.00	1100000.00			$ 285,960
						Total	**$ 2,638,379**

NOTE: (x<1MGD) Equation Values (y=Ax^3-Bx^2+Cx+D) from Omaha Spreadsheet

Depth to Rock=10'	15	$30
Depth to Rock=10'	25	$90

Pipe Cost

Pipe No.	Length (ft)	Slope	US Depth (ft)	DS Depth (ft)	Avg. Depth (ft)	Avg. Depth (rounded)	Pipe Diameter (in.)	Unit Cost ($/lf)	Total Cost
								TUALATIN TOTAL - 8" DEVELOPER	**$7,675,522**
								TUALATIN TOTAL - 10" DEVELOPER PORTION (AS 8")	**$357,033**
								TUALATIN TOTAL - 10" CITY PORTION (REST)	**$34,443**
								TUALATIN TOTAL - 6" FORCE MAINS	**$1,522,888**
								TUALATIN TOTAL	**$9,589,887**
8" PIPES									
1	533.5131	0.052482	10	10	10	10	8	$144.22	$76,941
2	317.1652	0.013873	10	7.4	8.7	9	8	$136.54	$43,307
3	406.7042	0.00386	7.4	8.97	8.185	8	8	$127.34	$51,789
4	788.9656	0.053741	10	7.4	8.7	9	8	$136.54	$107,729
5	478.0674	0.052294	10	10	10	10	8	$144.22	$68,945
6	233.399	0.004285	10	20	15	15	8	$174.90	$40,821
7	672.5881	0.040143	20	10	15	15	8	$174.90	$117,635
8	294.9152	0.050862	10	10	10	10	8	$144.22	$42,531
9	1433.515	0.04046	10	10	10	10	8	$144.22	$206,735
10	503.7495	0.063524	10	12	11	11	8	$148.82	$74,967
11	1268.839	0.047287	10	16	13	13	8	$162.63	$206,346
12	141.7276	0.007056	10	11	10.5	11	8	$148.82	$21,092
13	316.3644	0.006322	11	12	11.5	12	8	$154.95	$49,022
14	679.3226	0.004416	12	16	14	14	8	$168.76	$114,644
15	684.3602	0.004384	16	10	13	13	8	$162.63	$111,295
16	319.2039	0.004699	10	24.5	17.25	17	8	$190.24	$60,726
17	383.4716	0.043028	10	24.5	17.25	17	8	$190.24	$72,952
18	691.5291	0.029644	24.5	13	18.75	19	8	$204.05	$141,106
20	355.232	0.070377	10	13	11.5	12	8	$154.95	$55,045
21	1264.12	0.017403	10	10	10	10	8	$144.22	$182,305
22	420.1954	0.057116	10	10	10	10	8	$144.22	$60,599
23	659.7575	0.093974	10	13	11.5	12	8	$154.95	$102,233
24	135.4609	0.007382	10	13	11.5	12	8	$154.95	$20,990
25	135.4164	0.007385	10	16	13	13	8	$162.63	$22,022
26	604.9038	0.044635	19	16	17.5	18	8	$197.91	$119,718
27	315.9907	0.056964	16	10	13	13	8	$162.63	$51,388
28	343.7668	0.005818	10	16	13	13	8	$162.63	$55,905
29	604.2054	0.004965	16	20	18	18	8	$197.91	$119,580
30	1070.904	0.018676	20	10	15	15	8	$174.90	$187,300
31	469.1018	0.004263	10	24	17	17	8	$190.24	$89,243
32	299.7503	0.006672	24	15	19.5	20	8	$213.25	$63,923
33	700.0482	0.035712	15	10	12.5	13	8	$162.63	$113,846
40	304.5084	0.06568	10	10	10	10	8	$144.22	$43,915
41	662.8841	0.004526	10	12	11	11	8	$148.82	$98,649
42	181.7261	0.005503	12	11	11.5	12	8	$154.95	$28,159
43	467.3983	0.004279	11	24	17.5	18	8	$197.91	$92,504
44	256.4737	0.003899	24	20	22	22	8	$638.23	$163,689

Rock Excavation

Rock %	Rock Ex Length (ft)	Rock Ex. Unit Cost ($/LF)	Rock Ex. Cost
			$390,354
			$31,736
			$0
			$65,853
			$487,942
20%	106.70	$30	$3,201
20%	63.43	$30	$1,903
20%	81.34	$30	$2,440
20%	157.79	$30	$4,734
20%	95.61	$30	$2,868
20%	46.68	$30	$1,400
20%	134.52	$30	$4,036
20%	58.98	$30	$1,769
20%	286.70	$30	$8,601
20%	100.75	$30	$3,022
20%	253.77	$30	$7,613
20%	28.35	$30	$850
20%	63.27	$30	$1,898
20%	135.86	$30	$4,076
50%	342.18	$30	$10,265
10%	31.92	$30	$958
10%	38.35	$30	$1,150
10%	69.15	$30	$2,075
10%	35.52	$30	$1,066
50%	632.06	$30	$18,962
50%	210.10	$30	$6,303
10%	65.98	$30	$1,979
10%	13.55	$30	$406
10%	13.54	$30	$406
10%	60.49	$30	$1,815
10%	31.60	$30	$948
50%	171.88	$30	$5,157
50%	302.10	$30	$9,063
50%	535.45	$30	$16,064
50%	234.55	$30	$7,037
50%	149.88	$30	$4,496
50%	350.02	$30	$10,501
50%	152.25	$30	$4,568
50%	331.44	$30	$9,943
50%	90.86	$30	$2,726
50%	233.70	$30	$7,011
50%	128.24	$90	$11,541

53	791.0153	0.005057	10	20	15	15	8	$174.90	$138,348	50%	395.51	$30	$11,865
53	261.3918	-0.160678	20	10	15	15	8	$174.90	$45,717	50%	130.70	$30	$3,921
55	1022.206	0.012718	10	24	17	17	8	$190.24	$194,466	50%	511.10	$30	$15,333
56	668.1609	0.058369	10	10	10	10	8	$144.22	$96,359	50%	334.08	$30	$10,022
68	721.1372	0.00416	10	12	11	11	8	$148.82	$107,318	50%	360.57	$30	$10,817
76	277.7989	0.061195	10	10	10	10	8	$144.22	$40,063	20%	55.56	$30	$1,667
77	149.3053	0.006698	10	25	17.5	18	8	$197.91	$29,549	20%	29.86	$30	$896
78	118.1064	0.004233	25	22.5	23.75	24	8	$688.86	$81,359	20%	23.62	$90	$2,126
79	270.8926	0.004061	22.5	18.6	20.55	21	8	$613.68	$166,242	20%	54.18	$90	$4,876
80	387.5527	0.004128	18.6	23.2	20.9	21	8	$613.68	$237,834	20%	77.51	$90	$6,976
81	389.0448	0.003856	23.2	15.7	19.45	19	8	$204.05	$79,384	20%	77.808964	$30	$2,334
83	371.5919	0.004037	10	18.5	14.25	14	8	$168.76	$62,711	20%	74.318386	$30	$2,230
84	482.6379	0.004144	18.5	24.5	21.5	22	8	$638.23	$308,034	40%	193.05517	$90	$17,375
85	357.6326	0.004194	24.5	25	24.75	25	8	$713.41	$255,137	40%	143.05305	$90	$12,875
86	584.8259	0.010259	25	10	17.5	18	8	$197.91	$115,744	20%	116.96518	$30	$3,509
88	681.4497	0.01761	10	10	10	10	8	$144.22	$98,275	20%	136.28993	$30	$4,089
89	294.4963	0.004075	10	21.2	15.6	16	8	$181.04	$53,314	20%	58.899267	$30	$1,767
95	845.1399	0.03668	20	19	19.5	20	8	$213.25	$180,230	50%	422.56996	$30	$12,677
100	474.5182	0.004215	16.5	25.5	21	21	8	$613.68	$291,203	20%	94.903635	$90	$8,541
101	194.5823	0.005139	25.5	20.5	23	23	8	$664.31	$129,263	20%	38.916455	$90	$3,502
102	914.5668	0.018041	10	24.5	17.25	17	8	$190.24	$173,988	20%	182.91335	$30	$5,487
102	232.8832	0.004294	20.5	22.5	21.5	22	8	$638.23	$148,633	20%	46.576632	$90	$4,192
103	255.8989	0.003908	22.5	12.5	17.5	18	8	$197.91	$50,646	20%	51.179777	$30	$1,535
104	76.40136	0.006544	12.5	16	14.25	14	8	$168.76	$12,894	20%	15.280272	$30	$458
110	85.09742	0.211522	10	25	17.5	18	8	$197.91	$16,842	20%	17.019484	$30	$511
130	101.4267	0.009859	10	11	10.5	11	8	$148.82	$15,094	20%	20.285346	$30	$609
132	346.2103	0.005777	10	10	10	10	8	$144.22	$49,929	20%	69.242056	$30	$2,077
133	140.7495	0.042629	10	10	10	10	8	$144.22	$20,298	20%	28.149896	$30	$844
134	470.8758	0.050969	10	10	10	10	8	$144.22	$67,907	20%	94.175159	$30	$2,825
140	125.249	0.006387	15.7	23.5	19.6	20	8	$213.25	$26,710	20%	25.049797	$30	$751
141	135.4918	0.00369	23.5	31	27.25	27	8	$764.03	$103,520	40%	54.196734	$90	$4,878
142	359.9802	0.004167	31	24.5	27.75	28	8	$790.12	$284,426	40%	143.99209	$90	$12,959
143	511.6524	0.003909	24.5	18.5	21.5	22	8	$638.23	$326,552	40%	204.66096	$90	$18,419
144	114.5011	0.004367	18.5	12.5	15.5	16	8	$500.00	$57,251	20%	22.900213	$30	$687
145	161.813	0.08034	12.5	19	15.75	16	8	$500.00	$80,907	20%	32.36261	$30	$971
150	208.3746	0.004799	11	19	15	15	8	$174.90	$36,445	20%	41.674916	$30	$1,250
156	242.3682	-0.033008	20	13	16.5	17	8	$190.24	$46,108	20%	48.473641	$30	$1,454
157	569.0477	0.021088	13	10	11.5	12	8	$154.95	$88,177	20%	113.80955	$30	$3,414
300	451.9755	0.004425	10	19	14.5	15	8	$174.90	$79,050	50%	225.98773	$30	$6,780
10" PIPE													
90	971.0308	0.004119	15	10	12.5	13	10	$177.97	$172,812	50%	485.51538	$30	$14,565
90	83.61128	0.003588	21.2	16.5	18.85	19	10	$222.46	$18,600	20%	16.722257	$30	$502
91	367.4872	0.005442	10	15	12.5	13	10	$177.97	$65,401	50%	183.74359	$30	$5,512
92	191.4554	0.005223	12	10	11	11	10	$165.69	$31,723	50%	95.727711	$30	$2,872
93	335.889	0.005954	13	12	12.5	13	10	$177.97	$59,777	50%	167.94451	$30	$5,038
94	216.4139	0.004621	19	13	16	16	10	$199.45	$43,163	50%	108.20695	$30	$3,246
FORCEMAINS													
19	1328.432	-0.031616	13	10	11.5	12	6	$139.61	$185,466	10%	132.84	$30	$3,985
97	404.7144	-0.054359	10	10	10	10	6	$127.34	$51,536	50%	202.35721	$30	$6,071
98	368.8722	-0.067774	10	25	17.5	18	6	$177.97	$65,647	50%	184.43608	$30	$5,533
99	430.6636	-0.004644	25	25	25	25	6	$693.46	$298,648	50%	215.3318	$90	$19,380
100	155.8634	-0.006416	25	10	17.5	18	6	$177.97	$27,739	20%	31.172687	$30	$935
101	605.7148	-0.129104	10	9.8	9.9	10	6	$127.34	$77,131	20%	121.14296	$30	$3,634
135	335.3716	-0.071562	10	10	10	10	6	$127.34	$42,706	20%	67.074325	$30	$2,012
153	102.3925	-0.027346	10	4.7	7.35	7	6	$104.33	$10,682	20%	20.478507	$30	$614
200	204.8771	-0.009762	19	10	14.5	15	6	$156.49	$32,061	20%	40.975421	$30	$1,229
201	698.3856	-0.005012	10	27.5	18.75	19	6	$187.17	$130,719	20%	139.67712	$30	$4,190
202	563.3952	-0.00355	27.5	21.5	24.5	25	6	$693.46	$390,692	20%	112.67904	$90	$10,141
203	299.3563	-0.005011	21.5	10	15.75	16	6	$165.69	$49,602	20%	59.871263	$30	$1,796
204	681.8695	-0.005866	10	18	14	14	6	$151.89	$103,567	20%	136.3739	$30	$4,091
205	373.2523	-0.002679	18	10.45	14.225	14	6	$151.89	$56,692	20%	74.650455	$30	$2,240
10" PIPE - CALCULATED AS 8" FOR DEVELOPER PORTION													
90	971.0308	0.004119	15	10	12.5	13	8	$162.63	$157,915	50%	485.51538	$30	$14,565
90	83.61128	0.003588	21.2	16.5	18.85	19	8	$204.05	$17,061	20%	16.722257	$30	$502
91	367.4872	0.005442	10	15	12.5	13	8	$162.63	$59,763	50%	183.74359	$30	$5,512
92	191.4554	0.005223	12	10	11	11	8	$148.82	$28,492	50%	95.727711	$30	$2,872
93	335.889	0.005954	13	12	12.5	13	8	$162.63	$54,624	50%	167.94451	$30	$5,038
94	216.4139	0.004621	19	13	16	16	8	$181.04	$39,179	50%	108.20695	$30	$3,246

Note: This cost estimate was done outside of this Master Plan as part of the Basalt Creek Conceptual Design Plan.

Project: **Southwest Tualatin Concept Sewer**
Date: **1/22/2018**
Created By: **Grant Clemens**

Sanitary Sewer Cost Estimate

Total

$	1,097,174	Pipe Cost
$	82,739	Rock Excavation
$	472,761	Pump Station Capital Cost
$	**1,652,674**	**Total Construction Cost**
$	413,169	Engr/Legal/Admin (25%)
$	495,802	Contingency (30%)
$	**2,561,645**	**Total Project Cost**

Pump Stations

PS No.	Nearest Intersection	Peak Flow (MGD)	A	B	C	D	Construction Cost
			TUALATIN				
1	Southwest Tualatin PS	0.15	330627.00	1100000.00			$ 472,761
						Total	**$ 472,761**

NOTE: (x<1MGD) Equation Values (y=Ax^3-Bx^2+Cx+D) from Omaha Spreadsheet

0.15

Depth to Rock=10'	15	$30
Depth to Rock=10'	25	$90

Pipe Cost

FID	Length (ft)	Slope	US Depth (ft)	DS Depth (ft)	Avg. Depth (ft)	Avg. Depth (rounded)	Pipe Diameter (in.)	Unit Cost ($/lf)	Total Cost
								TUALATIN TOTAL - 8" DEVELOPER	**$835,930**
								TUALATIN TOTAL - 6" FORCE MAINS	**$261,244**
								TUALATIN TOTAL	**$1,097,174**
8" PIPES									
NE Sewer - Connection with SW Itel Street									
96	966.76	-0.0092	10.0	8.9	9.5	9	8	$136.54	$132,006
97	194.25	-0.0046	9.0	9.9	9.4	9	8	$136.54	$26,524
98	375.95	-0.0276	9.9	11.3	10.6	11	8	$148.82	$55,948
99	178.26	-0.0046	11.3	12.1	11.7	12	8	$154.95	$27,622
NW Sewer - Connection at SW 124th Ave									
100	1418.51	-0.0412	18.0	14.5	16.3	16	8	$181.04	$256,802
101	463.25	-0.0046	15.9	18.0	16.9	17	8	$190.24	$88,129
102	463.54	-0.0772	19.0	15.8	17.4	17	8	$190.24	$88,185
South Sewer - Connection with Basalt Creek PS 4									
103	412.27	-0.0070	10.0	9.9	10.0	10	8	$144.22	$59,456
104	333.06	-0.0117	10.0	9.9	10.0	10	8	$144.22	$48,032
105	369.08	-0.0217	10.0	10.0	10.0	10	8	$144.22	$53,227
FORCEMAINS									
6	1720	0.0564	10	17	13.5	14	6	$151.89	$261,244

Rock Excavation

Rock %	Rock Ex Length (ft)	Rock Ex. Unit Cost ($/LF)	Rock Ex. Cost
			$62,099
			$20,640
			$82,739
NE Sewer - Connection with SW Itel Street			
40%	386.70	$30	$11,601
40%	77.70	$30	$2,331
40%	150.38	$30	$4,511
40%	71.30	$30	$2,139
NW Sewer - Connection with SW 124th Ave			
40%	567.40	$30	$17,022
40%	185.30	$30	$5,559
40%	185.42	$30	$5,562
NE Sewer - Connection with Basalt Creek PS 4			
40%	164.91	$30	$4,947
40%	133.22	$30	$3,997
40%	147.63	$30	$4,429
40%	688.00	$30	$20,640

Upper Tualatin Interceptor - Gravity Sewer Unit Costs

Size	Pipe/Case #	Depth Description	Pipe Material ($/ft)	Installation ($/ft)	Surface Restoration: Local ($/ft)	Surface Restoration: Arterial ($/ft)	Surface Restoration: Dirt/Gravel ($/ft)	Total Unit Costs w/o MHs: Local ($/ft)	Total Unit Costs w/o MHs: Arterial ($/ft)	Total Unit Costs w/o MHs: Dirt/Gravel ($/ft)	MH Costs: Installed ($/ea)	Unit Costs with MHs @ 400 ft: Local ($/ft)	Unit Costs with MHs @ 400 ft: Arterial ($/ft)	Unit Costs with MHs @ 400 ft: Dirt/Gravel ($/ft)	Unit Costs with MHs @ 400 ft: Environmentally Sensitive Areas ($/ft)	TC with Contingency & Indirects ($): Local ($/ft)	TC with Contingency & Indirects ($): Arterial ($/ft)	TC with Contingency & Indirects ($): Dirt/Gravel ($/ft)	TC with Contingency & Indirects ($): Environmentally Sensitive Areas ($/ft)
10-inch-diameter																			
	1	0'-10' deep	$10.00	$85.00	$9.00	$20.00	$4.50	$104.00	$115.00	$99.50	$3,000.00	$111.50	$122.50	$107.00	$149.80	$181.19	$199.06	$173.88	$216.68
	2	10'-15' deep	$10.00	$130.00	$9.00	$20.00	$4.50	$149.00	$160.00	$144.50	$4,000.00	$159.00	$170.00	$154.50	$216.30	$258.38	$276.25	$251.06	$312.86
	3	15'-20' deep	$10.00	$200.00	$9.00	$20.00	$4.50	$219.00	$230.00	$214.50	$4,500.00	$230.25	$241.25	$225.75	$316.05	$374.16	$392.03	$366.84	$457.14
12-inch-diameter								$0.00	$0.00	$0.00									
	4	0'-10' deep	$12.00	$90.00	$9.00	$20.00	$4.50	$111.00	$122.00	$106.50	$3,000.00	$118.50	$129.50	$114.00	$159.60	$192.56	$210.44	$185.25	$230.85
	5	10'-15' deep	$12.00	$140.00	$9.00	$20.00	$4.50	$161.00	$172.00	$156.50	$4,000.00	$171.00	$182.00	$166.50	$233.10	$277.88	$295.75	$270.56	$337.16
	6	15'-20' deep	$12.00	$210.00	$9.00	$20.00	$4.50	$231.00	$242.00	$226.50	$4,500.00	$242.25	$253.25	$237.75	$332.85	$393.66	$411.53	$386.34	$481.44
15-inch-diameter																			
	7	0'-10' deep	$16.00	$95.00	$10.00	$22.00	$5.00	$121.00	$133.00	$116.00	$3,000.00	$128.50	$140.50	$123.50	$172.90	$208.81	$228.31	$200.69	$250.09
	8	10'-15' deep	$16.00	$145.00	$10.00	$22.00	$5.00	$171.00	$183.00	$166.00	$4,000.00	$181.00	$193.00	$176.00	$246.40	$294.13	$313.63	$286.00	$356.40
	9	15'-20' deep	$16.00	$215.00	$10.00	$22.00	$5.00	$241.00	$253.00	$236.00	$4,500.00	$252.25	$264.25	$247.25	$346.15	$409.91	$429.41	$401.78	$500.68
18-inch-diameter																			
	10	0'-10' deep	$27.00	$100.00	$10.00	$22.00	$5.00	$137.00	$149.00	$132.00	$3,000.00	$144.50	$156.50	$139.50	$195.30	$234.81	$254.31	$226.69	$282.49
	11	10'-15' deep	$27.00	$150.00	$10.00	$22.00	$5.00	$187.00	$199.00	$182.00	$4,000.00	$197.00	$209.00	$192.00	$268.80	$320.13	$339.63	$312.00	$388.80
	12	15'-20' deep	$27.00	$220.00	$10.00	$22.00	$5.00	$257.00	$269.00	$252.00	$4,500.00	$268.25	$280.25	$263.25	$368.55	$435.91	$455.41	$427.78	$533.08
	13	20'-25' deep	$27.00	$250.00	$10.00	$22.00	$5.00	$287.00	$299.00	$282.00	$5,000.00	$299.50	$311.50	$294.50	$412.30	$486.69	$506.19	$478.56	$596.36
	14	25'-30' deep	$27.00	$300.00	$10.00	$22.00	$5.00	$337.00	$349.00	$332.00	$5,500.00	$350.75	$362.75	$345.75	$484.05	$569.97	$589.47	$561.84	$700.14
21-inch-diameter																			
	15	0'-10' deep	$40.00	$105.00	$12.00	$25.00	$5.50	$157.00	$170.00	$150.50	$3,000.00	$164.50	$177.50	$158.00	$221.20	$267.31	$288.44	$256.75	$319.95
	16	10'-15' deep	$40.00	$155.00	$12.00	$25.00	$5.50	$207.00	$220.00	$200.50	$4,000.00	$217.00	$230.00	$210.50	$294.70	$352.63	$373.75	$342.06	$426.26
	17	15'-20' deep	$40.00	$225.00	$12.00	$25.00	$5.50	$277.00	$290.00	$270.50	$4,500.00	$288.25	$301.25	$281.75	$394.45	$468.41	$489.53	$457.84	$570.54
	18	20'-25' deep	$40.00	$260.00	$12.00	$25.00	$5.50	$312.00	$325.00	$305.50	$5,000.00	$324.50	$337.50	$318.00	$445.20	$527.31	$548.44	$516.75	$643.95
	19	25'-30' deep	$40.00	$310.00	$12.00	$25.00	$5.50	$362.00	$375.00	$355.50	$5,500.00	$375.75	$388.75	$369.25	$516.95	$610.59	$631.72	$600.03	$747.73
24-inch-diameter																			
	20	0'-10' deep	$42.00	$110.00	$13.00	$26.00	$5.75	$165.00	$178.00	$157.75	$4,000.00	$175.00	$188.00	$167.75	$234.85	$284.38	$305.50	$272.59	$339.69
	21	10'-15' deep	$42.00	$160.00	$13.00	$26.00	$5.75	$215.00	$228.00	$207.75	$5,000.00	$227.50	$240.50	$220.25	$308.35	$369.69	$390.81	$357.91	$446.01
	22	15'-20' deep	$42.00	$230.00	$13.00	$26.00	$5.75	$285.00	$298.00	$277.75	$5,500.00	$298.75	$311.75	$291.50	$408.10	$485.47	$506.59	$473.69	$590.29
	23	20'-25' deep	$42.00	$270.00	$13.00	$26.00	$5.75	$325.00	$338.00	$317.75	$6,000.00	$340.00	$353.00	$332.75	$465.85	$552.50	$573.63	$540.72	$673.82
	24	25'-30' deep	$42.00	$320.00	$13.00	$26.00	$5.75	$375.00	$388.00	$367.75	$6,500.00	$391.25	$404.25	$384.00	$537.60	$635.78	$656.91	$624.00	$777.60
30-inch-diameter																			
	30	0'-10' deep	$75.00	$115.00	$15.00	$28.00	$7.00	$205.00	$218.00	$197.00	$4,000.00	$215.00	$228.00	$207.00	$289.80	$349.38	$370.50	$336.38	$419.18
	31	10'-15' deep	$75.00	$165.00	$15.00	$28.00	$7.00	$255.00	$268.00	$247.00	$5,000.00	$267.50	$280.50	$259.50	$363.30	$434.69	$455.81	$421.69	$525.49
	32	15'-20' deep	$75.00	$240.00	$15.00	$28.00	$7.00	$330.00	$343.00	$322.00	$5,500.00	$343.75	$356.75	$335.75	$470.05	$558.59	$579.72	$545.59	$679.89
	33	20'-25' deep	$75.00	$280.00	$15.00	$28.00	$7.00	$370.00	$383.00	$362.00	$6,000.00	$385.00	$398.00	$377.00	$527.80	$625.63	$646.75	$612.63	$763.43
	34	25'-30' deep	$75.00	$330.00	$15.00	$28.00	$7.00	$420.00	$433.00	$412.00	$6,500.00	$436.25	$449.25	$428.25	$599.55	$708.91	$730.03	$695.91	$867.21
36-inch-diameter																			
	35	0'-10' deep	$95.00	$120.00	$17.00	$30.00	$8.00	$232.00	$245.00	$223.00	$5,500.00	$245.75	$258.75	$236.75	$331.45	$399.34	$420.47	$384.72	$479.42
	36	10'-15' deep	$95.00	$170.00	$17.00	$30.00	$8.00	$282.00	$295.00	$273.00	$6,000.00	$297.00	$310.00	$288.00	$403.20	$482.63	$503.75	$468.00	$583.20
	37	15'-20' deep	$95.00	$250.00	$17.00	$30.00	$8.00	$362.00	$375.00	$353.00	$6,500.00	$378.25	$391.25	$369.25	$516.95	$614.66	$635.78	$600.03	$747.73
	38	20'-25' deep	$95.00	$290.00	$17.00	$30.00	$8.00	$402.00	$415.00	$393.00	$7,000.00	$419.50	$432.50	$410.50	$574.70	$681.69	$702.81	$667.06	$831.26
	39	25'-30' deep	$95.00	$340.00	$17.00	$30.00	$8.00	$452.00	$465.00	$443.00	$7,500.00	$470.75	$483.75	$461.75	$646.45	$764.97	$786.09	$750.34	$935.04
42-inch-diameter																			
	40	0'-10' deep	$115.00	$125.00	$20.00	$35.00	$10.00	$260.00	$275.00	$250.00	$7,000.00	$277.50	$292.50	$267.50	$374.50	$450.94	$475.31	$434.69	$541.69
	41	10'-15' deep	$115.00	$180.00	$20.00	$35.00	$10.00	$315.00	$330.00	$305.00	$7,500.00	$333.75	$348.75	$323.75	$453.25	$542.34	$566.72	$526.09	$655.59
	42	15'-20' deep	$115.00	$275.00	$20.00	$35.00	$10.00	$410.00	$425.00	$400.00	$8,000.00	$430.00	$445.00	$420.00	$588.00	$698.75	$723.13	$682.50	$850.50
	43	20'-25' deep	$115.00	$320.00	$20.00	$35.00	$10.00	$455.00	$470.00	$445.00	$8,500.00	$476.25	$491.25	$466.25	$652.75	$773.91	$798.28	$757.66	$944.16
	44	25'-30' deep	$115.00	$360.00	$20.00	$35.00	$10.00	$495.00	$510.00	$485.00	$9,000.00	$517.50	$532.50	$507.50	$710.50	$840.94	$865.31	$824.69	$1,027.69
48-inch-diameter																			
	45	0'-10' deep	$135.00	$130.00	$24.00	$40.00	$12.00	$289.00	$305.00	$277.00	$7,000.00	$306.50	$322.50	$294.50	$412.30	$498.06	$524.06	$478.56	$596.36
	46	10'-15' deep	$135.00	$200.00	$24.00	$40.00	$12.00	$359.00	$375.00	$347.00	$7,500.00	$377.75	$393.75	$365.75	$512.05	$613.84	$639.84	$594.34	$740.64
	47	15'-20' deep	$135.00	$300.00	$24.00	$40.00	$12.00	$459.00	$475.00	$447.00	$8,000.00	$479.00	$495.00	$467.00	$653.80	$778.38	$804.38	$758.88	$945.68
	48	20'-25' deep	$135.00	$340.00	$24.00	$40.00	$12.00	$499.00	$515.00	$487.00	$8,500.00	$520.25	$536.25	$508.25	$711.55	$845.41	$871.41	$825.91	$1,029.21
	49	25'-30' deep	$135.00	$380.00	$24.00	$40.00	$12.00	$539.00	$555.00	$527.00	$9,000.00	$561.50	$577.50	$549.50	$769.30	$912.44	$938.44	$892.94	$1,112.74
															Includes permitting, surface restoration, & matting.				Includes permitting, surface restoration, & matting.

Highlighted values are used in the Tualatin Master Plan

Appendix B
Durham AWWTF Model Calibration

Clean Water Services, Durham Basin Collection System Model Calibration

PREPARED FOR: Clean Water Services and HDR

PREPARED BY: CH2M HILL

DATE: August 14, 2012

PROJECT NUMBER: 430555

Background

The purpose of this technical memorandum is to provide summary notes related to the Durham Basin Collection System Model calibration. The collection system model network was converted to INFOSWMM (Innovyze) software by HDR in January 2012. Subsequent to the model conversion, CH2M HILL performed network validation, dry weather calibration, and wet weather calibration utilizing data provided by Clean Water Services (District). This technical memorandum provides notes related to the validation and calibration activities. The notes should be utilized in conjunction with the calibrated model as well as referenced GIS layers and calibration plots.

Network

The District provided the following data for review:

1. Collection system model
2. Collection system GIS
3. Pump curves
4. Major flow diversion field measurements (diversion pipe depth relative to manhole rim)
5. Design or as-built drawings related to recent projects

CH2M HILL provided the following review activities and model modifications based on the available data:

1. The model network was reviewed for inconsistencies in connectivity and slope. Manhole inverts and associated pipeline inverts were modified to match one another for inconsistencies resulting in irregular connections (pipe invert below manhole invert) or adverse slopes (pipe invert above manhole invert). For adverse slopes, where the manhole and pipeline inverts are equal, no modifications were implemented. All changes and suspect slopes are flagged in the model "NET_NOTE_SLOPE" field.
2. The model network was compared to the GIS network and reviewed for inconsistencies related to recent construction projects. The District provided a list of recent projects including some design or as-built drawings. These projects were implemented into the model based on the available drawings and GIS. All changes are flagged in the model "NET_NOTE_PROJECTS" field.
3. Additional inconsistencies between the model and GIS (unrelated to the project list) are also flagged in the model "NET_NOTE_GIS" field. Modifications were only implemented to these model elements at locations of major flow diversions.
4. During the model conversion, many of the model elements were linked to the GIS based on the model "GIS_ID" and "EDGE_ID" fields for junctions and pipelines respectively. These fields were reviewed for consistency and populated where the link was missing.
5. Multi-point pump curves were added to the model for all modeled pump stations.

6. The District has a number of bolted manholes in stream corridors. Per discussions with the District, all manholes in the model are simulated as bolted manholes by increasing the allowable surcharge depth above the rim elevation.
7. All pipelines are assigned a Manning's roughness factor (n) of 0.013. Minor loss coefficients are scaled between 0.2 and 1.0 based on factors provided by HDR.

Flow Meters

Flow meter and SCADA data were provided by the District at 31 locations in the Durham Basin. Data was primarily available from October 2011 to March 2012. Historic flow data was available at several meter locations including the DU-IPS. CH2M HILL reviewed flow monitoring data at the 31 locations and selected 25 locations for the model calibration. Meters are referenced by manhole ID or pump station name. The meters locations, names, and descriptions are provided in the GIS shapefile "DU_Flow_Meter" and included with the calibrated model.

Service area polygons were delineated for the Durham Basin for model dry weather and wet weather loading. The service area polygons were developed utilizing the GIS network, model network, and District parcel GIS layers. Subsequent to the delineation, the service area polygons were grouped into sub-basins for the 25 selected meter sites. The service area and sub-basin delineations are provided in the GIS shapefile "DU_Subbasin" and included with the calibrated model.

Rainfall

The District maintains 12 precipitation gages with data available in 15-minute increments. For the model calibration, one precipitation gage was selected per sub-basin based on the closest distance between the gage and the centroid of the sub-basin. Precipitation gages used for the Durham Basin include CHR, DPR, LTR, MTR, and RVR. The precipitation gages are provided in the GIS shapefile "CWS_Rain_Gages" and included with the calibrated model.

Three precipitation time periods were selected for the wet weather model calibration. Multiple storm events occur during each time period.

Period 1: January 16, 2012 – January 26, 2012

The precipitation for the time period is presented in Exhibit 1 at gage MTR. This was selected as the primary calibration time period because of the severity of the impact to the system. Multiple events in a row on January 18th and 19th resulted in a maximum 72-hour precipitation depth of 3.8 inches. The second event included impacts from rainfall and snowmelt.

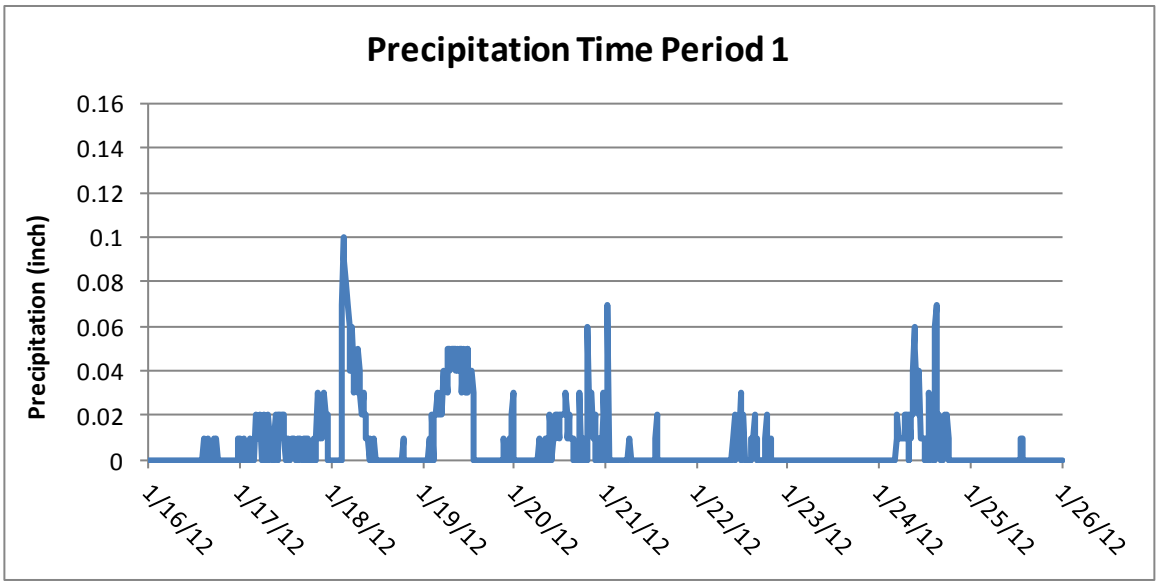


Exhibit 1. Calibration Time Period 1

Period 2: November 15, 2011 – November 27, 2011

The precipitation for the time period is presented in Exhibit 2 at gage MTR. The storm events during this time period were less impacted by antecedent moisture. The maximum precipitation depth over 72-hours is 2.6 inches.

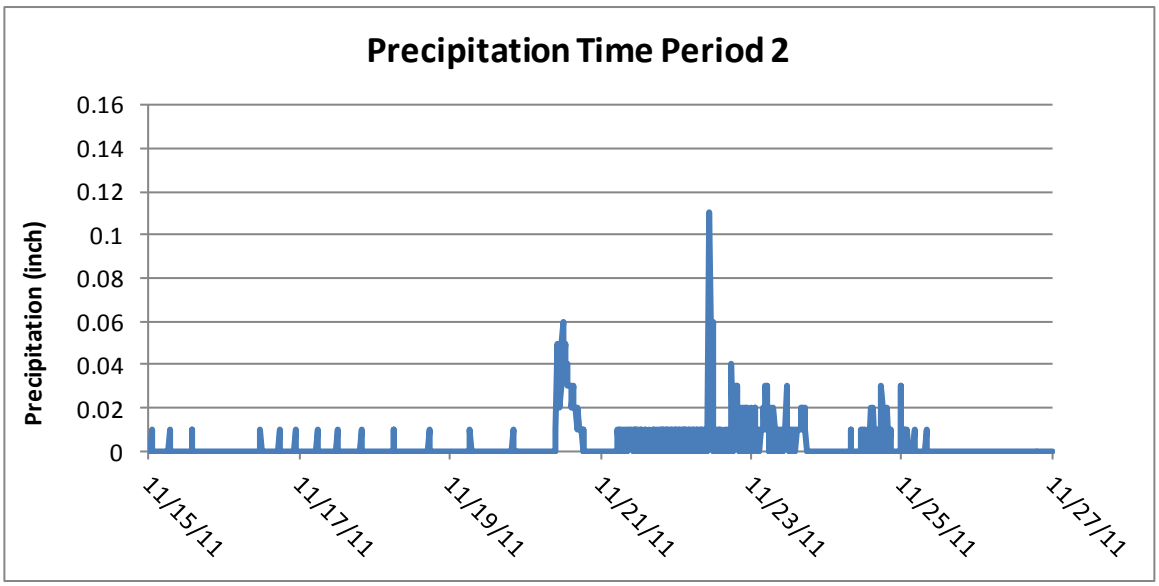


Exhibit 2. Calibration Time Period 2

Period 3: December 23,2008 – January 10,2009

The precipitation for the time period is presented in Exhibit 3 at gage MTR. This was selected as the validation time period. The maximum 72-hour precipitation depth of 3.9 inches is comparable to the depth for the primary calibration period.

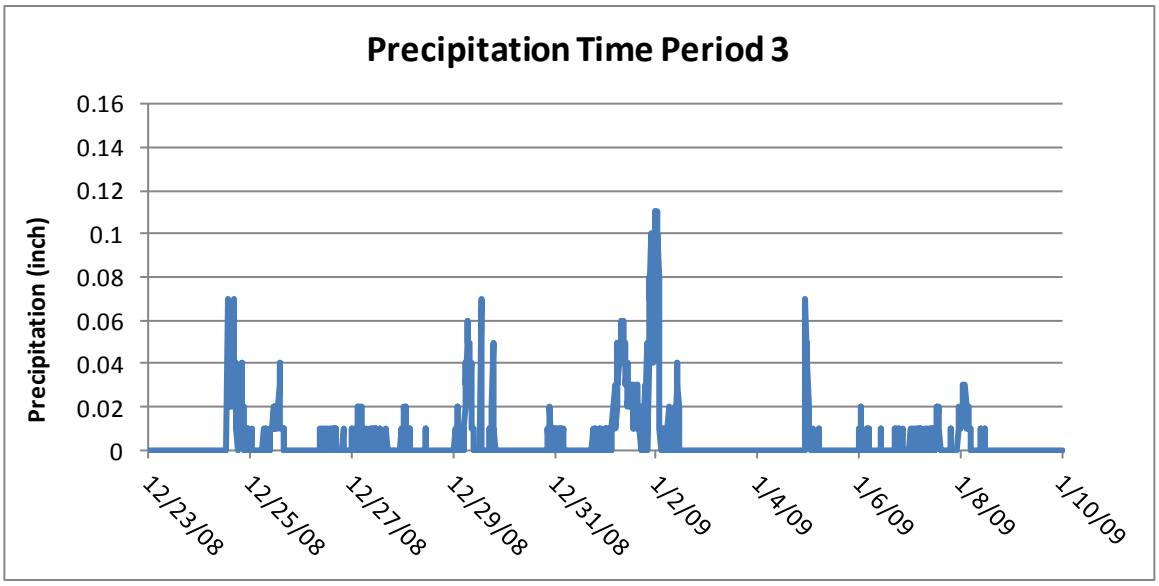


Exhibit 3. Calibration Time Period 3

Scenarios

Five scenarios were added to the model for the calibration as children to the "Existing System" scenario. These scenarios are described in Exhibit 4.

EXHIBIT 4

Durham Basin Calibration

Calibration Scenarios

Scenario Name	Time Period	Description
2011_DRY_CALIB	December 1, 2011 – December 22, 2011[a]	Dry weather simulation
2011_DRY_CALIB_INF	December 1, 2011 – December 22, 2011[a]	Dry weather simulation with adjustment to base flows to utilize full flow factor loading
2012_WET_CALIB_STORM1	January 16, 2012 – January 26, 2012	Wet weather simulation time period 1
2011_WET_CALIB_STORM2	November 15, 2011 – November 27, 2011	Wet weather simulation time period 2
2009_WET_CALIB_STORM3	December 23, 2008 – January 10, 2009	Wet weather simulation time period 3

[a] Dry period simulation can be run for shorter period of time as the diurnal pattern and average loading will repeat on a daily basis.

Active elements for each scenario are set by an existing element query within InfoSWMM. The existing network is active for all scenarios (future elements inactive). The Tektronix pump station is modeled as an ideal pump (flow in equals flow out) to minimize instability (flow spikes) in the model and to simulate a soft start.

Specific simulation options are set-up for each model scenario to adjust the simulated time period. All datasets remain constant for the five scenarios with the exception of the "DWF", "RDII", and "hydrograph" datasets.

Dry Weather

Initially, average dry weather loading was developed from land use data and dry weather flow factors provided by Carollo. Loading was assigned to model junctions using the service area polygon delineations. Flow factors are presented by land use in Exhibit 5 including the allocation code used to describe the flow within INFOSWMM. Next, average flow data and diurnal patterns were extracted from the 25 selected meters using SSOAP (EPA) for a time period between December 1 and December 22, 2011. For several meters, poor data required an alternate time period between November 1 and November 15, 2011. The average loading and diurnal patterns for each meter were based on averages of all weekdays excluding Fridays and days with suspect data. The average loading based on the land use flow factors were adjusted to coincide with the average loading based on the meter data. For most sub-basins, the average loading was scaled down to match meter data. In several sub-basins, the average loading was scaled up to match meter data. The increased loading was assigned to industrial parcels where industrial land uses were identified. Finally, the groundwater component of the base flow was separated from the average flow assuming that groundwater comprises 80% of the total base flow. Diurnal patterns were adjusted to reflect the separation of base flows into the two components. Scenario "2011_DRY_CALIB" represents calibration results with adjusted loading to coincide with meter data.

After the dry calibration was complete, base flow was added back to the model so that the average loading in each sub-basin equaled or exceeded the initial loading established by dry weather flow factors. The augmented base flow is assumed to be additional groundwater infiltration. Scenario "2011_DRY_CALIB_INF" represents calibration results with increased base flows to coincide with the dry weather flow factors.

The steps of the flow loading are presented for each meter in Exhibit 6.

EXHIBIT 5

Durham Basin Calibration

Dry Weather Flow Factors and Allocation Codes

Land Use	Flow Factor (gallons per acre day, GPAD)	Allocation Code
Commercial	1,000	COM
Industrial	1,050	IND
Multi-Family Residential	2,300	MFR
Rural	350	RUR
Single-Family Residential	1,250	SFR
Mixed-Use Residential	1,250	MUR
Groundwater Infiltration (80% of metered base flow)		GWI
Additional Groundwater Infiltration (Difference between metered and flow factor loading)		INF

EXHIBIT 6

Durham Basin Calibration

Dry Weather Flow Loading

Meter	Dry Weather Average Load Based on Flow Factor (gpm)	Industrial Adjustment	Dry Weather Average Load Adjustment Factor Based on Meter	Dry Weather Average Load (gpm)	Groundwater Infiltration (80% of Base, gpm)	Additional Base Flow (gpm)[a]	Adjustment Factor Justification
4326	17	1.00	1.00	17	556	0	no adjustment
4713	221	1.00	0.70	155	60	67	excess infiltration
5048	111	1.00	1.04	115	57	0	limited adjustment
6551	1228	1.00	0.48	595	182	633	excess infiltration
10483	11244	1.00	0.50	7777	2875	782	excess infiltration
10692	1832	1.00	0.53	1062	374	708	excess infiltration
10740	341	1.00	0.71	247	118	94	excess infiltration
10796	4891	1.00	0.41	3423	579	866	excess infiltration
11659	1083	1.00	0.57	621	116	462	excess infiltration
11679	967	1.00	0.94	913	101	54	excess infiltration
11719	2930	1.00	1.96	2701	1006	0	over-estimate of vacant lands or higher residential density
11779	3081	1.00	0.50	2574	1054	74	excess infiltration
11792	1776	1.00	0.93	1103	448	41	excess infiltration
12430	766	1.00	1.00	1085	319	0	no adjustment
13248	372	1.00	0.66	250	100	109	excess infiltration
14366	330	1.00	0.41	135	26	195	excess infiltration
14939	1567	1.00	0.93	1457	223	110	excess infiltration
16581	335	3.33	1.00	654	422	0	additional industrial load from Tektronix Inc
19970	264	1.00	0.74	195	54	69	excess infiltration
20611	55	1.00	0.77	43	30	13	excess infiltration
20650	19	12.28	1.00	62.75	17	0	additional industrial load from Reser Foods
22276	1358	1.00	0.96	1304	342	54	excess infiltration
25656	563	1.00	0.94	529	159	34	excess infiltration
57387	152	1.00	1.00	152	26	0	no adjustment
800892	1464	1.00	0.50	811	286	190	excess infiltration
DU_WWTP	16929	1.50	1.00	13489	5892	0	additional industrial load (multiple owners)

[a] Base flow added back to the model so that the average loading in each sub-basin equaled or exceeded the initial loading established by dry weather flow factors.

The calibration criteria established by HDR for dry weather validation includes the following:

- The shapes of the hydrographs should follow closely in shape and magnitude

- The timing of peaks and troughs should be within 1 hour
- The peak flow rate should be in the range of +/- 10%
- The volume of flow should be in the range of +/- 10%

The dry weather model was run for several iterations to satisfy the calibration criteria with a 1 to 2 hour adjustment made for travel time to align peaks and troughs. In general, the dry weather calibration satisfies the criteria. In some sub-basins, weekend days or a singular weekday control the peak flow rate. Adjustments were not implemented to satisfy weekend day peaks or abnormally high singular day peaks. Additionally, there are a number of meters where the data was suspect and the alternate time period was used for model validation. The calibration was performed prior to implementing the excess infiltration from the land use flow factors. For some sub-basins, the addition of excess infiltration may over-estimate impacts from groundwater.

Calibration time series plots comparing model results to field data and calibration criteria statistics for each meter can be found in the following files:

1. Calibration_DRY_DU1a.xlsm & Calibration_DRY_DU1b.xlsm: Files include time series plots and calibration statistics from December 1 to December 22, 2011 and December 12 to December 16, 2011 [2011_DRY_CALIB]. The shorter period reflects a typical weekday calibration excluding Friday and weekend days.
2. Calibration_DRY_DU2a.xlsm & Calibration_DRY_DU2b.xlsm: Files include time series plots and calibration statistics for the alternate time period from November 1 to November 15, 2011 and November 7 to November 11, 2011 [2011_DRY_CALIB].
3. Calibration_DRY_DU1a_INF.xlsm & Calibration_DRY_DU1b_INF.xlsm: Files include time series plots and calibration statistics from December 1 to December 22, 2011 and December 12 to December 16, 2011 [2011_DRY_CALIB_INF]. The shorter period reflects a typical weekday calibration excluding Friday and weekend days. Includes additional base flow such that the average loading in each sub-basin equals or exceeds the initial loading established by the dry weather flow factors.
4. Calibration_DRY_DU2a_INF.xlsm & Calibration_DRY_DU2b_INF.xlsm: Files include time series plots and calibration statistics for the alternate time period from November 1 to November 15, 2011 and November 7 to November 11, 2011 [2011_DRY_CALIB_INF]. Includes additional base flow such that the average loading in each sub-basin equals or exceeds the initial loading established by the dry weather flow factors.

A summary of calibration results statistics are presented in Exhibit 7.

EXHIBIT 7

Durham Basin Calibration

Dry Weather Calibration Results Statistics[a]

Meter	Peak Flow Comparison (%)	Volume Comparison (%)	Level Comparison (inch)	Time Period	Calibration Comment
4326	NA	NA	-1.0	Dec 12 - 16, 2011	Meter flow used as boundary inflow to model from Fanno Basin.
4713	5%	-4%	-0.6	Dec 12 - 16, 2011	
5048	8%	-2%	0.2	Dec 12 - 16, 2011	
6551	6%	-6%	-0.3	Dec 12 - 16, 2011	
10483	-11%	-8%	-0.3	Dec 12 - 16, 2011	Conservative peak flow estimate in contributing sub-basins.
10692	9%	-5%	1.3	Dec 12 - 16, 2011	
10740	-1%	-14%	-0.4	Dec 12 - 16, 2011	Erratic diurnal pattern

EXHIBIT 7

Durham Basin Calibration

Dry Weather Calibration Results Statistics[a]

Meter	Peak Flow Comparison (%)	Volume Comparison (%)	Level Comparison (inch)	Time Period	Calibration Comment
					replaced with typical diurnal pattern.
10796	-10%	-109%	-0.4	Dec 12 - 16, 2011	Erratic meter data (flow drops out routinely) causing an over-estimation of volume.
11659	-1%	-22%	-0.5	Dec 12 - 16, 2011	Over-estimation of volume based on contributions from upstream sub-basins.
11679	2%	-11%	3.0	Dec 1 – 4, 2011	
11719	0%	4%	0.3	Dec 12 - 16, 2011	
11779	-8%	-8%	1.1	Dec 12 - 16, 2011	
11792	-1%	-4%	3.8	Dec 12 - 16, 2011	
12430	22%	-78%	0.1	Dec 12 - 16, 2011	Erratic meter data caused by un-modeled pump stations.
13248	12%	-3%	0.2	Dec 12 - 16, 2011	Erratic flow pattern on some days.
14366	-2%	-51%	-0.1	Dec 7 – 11, 2011	Erratic meter data.
14939	1%	-21%	-1.8	Dec 12 - 16, 2011	Excess volume not noticed during other time periods.
16581	11%	3%	3.2	Dec 12 - 16, 2011	Erratic flow pattern.
19970	NA	NA	NA	Dec 3, 11, 2011	Limited meter data.
20611	2%	-41%	0.5	Dec 12 - 16, 2011	Erratic diurnal pattern replaced with typical diurnal pattern.
20650	27%	-14%	2.2	Dec 12 - 16, 2011	Erratic diurnal pattern replaced with typical diurnal pattern.
22276	-13%	-6%	-0.2	Dec 12 - 16, 2011	Erratic model peak flow caused by several pump stations.
25656	1%	-13%	2.8	Dec 3 – 6, 2011	Excess volume not noticed during other time periods.
57387	26%	-6%	0.4	Dec 12 - 16, 2011	Erratic flow pattern on some days.
800892	-2%	-15%	-1.0	Dec 12 - 16, 2011	Excess volume not noticed during other time periods.
DU_WWTP	16%	2%	NA	Dec 12 - 16, 2011	High peak flow likely error in meter data. Peak flow discrepancy not noticed on most days.

[a]Includes results without excess infiltration.

Wet Weather

The wet weather component of the model consists of precipitation, sewershed acreage (wet weather area of impact), and rainfall distributed infiltration and inflow (RDII) unit hydrograph. In the Durham model, the

sewersheds were defined by placing a 50 ft buffer around all system pipes (100 ft total buffer width). The sewershed areas were assigned to model junctions using the service area polygons. The modeled sewersheds are provided in the GIS shapefile "DU_Sewershed" and included with the calibrated model. During the model calibration, actual precipitation data was applied to the sewershed areas for the three time periods described in Exhibit 4.

The wet weather component of the model utilizes the EPASWMM RTK unit hydrograph methodology. The unit hydrograph defines the amount of runoff (percentage of the volume created from the sewershed and precipitation depth) which enters the system and the travel time. The unit hydrograph is broken into an initial, intermediate, and long-term hydrograph response. The three unit hydrographs combine to form a composite unit hydrograph. Each of the three unit hydrographs is defined by three parameters which are adjusted during model calibration until field and model flows match within a reasonable tolerance. The unit hydrograph parameters are described below and shown in Exhibit 8.

Unit Hydrograph Parameter 1 - R1, **R2**, **R3 -** Response ratios for the short-term, intermediate-term, and long-term UH responses, respectively.

Unit Hydrograph Parameter 2 - T1, **T2**, **T3** - Time to peak for the short-term, intermediate-term, and long-term UH responses, respectively.

Unit Hydrograph Parameter 3 - K1, **K2**, **K3 -** Recession limb ratios for short-term, intermediate-term, and long-term UH responses, respectively.

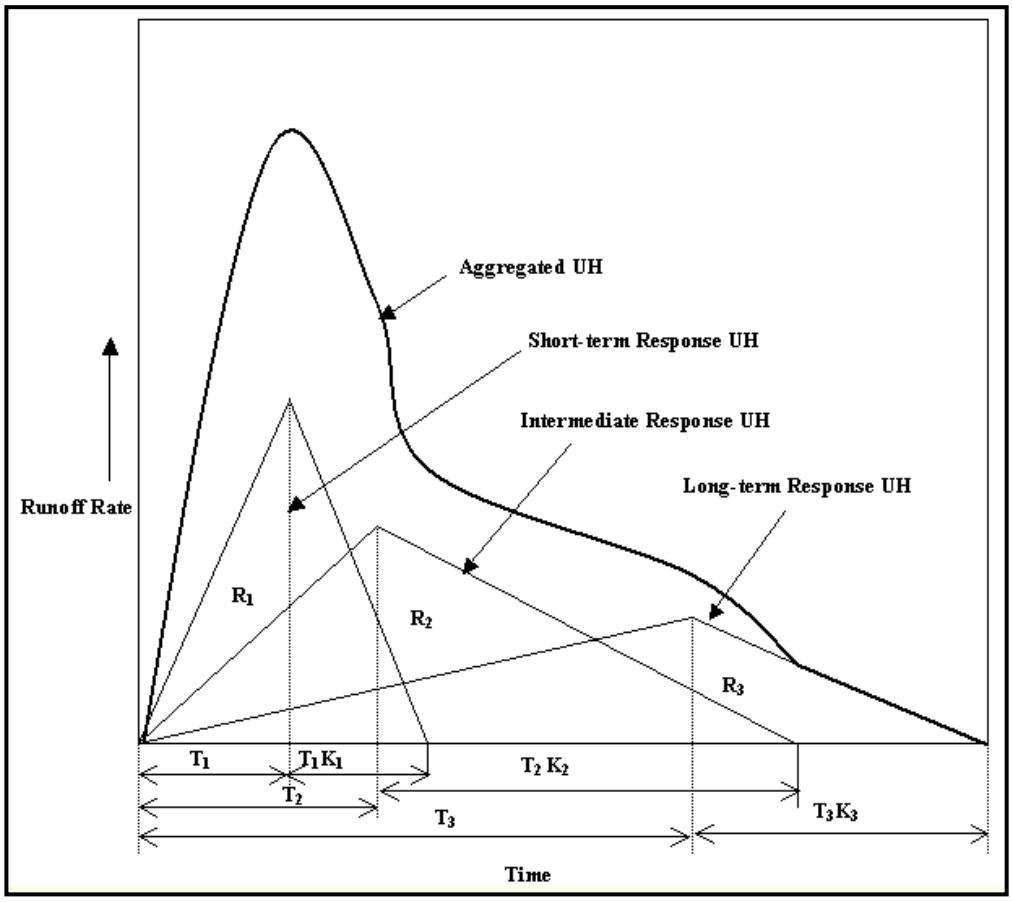


Exhibit 8. SWMM RTK Unit Hydrograph Description

In general, the "R" value will vary by storm event and antecedent moisture condition. For this reason, the rainfall period with the greatest impact to the system was selected as the primary calibration storm (January 16 - 26, 2012). The RTK parameters were initially extracted for the primary calibration storm using SSOAP for the 25 selected meters. The unit hydrographs were assigned to model junctions by sub-basin. Unit hydrograph parameters were then adjusted for each sub-basin through seven iterations of model scenarios with primary focus on adjusting "R" values. Finally, the model was run for two additional precipitation periods (November 15 – 27, 2011 and December 23, 2008 – January 10, 2009) to identify the sensitivity of the model to alternate rainfall characteristics and antecedent moisture conditions. The final RTK parameters are presented for each meter in Exhibit 9.

EXHIBIT 9

Durham Basin Calibration

Wet Weather Calibration, RTK Parameters

Unit Hydrograph	R1	T1 (hours)	K1	R2	T2 (hours)	K2	R3	T3 (hours)	K3
4713	0.04	0.5	1	0.1	2	4	0.25	8	12
5048	0.05	0.5	1	0.1	2	4	0.25	8	12
6551	0.015	0.5	1	0.02	2	4	0.11	8	12
10483	0.015	0.5	1	0.15	4	6	0.25	8	12
10692	0.01	0.5	1	0.1	2	4	0.12	8	12
10740	0.005	0.5	1	0.05	2	6	0.06	8	12
10796	0.01	0.5	1	0.05	2	4	0.1	8	12
11659	0.01	0.5	1	0.02	2	4	0.05	8	12
11679	0.003	0.5	1	0.009	2	4	0.1	8	12
11719	0.01	0.5	1	0.07	2	4	0.2	8	12
11779	0.017	0.5	1	0.08	2	4	0.225	8	12
11792	0.017	0.5	1	0.1	2	4	0.21	8	12
12430	0.01	0.5	1	0.1	2	4	0.33	8	12
13248	0.008	0.5	1	0.1	2	4	0.25	8	12
14366	0.01	0.5	1	0.02	2	4	0.1	8	12
14939	0.005	0.5	1	0.025	2	4	0.075	8	12
16581	0.01	0.5	1	0.1	2	4	0.3	8	12
19970	0.005	0.5	1	0.025	2	4	0.075	8	12
20611	0.04	0.5	1	0.15	2	4	0.25	8	12
20650	0.005	0.5	1	0.04	2	4	0.23	8	12
22276	0.006	0.5	1	0.03	2	4	0.12	8	12
25656	0.005	0.5	1	0.07	2	4	0.25	8	12
57387	0.01	0.5	1	0.02	2	4	0.12	8	12
59140	0.01	0.5	1	0.02	2	4	0.1	8	12
800892	0.005	0.5	1	0.008	2	4	0.05	8	12
DU_WWTP	0.008	0.5	1	0.04	2	4	0.18	8	12

The calibration criteria established by HDR for wet weather validation includes the following:

- The flow hydrographs should follow each other in both shape and magnitude until the flow has substantially returned to dry weather flow rates
- The timing of peaks and troughs should be similar having regard to the duration of the event

- Peak flow rates at each significant peak should be in the range of +25% to -15% and should be generally similar throughout the event
- The volume of flow should be in the range of +20% to -10%
- The depth of surcharge should be in the range of +18 inches to -4 inches (optional)
- The unsurcharged depth at any key point should be within the range of +/- 4 inches (optional)

The calibrated RTK parameters for many of the sub-basins and for the primary calibration storm (January 16 – 26, 2012) suggest the greatest impact from RDII occurs in the long-term response. The precipitation time period consisted of snow and rain on January 18th followed by rain and snow melt on January 19th. The greater system impact occurred on the second day because of the combined impacts of antecedent moisture and rain on snow. Although this precipitation event is not typical of year-round rainfall, it may be typical of winter time events at the one-in-five year frequency.

When applying the calibrated RTK parameters to a rainfall period earlier in the year (November 2011), the model calibration is conservative. The conservatism is due to a lesser antecedent moisture condition. When applying the calibrated RTK parameters to a historic rainfall period during a similar time of year (December 2008 – January 2009), the model calibration is reasonable. Fewer flow meters were available for the historic rainfall period; however, the calibration matches the peak flow rate and volume particularly well at the DU-IPS. The calibration was performed after implementing the excess infiltration from the land use flow factors. For some sub-basins, the addition of excess infiltration may over-estimate impacts from groundwater during smaller storm events.

The District provided information on a known obstruction in a 48-inch pipeline near Broadway Street and west of 117th Avenue. The pipe diameter was reduced to 29-inches to calibrate the water level in upstream meter 12430 for the primary calibration storm.

Calibration time series plots comparing model results to field data, calibration criteria statistics, and best fit plots for each meter and precipitation time period can be found in the following files:

1. Calibration_WET_DU1.xlsm: Files include time series plots and calibration statistics from January 16 to January 26, 2012 [2012_WET_CALIB_STORM1].
2. Calibration_WET_DU2.xlsm: Files include time series plots and calibration statistics from November 15 to November 27, 2011 [2011_WET_CALIB_STORM2].
3. Calibration_WET_DU3.xlsm: Files include time series plots and calibration statistics from December 23, 2008 to January 10, 2009 [2009_WET_CALIB_STORM3].
4. Best_Fit_Plots.xlsm: Files include best fit plots comparing results statistics for three precipitation periods.

A summary of calibration results statistics are presented in Exhibit 10.

EXHIBIT 10

Durham Basin Calibration

Wet Weather Calibration Results Statistics

Meter	Time Period 1, Jan 16 – 26, 2012			Time Period 2, Nov 15 – 27, 2011			Time Period 3, Dec 23, 2008 – Jan 10, 2009			Calibration Comment
	Peak Flow Difference (%)	Volume Difference (%)	Surcharge Level Difference (inch)	Peak Flow Difference (%)	Volume Difference (%)	Surcharge Level Difference (inch)	Peak Flow Difference (%)	Volume Difference (%)	Surcharge Level Difference (inch)	
4326	1%	-9%	-0.3	0%	201%	29.6	NA	NA	NA	
4713	3%	-19%	-280.8	-16%	-50%	-2.3	-31%	-27%	-1303.3	Conservative calibration required to match peak flow. Surcharge not metered.
5048	2%	1%	-174.5	NA	NA	NA	19%	50%	-1214.1	Surcharge not metered.
6551	-7%	-25%	-10.8	-15%	-86%	-7.1	-15%	-39%	6.8	Conservative volume based on excess infiltration based on flow factors. Surcharge level not fully metered.
10483	4%	-34%	-13.6	-4%	-59%	11.9	NA	NA	NA	Erratic meter data resulting in excessive volume difference.
10692	-3%	-11%	-143.4	-17%	-48%	-2.7	NA	NA	NA	Surcharge not metered.
10740	-20%	0%	18.3	-51%	-34%	24.0	NA	NA	NA	Erratic meter data.
10796	67%	-22%	8.2	-53%	-75%	24.6	64%	9%	-72.0	Calibration adequate when ignoring erratic meter spikes. Flow criteria satisfied 61% of time steps.
11659	2%	-55%	-1.2	-115%	-126%	-6.3	NA	NA	NA	Conservative volume based on excess infiltration based on flow factors.
11679	-90%	5%	1.7	NA	NA	NA	NA	NA	NA	Model instability caused by pump stations impacts peak flow. Instability is eliminated in next downstream meter.

EXHIBIT 10

Durham Basin Calibration

Wet Weather Calibration Results Statistics

Meter	Time Period 1, Jan 16 – 26, 2012			Time Period 2, Nov 15 – 27, 2011			Time Period 3, Dec 23, 2008 – Jan 10, 2009			Calibration Comment
	Peak Flow Difference (%)	Volume Difference (%)	Surcharge Level Difference (inch)	Peak Flow Difference (%)	Volume Difference (%)	Surcharge Level Difference (inch)	Peak Flow Difference (%)	Volume Difference (%)	Surcharge Level Difference (inch)	
11719	0%	-4%	-0.1	-27%	-38%	-3.4	32%	10%	3.3	
11779	1%	-11%	10.8	-20%	-58%	24.6	NA	NA	NA	
11792	75%	-23%	-52.8	-9%	-75%	-66.1	NA	NA	NA	Calibration adequate when ignoring erratic meter spikes. Flow criteria satisfied 48% of time steps.
12430	59%	-17%	-3.0	-16%	-147%	-32.9	-17%	19%	-39.0	Calibration adequate when ignoring erratic meter spikes. Flow criteria satisfied 70% of time steps.
13248	1%	-9%	-6.8	-12%	-123%	-6.0	NA	NA	NA	
14366	21%	-1261%	-11.9	-439%	-24697%	-2.0	-51%	-211%	-77.5	Volume and peak flow impacted by meter and model diversion. Potential meter data error.
14939	-6%	2%	-8.8	10%	-6%	-2.0	NA	NA	NA	
16581	-2%	6%	3.0	-21%	-41%	1.5	NA	NA	NA	
19970	NA	NA	NA	NA	NA	NA	-69%	-521%	450.4	Meter data not available. Used wet weather parameters from downstream sub-basins.
20611	-1%	7%	1.0	-23%	-58%	-0.9	NA	NA	NA	
20650	-8%	-1%	335.6	25%	14%	199.8	NA	NA	NA	Surcharge not metered.

EXHIBIT 10

Durham Basin Calibration

Wet Weather Calibration Results Statistics

Meter	Time Period 1, Jan 16 – 26, 2012			Time Period 2, Nov 15 – 27, 2011			Time Period 3, Dec 23, 2008 – Jan 10, 2009			Calibration Comment
	Peak Flow Difference (%)	Volume Difference (%)	Surcharge Level Difference (inch)	Peak Flow Difference (%)	Volume Difference (%)	Surcharge Level Difference (inch)	Peak Flow Difference (%)	Volume Difference (%)	Surcharge Level Difference (inch)	
22276	0%	-3%	-0.3	-33%	-14%	-2.7	NA	NA	NA	
25656	-5%	9%	0.2	NA	NA	NA	NA	NA	NA	
57387	8%	-45%	-9.8	-19%	-41%	0.4	NA	NA	NA	Potential error in meter data impacting volume estimate.
800892	2%	-35%	-0.2	-139%	-119%	-6.8	-6%	-67%	36.3	Conservative volume based on excess infiltration based on flow factors.
DU_WWTP	-2%	-9%	NA	-5%	-44%	NA	-5%	-3%	0.0	

Murray, Smith & Associates, Inc.
Engineers/Planners

888 SW 5th Avenue, Suite 1170 ▪ Portland, OR 97204 ▪ PHONE 503.225.9010 ▪ FAX 503.225.9022

TECHNICAL MEMORANDUM

DATE: April 29, 2017

PROJECT: 16-1809

TO: Clean Water Services

FROM: Shad J. Roundy, P.E.
Murray, Smith & Associates, Inc.

RE: Durham Basin Hydraulic Model Calibration (2016)

Introduction

Clean Water Services (District) is planning for improvements at the Durham Advanced Wastewater Treatment Facility (AWWTF). Murray, Smith, & Associates, Inc (MSA) was contracted to perform base design flow projections for the Durham Basin in support of the AWWTF work. The base flow projections are documented in a technical memorandum entitled, *Durham Basin Base Flow, Household, Population, and Employment Projections* [MSA, January 2017].

As part of the base flow projections, MSA calibrated the District's InfoSWMM (Innovyze) Collection System Hydraulic Model to summer time and winter time flow conditions. This technical memorandum documents the model calibration procedure and results. The calibration is an update to the model calibration performed in 2012 and documented in a technical memorandum entitled, *Clean Water Services, Durham Basin Collection System Model Calibration* [CH2M HILL, August 2012].

Flow Metering and Precipitation Data

Flow meter data were provided by the District at 30 locations in the Durham Basin as shown in Figure 1. The flow metering data were reviewed and three calibration periods were selected to represent summer time dry weather, winter time dry weather, and winter time wet weather conditions as described below.

- Summer time dry weather flow: July 1 – July 6, 2015. This period represents primarily sanitary flows with limited to no influence from groundwater infiltration (GWI) and rainfall derived infiltration and inflow (RDII).

- Winter time dry weather flow: December 30, 2015 – January 3, 2016. This period represents sanitary flows with a high influence from groundwater infiltration (GWI) because of antecedent moisture and saturated soil conditions. The period is not influenced directly by RDII.

- Winter time wet weather flow: December 6, 2015 – December 19, 2015. This period represents peak flow conditions with influence from GWI and RDII. Two significant rainfall events occurred during the calibration period, including 5 to 10-year frequency storm events on December 7th and December 17th.

The District maintains 12 precipitation gages with data available in 15-minute increments. For the model calibration, precipitation gages were assigned to service areas based on proximity. Precipitation gages used for the Durham Basin include CHR, DPR, LTR, MTR, and RVR.

FIGURE 1

CleanWater Services

DURHAM MODEL CALIBRATION METER MAP

MSA Murray, Smith & Associates, Inc. Engineers/Planners

April 2017

Tektronix
Beaverton
Beaverton
Tigard
Scholls County Estates
River Terrace North
Meyers Farm
Pleasant View
King City
Bull Mountain
Durham
Lower Tualatin
Sherwood
Cipole
Tualatin
Foxhill
Orchard Hill
Saum Creek
Sequoia Ridge
Borland
Victoria Wooods
Sherwood
Lake Oswego

6551
12430
11792
13248
11779
10740
20654
4713
20860
6602
6634
811894
19689
10796
9450
9495
10692
19970
14939
14366
16650
21142
21186
25656
10483
AWWTF
11719
11679
800892
22276

Flow Meter
Pump Station
Gravity Pipeline
Durham Basin
Urban Growth Boundary
City Boundary
Stream or River
Street

0 0.5 1 2 Miles

N

G:\PDX_Projects\161809_CWS_DURHAM\GIS\MXD\Flow_Meter_Map_2017_05_05.mxd 5/5/2017 2:59:02 PM SJR

Dry Weather Calibration (Summer-time)

Prior to completing the dry weather flow calibration, data was extracted from the flow monitoring data and reconciled with the planning load projections as described below.

- Average dry weather loading was developed from land use/zoning data, Metro population and employment projections by TAZ polygon, and dry weather flow factors as documented in the technical memorandum entitled, *Durham Basin Base Flow, Household, Population, and Employment Projections [MSA, January 2017]*.

- Loading was developed at the parcel (tax lot) level and assigned to model junctions using the service area polygon delineations developed in the 2012.

- Average flow data and diurnal patterns were extracted from the flow metering data using EPASSOAP (*US Environmental Protection Agency*) for the July 1 thru July 6, 2015 timeframe.

- Scaling of flow loading was used to balance the planning and unit flow factor loading with the metered average dry weather flows.

The summer-time dry weather model was run for several iterations to achieve the target calibration criteria of matching modeled peak flow rates within +/- 10-percent of field measured peak flow rates. Load scaling and diurnal pattern variations were used to adjust the model between iterations. A summary of calibration result statistics is presented in Table 1 including notes on specific meter basins. Overall the model calibrated within 9-percent of the measured field data for peak dry weather flow based on flow rates at the Durham AWWTF. Charts of field vs model data are presented in Appendix A.

Dry Weather Calibration (Winter-time, DWF+GWI)

The winter-time dry weather period was used to establish the GWI component of the model following a similar procedure to the summer-time dry weather loading.

- Average flow data was extracted from the flow metering data using EPASSOAP (*US Environmental Protection Agency*) for the December 30, 2015 thru January 3, 2016 timeframe.

- GWI flows for each meter basin were calculated by subtracting the average summer-time load from the average winter-time loading. A uniform diurnal pattern was assumed for GWI.

- GWI loading was distributed to parcels in each meter basin using the ratio of parcel specific dry weather flow to total meter basin dry weather flow. Loading was assigned to

model junctions using the service area polygon delineations developed in the 2012 model calibration.

The winter-time dry weather model was run for several iterations to achieve the target calibration criteria of matching modeled peak flow rates within +/- 10-percent of field measured peak flow rates. GWI scaling were used to adjust the model between iterations at the meter basin level. A summary of calibration result statistics is presented in Table 1 including notes on specific meter basins. Overall the model calibrated within 5-percent of the measured field data for peak flow based on flow rates at the Durham AWWTF. Charts of field vs model data are presented in Appendix A.

Wet Weather Calibration (Winter-time)

The wet weather component of the model consists of precipitation, sewershed acreage (wet weather area of impact), and RDII unit hydrograph. In the Durham Basin model, the sewersheds were defined by placing a 50-foot buffer around all system pipes (100 feet total buffer width). The sewershed areas were assigned to model junctions using the service area polygons delineated in 2012.

The wet weather component of the model utilizes the EPASWMM RTK unit hydrograph methodology. The unit hydrograph defines the amount of runoff (percentage of the volume created from the sewershed and precipitation depth) which enters the system and the travel time. The unit hydrograph is broken into an initial, intermediate, and long-term hydrograph response. The three unit hydrographs combine to form a composite unit hydrograph. Each of the three unit hydrographs is defined by three parameters which are adjusted during model calibration until field and model flows match within a reasonable tolerance. The unit hydrograph parameters are described below and shown in Figure 2.

Unit Hydrograph Parameter 1 - R1, **R2**, **R3 -** Response ratios for the short-term, intermediate-term, and long-term UH responses, respectively.

Unit Hydrograph Parameter 2 - T1, **T2**, **T3** - Time to peak for the short-term, intermediate-term, and long-term UH responses, respectively.

Unit Hydrograph Parameter 3 - K1, **K2**, **K3 -** Recession limb ratios for short-term, intermediate-term, and long-term UH responses, respectively.

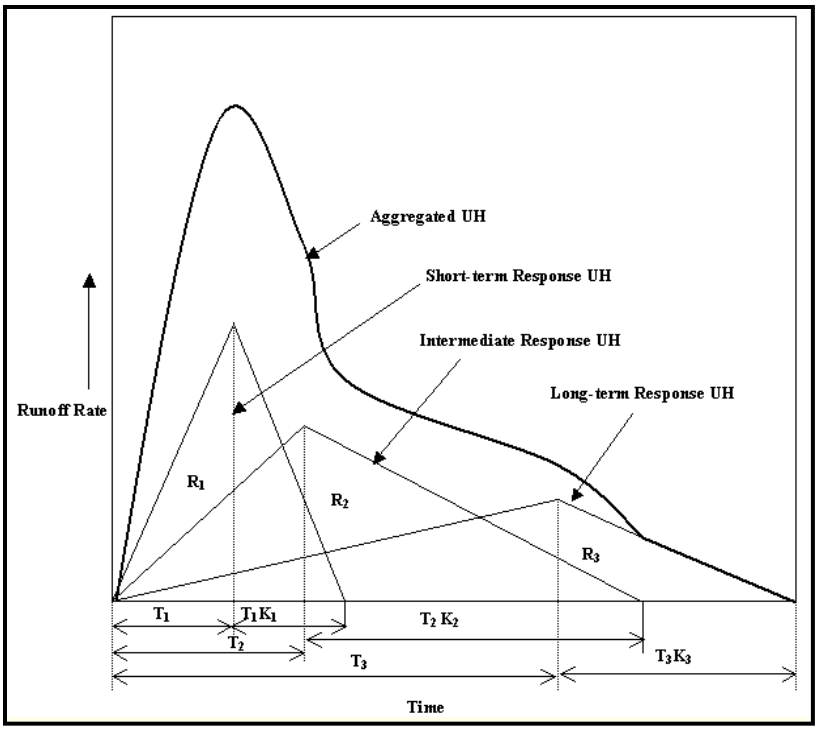


Figure 2. SWMM RTK Unit Hydrograph Description

In general, the "R" value will vary by storm event and antecedent moisture condition. For this reason, a rainfall period with the greatest impact to the system was selected for the model calibration (December 6, 2015 – December 19, 2015). The RTK parameters were initially extracted for calibration using EPASSOAP and the meter data. Unit hydrograph parameters were then adjusted for each meter basin through several iterations. The final RTK parameters are presented for each meter basin in Table 2.

The wet weather model was run for several iterations to achieve the target calibration criteria of matching modeled peak flow rates within +/- 25-percent of field measured peak flow rates. A summary of calibration result statistics is presented in Table 1. Overall the model calibrated within 20-percent of the measured field data for peak wet weather flow based on flow rates at the Durham AWWTF. Charts of field vs model data are presented in Appendix A.

The meter data used for the model calibration does not account for potential system overflows or relief to the system during the largest calibration storm event which occurred on December 7th. The peak influent flow to the AWWTF was calibrated conservatively to account for the potential relief. Secondary metered times on December 8th and December 17th-18th were used to confirm the calibration.

Table 1. Model Calibration Results and Statistics

Unit Hydrograph (Meter)	Peak DWF (gpm)	Peak DWF Modeled (gpm)	DWF Calibration Percent Difference	Peak DWF+GWI (gpm)	Peak DWF+GWI Modeled (gpm)	DWF+GWI Calibration Percent Difference	Peak DWF+GWI +WWF (gpm)	Peak DWF+GWI +WWF Modeled (gpm)	DWF+GWI +WWF Calibration Percent Difference	Notes
10692	1,240	1,300	5%	2,850	3,000	5%	23,000	21,000	-9%	Peak flow meter issues; calibrated to alternate peak times.
10796	3,400	4,800	41%	6,500	9,000	38%	27,500	25,000	-9%	DWF and DWF+GWI calibration impacted by upstream metered basins. Peak flow meter issues, calibrated to alternative peak times.
14939	2,300	2,500	9%	3,150	3,400	8%	5,250	5,800	10%	
19689		680	N/A	1,100	1,050	-5%	3,500	3,350	-4%	Meter data unavailable for DWF calibration.
19970	360	340	-6%	420	420	0%	975	1,050	8%	
20860		270	N/A		390	N/A		1,000	N/A	Meter data unavailable for calibration periods. Adjacent basin parameters applied.
9450		1,225	N/A	2,750	2,900	5%	9,000	11,000	22%	Meter data unavailable for DWF calibration. WWF calibration impacted by upstream metered basins. Peak flow meter issues, calibrated to alternative peak times.
20654		220	N/A	380	380	0%	1,050	1,025	-2%	Meter data unavailable for DWF calibration. Peak flow meter issues; calibrated to alternate peak times.
25656	640	630	-2%	825	960	16%	2,200	2,300	5%	
10483	8,500	11,500	35%	19,000	19,300	2%	48,000	50,000	4%	DWF calibration impacted by upstream meter basins. Peak flow meter issues; calibrated to alternate peak times.
21186		280	N/A		390	N/A		720	N/A	Meter data unavailable for calibration periods. Adjacent basin parameters applied.
21142		275	N/A		400	N/A		925	N/A	Meter data unavailable for calibration periods. Adjacent basin parameters applied.
14366	167	180	8%	365	345	-5%	7,500	5,500	-27%	WWF calibration impacted by upstream metered basins and diversion operation.
11719	3,800	4,750	25%	5,000	6,500	30%	12,800	11,700	-9%	DWF and DWF+GWI calibration impacted by upstream metered basins.
22276	1,550	1,550	0%	1,900	1,850	-3%	4,050	3,850	-5%	
11679	1,400	3,000	N/A	2,000	4,400	N/A	2,500	5,000	N/A	Meter location may be upstream of the Bull Mtn Trunk on the Upper Tualatin Interceptor. The reported model flows include both the Bull Mtn Trunk and Upper Tualatin Interceptor combined flow rates.
16650		620	N/A		860	N/A	1,000	1,050	5%	Meter data unavailable for DWF and DWF+GWI calibration.
800892	1,050	1,060	1%	1,400	1,525	9%	2,360	2,350	0%	
10740	360	340	-6%	750	540	-28%	3,600	3,500	-3%	Peak flow meter issues for DWF+GWI and WWF calibrations.
6551	725	900	24%	1,600	1,650	3%	5,000	5,400	8%	DWF calibration scaled back to lowest reduction factors in basin and still calibrated conservatively.

Table 1. Model Calibration Results and Statistics

Unit Hydrograph (Meter)	Peak DWF (gpm)	Peak DWF Modeled (gpm)	DWF Calibration Percent Difference	Peak DWF+GWI (gpm)	Peak DWF+GWI Modeled (gpm)	DWF+GWI Calibration Percent Difference	Peak DWF+GWI +WWF (gpm)	Peak DWF+GWI +WWF Modeled (gpm)	DWF+GWI +WWF Calibration Percent Difference	Notes
11779	2,750	2,800	2%	5,000	5,400	8%	14,500	13,000	-10%	Peak flow meter issues; calibrated to alternate peak times.
11792	1,250	1,200	-4%	2,100	2,120	1%	7,100	7,000	-1%	Peak flow meter issues; calibrated to alternate peak times.
12430	1,410	1,100	-22%	1,900	1,550	-18%	4,800	4,400	-8%	Peak flow meter issues; calibrated to alternate peak times.
13248	320	300	-6%	690	640	-7%	2,000	2,200	10%	Peak flow meter issues; calibrated to alternate peak times.
811894	190		N/A	420		N/A	1,800	2,400	33%	Uncertainty about loading location relative to flow meter location. Portland flows loaded downstream of meter location in model based on network definition.
6602	365	400	10%	1,100	1,270	15%	6,000	5,400	-10%	
6634	160	150	-6%	440	460	5%	4,050	4,100	1%	
9495	230	210	-9%	390	360	-8%	950	1,250	32%	Peak flow meter issues; calibrated to alternate peak times.
4713	87	90	3%	195	215	10%	2,200	2,000	-9%	
AWWTF	16,000	17,500	9%	28,000	29,500	5%	82,000	98,000	20%	Meter flow includes inflow into two wet wells at the Influent Pump Station. The model captures this flow through two pipe segments, 20008 and 20010. During peak WWF, the upstream gravity sewers are surcharged and pressurized. The modeled influent flow assumes that the sewer is not seeing relief from overflows in the upstream sewers resulting in a conservative calibration.

Table 2. Unit Hydrograph Parameters

Unit Hydrograph (Meter)	R1	T1 (hours)	K1	R2	T2 (hours)	K2	R3	T3 (hours)	K3
10692	0.036	0.5	1	0.018	2	4	0.011	8	12
10796	0.042	2	4	0.066	3	4	0.044	8	12
14939	0.015	2	5	0.020	3	5	0.033	8	12
19689	0.136	3	4	0.001	4	5	0.001	8	12
19970	0.019	2	4	0.014	3	5	0.010	8	12
20860	0.042	2	4	0.066	3	4	0.044	8	12
9450	0.032	1	2	0.050	2	4	0.050	8	12
20654	0.066	2	4	0.036	3	5	0.019	8	12
25656	0.032	1	4	0.029	3	6	0.014	8	12
10483	0.020	0.5	1	0.018	2	5	0.012	8	12
21186	0.017	0.8	4	0.014	3	5	0.002	8	12
21142	0.020	0.5	1	0.018	2	5	0.012	8	12
14366	0.600	4	5	0.028	4	5	0.004	8	12
11719	0.099	1.8	3	0.036	2	4	0.018	8	12
22276	0.026	2	4	0.025	3	5	0.022	8	12
11679	0.012	0.5	1	0.002	2	4	0.0003	8	12
16650	0.012	2	4	0.001	3	5	0.001	8	12
800892	0.011	2	4	0.001	3	5	0.008	8	12
10740	0.023	1	2	0.004	2	4	0.004	8	12
6551	0.037	1	2	0.015	2	6	0.015	8	12
11779	0.300	3	6	0.006	4	7	0.006	8	12
11792	0.042	1	2	0.030	2	4	0.030	8	12
12430	0.055	1	3	0.067	3	4	0.063	8	12
13248	0.055	1	2	0.068	4	6	0.060	8	12
811894	0.360	2	4	0.350	3	5	0.250	8	12
6602	0.083	1	3	0.003	2	4	0.003	8	12
6634	0.198	1	2	0.090	3	5	0.018	8	12
9495	0.184	2	4	0.090	3	5	0.070	8	12
4713	0.222	2	3	0.029	2	4	0.010	8	12
AWWTF	0.012	0.5	1	0.135	2	4	0.150	8	12

APPENDIX A – FLOW MONITORING PLOTS

Green plot lines = Observed Flow Rate

Blue plot lines = Modeled Flow Rate

Figure A1a. Meter 10692 DWF Calibration

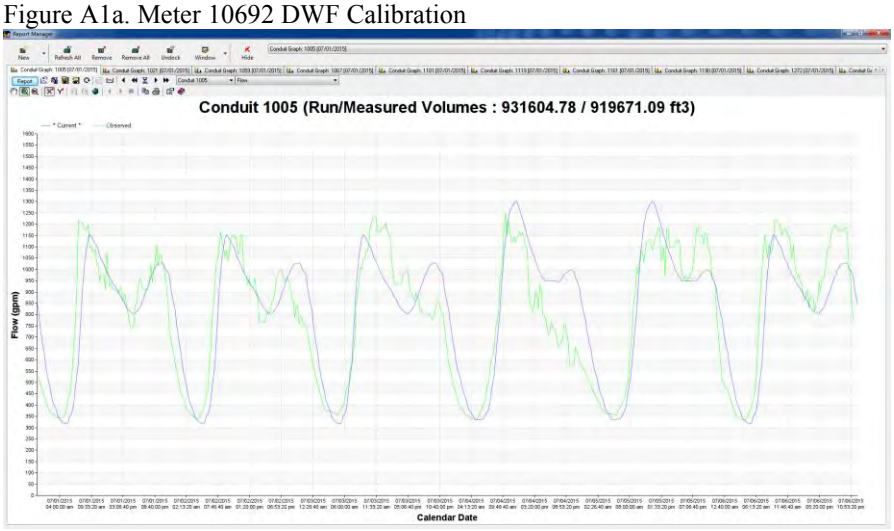


Figure A1b. Meter 10692 DWF+GWI Calibration

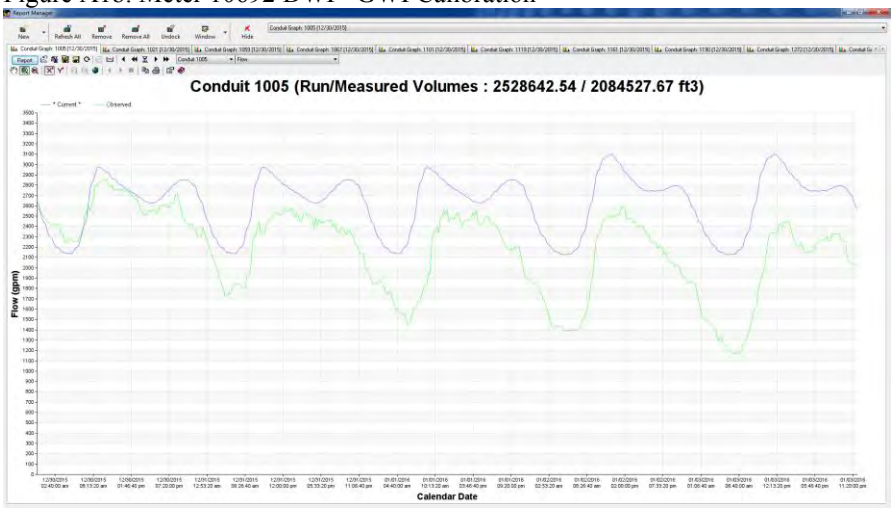


Figure A1c. Meter 10692 DWF+GWI+WWF Calibration

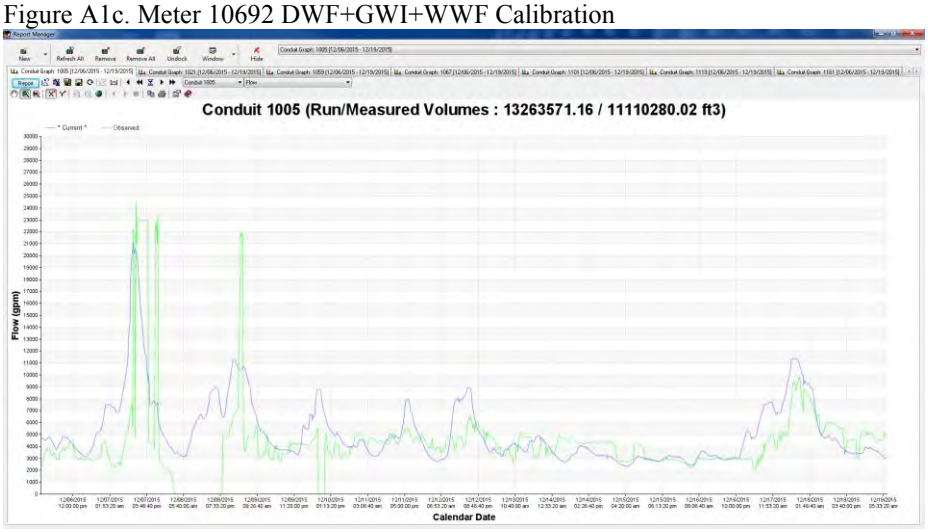


Figure A2a. Meter 10796 DWF Calibration

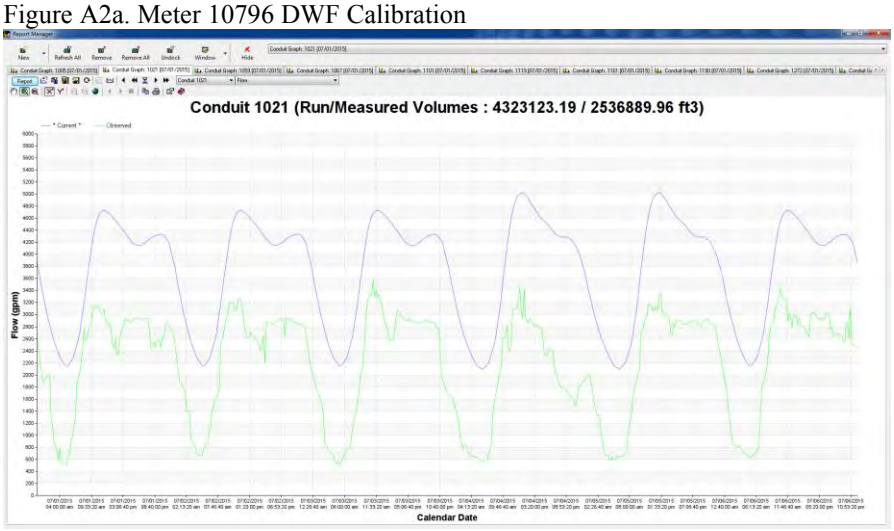


Figure A2b. Meter 10796 DWF+GWI Calibration

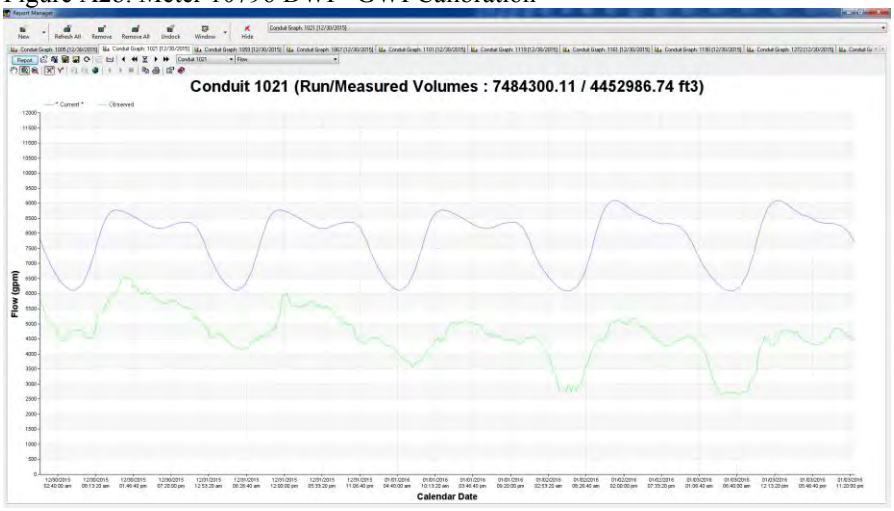


Figure A2c. Meter 10796 DWF+GWI+WWF Calibration

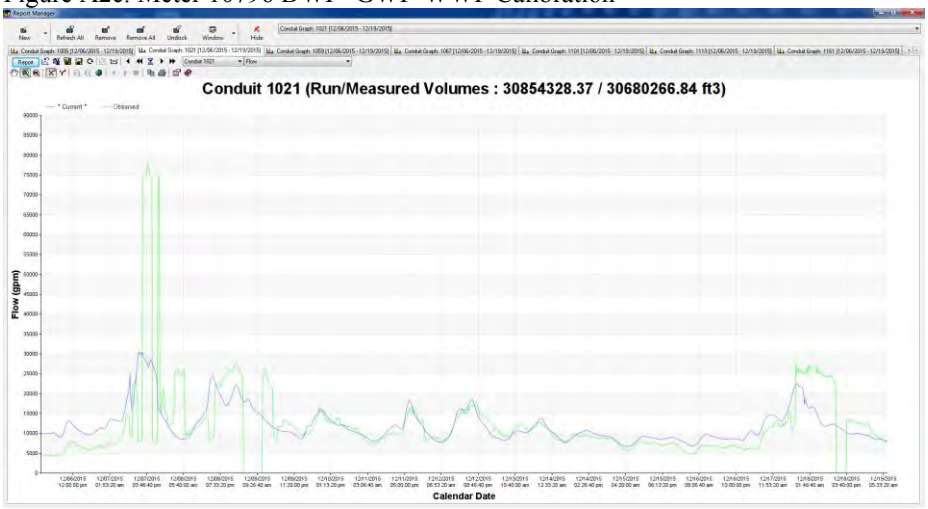


Figure A3a. Meter 14939 DWF Calibration

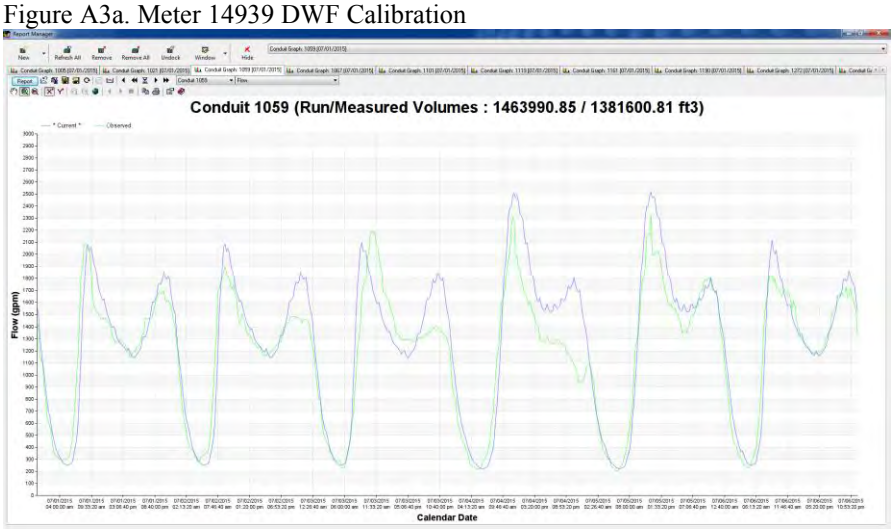


Figure A3b. Meter 14939 DWF+GWI Calibration

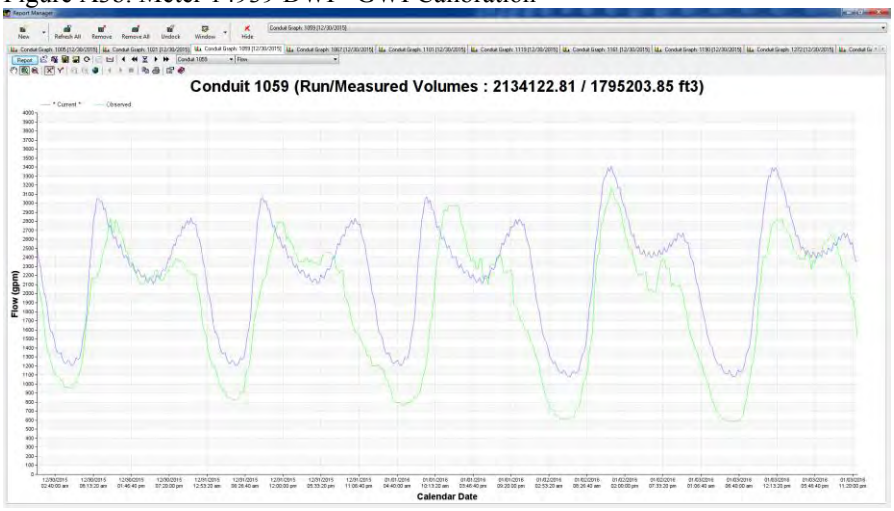


Figure A3c. Meter 14939 DWF+GWI+WWF Calibration

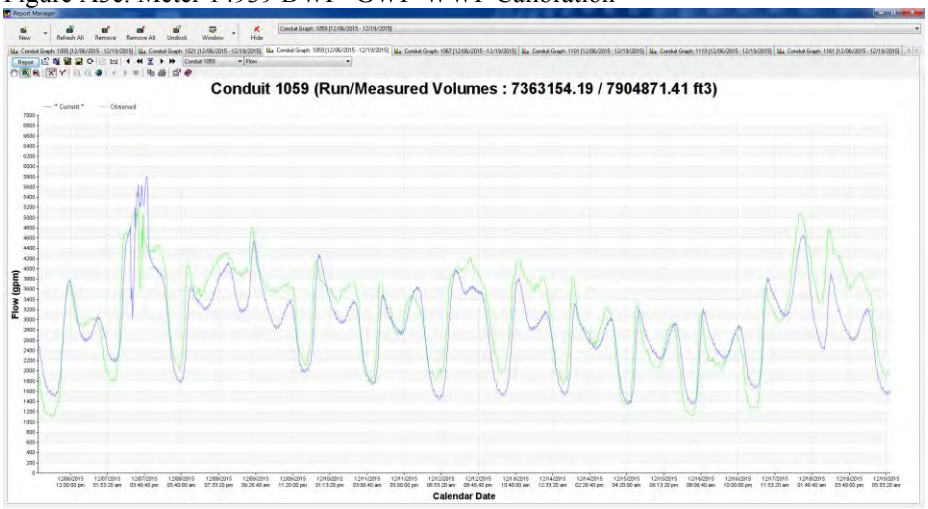


Figure A4a. Meter 19689 DWF Calibration

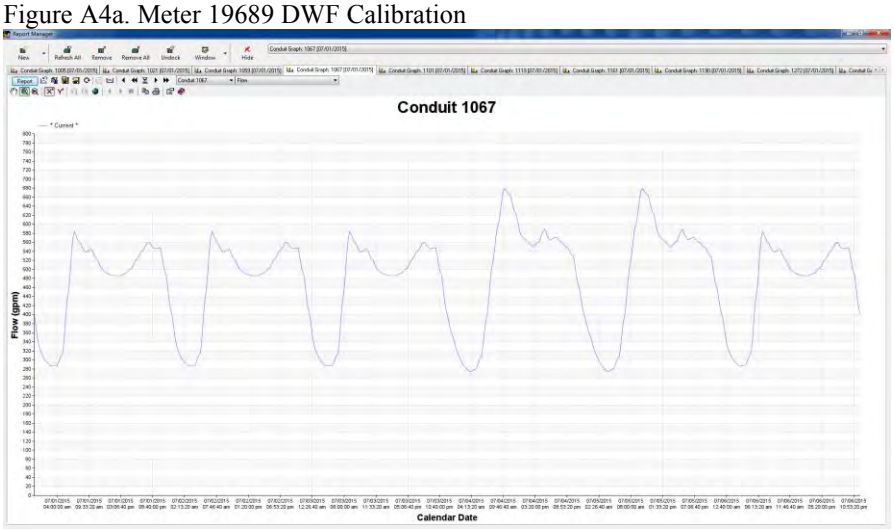


Figure A4b. Meter 19689 DWF+GWI Calibration

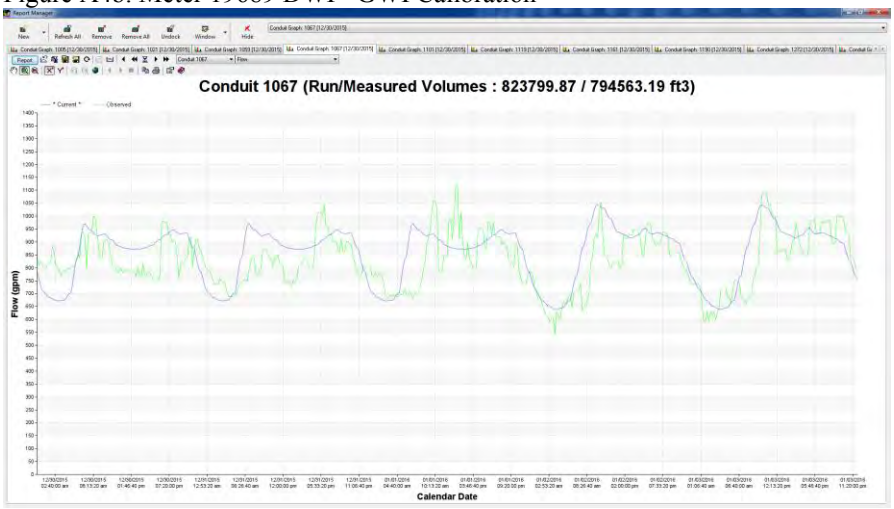


Figure A4c. Meter 19689 DWF+GWI+WWF Calibration

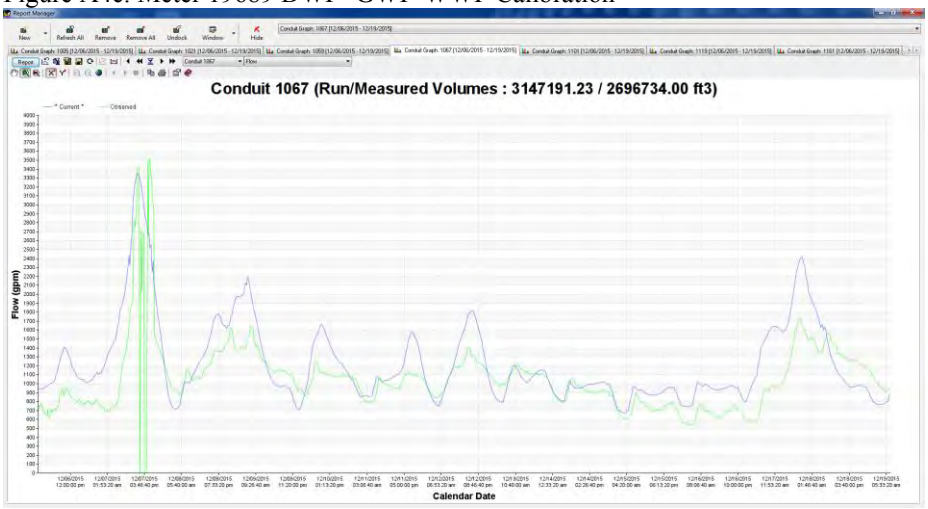


Figure A5a. Meter 19970 DWF Calibration

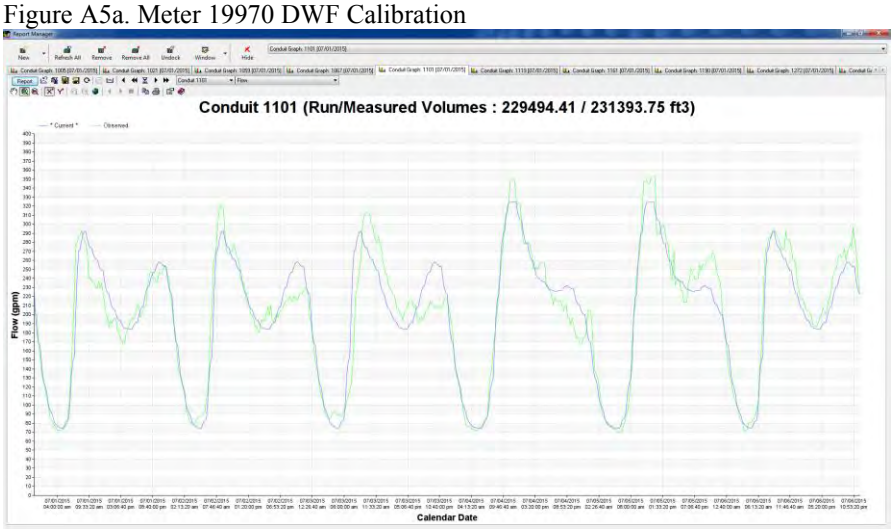


Figure A5b. Meter 19970 DWF+GWI Calibration

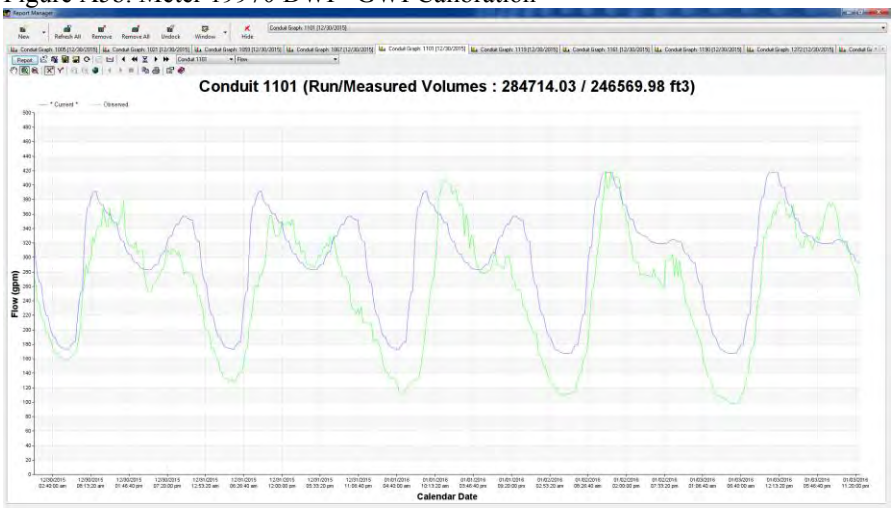


Figure A5c. Meter 19970 DWF+GWI+WWF Calibration

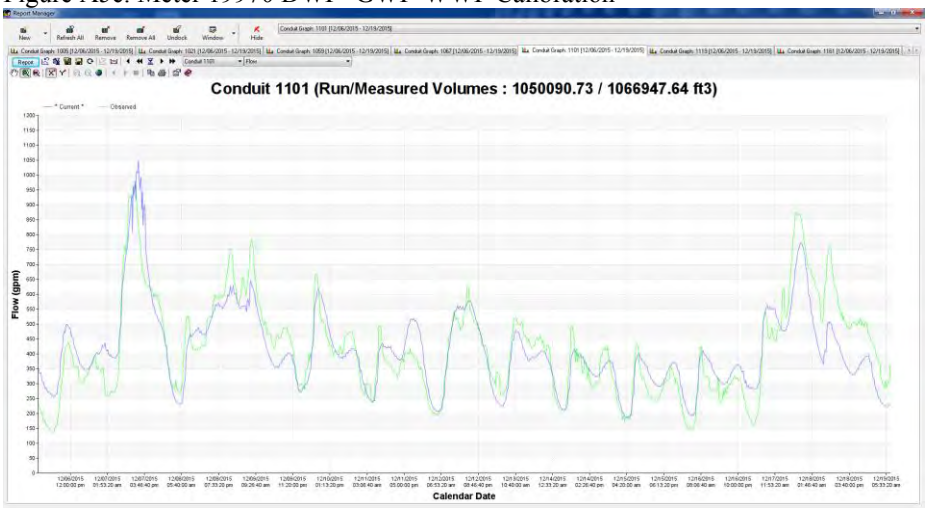


Figure A6a. Meter 20860 DWF Calibration

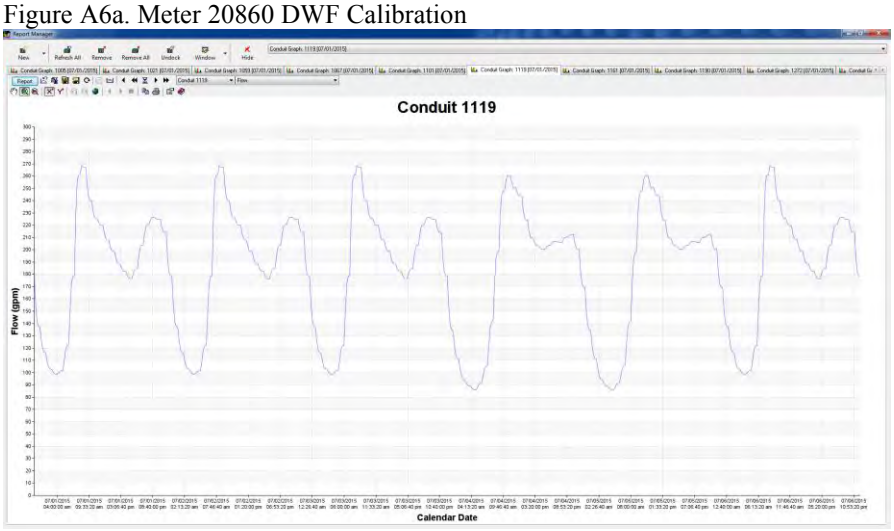


Figure A6b. Meter 20860 DWF+GWI Calibration

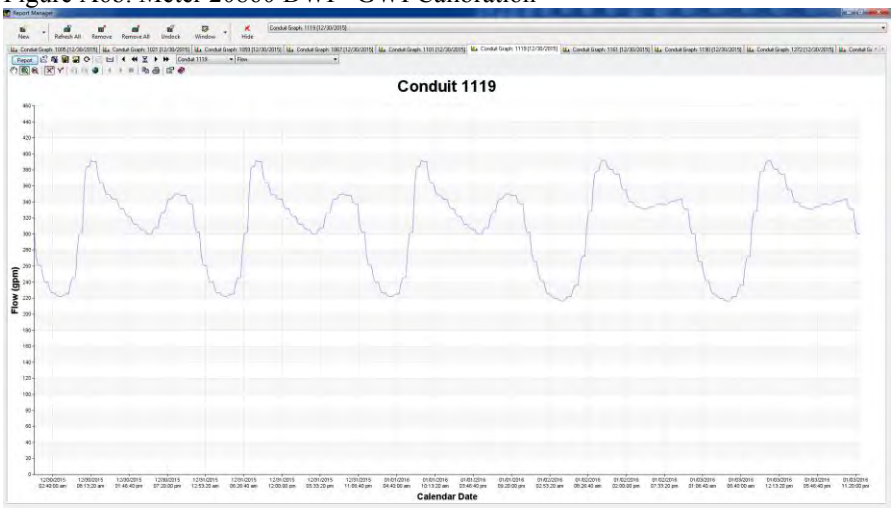


Figure A6c. Meter 20860 DWF+GWI+WWF Calibration

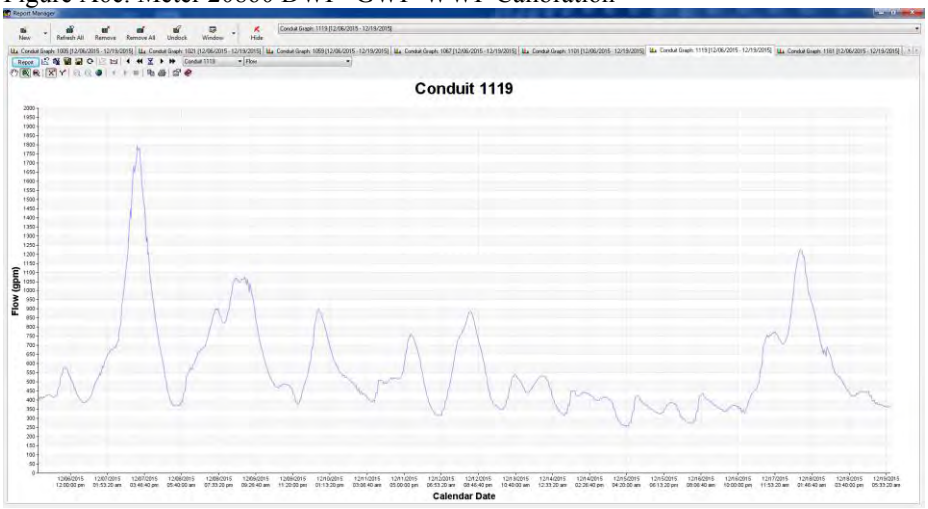


Figure A7a. Meter 9450 DWF Calibration

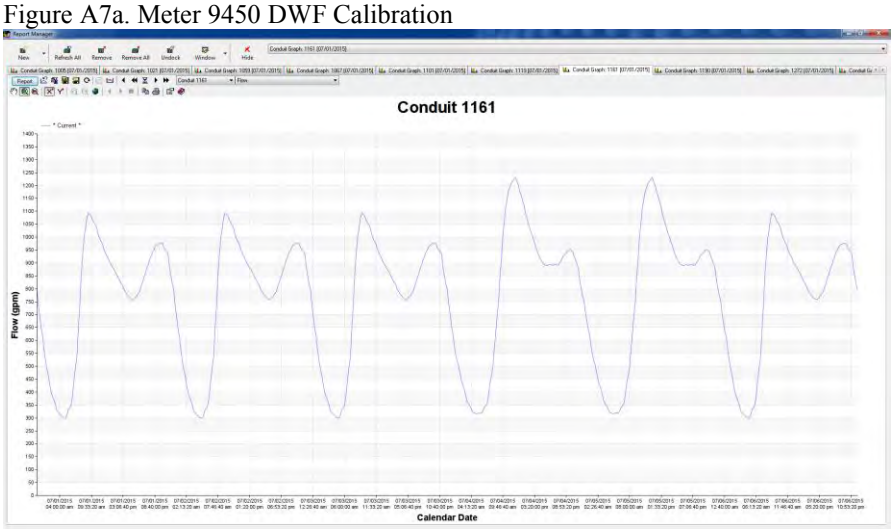


Figure A7b. Meter 9450 DWF+GWI Calibration

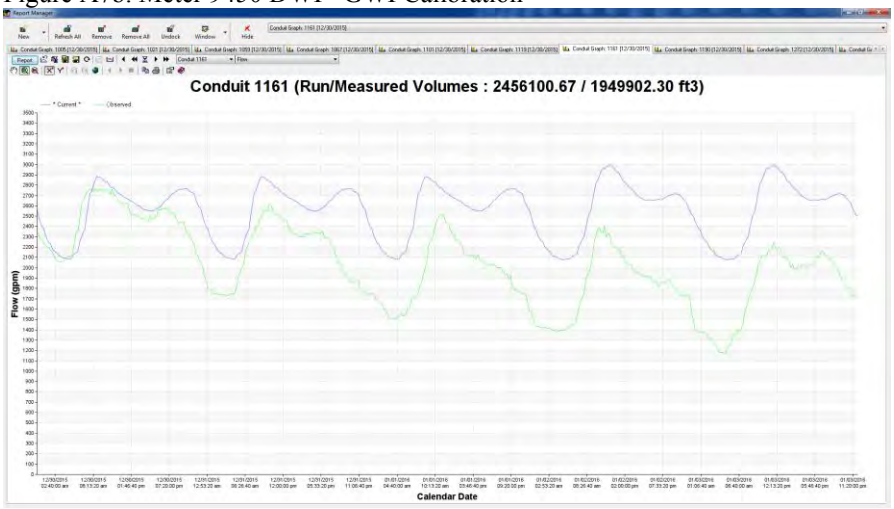


Figure A7c. Meter 9450 DWF+GWI+WWF Calibration

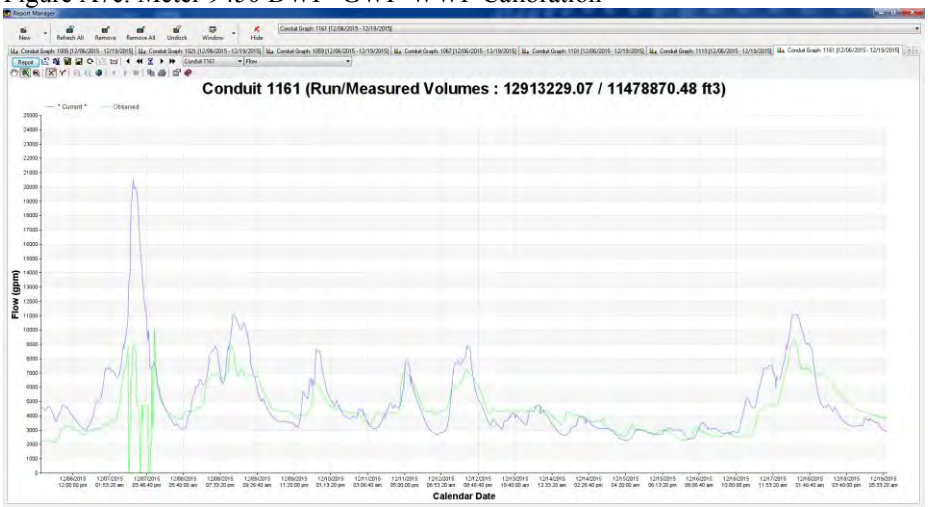


Figure A8a. Meter 20654 DWF Calibration

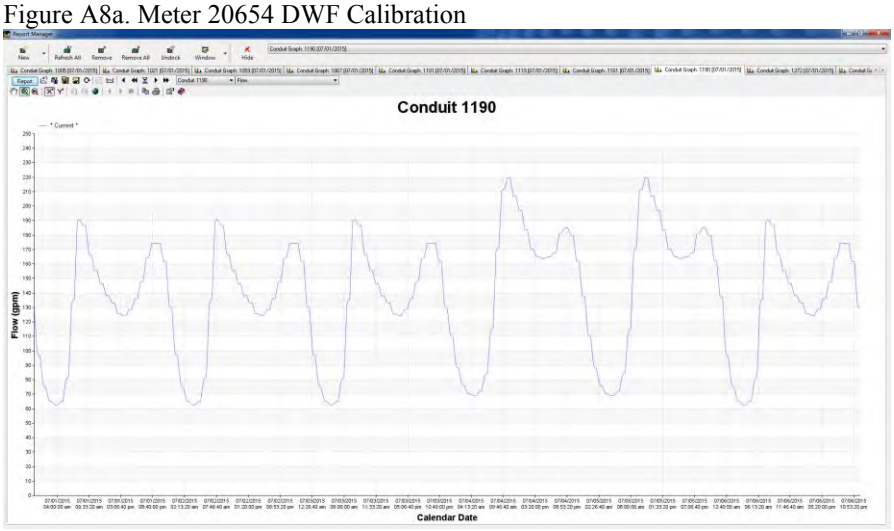


Figure A8b. Meter 20654 DWF+GWI Calibration

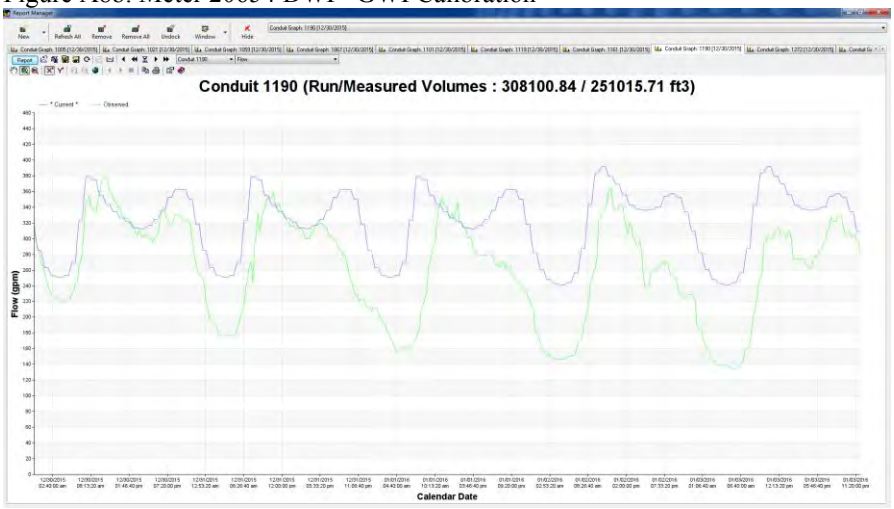


Figure A8c. Meter 20654 DWF+GWI+WWF Calibration

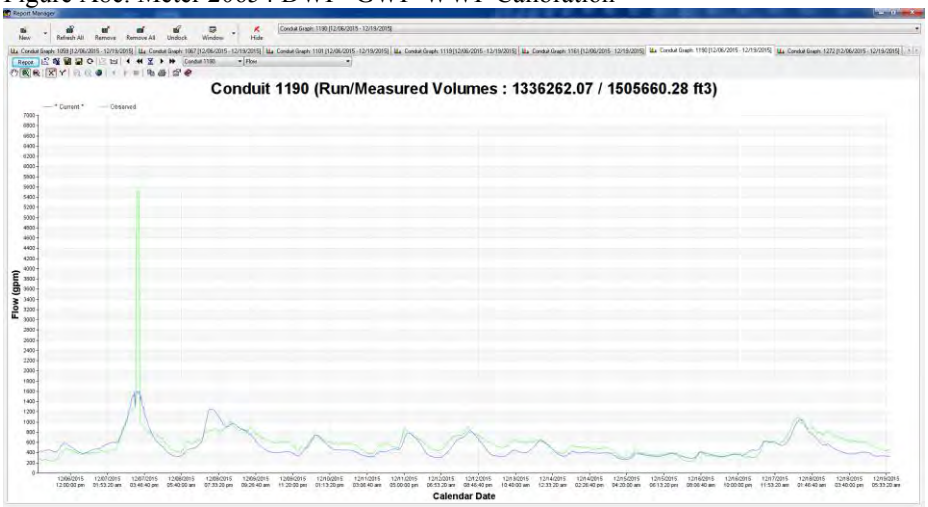


Figure A9a. Meter 25656 DWF Calibration

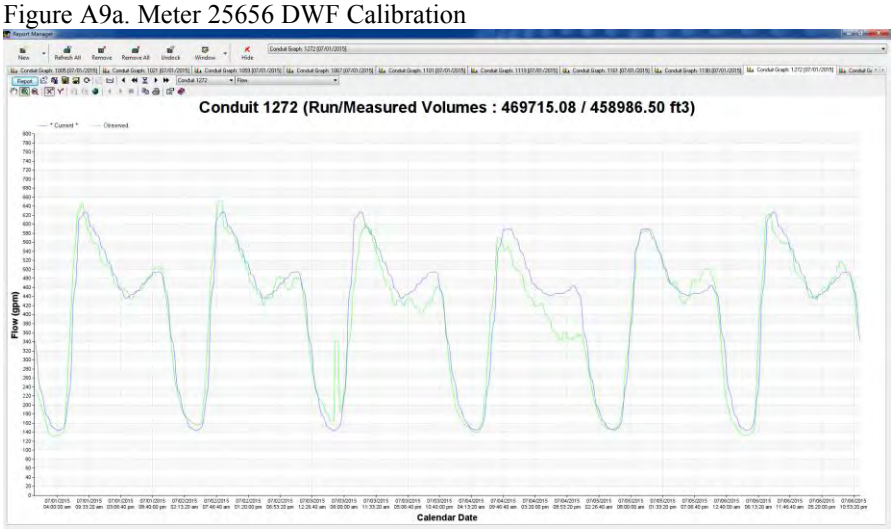


Figure A9b. Meter 25656 DWF+GWI Calibration

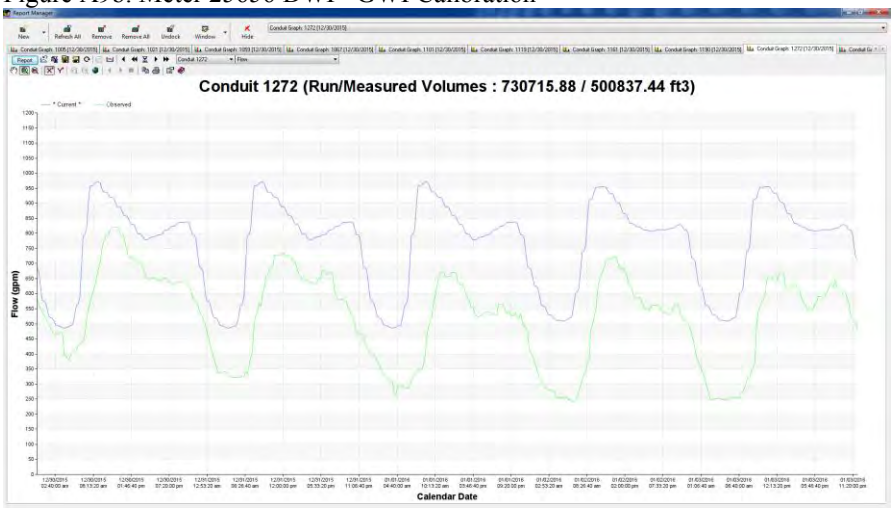


Figure A9c. Meter 25656 DWF+GWI+WWF Calibration

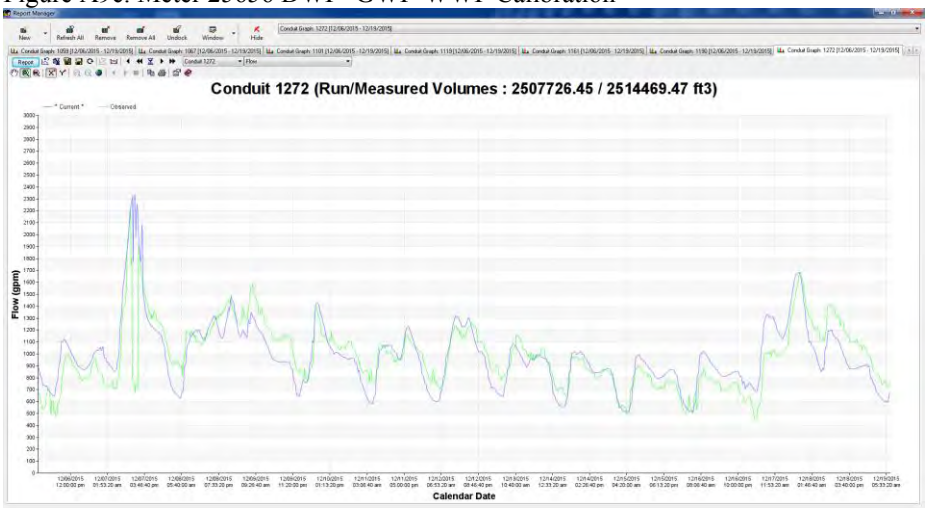


Figure A10a. Meter 10483 DWF Calibration

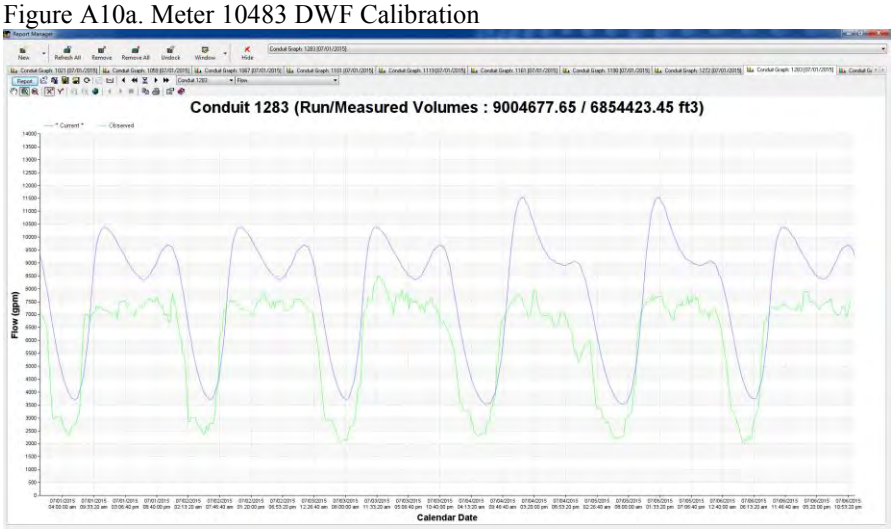


Figure A10b. Meter 10483 DWF+GWI Calibration

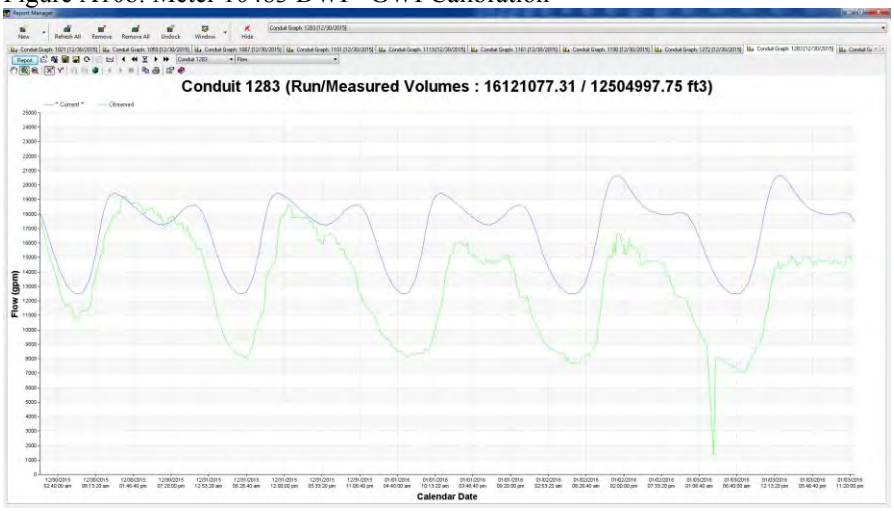


Figure A10c. Meter 10483 DWF+GWI+WWF Calibration

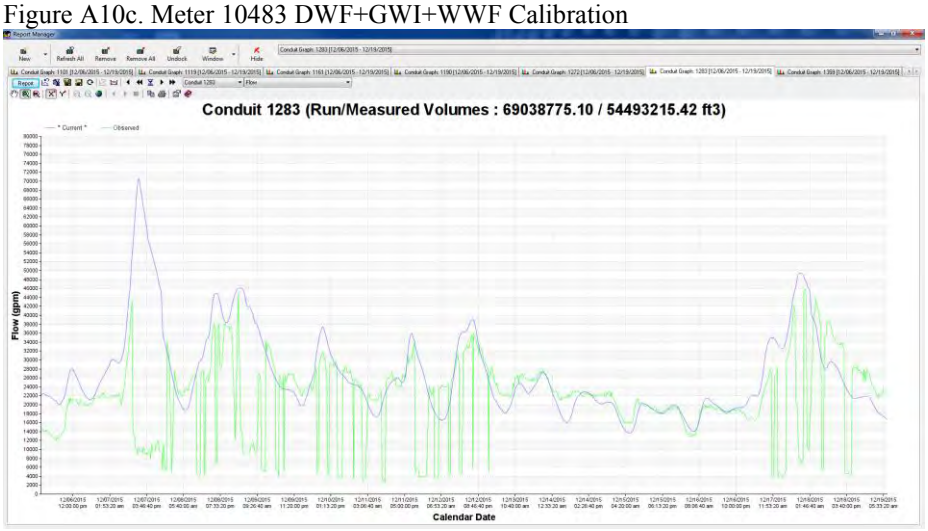


Figure A11a. Meter 21186 DWF Calibration

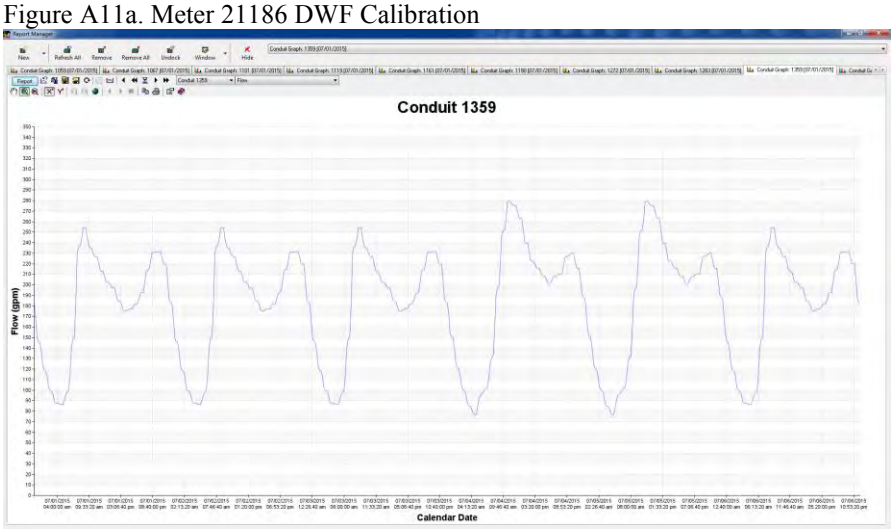


Figure A11b. Meter 21186 DWF+GWI Calibration

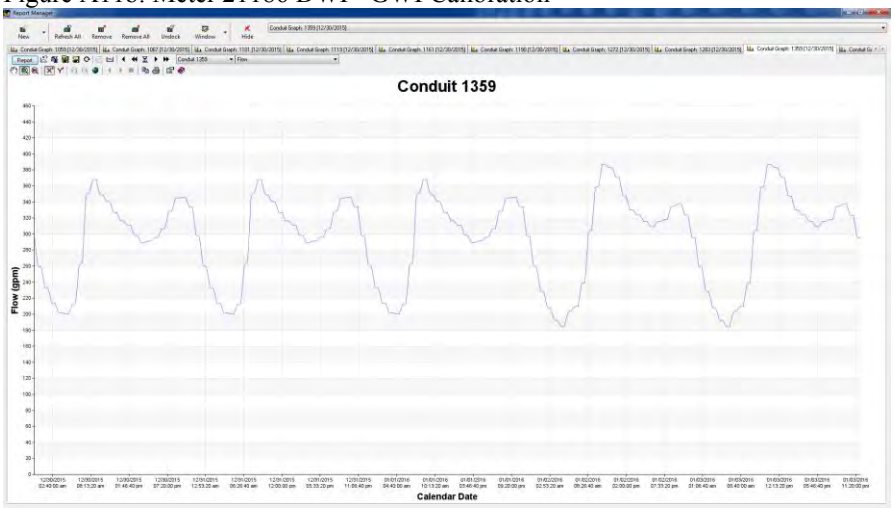


Figure A11c. Meter 21186 DWF+GWI+WWF Calibration

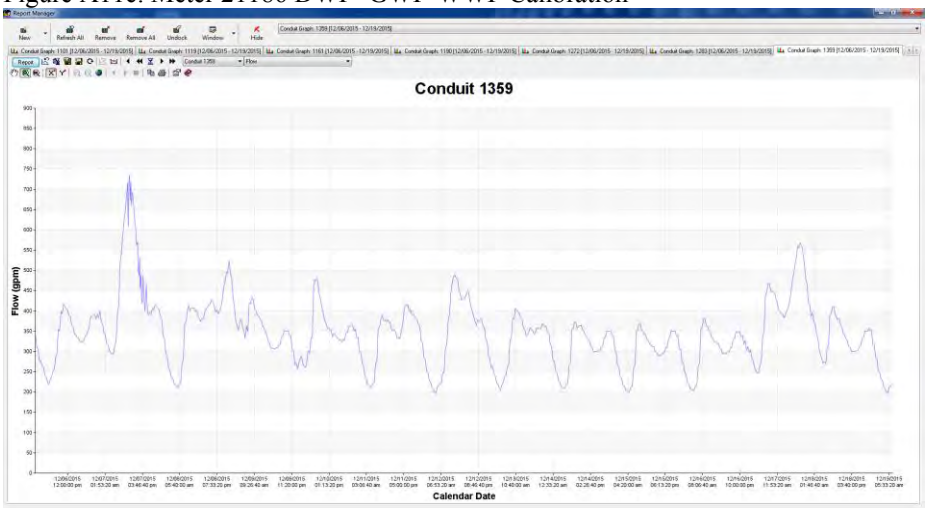


Figure A12a. Meter 21142 DWF Calibration

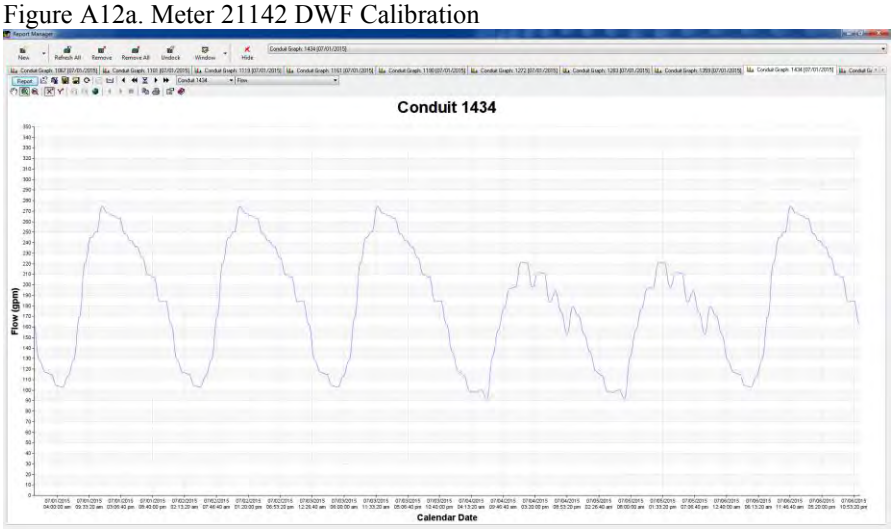


Figure A12b. Meter 21142 DWF+GWI Calibration

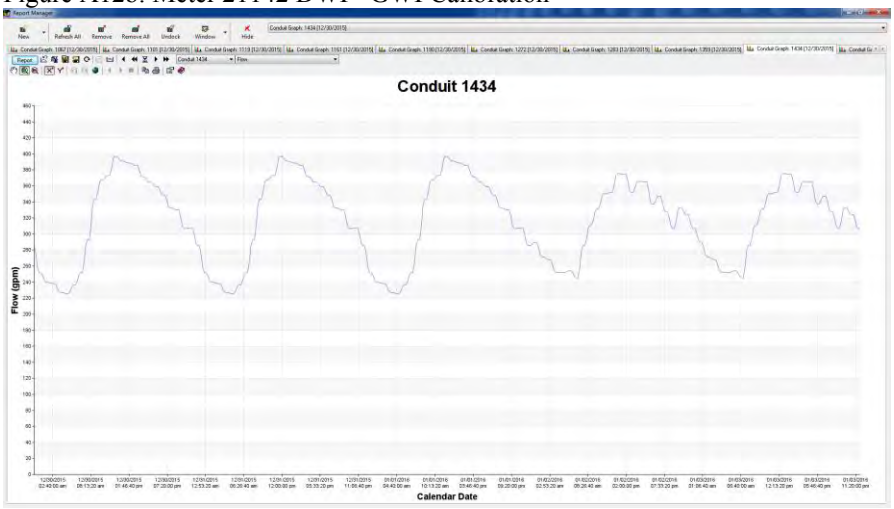


Figure A12c. Meter 21142 DWF+GWI+WWF Calibration

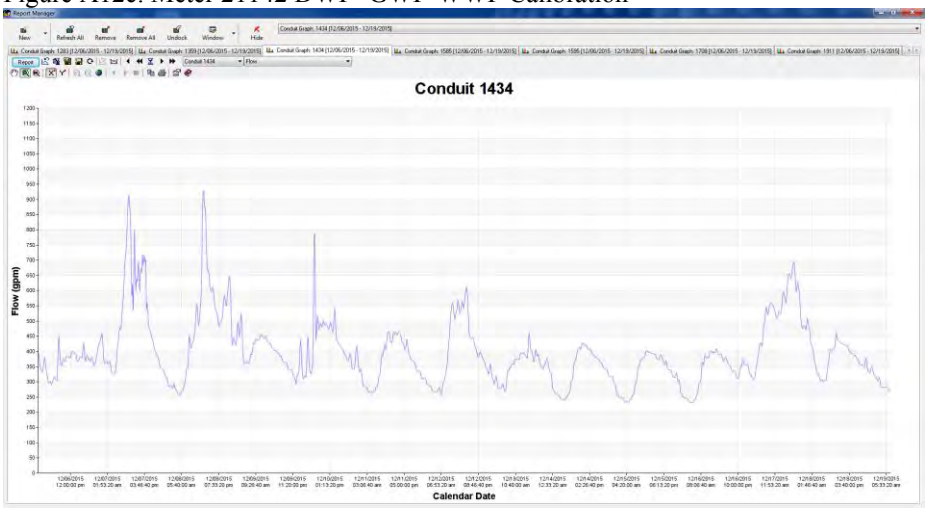


Figure A13a. Meter 14366 DWF Calibration

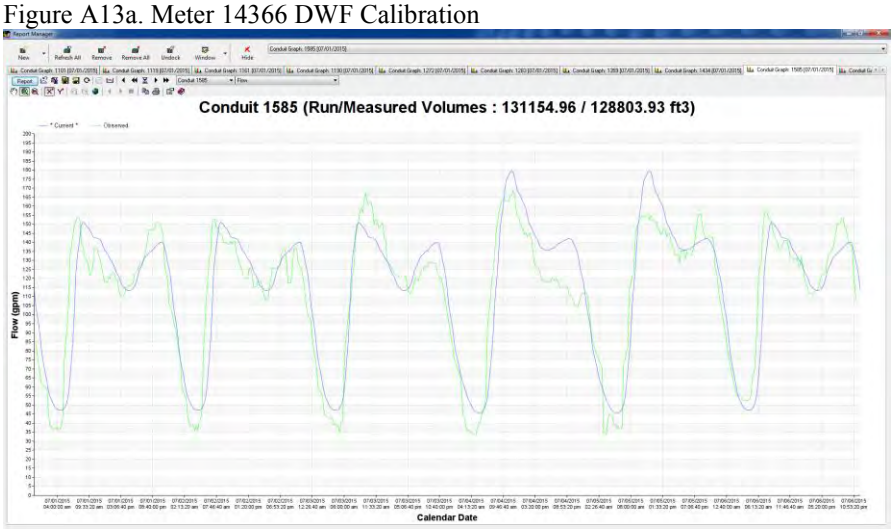


Figure A13b. Meter 14366 DWF+GWI Calibration

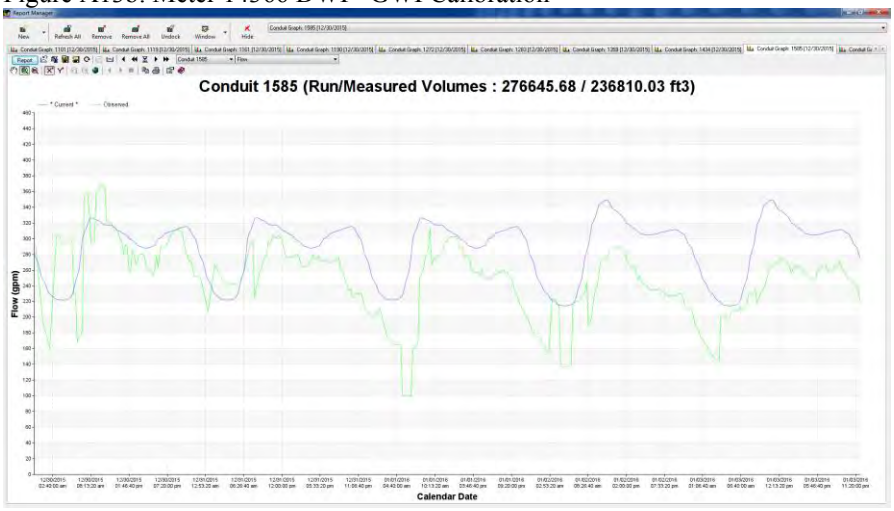


Figure A13c. Meter 14366 DWF+GWI+WWF Calibration

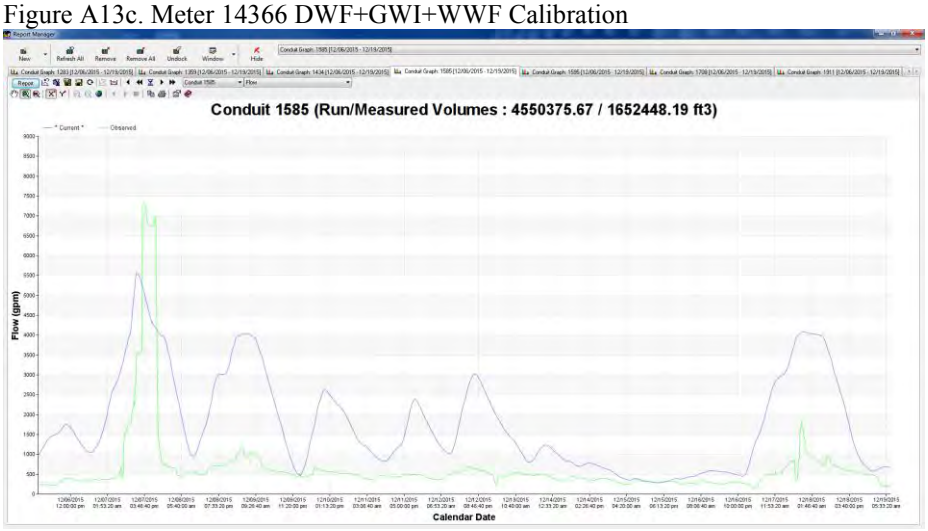


Figure A14a. Meter 11719 DWF Calibration

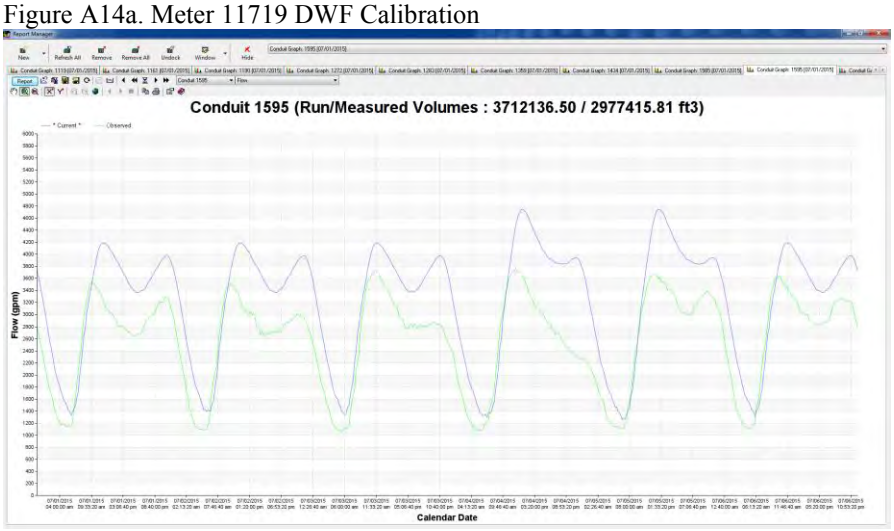


Figure A14b. Meter 11719 DWF+GWI Calibration

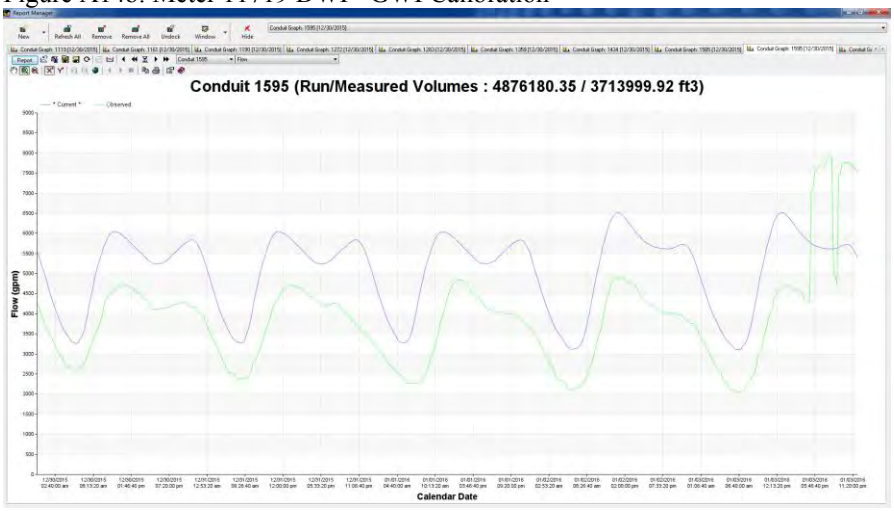


Figure A14c. Meter 11719 DWF+GWI+WWF Calibration

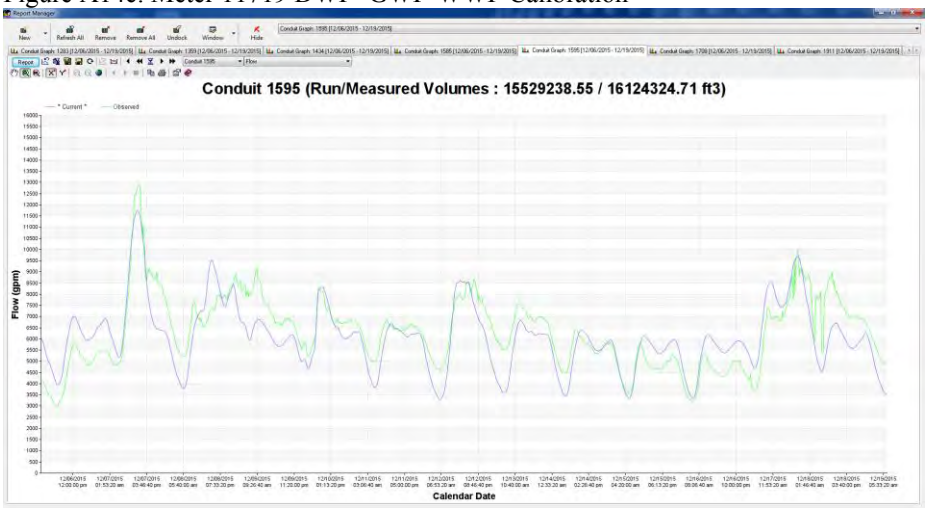


Figure A15a. Meter 22276 DWF Calibration

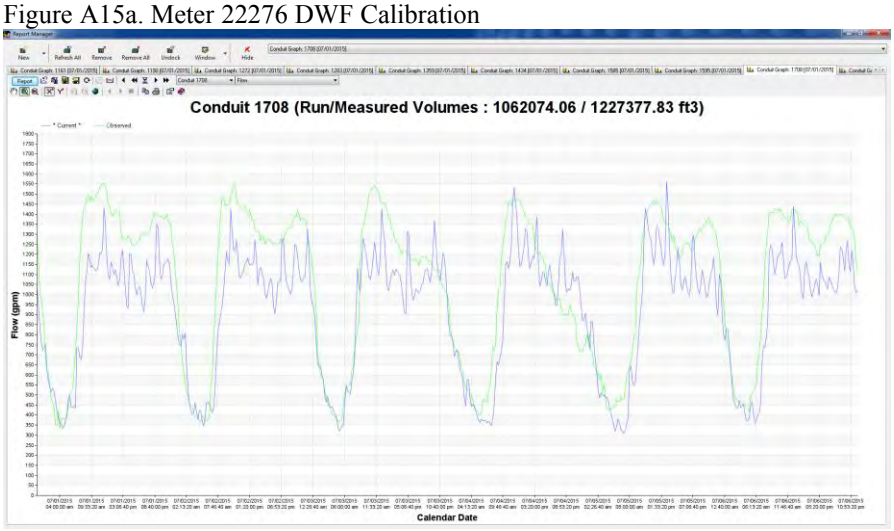


Figure A15b. Meter 22276 DWF+GWI Calibration

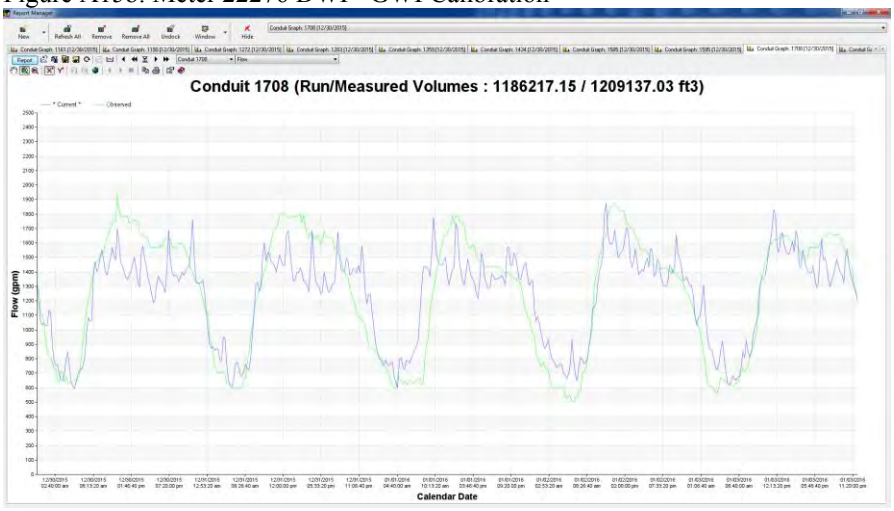


Figure A15c. Meter 22276 DWF+GWI+WWF Calibration

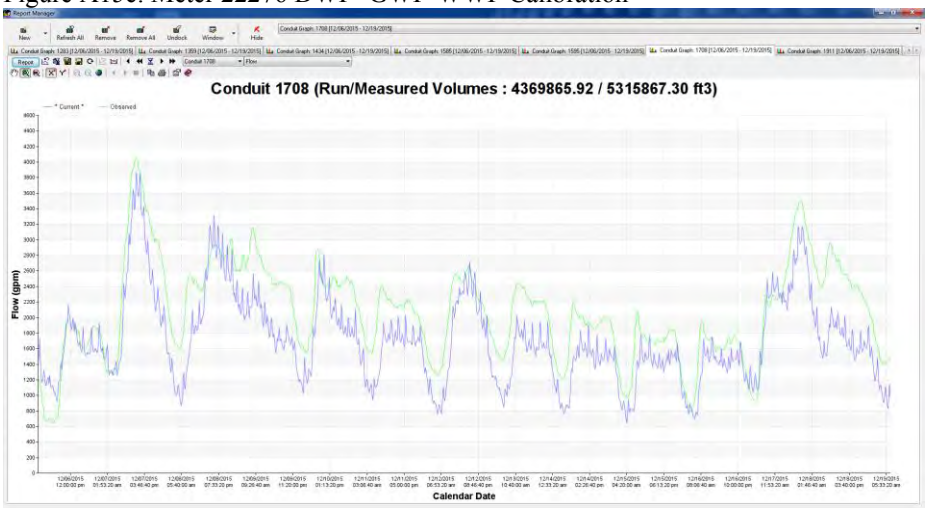


Figure A16a. Meter 11679 DWF Calibration

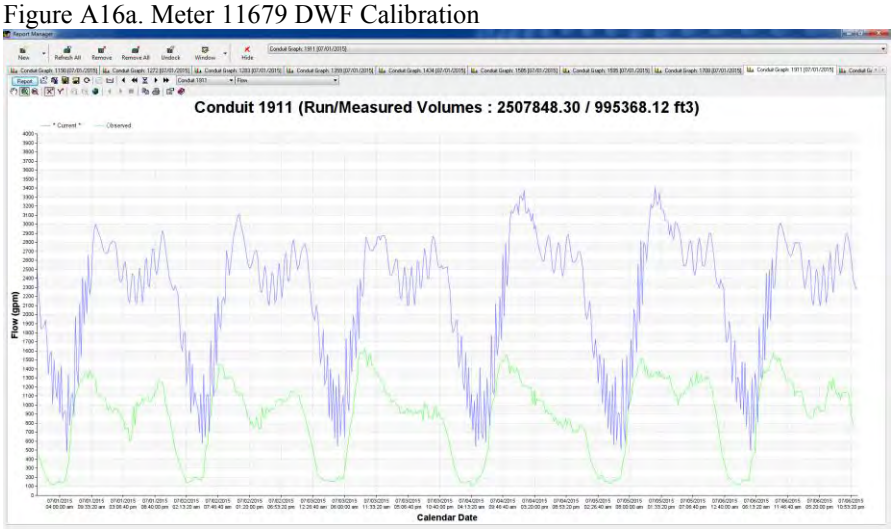


Figure A16b. Meter 11679 DWF+GWI Calibration

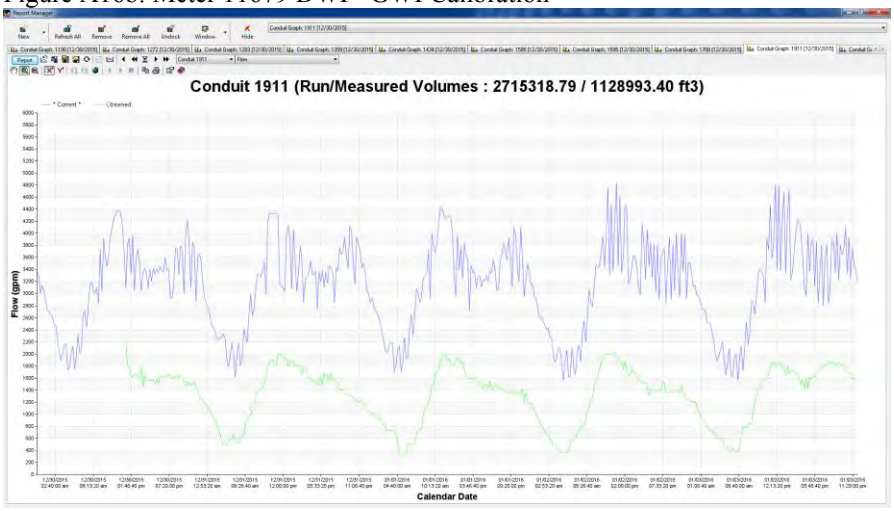


Figure A16c. Meter 11679 DWF+GWI+WWF Calibration

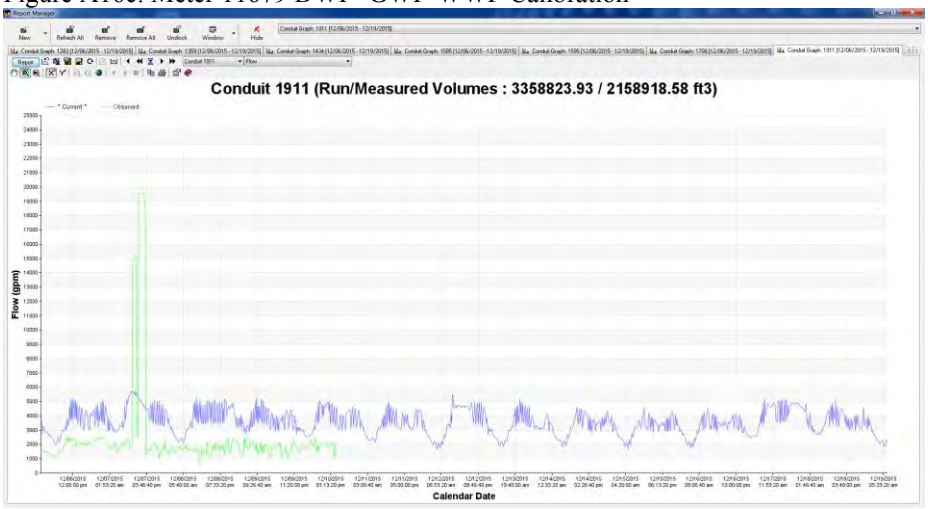


Figure A17a. Meter 16650 DWF Calibration

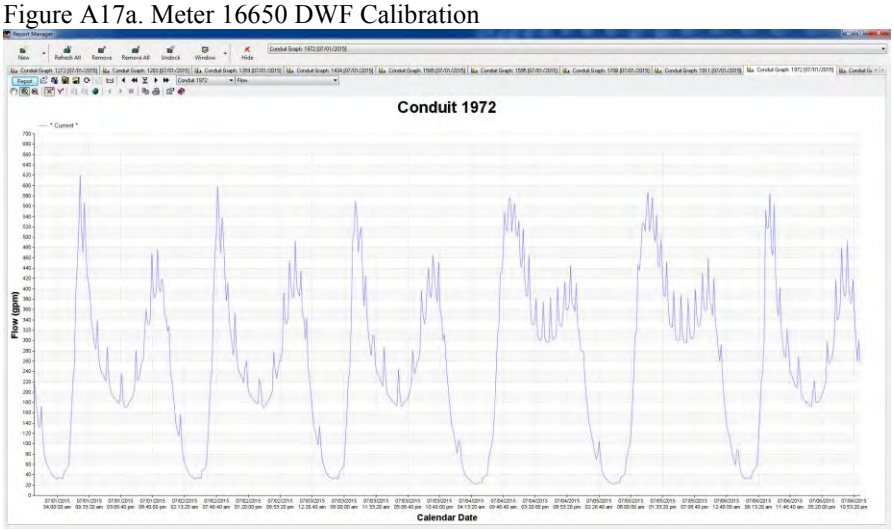


Figure A17b. Meter 16650 DWF+GWI Calibration

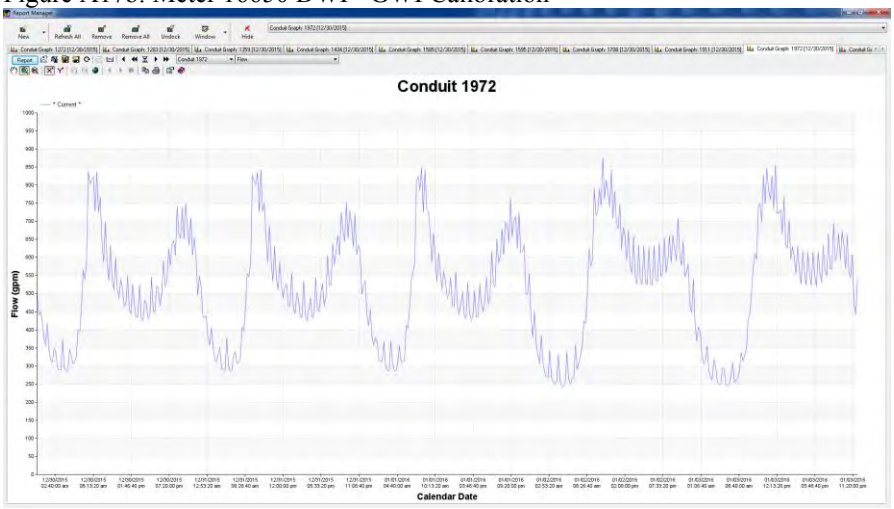


Figure A17c. Meter 16650 DWF+GWI+WWF Calibration

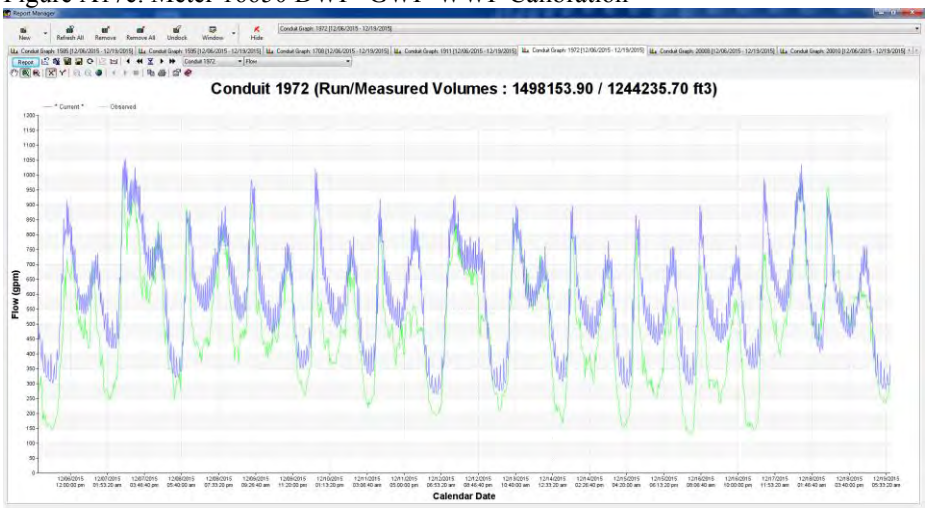


Figure A18a. Meter AWWTF1 DWF Calibration

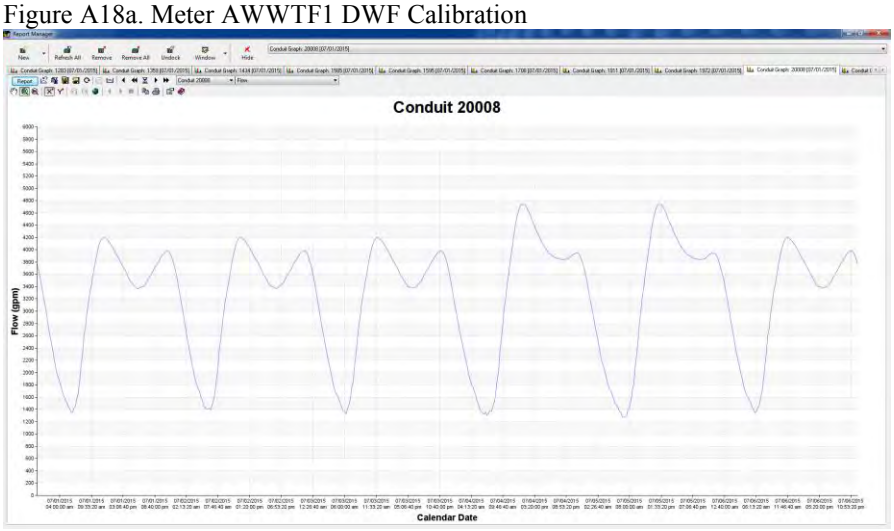


Figure A18b. Meter AWWTF1 DWF+GWI Calibration

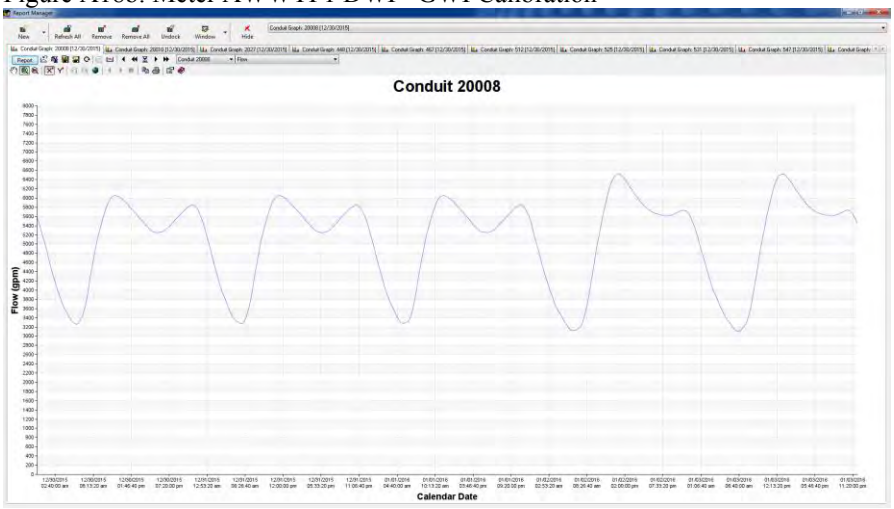


Figure A18c. Meter AWWTF1 DWF+GWI+WWF Calibration

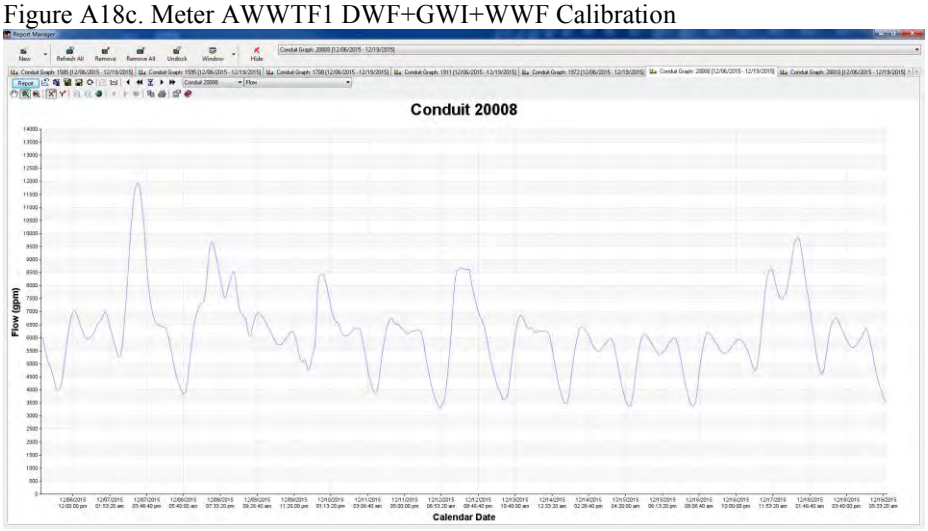


Figure A19a. Meter AWWTF2 DWF Calibration

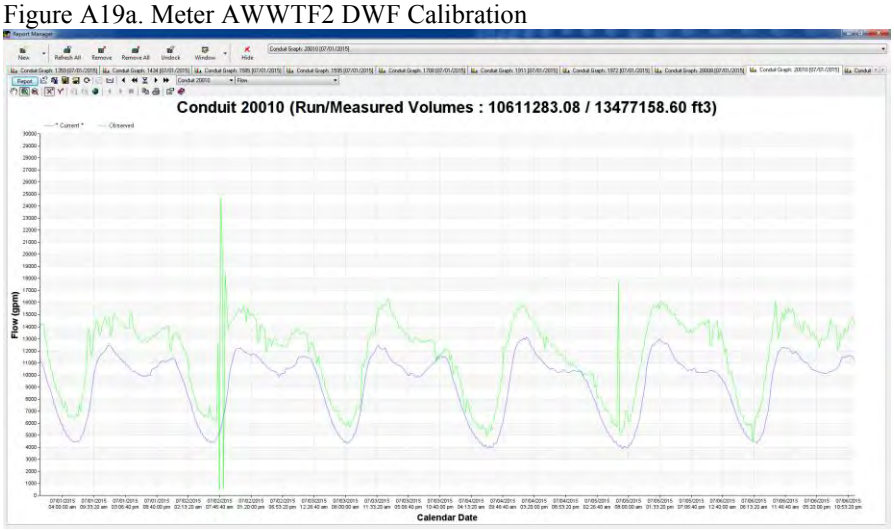


Figure A19b. Meter AWWTF2 DWF+GWI Calibration

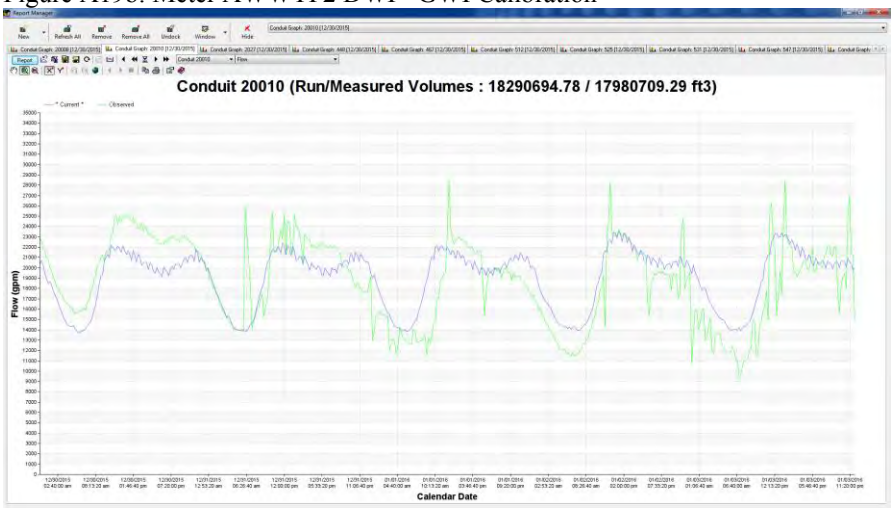


Figure A19c. Meter AWWTF2 DWF+GWI+WWF Calibration

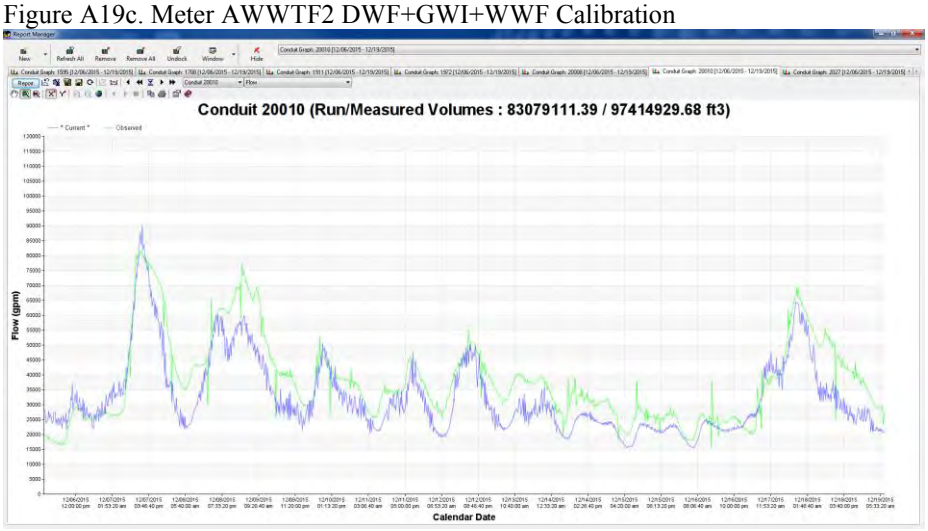


Figure A20a. Meter 800892 DWF Calibration

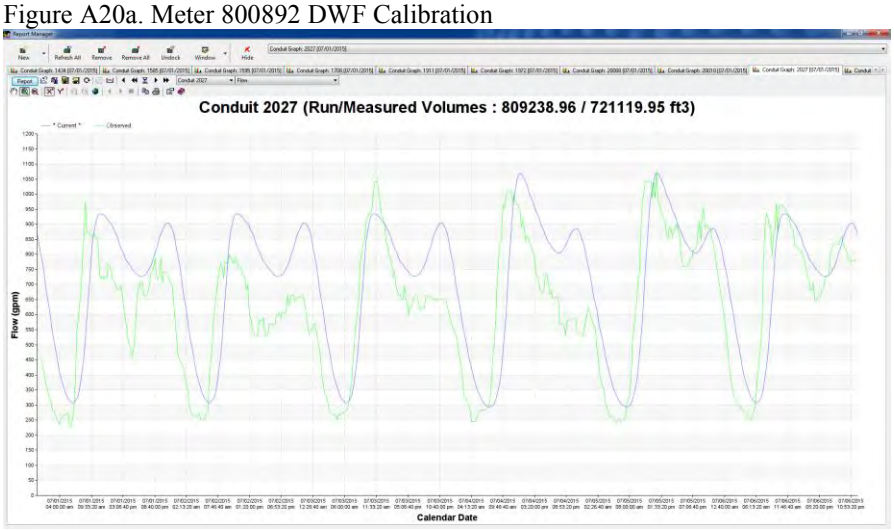


Figure A20b. Meter 800892 DWF+GWI Calibration

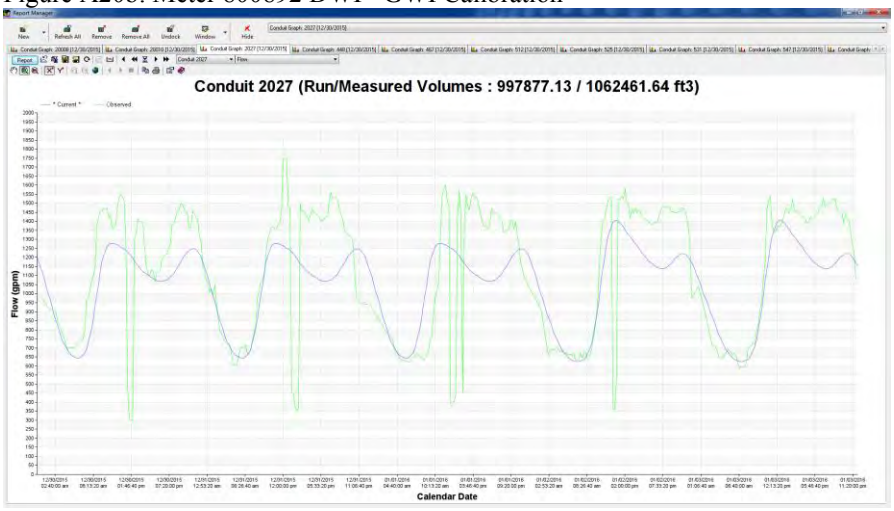


Figure A20c. Meter 800892 DWF+GWI+WWF Calibration

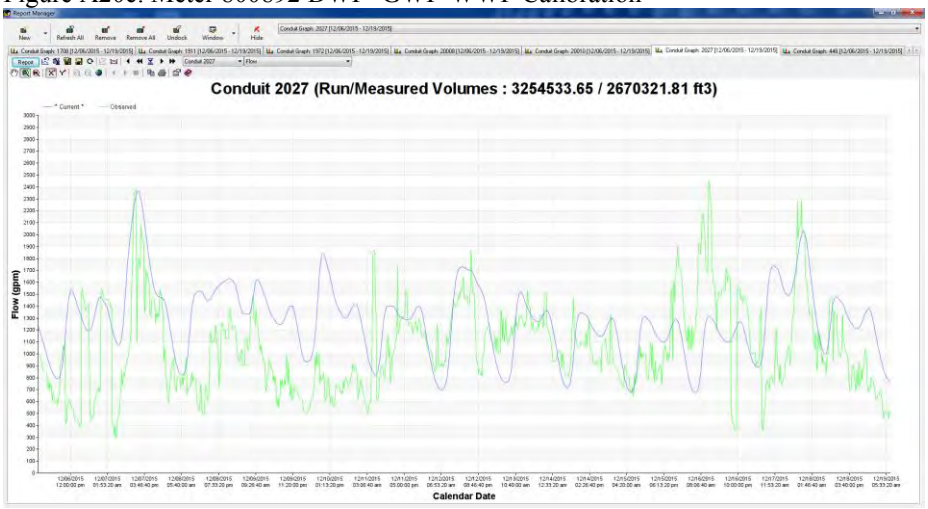


Figure A21a. Meter 10740 DWF Calibration

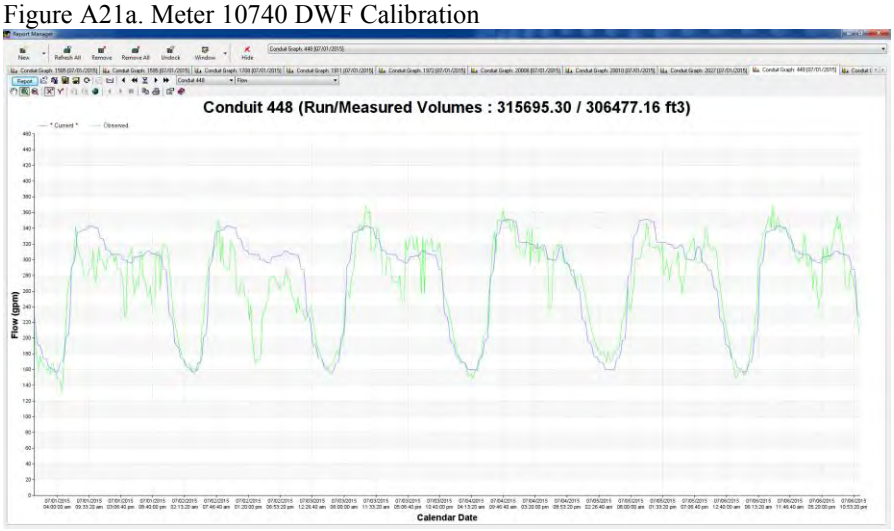


Figure A21b. Meter 10740 DWF+GWI Calibration

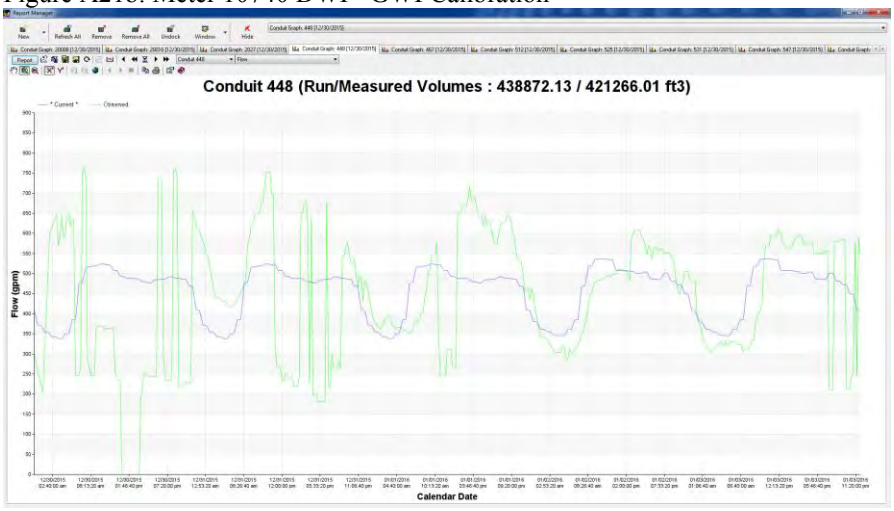


Figure A21c. Meter 10740 DWF+GWI+WWF Calibration

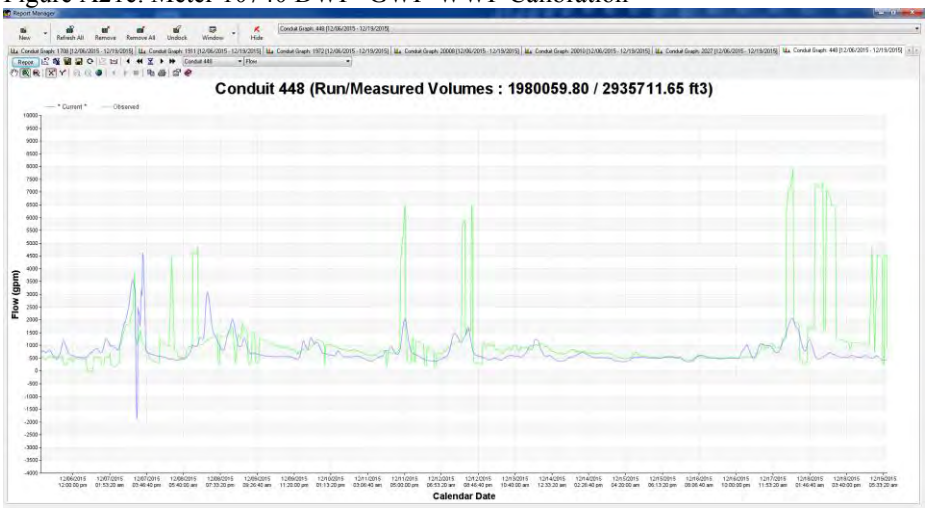


Figure A22a. Meter 6551 DWF Calibration

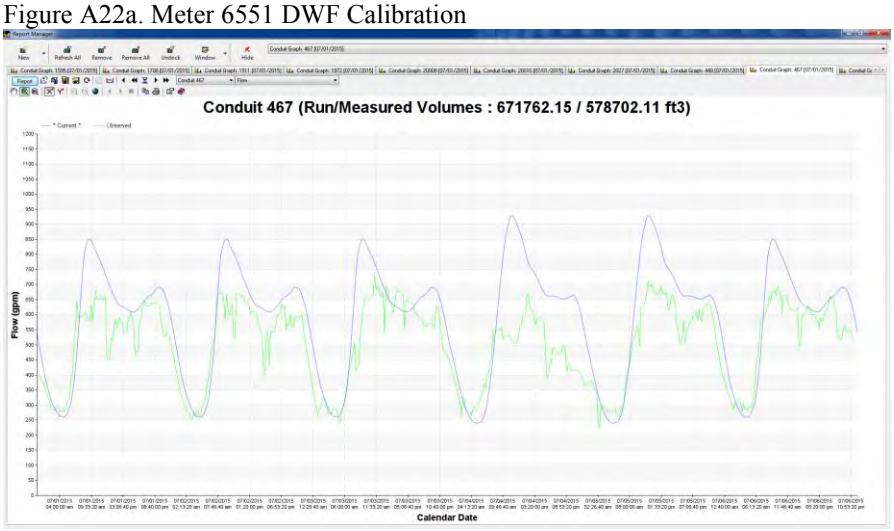


Figure A22b. Meter 6551 DWF+GWI Calibration

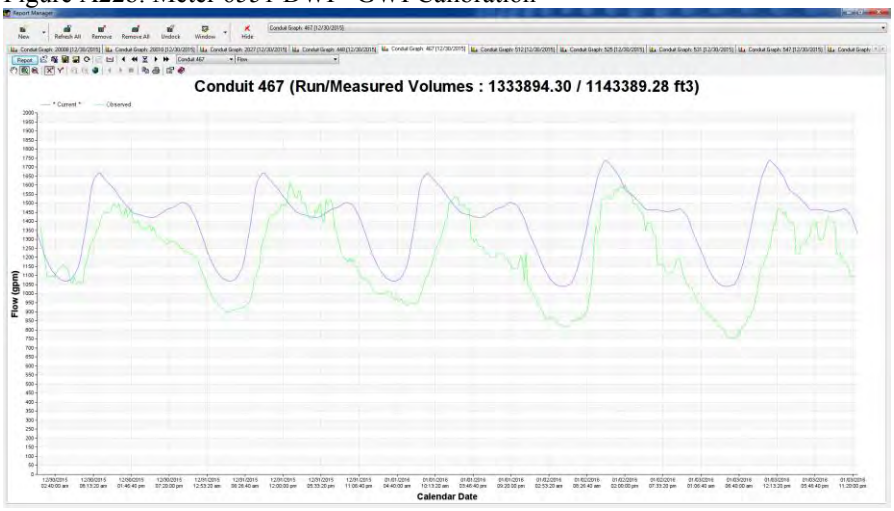


Figure A22c. Meter 6551 DWF+GWI+WWF Calibration

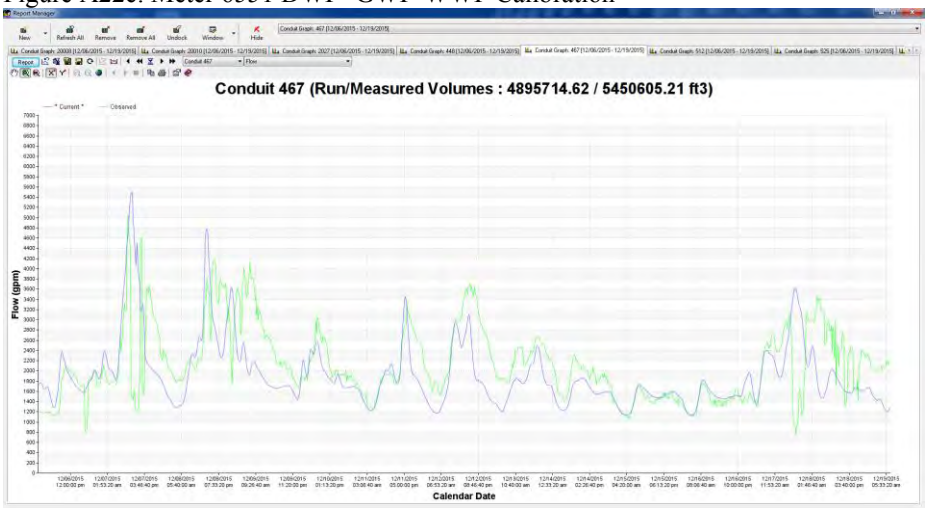


Figure A23a. Meter 11779 DWF Calibration

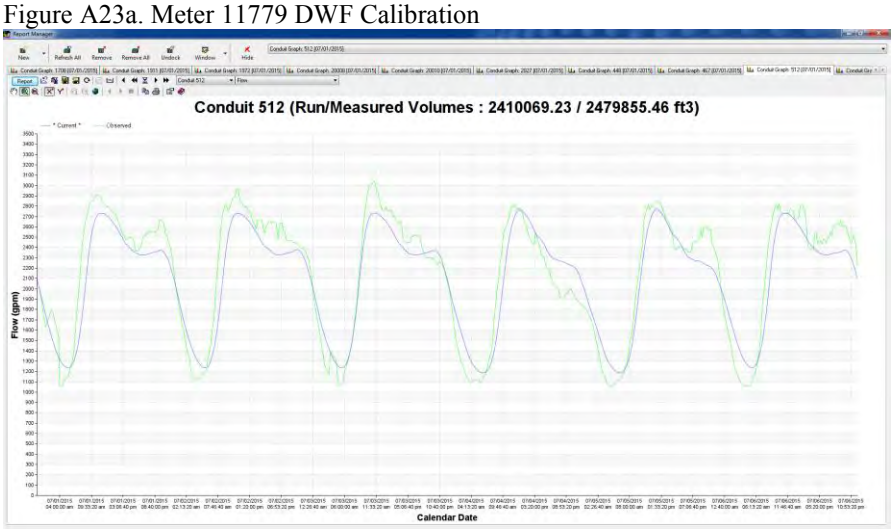


Figure A23b. Meter 11779 DWF+GWI Calibration

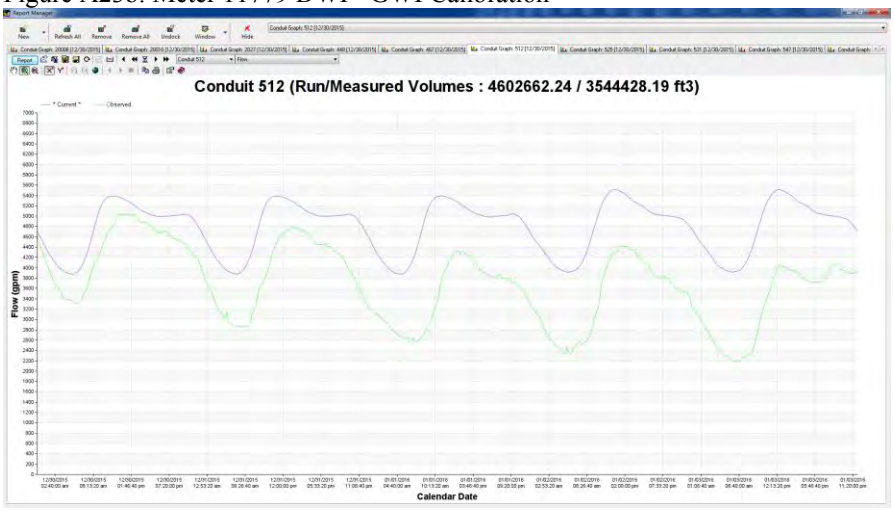


Figure A23c. Meter 11779 DWF+GWI+WWF Calibration

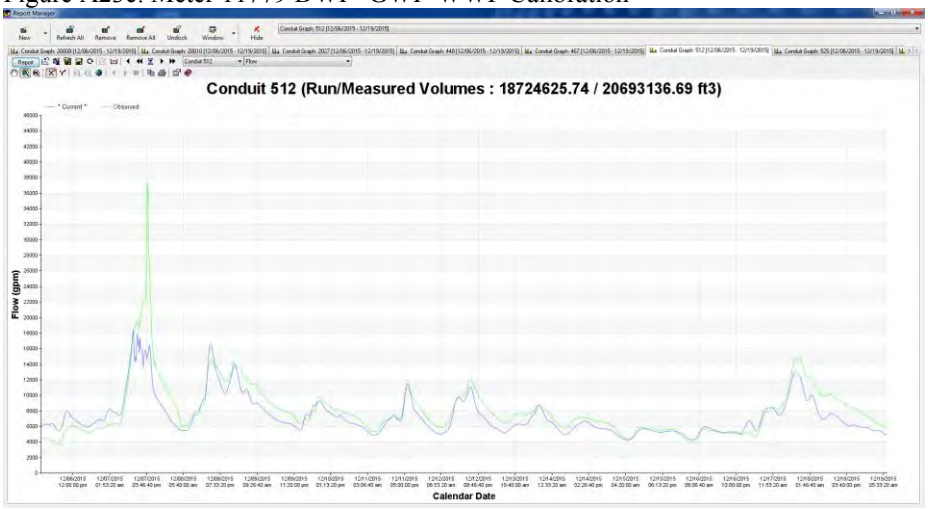


Figure A24a. Meter 11792 DWF Calibration

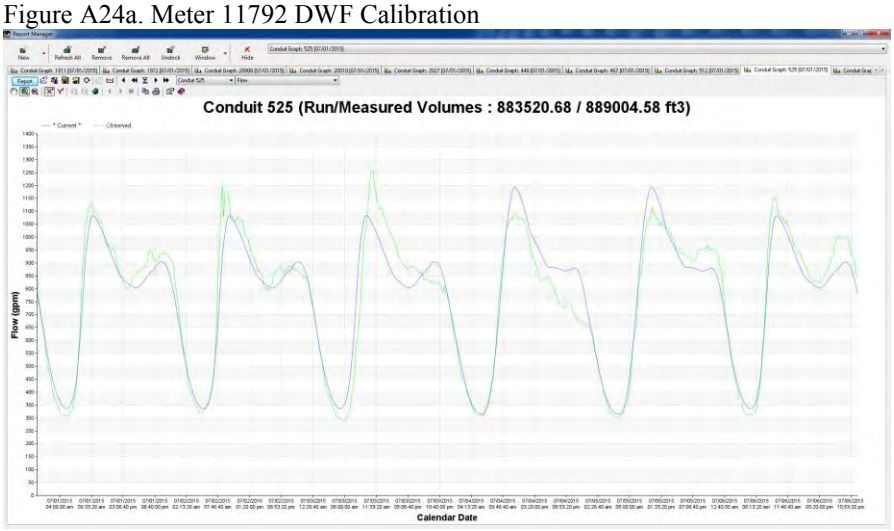


Figure A24b. Meter 11792 DWF+GWI Calibration

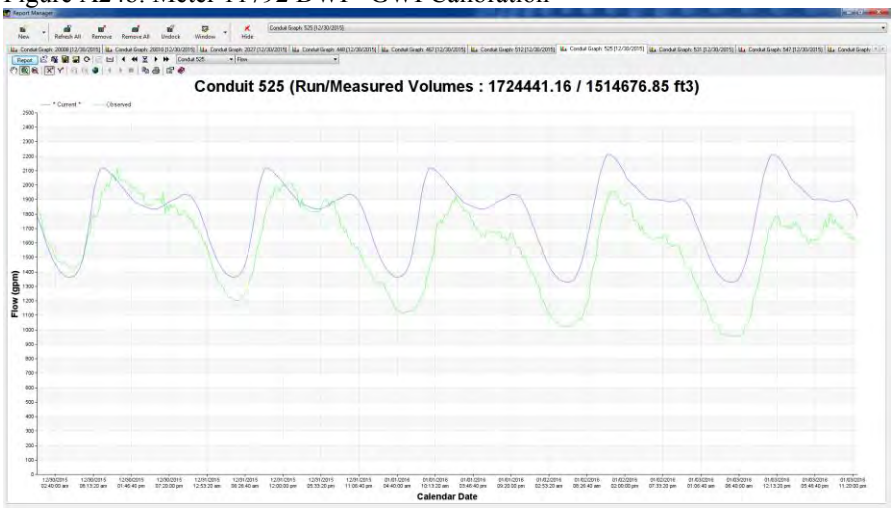


Figure A24c. Meter 11792 DWF+GWI+WWF Calibration

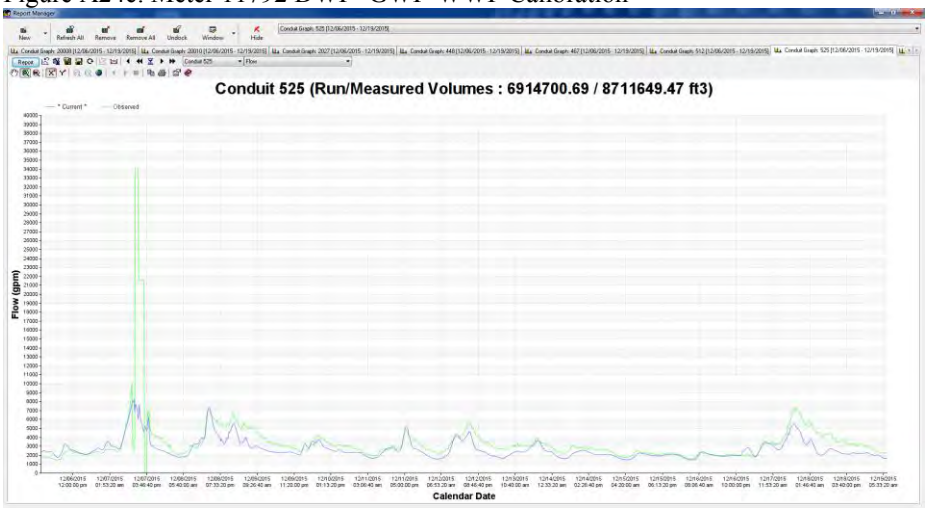


Figure A25a. Meter 12430 DWF Calibration

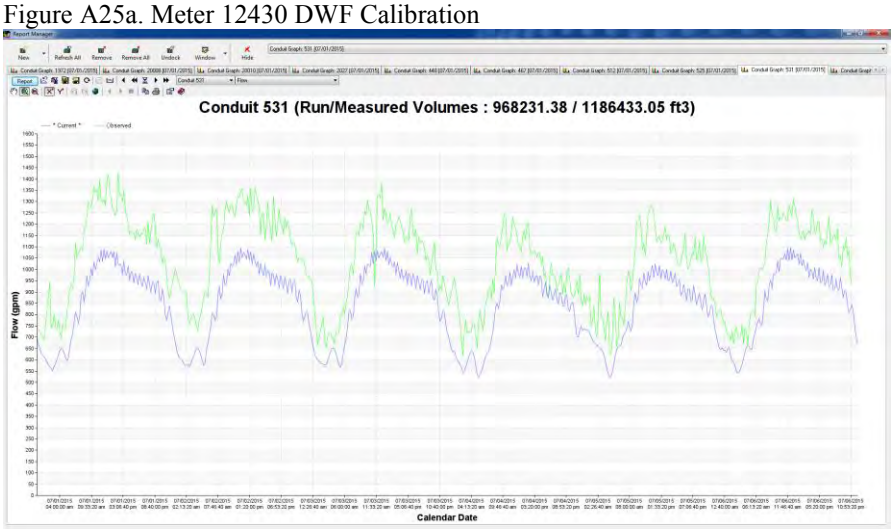


Figure A25b. Meter 12430 DWF+GWI Calibration

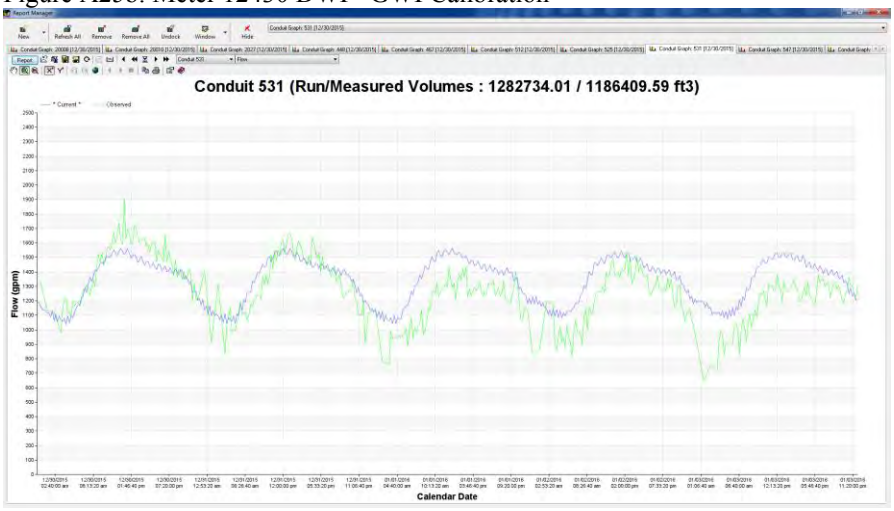


Figure A25c. Meter 12430 DWF+GWI+WWF Calibration

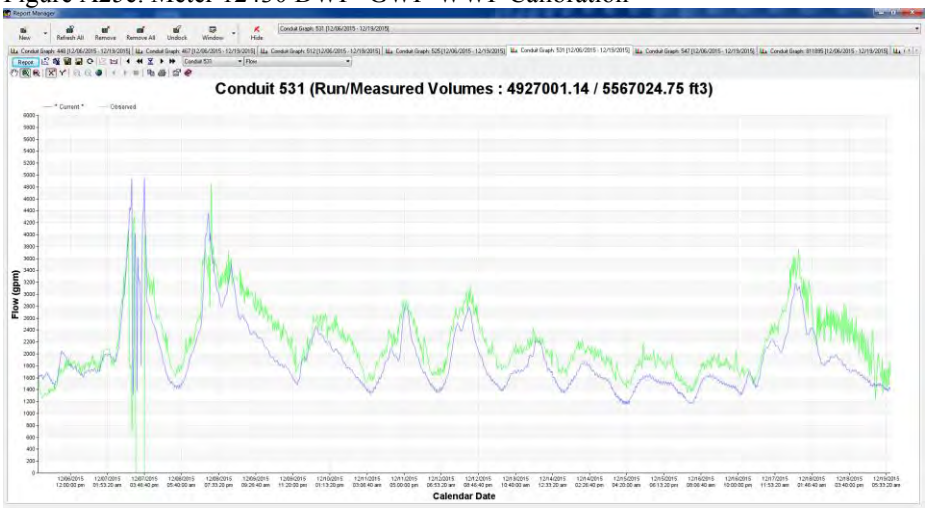


Figure A26a. Meter 13248 DWF Calibration

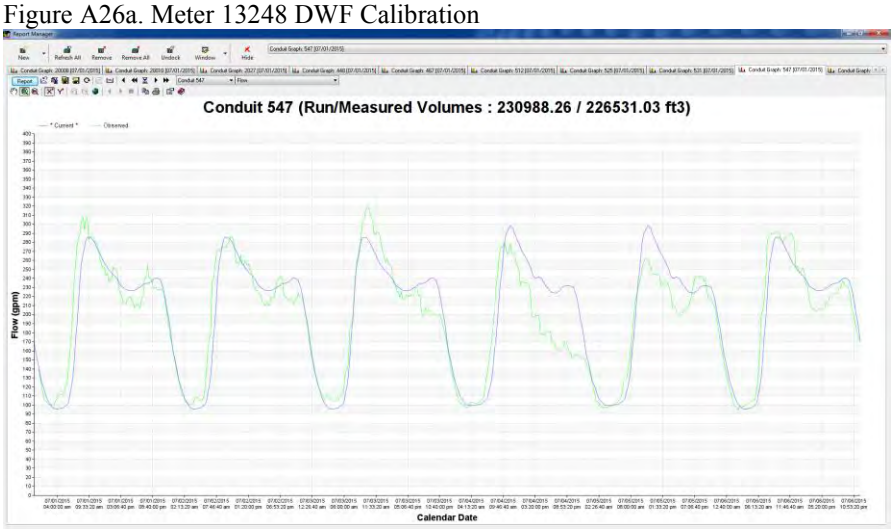


Figure A26b. Meter 13248 DWF+GWI Calibration

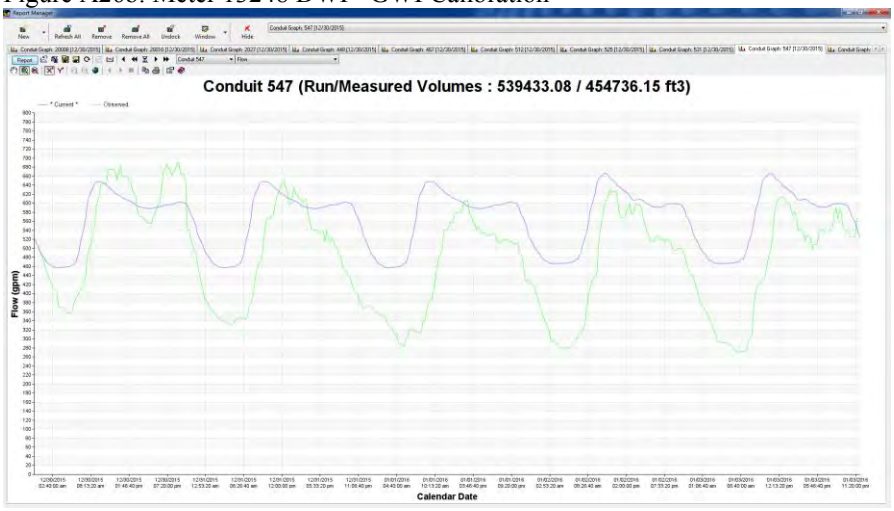


Figure A26c. Meter 13248 DWF+GWI+WWF Calibration

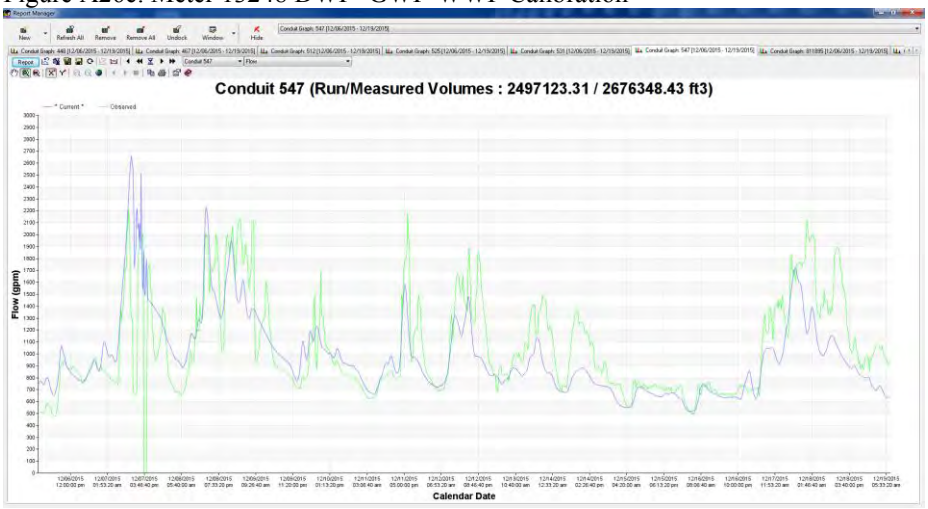


Figure A27a. Meter 811894 DWF Calibration

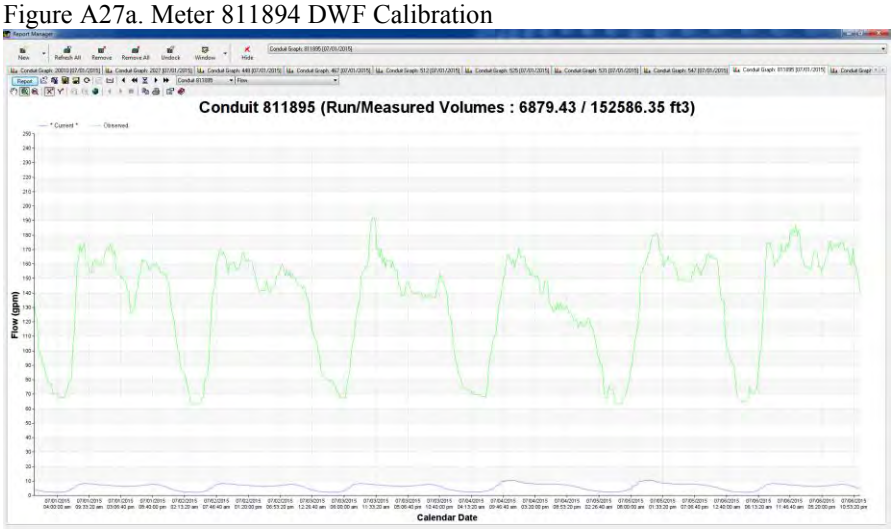


Figure A27b. Meter 811894 DWF+GWI Calibration

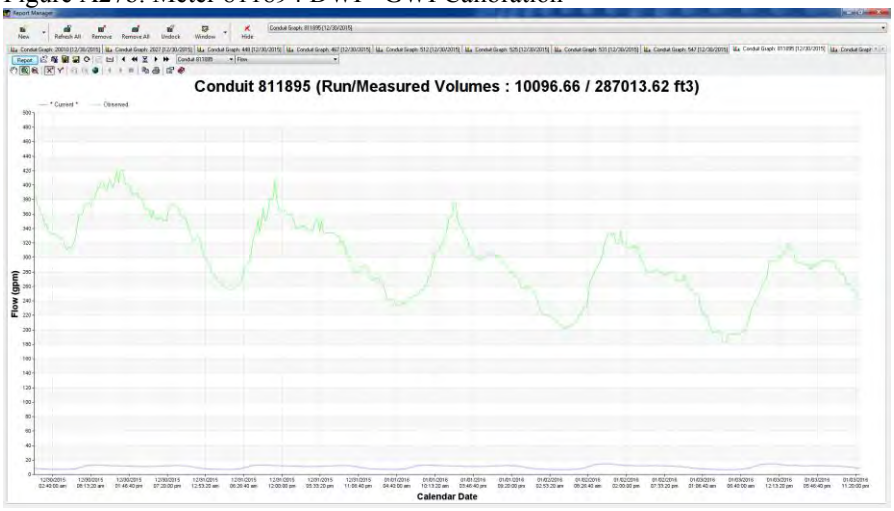


Figure A27c. Meter 811894 DWF+GWI+WWF Calibration

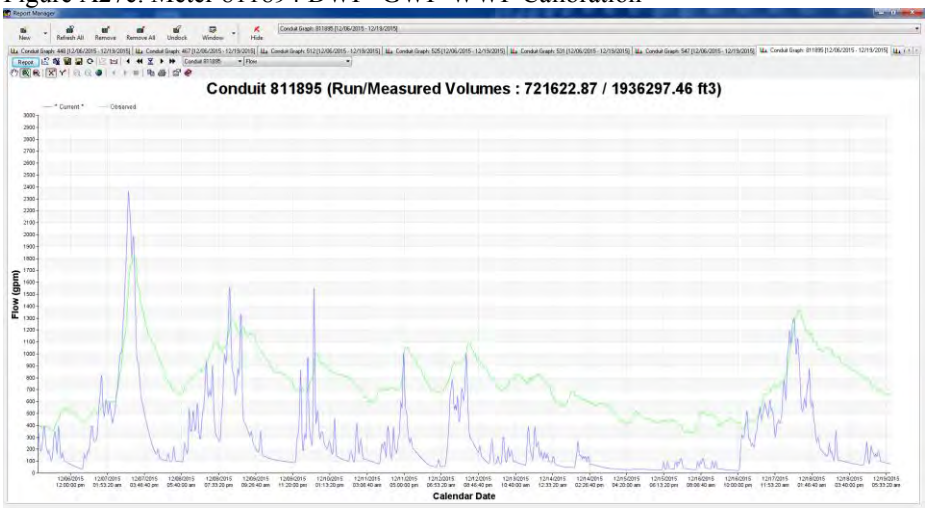


Figure A28a. Meter 6602 DWF Calibration

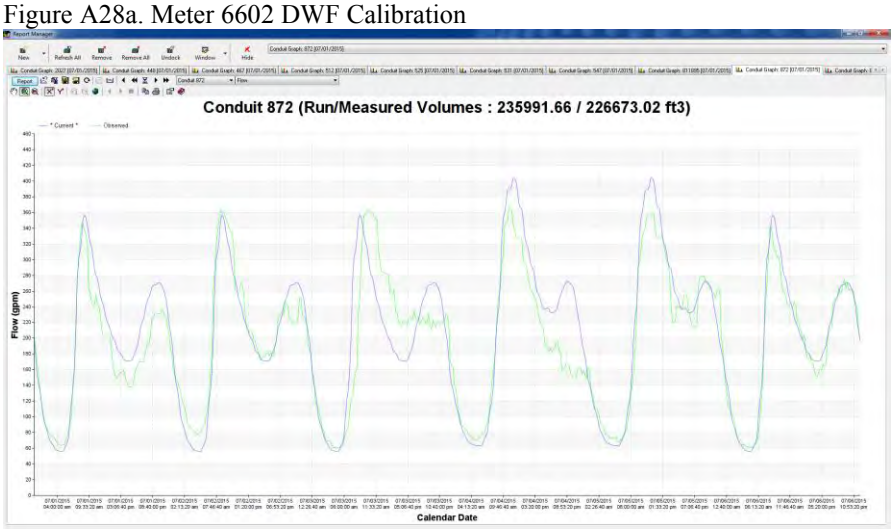


Figure A28b. Meter 6602 DWF+GWI Calibration

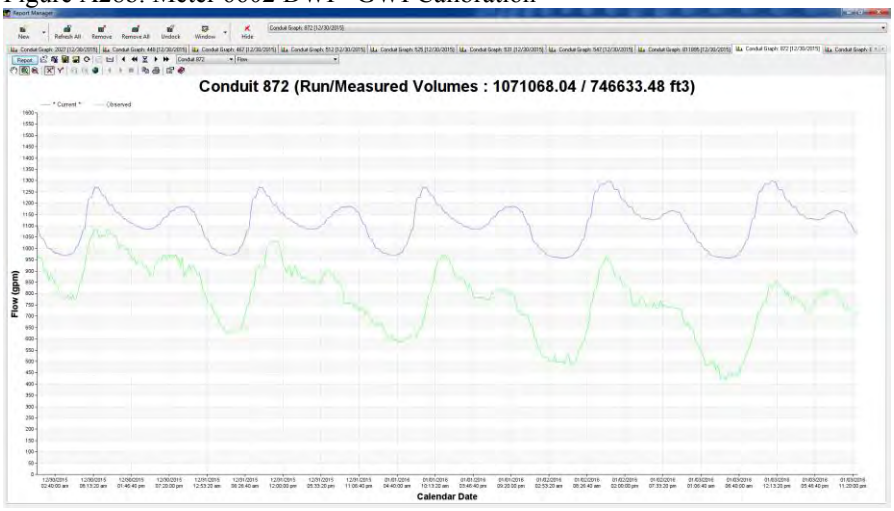


Figure A28c. Meter 6602 DWF+GWI+WWF Calibration

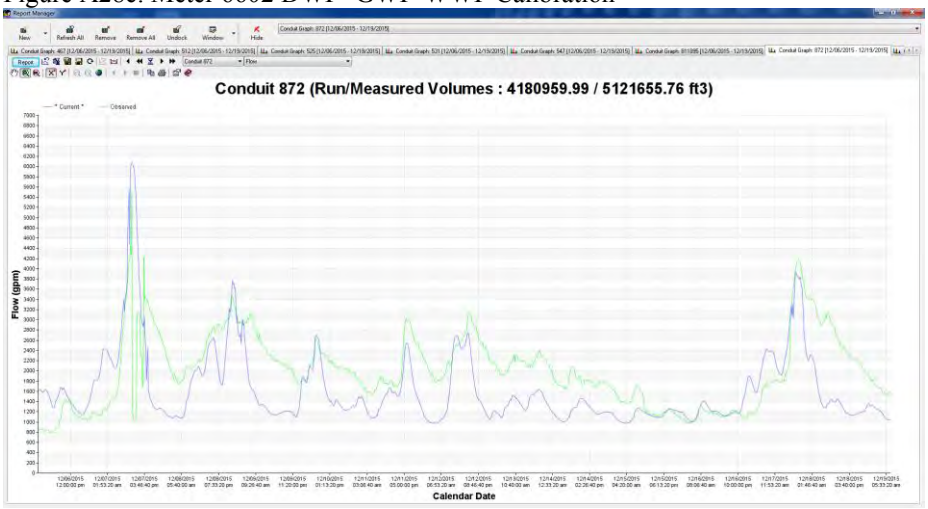


Figure A29a. Meter 6634 DWF Calibration

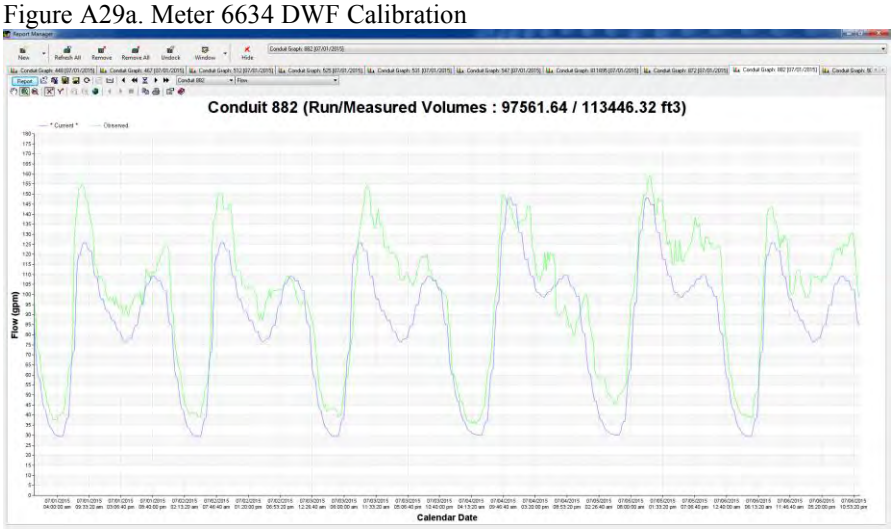


Figure A29b. Meter 6634 DWF+GWI Calibration

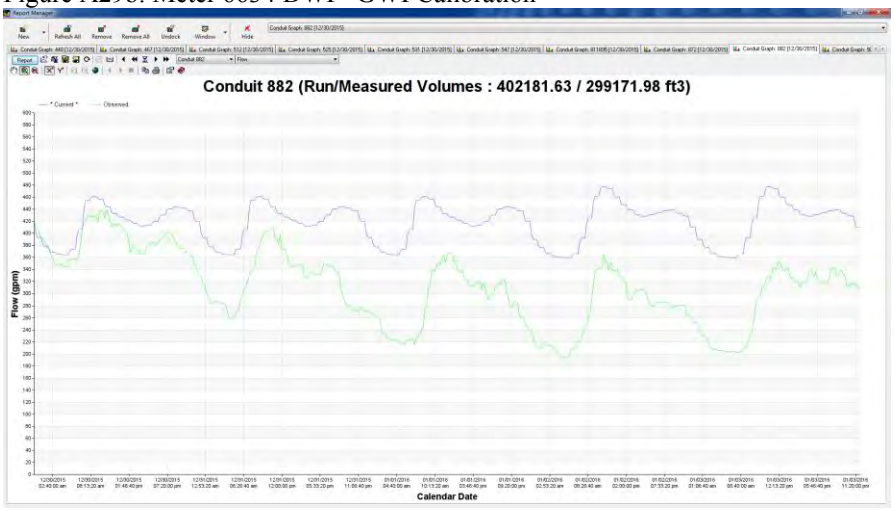


Figure A29c. Meter 6634 DWF+GWI+WWF Calibration

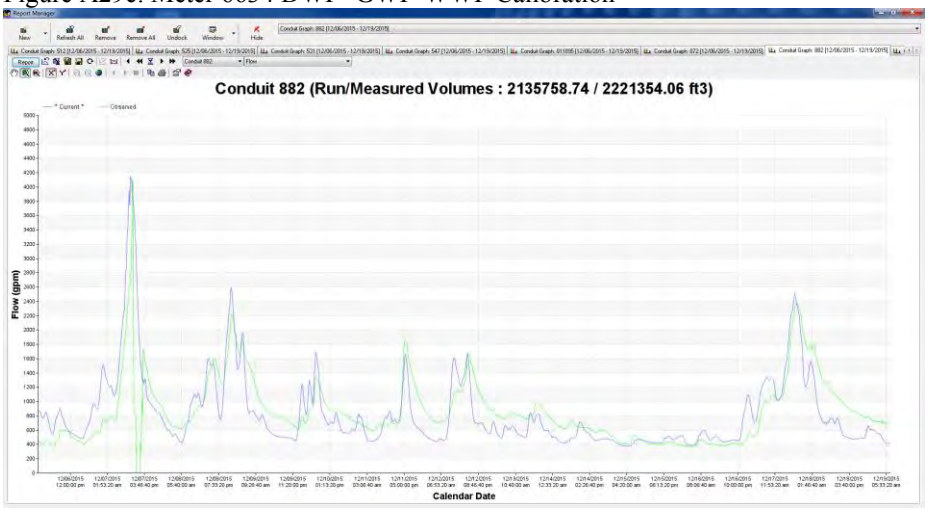


Figure A30a. Meter 9495 DWF Calibration

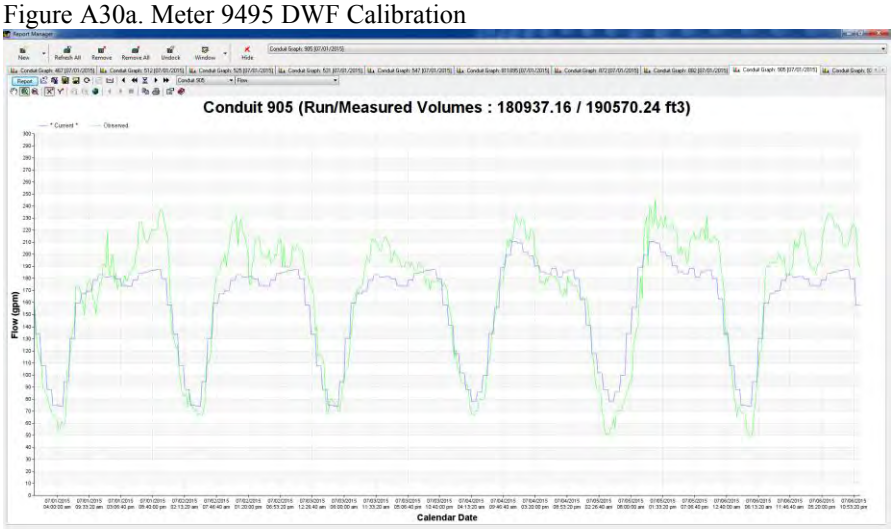


Figure A30b. Meter 9495 DWF+GWI Calibration

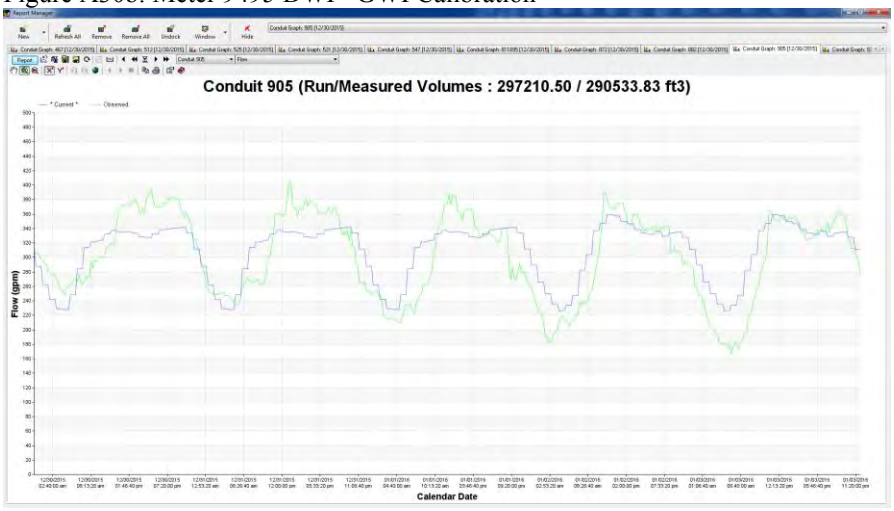


Figure A30c. Meter 9495 DWF+GWI+WWF Calibration

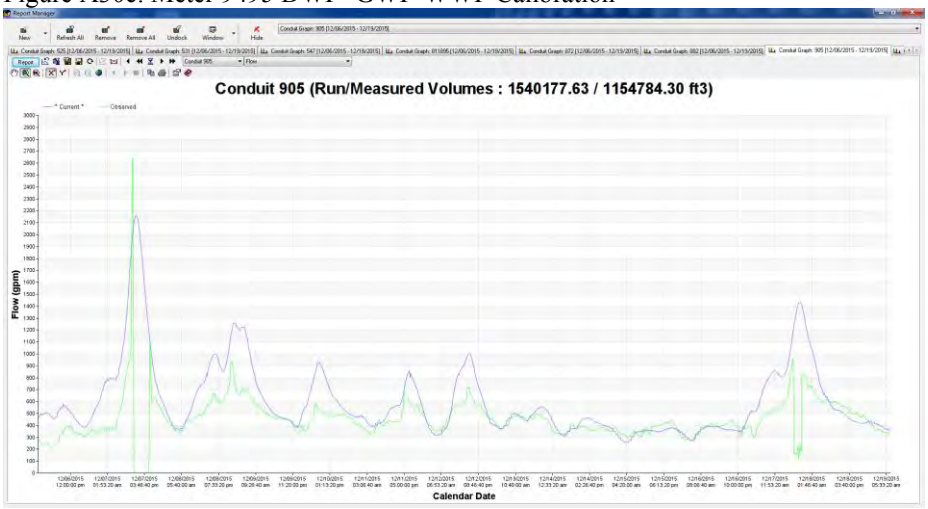


Figure A31a. Meter 4713 DWF Calibration

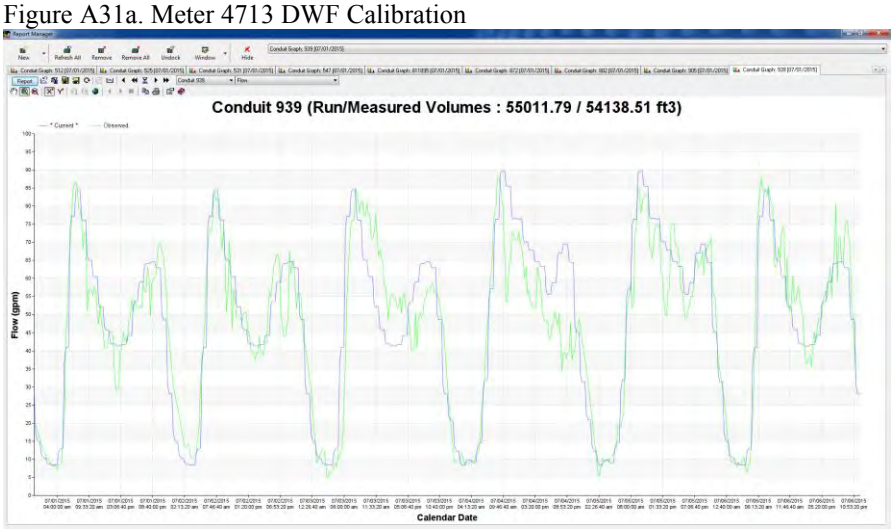


Figure A31b. Meter 4713 DWF+GWI Calibration

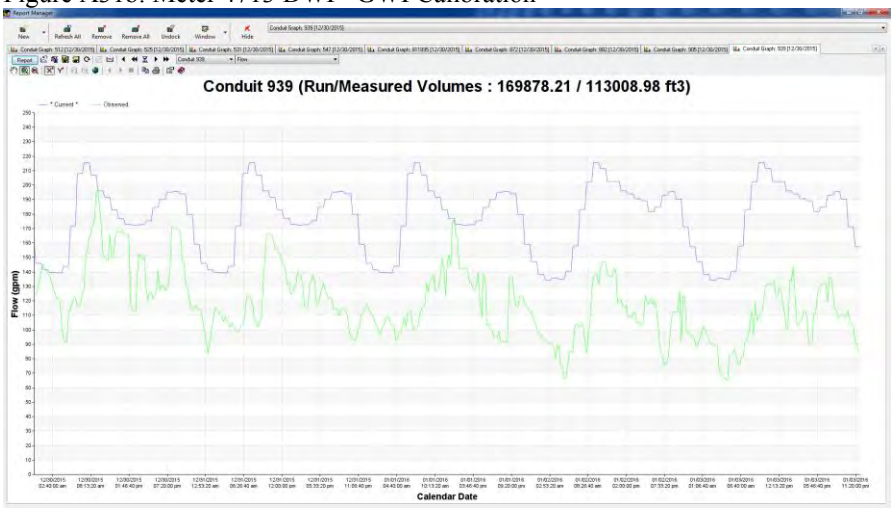
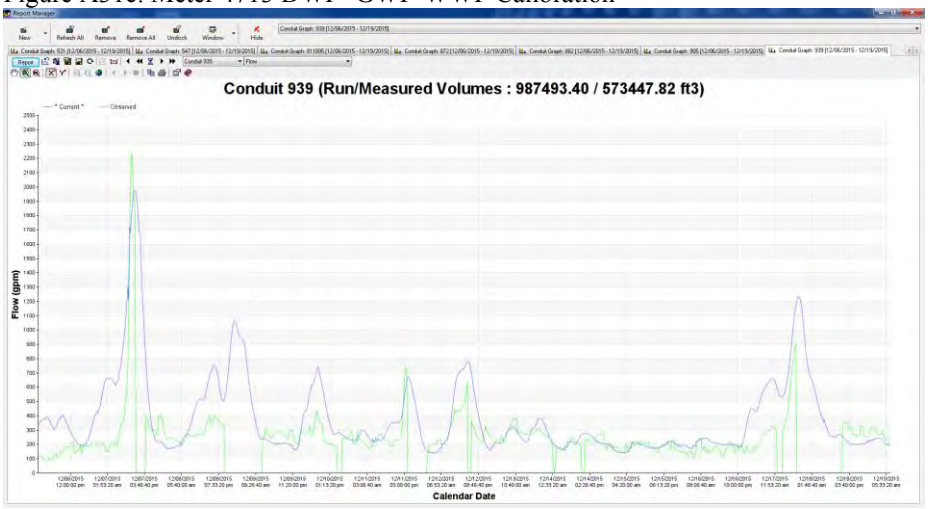


Figure A31c. Meter 4713 DWF+GWI+WWF Calibration



Appendix C
Model Input Summary

Junction ID	GIS-ID	ALLOC_CODE	Pattern ID	Existing DWF Value (gpm)	2025 DWF Value (gpm)	2035 DWF Value (gpm)	Buildout DWF Value (gpm)
5006	SSF-2006	GWI	BASE	2.065	2.065	2.065	2.065
5006	SSF-2006	IND	22276	4.000	6.616	8.845	9.774
5006	SSF-2006	INF	BASE	0.308	0.308	0.308	0.308
6596	SSF-0507	GWI	BASE	2.520	2.520	2.520	2.520
6596	SSF-0507	SFR	DU_WWTP	3.221	3.355	3.471	3.530
6599	SSF-1570	GWI	BASE	4.985	4.985	4.985	4.985
6599	SSF-1570	SFR	DU_WWTP	6.373	6.637	6.867	6.984
6742	SSF-0514	GWI	BASE	0.999	0.999	0.999	0.999
6742	SSF-0514	SFR	11719	2.476	2.579	2.668	2.713
6743	SSF-0509	GWI	BASE	0.870	0.870	0.870	0.870
6743	SSF-0509	SFR	11719	1.465	1.526	1.578	1.606
6746	NoMatch	GWI	BASE	11.432	11.432	11.432	11.432
6746	NoMatch	SFR	11719	19.242	20.042	20.734	21.089
6759	SSF-0518	GWI	BASE	2.012	2.012	2.012	2.012
6759	SSF-0518	SFR	11719	5.076	5.287	5.470	5.564
6767	SSF-0511	GWI	BASE	2.087	2.087	2.087	2.087
6767	SSF-0511	SFR	11719	11.266	11.734	12.139	12.347
6768	SSF-0512	GWI	BASE	0.269	0.269	0.269	0.269
6768	SSF-0512	SFR	11719	0.453	0.472	0.488	0.496
6769	SSF-0513	GWI	BASE	0.999	0.999	0.999	0.999
6769	SSF-0513	SFR	11719	0.888	0.925	0.957	0.973
6812	NoMatch	GWI	BASE	28.409	28.409	28.409	28.409
6812	NoMatch	SFR	11719	47.818	49.806	51.526	52.408
6868	SSF-0510	GWI	BASE	0.120	0.120	0.120	0.120
6868	SSF-0510	SFR	11719	0.201	0.210	0.217	0.221
6877	NoMatch	GWI	BASE	14.318	14.318	14.318	14.318
6877	NoMatch	SFR	11719	24.100	25.102	25.969	26.413
6904	SSF-0201	GWI	BASE	4.791	4.791	4.791	4.791
6904	SSF-0201	MFR	DU_WWTP	3.536	8.855	19.029	27.895
6906	NoMatch	COM	DU_WWTP	2.642	4.371	5.844	6.457
6906	NoMatch	GWI	BASE	0.942	0.942	0.942	0.942
6911	SSF-0206	COM	22276	2.324	3.844	5.139	5.679
6911	SSF-0206	GWI	BASE	1.200	1.200	1.200	1.200
6911	SSF-0206	INF	BASE	0.188	0.188	0.188	0.188
6912	SSF-1923	COM	22276	0.056	0.093	0.124	0.137
6912	SSF-1923	GWI	BASE	0.029	0.029	0.029	0.029
6914	SSF-1544	COM	DU_WWTP	0.015	0.026	0.034	0.038
6914	SSF-1544	GWI	BASE	0.012	0.012	0.012	0.012
6919	SSF-0887	COM	22276	0.277	0.458	0.612	0.676
6919	SSF-0887	GWI	BASE	2.388	2.388	2.388	2.388
6919	SSF-0887	GWI	BASE	2.388	2.388	2.388	2.388
6919	SSF-0887	INF	BASE	0.169	0.169	0.169	0.169
6919	SSF-0887	INF	BASE	0.169	0.169	0.169	0.169
6919	SSF-0887	MFR	22276	8.973	9.346	9.669	9.834
6920	SSF-0884	COM	22276	0.054	0.089	0.118	0.131
6920	SSF-0884	GWI	BASE	0.028	0.028	0.028	0.028
6922	SSF-0889	GWI	BASE	1.167	1.167	1.167	1.167
6922	SSF-0889	INF	BASE	0.082	0.082	0.082	0.082
6922	SSF-0889	MFR	22276	5.365	5.588	5.781	5.880
6923	SSF-0890	GWI	BASE	3.115	3.115	3.115	3.115
6923	SSF-0890	INF	BASE	0.240	0.240	0.240	0.240
6923	SSF-0890	SFR	22276	1.734	1.806	1.868	1.900
6926	SSF-0883	COM	22276	3.083	5.100	6.818	7.534
6926	SSF-0883	GWI	BASE	1.592	1.592	1.592	1.592
6926	SSF-0883	INF	BASE	0.250	0.250	0.250	0.250
6931	SSF-0876	COM	22276	1.513	2.503	3.346	3.698
6931	SSF-0876	GWI	BASE	1.822	1.822	1.822	1.822
6931	SSF-0876	INF	BASE	0.286	0.286	0.286	0.286
6934	SSF-0885	COM	22276	0.000	21.224	23.100	23.498
6934	SSF-0885	GWI	BASE	5.149	5.149	5.149	5.149
6934	SSF-0885	INF	BASE	0.804	0.804	0.804	0.804

Junction ID	GIS-ID	ALLOC_CODE	Pattern ID	Existing DWF Value (gpm)	2025 DWF Value (gpm)	2035 DWF Value (gpm)	Buildout DWF Value (gpm)
6934	SSF-0885	SFR	22276	0.406	0.422	0.437	0.444
6935	SSF-0209	COM	22276	2.110	3.491	4.667	5.157
6935	SSF-0209	GWI	BASE	1.295	1.295	1.295	1.295
6935	SSF-0209	INF	BASE	0.157	0.157	0.157	0.157
6936	SSF-0208	COM	22276	1.046	1.730	2.312	2.555
6936	SSF-0208	GWI	BASE	0.540	0.540	0.540	0.540
6936	SSF-0208	INF	BASE	0.085	0.085	0.085	0.085
6937	SSF-0207	COM	22276	0.774	1.281	1.712	1.892
6937	SSF-0207	GWI	BASE	0.400	0.400	0.400	0.400
6937	SSF-0207	INF	BASE	0.063	0.063	0.063	0.063
6939	SSF-0226	GWI	BASE	3.452	3.452	3.452	3.452
6939	SSF-0226	INF	BASE	0.430	0.430	0.430	0.430
6939	SSF-0226	MFR	22276	2.333	5.842	12.555	18.404
6940	SSF-0227	COM	22276	0.168	0.278	0.372	0.411
6940	SSF-0227	GWI	BASE	0.133	0.133	0.133	0.133
6940	SSF-0227	GWI	BASE	0.133	0.133	0.133	0.133
6940	SSF-0227	IND	22276	0.348	0.576	0.770	0.851
6940	SSF-0227	INF	BASE	0.020	0.020	0.020	0.020
6940	SSF-0227	INF	BASE	0.020	0.020	0.020	0.020
6941	NoMatch	GWI	BASE	1.532	1.532	1.532	1.532
6941	NoMatch	IND	22276	2.966	4.907	6.560	7.249
6941	NoMatch	INF	BASE	0.229	0.229	0.229	0.229
6943	SSF-0292	COM	22276	0.588	0.972	1.300	1.436
6943	SSF-0292	GWI	BASE	0.303	0.303	0.303	0.303
6943	SSF-0292	INF	BASE	0.048	0.048	0.048	0.048
6944	SSF-0308	COM	22276	0.162	0.268	0.359	0.397
6944	SSF-0308	GWI	BASE	1.167	1.167	1.167	1.167
6944	SSF-0308	INF	BASE	0.082	0.082	0.082	0.082
6946	SSF-0306	GWI	BASE	1.167	1.167	1.167	1.167
6946	SSF-0306	INF	BASE	0.082	0.082	0.082	0.082
6946	SSF-0306	MFR	22276	1.255	1.307	1.352	1.375
6947	SSF-0610	GWI	BASE	3.115	3.115	3.115	3.115
6947	SSF-0610	INF	BASE	0.240	0.240	0.240	0.240
6947	SSF-0610	SFR	22276	2.944	3.066	3.172	3.227
6948	SSF-0608	GWI	BASE	3.115	3.115	3.115	3.115
6948	SSF-0608	INF	BASE	0.240	0.240	0.240	0.240
6948	SSF-0608	MFR	22276	3.032	3.158	3.267	3.323
6951	NoMatch	GWI	BASE	0.014	0.014	0.014	0.014
6951	NoMatch	SFR	22276	0.027	0.028	0.029	0.029
6954	SSF-1092	COM	22276	1.349	2.231	2.983	3.296
6954	SSF-1092	GWI	BASE	0.362	0.362	0.362	0.362
6954	SSF-1092	GWI	BASE	0.362	0.362	0.362	0.362
6954	SSF-1092	INF	BASE	0.056	0.056	0.056	0.056
6954	SSF-1092	INF	BASE	0.056	0.056	0.056	0.056
6954	SSF-1092	SFR	22276	0.055	0.057	0.059	0.060
6956	SSF-0293	COM	DU_WWTP	8.715	14.416	19.273	21.296
6956	SSF-0293	GWI	BASE	4.791	4.791	4.791	4.791
6958	SSF-0873	COM	DU_WWTP	0.856	1.417	1.894	2.093
6958	SSF-0873	GWI	BASE	0.670	0.670	0.670	0.670
6959	SSF-1543	COM	DU_WWTP	0.376	0.622	0.832	0.919
6959	SSF-1543	GWI	BASE	0.294	0.294	0.294	0.294
6960	SSF-0624	COM	22276	0.786	1.300	1.738	1.920
6960	SSF-0624	GWI	BASE	1.588	1.588	1.588	1.588
6960	SSF-0624	GWI	BASE	1.588	1.588	1.588	1.588
6960	SSF-0624	GWI	BASE	1.588	1.588	1.588	1.588
6960	SSF-0624	INF	BASE	0.121	0.121	0.121	0.121
6960	SSF-0624	INF	BASE	0.121	0.121	0.121	0.121
6960	SSF-0624	INF	BASE	0.121	0.121	0.121	0.121
6960	SSF-0624	MFR	22276	8.398	8.747	9.049	9.204
6960	SSF-0624	SFR	22276	0.040	0.042	0.043	0.044
6961	SSF-0625	COM	22276	1.070	1.769	2.366	2.614

Junction ID	GIS-ID	ALLOC_CODE	Pattern ID	Existing DWF Value (gpm)	2025 DWF Value (gpm)	2035 DWF Value (gpm)	Buildout DWF Value (gpm)
6961	SSF-0625	GWI	BASE	2.089	2.089	2.089	2.089
6961	SSF-0625	INF	BASE	0.167	0.167	0.167	0.167
6962	SSF-0626	GWI	BASE	2.089	2.089	2.089	2.089
6962	SSF-0626	INF	BASE	0.167	0.167	0.167	0.167
6962	SSF-0626	MFR	22276	7.021	7.313	7.565	7.695
6963	SSF-0627	COM	22276	1.973	3.264	4.363	4.821
6963	SSF-0627	GWI	BASE	1.037	1.037	1.037	1.037
6963	SSF-0627	INF	BASE	0.163	0.163	0.163	0.163
6965	SSF-0618	COM	22276	0.737	1.219	1.629	1.800
6965	SSF-0618	GWI	BASE	0.352	0.352	0.352	0.352
6965	SSF-0618	INF	BASE	0.055	0.055	0.055	0.055
6967	SSF-0617	COM	22276	0.625	1.033	1.382	1.527
6967	SSF-0617	GWI	BASE	0.352	0.352	0.352	0.352
6967	SSF-0617	INF	BASE	0.055	0.055	0.055	0.055
6969	SSF-0612	COM	22276	0.585	0.968	1.295	1.430
6969	SSF-0612	GWI	BASE	0.302	0.302	0.302	0.302
6969	SSF-0612	INF	BASE	0.047	0.047	0.047	0.047
6972	SSF-0615	COM	22276	6.963	11.519	15.399	17.016
6972	SSF-0615	GWI	BASE	3.130	3.130	3.130	3.130
6972	SSF-0615	INF	BASE	0.491	0.491	0.491	0.491
6975	SSF-2478	GWI	BASE	2.321	2.321	2.321	2.321
6975	SSF-2478	INF	BASE	0.158	0.158	0.158	0.158
6975	SSF-2478	MFR	22276	4.494	4.681	4.843	4.926
6976	SSF-0291	COM	22276	1.743	2.883	3.855	4.259
6976	SSF-0291	GWI	BASE	1.017	1.017	1.017	1.017
6976	SSF-0291	GWI	BASE	1.017	1.017	1.017	1.017
6976	SSF-0291	INF	BASE	0.109	0.109	0.109	0.109
6976	SSF-0291	INF	BASE	0.109	0.109	0.109	0.109
6976	SSF-0291	MFR	22276	2.197	2.289	2.368	2.408
6979	SSF-0559	GWI	BASE	4.336	4.336	4.336	4.336
6979	SSF-0559	INF	BASE	0.296	0.296	0.296	0.296
6979	SSF-0559	MFR	22276	8.396	8.745	9.047	9.202
6981	SSF-0564	GWI	BASE	0.032	0.032	0.032	0.032
6981	SSF-0564	MFR	22276	0.063	0.065	0.068	0.069
6982	SSF-0563	GWI	BASE	0.087	0.087	0.087	0.087
6982	SSF-0563	GWI	BASE	0.087	0.087	0.087	0.087
6982	SSF-0563	INF	BASE	0.009	0.009	0.009	0.009
6982	SSF-0563	INF	BASE	0.009	0.009	0.009	0.009
6982	SSF-0563	MFR	22276	0.151	0.157	0.162	0.165
6982	SSF-0563	SFR	22276	0.186	0.193	0.200	0.204
6986	SSF-0557	GWI	BASE	1.296	1.296	1.296	1.296
6986	SSF-0557	INF	BASE	0.162	0.162	0.162	0.162
6986	SSF-0557	SFR	22276	0.484	0.504	0.522	0.530
6987	SSF-0762	GWI	BASE	0.300	0.300	0.300	0.300
6987	SSF-0762	INF	BASE	0.038	0.038	0.038	0.038
6987	SSF-0762	SFR	22276	0.580	0.604	0.625	0.636
6988	SSF-0760	GWI	BASE	0.830	0.830	0.830	0.830
6988	SSF-0760	INF	BASE	0.104	0.104	0.104	0.104
6988	SSF-0760	SFR	22276	1.608	1.675	1.733	1.762
6990	SSF-0465	GWI	BASE	5.137	5.137	5.137	5.137
6990	SSF-0465	GWI	BASE	5.137	5.137	5.137	5.137
6990	SSF-0465	INF	BASE	0.357	0.357	0.357	0.357
6990	SSF-0465	INF	BASE	0.357	0.357	0.357	0.357
6990	SSF-0465	MFR	22276	19.446	20.255	20.954	21.313
6990	SSF-0465	SFR	22276	0.448	0.466	0.482	0.490
6991	SSF-0464	GWI	BASE	2.985	2.985	2.985	2.985
6991	SSF-0464	INF	BASE	0.374	0.374	0.374	0.374
6991	SSF-0464	SFR	22276	5.780	6.020	6.228	6.335
6992	SSF-0462	GWI	BASE	1.738	1.738	1.738	1.738
6992	SSF-0462	INF	BASE	0.218	0.218	0.218	0.218
6992	SSF-0462	SFR	22276	2.669	2.780	2.876	2.925

Junction ID	GIS-ID	ALLOC_CODE	Pattern ID	Existing DWF Value (gpm)	2025 DWF Value (gpm)	2035 DWF Value (gpm)	Buildout DWF Value (gpm)
6993	SSF-0457	GWI	BASE	1.296	1.296	1.296	1.296
6993	SSF-0457	INF	BASE	0.163	0.163	0.163	0.163
6993	SSF-0457	SFR	22276	2.509	2.614	2.704	2.750
6995	SSF-0455	GWI	BASE	0.975	0.975	0.975	0.975
6995	SSF-0455	INF	BASE	0.122	0.122	0.122	0.122
6995	SSF-0455	SFR	22276	1.888	1.966	2.034	2.069
6996	SSF-0470	GWI	BASE	0.898	0.898	0.898	0.898
6996	SSF-0470	INF	BASE	0.113	0.113	0.113	0.113
6996	SSF-0470	SFR	22276	1.739	1.811	1.873	1.905
6997	SSF-0474	GWI	BASE	1.390	1.390	1.390	1.390
6997	SSF-0474	INF	BASE	0.174	0.174	0.174	0.174
6997	SSF-0474	SFR	22276	3.513	3.659	3.786	3.850
6998	SSF-0473	GWI	BASE	0.227	0.227	0.227	0.227
6998	SSF-0473	INF	BASE	0.029	0.029	0.029	0.029
6998	SSF-0473	SFR	22276	0.440	0.459	0.475	0.483
6999	SSF-0472	GWI	BASE	0.797	0.797	0.797	0.797
6999	SSF-0472	INF	BASE	0.100	0.100	0.100	0.100
6999	SSF-0472	SFR	22276	1.543	1.607	1.663	1.691
7000	SSF-0680	GWI	BASE	0.254	0.254	0.254	0.254
7000	SSF-0680	INF	BASE	0.032	0.032	0.032	0.032
7000	SSF-0680	SFR	22276	0.492	0.513	0.530	0.539
7001	SSF-2242	GWI	BASE	0.290	0.290	0.290	0.290
7001	SSF-2242	INF	BASE	0.036	0.036	0.036	0.036
7001	SSF-2242	SFR	22276	0.562	0.586	0.606	0.616
7002	SSF-0678	GWI	BASE	0.441	0.441	0.441	0.441
7002	SSF-0678	INF	BASE	0.055	0.055	0.055	0.055
7002	SSF-0678	SFR	22276	0.854	0.889	0.920	0.936
7004	SSF-0676	GWI	BASE	0.357	0.357	0.357	0.357
7004	SSF-0676	INF	BASE	0.045	0.045	0.045	0.045
7004	SSF-0676	SFR	22276	0.691	0.720	0.744	0.757
7005	SSF-0151	GWI	BASE	0.465	0.465	0.465	0.465
7005	SSF-0151	INF	BASE	0.058	0.058	0.058	0.058
7005	SSF-0151	SFR	22276	0.900	0.938	0.970	0.987
7006	SSF-0692	GWI	BASE	0.172	0.172	0.172	0.172
7006	SSF-0692	INF	BASE	0.022	0.022	0.022	0.022
7006	SSF-0692	SFR	22276	0.333	0.347	0.359	0.365
7008	SSF-1556	GWI	BASE	0.791	0.791	0.791	0.791
7008	SSF-1556	INF	BASE	0.099	0.099	0.099	0.099
7008	SSF-1556	SFR	22276	2.243	2.336	2.417	2.458
7009	SSF-1560	GWI	BASE	0.791	0.791	0.791	0.791
7009	SSF-1560	INF	BASE	0.099	0.099	0.099	0.099
7009	SSF-1560	SFR	22276	0.821	0.855	0.885	0.900
7010	SSF-1559	GWI	BASE	0.301	0.301	0.301	0.301
7010	SSF-1559	INF	BASE	0.038	0.038	0.038	0.038
7010	SSF-1559	SFR	22276	0.582	0.606	0.627	0.638
7011	SSF-1557	GWI	BASE	3.527	3.527	3.527	3.527
7011	SSF-1557	INF	BASE	0.442	0.442	0.442	0.442
7012	SSF-1921	COM	DU_WWTP	0.925	1.530	2.045	2.260
7012	SSF-1921	GWI	BASE	0.723	0.723	0.723	0.723
7015	SSF-1918	COM	DU_WWTP	0.329	0.544	0.727	0.803
7015	SSF-1918	GWI	BASE	0.257	0.257	0.257	0.257
7016	SSF-1917	COM	DU_WWTP	0.835	1.381	1.846	2.039
7016	SSF-1917	GWI	BASE	0.653	0.653	0.653	0.653
7017	SSF-1919	COM	DU_WWTP	0.497	0.822	1.099	1.215
7017	SSF-1919	GWI	BASE	0.293	0.293	0.293	0.293
7020	SSF-0443	GWI	BASE	6.357	6.357	6.357	6.357
7020	SSF-0443	GWI	BASE	6.357	6.357	6.357	6.357
7020	SSF-0443	GWI	BASE	6.357	6.357	6.357	6.357
7020	SSF-0443	IND	DU_WWTP	4.153	6.869	9.184	10.148
7020	SSF-0443	SFR	DU_WWTP	20.229	21.070	21.798	22.171
7022	SSF-0449	COM	DU_WWTP	0.031	0.051	0.069	0.076

Junction ID	GIS-ID	ALLOC_CODE	Pattern ID	Existing DWF Value (gpm)	2025 DWF Value (gpm)	2035 DWF Value (gpm)	Buildout DWF Value (gpm)
7022	SSF-0449	GWI	BASE	0.361	0.361	0.361	0.361
7023	SSF-0448	COM	DU_WWTP	1.256	2.077	2.777	3.069
7023	SSF-0448	GWI	BASE	0.361	0.361	0.361	0.361
7027	SSF-0445	COM	DU_WWTP	0.098	0.161	0.216	0.238
7027	SSF-0445	GWI	BASE	0.361	0.361	0.361	0.361
7039	NoMatch	GWI	BASE	2.621	2.621	2.621	2.621
7039	NoMatch	IND	DU_WWTP	3.351	5.543	7.410	8.188
7040	SSF-0389	COM	DU_WWTP	4.055	6.708	8.967	9.909
7040	SSF-0389	GWI	BASE	6.134	6.134	6.134	6.134
7040	SSF-0389	GWI	BASE	6.134	6.134	6.134	6.134
7040	SSF-0389	IND	DU_WWTP	18.742	31.004	41.449	45.800
7042	SSF-0302	GWI	BASE	5.100	5.100	5.100	5.100
7042	SSF-0302	GWI	BASE	5.100	5.100	5.100	5.100
7042	SSF-0302	GWI	BASE	5.100	5.100	5.100	5.100
7042	SSF-0302	IND	DU_WWTP	0.344	0.569	0.761	0.841
7042	SSF-0302	SFR	DU_WWTP	19.217	20.016	20.707	21.061
7043	SSF-0301	GWI	BASE	0.909	0.909	0.909	0.909
7043	SSF-0301	IND	DU_WWTP	1.163	1.923	2.571	2.841
7044	SSF-0300	GWI	BASE	3.610	3.610	3.610	3.610
7044	SSF-0300	GWI	BASE	3.610	3.610	3.610	3.610
7044	SSF-0300	GWI	BASE	3.610	3.610	3.610	3.610
7044	SSF-0300	MFR	DU_WWTP	11.254	11.722	12.127	12.334
7044	SSF-0300	SFR	DU_WWTP	1.432	1.491	1.543	1.569
7051	SSF-1827	GWI	BASE	0.798	0.798	0.798	0.798
7051	SSF-1827	GWI	BASE	0.798	0.798	0.798	0.798
7051	SSF-1827	GWI	BASE	0.798	0.798	0.798	0.798
7051	SSF-1827	IND	DU_WWTP	15.207	16.521	17.980	18.291
7051	SSF-1827	MFR	DU_WWTP	2.042	2.127	2.201	2.238
7052	SSF-2017	GWI	BASE	1.074	1.074	1.074	1.074
7052	SSF-2017	INF	BASE	0.135	0.135	0.135	0.135
7052	SSF-2017	SFR	22276	2.398	2.498	2.584	2.628
7053	SSF-0336	GWI	BASE	2.511	2.511	2.511	2.511
7053	SSF-0336	INF	BASE	0.315	0.315	0.315	0.315
7053	SSF-0336	SFR	22276	2.805	2.922	3.022	3.074
7054	SSF-0395	GWI	BASE	0.562	0.562	0.562	0.562
7054	SSF-0395	IND	22276	1.088	1.800	2.406	2.659
7054	SSF-0395	INF	BASE	0.084	0.084	0.084	0.084
7055	SSF-0394	GWI	BASE	2.679	2.679	2.679	2.679
7055	SSF-0394	IND	22276	6.226	10.298	13.768	15.213
7055	SSF-0394	INF	BASE	0.400	0.400	0.400	0.400
7060	SSF-1859	GWI	BASE	4.099	4.099	4.099	4.099
7060	SSF-1859	IND	DU_WWTP	5.240	8.669	11.589	12.806
7061	SSF-1858	GWI	BASE	0.490	0.490	0.490	0.490
7061	SSF-1858	IND	DU_WWTP	0.734	1.214	1.624	1.794
7068	SSF-2401	GWI	BASE	4.306	4.306	4.306	4.306
7068	SSF-2401	IND	DU_WWTP	7.301	7.932	8.633	8.782
7070	SSF-2308	GWI	BASE	7.064	7.064	7.064	7.064
7070	SSF-2308	IND	DU_WWTP	9.030	14.938	19.970	22.067
7075	SSF-1798	GWI	BASE	8.185	8.185	8.185	8.185
7075	SSF-1798	IND	DU_WWTP	8.093	13.388	17.899	19.778
7078	SSF-1777	GWI	BASE	2.550	2.550	2.550	2.550
7078	SSF-1777	IND	DU_WWTP	3.260	5.393	7.210	7.967
7079	SSF-1794	GWI	BASE	8.185	8.185	8.185	8.185
7079	SSF-1794	IND	DU_WWTP	12.834	21.231	28.383	31.362
7080	SSF-1875	GWI	BASE	2.517	2.517	2.517	2.517
7080	SSF-1875	IND	DU_WWTP	3.218	5.323	7.117	7.864
7081	SSF-1752	GWI	BASE	0.524	0.524	0.524	0.524
7081	SSF-1752	IND	DU_WWTP	0.336	0.556	0.744	0.822
7082	SSF-1750	GWI	BASE	3.924	3.924	3.924	3.924
7082	SSF-1750	IND	DU_WWTP	5.016	8.298	11.093	12.258
7084	SSF-1756	GWI	BASE	0.524	0.524	0.524	0.524

Junction ID	GIS-ID	ALLOC_CODE	Pattern ID	Existing DWF Value (gpm)	2025 DWF Value (gpm)	2035 DWF Value (gpm)	Buildout DWF Value (gpm)
7084	SSF-1756	IND	DU_WWTP	1.002	1.658	2.217	2.450
7085	SSF-1757	GWI	BASE	10.999	10.999	10.999	10.999
7085	SSF-1757	IND	DU_WWTP	14.061	15.276	16.626	16.912
7086	SSF-1751	GWI	BASE	0.694	0.694	0.694	0.694
7086	SSF-1751	IND	DU_WWTP	0.887	1.467	1.961	2.167
7089	SSF-1734	GWI	BASE	1.171	1.171	1.171	1.171
7089	SSF-1734	IND	DU_WWTP	1.705	2.821	3.772	4.168
7097	SSF-1024	GWI	BASE	1.463	1.463	1.463	1.463
7097	SSF-1024	INF	BASE	0.183	0.183	0.183	0.183
7097	SSF-1024	SFR	22276	2.833	2.951	3.053	3.105
7098	SSF-0318	GWI	BASE	0.977	0.977	0.977	0.977
7098	SSF-0318	IND	22276	1.125	1.862	2.489	2.750
7098	SSF-0318	INF	BASE	0.129	0.129	0.129	0.129
7100	SSF-0317	GWI	BASE	0.755	0.755	0.755	0.755
7100	SSF-0317	GWI	BASE	0.755	0.755	0.755	0.755
7100	SSF-0317	IND	22276	2.702	4.469	5.975	6.602
7100	SSF-0317	INF	BASE	0.111	0.111	0.111	0.111
7100	SSF-0317	INF	BASE	0.111	0.111	0.111	0.111
7100	SSF-0317	SFR	22276	0.223	0.232	0.240	0.244
7101	SSF-0316	GWI	BASE	0.416	0.416	0.416	0.416
7101	SSF-0316	GWI	BASE	0.416	0.416	0.416	0.416
7101	SSF-0316	IND	22276	0.798	1.321	1.766	1.951
7101	SSF-0316	INF	BASE	0.057	0.057	0.057	0.057
7101	SSF-0316	INF	BASE	0.057	0.057	0.057	0.057
7101	SSF-0316	SFR	22276	0.812	0.845	0.875	0.890
7102	SSF-1153	GWI	BASE	1.295	1.295	1.295	1.295
7102	SSF-1153	IND	22276	0.656	1.085	1.451	1.603
7102	SSF-1153	INF	BASE	0.157	0.157	0.157	0.157
7103	SSF-0315	GWI	BASE	0.470	0.470	0.470	0.470
7103	SSF-0315	GWI	BASE	0.470	0.470	0.470	0.470
7103	SSF-0315	IND	22276	1.493	2.469	3.301	3.648
7103	SSF-0315	INF	BASE	0.068	0.068	0.068	0.068
7103	SSF-0315	INF	BASE	0.068	0.068	0.068	0.068
7103	SSF-0315	SFR	22276	0.328	0.342	0.354	0.360
7105	SSF-0399	GWI	BASE	1.564	1.564	1.564	1.564
7105	SSF-0399	IND	22276	8.201	8.909	9.697	9.864
7105	SSF-0399	INF	BASE	0.203	0.203	0.203	0.203
7106	SSF-2028	GWI	BASE	0.575	0.575	0.575	0.575
7106	SSF-2028	IND	22276	1.113	1.840	2.460	2.719
7106	SSF-2028	INF	BASE	0.086	0.086	0.086	0.086
7107	SSF-2029	GWI	BASE	2.400	2.400	2.400	2.400
7107	SSF-2029	IND	22276	4.648	7.689	10.279	11.358
7107	SSF-2029	INF	BASE	0.358	0.358	0.358	0.358
7108	SSF-2030	GWI	BASE	7.980	7.980	7.980	7.980
7108	SSF-2030	IND	22276	15.453	25.562	34.173	37.761
7108	SSF-2030	INF	BASE	1.192	1.192	1.192	1.192
7110	SSF-2032	GWI	BASE	2.371	2.371	2.371	2.371
7110	SSF-2032	IND	22276	4.591	7.595	10.153	11.219
7110	SSF-2032	INF	BASE	0.354	0.354	0.354	0.354
7112	SSF-2004	GWI	BASE	3.914	3.914	3.914	3.914
7112	SSF-2004	IND	DU_WWTP	4.123	4.479	4.874	4.959
7113	SSF-2127	GWI	BASE	1.388	1.388	1.388	1.388
7113	SSF-2127	IND	DU_WWTP	1.774	2.935	3.924	4.336
7114	SSF-1861	GWI	BASE	2.694	2.694	2.694	2.694
7114	SSF-1861	IND	DU_WWTP	3.444	3.742	4.072	4.143
7115	SSF-1860	GWI	BASE	0.640	0.640	0.640	0.640
7115	SSF-1860	IND	DU_WWTP	0.819	1.354	1.810	2.000
7119	SSF-1613	GWI	BASE	11.966	11.966	11.966	11.966
7119	SSF-1613	IND	DU_WWTP	15.298	25.306	33.831	37.383
7121	SSF-1685	GWI	BASE	0.053	0.053	0.053	0.053
7121	SSF-1685	IND	DU_WWTP	0.068	0.113	0.151	0.167

Junction ID	GIS-ID	ALLOC_CODE	Pattern ID	Existing DWF Value (gpm)	2025 DWF Value (gpm)	2035 DWF Value (gpm)	Buildout DWF Value (gpm)
7122	SSF-1915	GWI	BASE	0.699	0.699	0.699	0.699
7122	SSF-1915	IND	DU_WWTP	0.889	1.471	1.967	2.173
7127	SSF-1703	GWI	BASE	0.699	0.699	0.699	0.699
7127	SSF-1703	IND	DU_WWTP	0.899	1.486	1.987	2.196
7128	SSF-1702	GWI	BASE	2.536	2.536	2.536	2.536
7128	SSF-1702	IND	DU_WWTP	3.242	5.363	7.170	7.923
7130	SSF-1712	GWI	BASE	2.847	2.847	2.847	2.847
7130	SSF-1712	IND	DU_WWTP	3.639	6.020	8.048	8.892
7131	SSF-1209	GWI	BASE	1.480	1.480	1.480	1.480
7131	SSF-1209	SFR	DU_WWTP	1.242	1.294	1.338	1.361
7134	SSF-1206	GWI	BASE	2.970	2.970	2.970	2.970
7134	SSF-1206	IND	DU_WWTP	1.637	2.708	3.620	4.000
7136	SSF-1161	GWI	BASE	0.245	0.245	0.245	0.245
7136	SSF-1161	SFR	DU_WWTP	0.313	0.326	0.338	0.343
7138	SSF-1159	GWI	BASE	1.012	1.012	1.012	1.012
7138	SSF-1159	SFR	DU_WWTP	1.293	1.347	1.394	1.417
7139	SSF-1158	GWI	BASE	0.844	0.844	0.844	0.844
7139	SSF-1158	SFR	DU_WWTP	1.363	1.420	1.469	1.494
7141	SSF-1226	GWI	BASE	1.185	1.185	1.185	1.185
7141	SSF-1226	SFR	DU_WWTP	1.515	1.578	1.632	1.660
7142	SSF-0350	GWI	BASE	1.550	1.550	1.550	1.550
7142	SSF-0350	INF	BASE	0.194	0.194	0.194	0.194
7142	SSF-0350	SFR	22276	3.002	3.127	3.235	3.290
7143	SSF-0349	GWI	BASE	0.127	0.127	0.127	0.127
7143	SSF-0349	INF	BASE	0.016	0.016	0.016	0.016
7143	SSF-0349	SFR	22276	0.246	0.256	0.265	0.270
7145	SSF-0358	GWI	BASE	0.149	0.149	0.149	0.149
7145	SSF-0358	INF	BASE	0.019	0.019	0.019	0.019
7145	SSF-0358	SFR	22276	0.288	0.300	0.310	0.316
7146	SSF-0360	GWI	BASE	0.116	0.116	0.116	0.116
7146	SSF-0360	INF	BASE	0.015	0.015	0.015	0.015
7146	SSF-0360	SFR	22276	0.225	0.235	0.243	0.247
7147	SSF-0357	GWI	BASE	0.410	0.410	0.410	0.410
7147	SSF-0357	INF	BASE	0.051	0.051	0.051	0.051
7147	SSF-0357	SFR	22276	0.795	0.828	0.856	0.871
7148	SSF-0361	GWI	BASE	0.588	0.588	0.588	0.588
7148	SSF-0361	INF	BASE	0.074	0.074	0.074	0.074
7148	SSF-0361	SFR	22276	1.138	1.185	1.226	1.247
7149	SSF-0347	GWI	BASE	0.406	0.406	0.406	0.406
7149	SSF-0347	INF	BASE	0.051	0.051	0.051	0.051
7149	SSF-0347	SFR	22276	0.786	0.819	0.847	0.861
7150	SSF-0353	GWI	BASE	0.433	0.433	0.433	0.433
7150	SSF-0353	INF	BASE	0.054	0.054	0.054	0.054
7150	SSF-0353	SFR	22276	0.838	0.873	0.903	0.919
7151	SSF-0346	GWI	BASE	0.155	0.155	0.155	0.155
7151	SSF-0346	INF	BASE	0.019	0.019	0.019	0.019
7151	SSF-0346	SFR	22276	0.300	0.312	0.323	0.329
7152	SSF-2011	GWI	BASE	0.492	0.492	0.492	0.492
7152	SSF-2011	INF	BASE	0.062	0.062	0.062	0.062
7152	SSF-2011	SFR	22276	0.952	0.992	1.026	1.044
7153	SSF-2012	GWI	BASE	0.301	0.301	0.301	0.301
7153	SSF-2012	INF	BASE	0.038	0.038	0.038	0.038
7153	SSF-2012	SFR	22276	0.583	0.607	0.628	0.638
7155	SSF-0356	GWI	BASE	0.977	0.977	0.977	0.977
7155	SSF-0356	INF	BASE	0.129	0.129	0.129	0.129
7155	SSF-0356	SFR	22276	2.657	2.767	2.863	2.912
7158	SSF-0323	GWI	BASE	0.678	0.678	0.678	0.678
7158	SSF-0323	INF	BASE	0.085	0.085	0.085	0.085
7158	SSF-0323	SFR	22276	1.313	1.368	1.415	1.440
7159	SSF-2015	GWI	BASE	0.183	0.183	0.183	0.183
7159	SSF-2015	INF	BASE	0.023	0.023	0.023	0.023

Junction ID	GIS-ID	ALLOC_CODE	Pattern ID	Existing DWF Value (gpm)	2025 DWF Value (gpm)	2035 DWF Value (gpm)	Buildout DWF Value (gpm)
7159	SSF-2015	SFR	22276	0.354	0.368	0.381	0.388
7160	SSF-0324	GWI	BASE	0.316	0.316	0.316	0.316
7160	SSF-0324	INF	BASE	0.040	0.040	0.040	0.040
7160	SSF-0324	SFR	22276	0.611	0.637	0.659	0.670
7161	SSF-0340	GWI	BASE	1.106	1.106	1.106	1.106
7161	SSF-0340	INF	BASE	0.139	0.139	0.139	0.139
7161	SSF-0340	SFR	22276	1.263	1.315	1.361	1.384
7162	SSF-1776	GWI	BASE	3.695	3.695	3.695	3.695
7162	SSF-1776	IND	DU_WWTP	4.723	7.814	10.446	11.542
7164	SSF-2008	GWI	BASE	1.106	1.106	1.106	1.106
7164	SSF-2008	IND	22276	2.141	3.542	4.736	5.233
7164	SSF-2008	INF	BASE	0.165	0.165	0.165	0.165
7166	SSF-0398	GWI	BASE	0.504	0.504	0.504	0.504
7166	SSF-0398	IND	22276	0.976	1.614	2.158	2.385
7166	SSF-0398	INF	BASE	0.075	0.075	0.075	0.075
7167	SSF-0397	GWI	BASE	0.091	0.091	0.091	0.091
7167	SSF-0397	IND	22276	0.176	0.290	0.388	0.429
7167	SSF-0397	INF	BASE	0.014	0.014	0.014	0.014
7168	SSF-0396	GWI	BASE	3.452	3.452	3.452	3.452
7168	SSF-0396	IND	22276	4.879	8.070	10.789	11.922
7168	SSF-0396	INF	BASE	0.430	0.430	0.430	0.430
7176	SSF-1815	GWI	BASE	2.461	2.461	2.461	2.461
7176	SSF-1815	GWI	BASE	9.302	9.302	9.302	9.302
7176	SSF-1815	GWI	BASE	9.302	9.302	9.302	9.302
7176	SSF-1815	IND	DU_WWTP	3.147	3.419	3.721	3.785
7176	SSF-1815	IND	DU_WWTP	23.782	39.341	52.594	58.115
7178	SSF-1619	GWI	BASE	2.970	2.970	2.970	2.970
7178	SSF-1619	IND	DU_WWTP	14.727	24.361	32.568	35.987
7180	SSF-1205	GWI	BASE	2.970	2.970	2.970	2.970
7180	SSF-1205	IND	DU_WWTP	2.752	4.552	6.086	6.725
7184	SSF-1705	GWI	BASE	6.489	6.489	6.489	6.489
7184	SSF-1705	IND	DU_WWTP	8.296	13.723	18.346	20.273
7187	SSF-0828	GWI	BASE	1.037	1.037	1.037	1.037
7187	SSF-0828	MFR	DU_WWTP	1.325	3.319	7.132	10.455
7189	SSF-0404	GWI	BASE	0.906	0.906	0.906	0.906
7189	SSF-0404	INF	BASE	0.114	0.114	0.114	0.114
7189	SSF-0404	SFR	22276	1.366	1.423	1.472	1.497
7190	SSF-0405	GWI	BASE	0.989	0.989	0.989	0.989
7190	SSF-0405	INF	BASE	0.124	0.124	0.124	0.124
7190	SSF-0405	SFR	22276	1.916	1.995	2.064	2.100
7191	SSF-2018	GWI	BASE	0.350	0.350	0.350	0.350
7191	SSF-2018	INF	BASE	0.044	0.044	0.044	0.044
7191	SSF-2018	SFR	22276	0.677	0.706	0.730	0.742
7192	SSF-0393	GWI	BASE	2.679	2.679	2.679	2.679
7192	SSF-0393	IND	22276	4.148	6.862	9.174	10.137
7192	SSF-0393	INF	BASE	0.400	0.400	0.400	0.400
7193	SSF-0392	GWI	BASE	1.268	1.268	1.268	1.268
7193	SSF-0392	IND	22276	2.455	4.060	5.428	5.998
7193	SSF-0392	INF	BASE	0.189	0.189	0.189	0.189
7196	SSF-0829	GWI	BASE	2.323	2.323	2.323	2.323
7196	SSF-0829	IND	22276	4.498	7.441	9.948	10.992
7196	SSF-0829	INF	BASE	0.347	0.347	0.347	0.347
7202	SSF-0145	COM	11679	0.291	0.481	0.643	0.710
7202	SSF-0145	GWI	BASE	0.284	0.284	0.284	0.284
7202	SSF-0145	GWI	BASE	0.284	0.284	0.284	0.284
7202	SSF-0145	INF	BASE	0.088	0.088	0.088	0.088
7202	SSF-0145	INF	BASE	0.088	0.088	0.088	0.088
7202	SSF-0145	MFR	11679	6.756	7.037	7.280	7.404
7204	SSF-0143	GWI	BASE	0.569	0.569	0.569	0.569
7204	SSF-0143	INF	BASE	0.176	0.176	0.176	0.176
7204	SSF-0143	SFR	11679	1.206	1.256	1.299	1.321

Junction ID	GIS-ID	ALLOC_CODE	Pattern ID	Existing DWF Value (gpm)	2025 DWF Value (gpm)	2035 DWF Value (gpm)	Buildout DWF Value (gpm)
7207	SSF-0137	COM	11679	4.252	7.034	9.403	10.390
7207	SSF-0137	GWI	BASE	0.711	0.711	0.711	0.711
7207	SSF-0137	INF	BASE	0.390	0.390	0.390	0.390
7208	SSF-0136	COM	11679	0.553	0.915	1.223	1.351
7208	SSF-0136	GWI	BASE	0.456	0.456	0.456	0.456
7208	SSF-0136	GWI	BASE	0.456	0.456	0.456	0.456
7208	SSF-0136	INF	BASE	0.123	0.123	0.123	0.123
7208	SSF-0136	INF	BASE	0.123	0.123	0.123	0.123
7208	SSF-0136	MFR	11679	4.902	5.106	5.282	5.373
7213	SSF-0131	GWI	BASE	2.275	2.275	2.275	2.275
7213	SSF-0131	MFR	11719	2.778	2.893	2.993	3.044
7215	SSF-1040	COM	11719	3.141	5.196	6.947	7.676
7215	SSF-1040	GWI	BASE	2.275	2.275	2.275	2.275
7221	SSF-0524	GWI	BASE	1.472	1.472	1.472	1.472
7221	SSF-0524	SFR	11719	2.477	2.580	2.670	2.715
7222	SSF-0525	GWI	BASE	1.688	1.688	1.688	1.688
7222	SSF-0525	SFR	11719	2.841	2.959	3.061	3.114
7231	SSF-0516	GWI	BASE	4.358	4.358	4.358	4.358
7231	SSF-0516	SFR	11719	7.335	7.640	7.904	8.039
7232	SSF-0517	GWI	BASE	2.012	2.012	2.012	2.012
7232	SSF-0517	SFR	11719	1.698	1.769	1.830	1.861
7419	SSF-1507	GWI	BASE	1.441	1.441	1.441	1.441
7419	SSF-1507	IND	DU_WWTP	1.842	3.048	4.074	4.502
7443	NoMatch	GWI	BASE	1.923	1.923	1.923	1.923
7443	NoMatch	SFR	DU_WWTP	8.776	9.141	9.456	9.618
7446	SSF-1638	GWI	BASE	1.159	1.159	1.159	1.159
7446	SSF-1638	SFR	DU_WWTP	1.482	1.543	1.597	1.624
7450	SSF-1575	GWI	BASE	0.376	0.376	0.376	0.376
7450	SSF-1575	SFR	DU_WWTP	0.481	0.501	0.518	0.527
7452	SSF-1581	GWI	BASE	0.360	0.360	0.360	0.360
7452	SSF-1581	SFR	DU_WWTP	0.756	0.788	0.815	0.829
7454	SSF-1582	GWI	BASE	0.431	0.431	0.431	0.431
7454	SSF-1582	SFR	DU_WWTP	0.550	0.573	0.593	0.603
7456	SSF-1583	GWI	BASE	0.523	0.523	0.523	0.523
7456	SSF-1583	SFR	DU_WWTP	0.669	0.696	0.720	0.733
7462	SSF-1586	GWI	BASE	2.970	2.970	2.970	2.970
7462	SSF-1586	IND	DU_WWTP	0.589	0.975	1.303	1.440
7464	SSF-1587	GWI	BASE	2.970	2.970	2.970	2.970
7464	SSF-1587	IND	DU_WWTP	0.378	0.625	0.835	0.923
7632	SSF-1470	COM	DU_WWTP	0.083	0.137	0.184	0.203
7632	SSF-1470	GWI	BASE	0.065	0.065	0.065	0.065
7638	SSF-1472	COM	DU_WWTP	0.190	0.315	0.421	0.465
7638	SSF-1472	GWI	BASE	0.149	0.149	0.149	0.149
7640	SSF-0453	COM	DU_WWTP	0.670	1.109	1.482	1.638
7640	SSF-0453	GWI	BASE	0.524	0.524	0.524	0.524
7739	SSF-1768	GWI	BASE	15.757	15.757	15.757	15.757
7739	SSF-1768	MFR	DU_WWTP	10.065	10.484	10.846	11.031
7747	SSF-1764	GWI	BASE	8.373	8.373	8.373	8.373
7747	SSF-1764	IND	DU_WWTP	10.704	17.706	23.671	26.156
7749	SSF-1674	GWI	BASE	2.206	2.206	2.206	2.206
7749	SSF-1674	SFR	DU_WWTP	2.820	2.937	3.039	3.091
7751	SSF-0698	GWI	BASE	2.167	2.167	2.167	2.167
7751	SSF-0698	INF	BASE	0.308	0.308	0.308	0.308
7751	SSF-0698	SFR	22276	6.416	6.683	6.914	7.032
7753	SSF-1070	GWI	BASE	0.761	0.761	0.761	0.761
7753	SSF-1070	IND	DU_WWTP	0.973	1.610	2.152	2.378
7800	SSF-1986	GWI	BASE	2.148	2.148	2.148	2.148
7800	SSF-1986	SFR	DU_WWTP	2.009	2.092	2.165	2.202
7808	SSF-0911	COM	22276	9.100	15.054	20.125	22.238
7808	SSF-0911	GWI	BASE	7.055	7.055	7.055	7.055
7808	SSF-0911	GWI	BASE	7.055	7.055	7.055	7.055

Junction ID	GIS-ID	ALLOC_CODE	Pattern ID	Existing DWF Value (gpm)	2025 DWF Value (gpm)	2035 DWF Value (gpm)	Buildout DWF Value (gpm)
7808	SSF-0911	INF	BASE	0.689	0.689	0.689	0.689
7808	SSF-0911	INF	BASE	0.689	0.689	0.689	0.689
7808	SSF-0911	MFR	22276	18.224	18.982	19.637	19.973
7812	SSF-0548	GWI	BASE	1.305	1.305	1.305	1.305
7812	SSF-0548	INF	BASE	0.161	0.161	0.161	0.161
7812	SSF-0548	MFR	22276	0.847	0.882	0.913	0.928
7814	SSF-1256	GWI	BASE	1.310	1.310	1.310	1.310
7814	SSF-1256	INF	BASE	0.164	0.164	0.164	0.164
7814	SSF-1256	SFR	22276	9.300	9.687	10.021	10.193
7822	SSF-1177	GWI	BASE	0.964	0.964	0.964	0.964
7822	SSF-1177	INF	BASE	0.124	0.124	0.124	0.124
7826	SSF-1074	GWI	BASE	2.523	2.523	2.523	2.523
7826	SSF-1074	INF	BASE	0.231	0.231	0.231	0.231
7826	SSF-1074	MFR	22276	20.200	21.040	21.766	22.139
7897	SSF-1850	GWI	BASE	3.943	3.943	3.943	3.943
7897	SSF-1850	IND	DU_WWTP	15.406	25.485	34.070	37.646
7905	SSF-1848	GWI	BASE	1.282	1.282	1.282	1.282
7905	SSF-1848	IND	DU_WWTP	1.638	2.710	3.623	4.004
7909	SSF-1844	GWI	BASE	5.630	5.630	5.630	5.630
7909	SSF-1844	IND	DU_WWTP	7.197	7.819	8.510	8.656
7910	SSF-1843	GWI	BASE	1.526	1.526	1.526	1.526
7910	SSF-1843	IND	DU_WWTP	1.950	3.226	4.313	4.766
7969	SSF-1762	GWI	BASE	6.899	6.899	6.899	6.899
7969	SSF-1762	IND	DU_WWTP	8.820	14.590	19.505	21.553
8272	SSF-2621	GWI	BASE	2.523	2.523	2.523	2.523
8272	SSF-2621	IND	DU_WWTP	3.225	3.504	3.814	3.879
8285	SSF-1911	GWI	BASE	0.938	0.938	0.938	0.938
8285	SSF-1911	IND	DU_WWTP	1.199	1.302	1.417	1.442
8296	SSF-2110	GWI	BASE	2.675	2.675	2.675	2.675
8296	SSF-2110	IND	DU_WWTP	3.419	5.656	7.562	8.355
8301	SSF-2119	GWI	BASE	0.300	0.300	0.300	0.300
8301	SSF-2119	IND	DU_WWTP	0.383	0.633	0.847	0.936
8306	SSF-2123	GWI	BASE	1.333	1.333	1.333	1.333
8306	SSF-2123	IND	DU_WWTP	1.704	2.819	3.769	4.164
8320	SSF-2107	GWI	BASE	4.403	4.403	4.403	4.403
8320	SSF-2107	IND	DU_WWTP	5.629	9.312	12.449	13.756
8330	SSF-2116	GWI	BASE	0.679	0.679	0.679	0.679
8330	SSF-2116	IND	DU_WWTP	0.868	1.436	1.919	2.121
8338	SSF-1700	GWI	BASE	5.673	5.673	5.673	5.673
8338	SSF-1700	IND	DU_WWTP	7.253	11.998	16.040	17.724
8409	SSF-1732	GWI	BASE	4.234	4.234	4.234	4.234
8409	SSF-1732	IND	DU_WWTP	5.413	5.881	6.401	6.511
8411	SSF-1731	GWI	BASE	0.813	0.813	0.813	0.813
8411	SSF-1731	IND	DU_WWTP	1.040	1.720	2.299	2.540
8497	SSF-1993	GWI	BASE	0.558	0.558	0.558	0.558
8497	SSF-1993	GWI	BASE	0.292	0.292	0.292	0.292
8497	SSF-1993	SFR	DU_WWTP	0.713	0.743	0.769	0.782
8497	SSF-1993	SFR	DU_WWTP	0.373	0.389	0.402	0.409
8498	SSF-1992	GWI	BASE	0.448	0.448	0.448	0.448
8498	SSF-1992	SFR	DU_WWTP	0.573	0.597	0.618	0.628
8501	SSF-1991	GWI	BASE	1.015	1.015	1.015	1.015
8501	SSF-1991	SFR	DU_WWTP	1.297	1.351	1.398	1.422
8503	SSF-1990	GWI	BASE	0.186	0.186	0.186	0.186
8503	SSF-1990	SFR	DU_WWTP	0.238	0.247	0.256	0.260
8504	SSF-1865	GWI	BASE	0.064	0.064	0.064	0.064
8504	SSF-1865	SFR	DU_WWTP	0.081	0.085	0.088	0.089
8506	SSF-1864	GWI	BASE	0.323	0.323	0.323	0.323
8506	SSF-1864	SFR	DU_WWTP	0.413	0.430	0.445	0.453
8509	SSF-1866	GWI	BASE	2.561	2.561	2.561	2.561
8509	SSF-1866	SFR	DU_WWTP	3.709	3.864	3.997	4.065
8513	SSF-1367	GWI	BASE	2.986	2.986	2.986	2.986

Junction ID	GIS-ID	ALLOC_CODE	Pattern ID	Existing DWF Value (gpm)	2025 DWF Value (gpm)	2035 DWF Value (gpm)	Buildout DWF Value (gpm)
8513	SSF-1367	SFR	DU_WWTP	3.817	3.976	4.113	4.183
8515	SSF-1358	GWI	BASE	2.004	2.004	2.004	2.004
8515	SSF-1358	SFR	DU_WWTP	2.562	2.669	2.761	2.808
8518	SSF-1356	GWI	BASE	0.880	0.880	0.880	0.880
8518	SSF-1356	SFR	DU_WWTP	1.646	1.714	1.773	1.804
8519	SSF-0001	GWI	BASE	1.668	1.668	1.668	1.668
8519	SSF-0001	SFR	DU_WWTP	0.860	0.896	0.927	0.943
8522	SSF-1366	GWI	BASE	0.080	0.080	0.080	0.080
8522	SSF-1366	SFR	DU_WWTP	0.103	0.107	0.111	0.113
8524	SSF-1365	GWI	BASE	1.876	1.876	1.876	1.876
8524	SSF-1365	SFR	DU_WWTP	2.635	2.744	2.839	2.888
8529	SSF-1187	GWI	BASE	0.410	0.410	0.410	0.410
8529	SSF-1187	INF	BASE	0.051	0.051	0.051	0.051
8529	SSF-1187	SFR	22276	0.794	0.827	0.856	0.871
8531	SSF-1127	GWI	BASE	0.782	0.782	0.782	0.782
8531	SSF-1127	INF	BASE	0.098	0.098	0.098	0.098
8531	SSF-1127	SFR	22276	1.514	1.577	1.631	1.659
8534	SSF-1067	GWI	BASE	1.814	1.814	1.814	1.814
8534	SSF-1067	INF	BASE	0.228	0.228	0.228	0.228
8534	SSF-1067	SFR	22276	3.513	3.659	3.786	3.851
8536	SSF-1185	GWI	BASE	0.319	0.319	0.319	0.319
8536	SSF-1185	INF	BASE	0.040	0.040	0.040	0.040
8536	SSF-1185	SFR	22276	0.618	0.643	0.666	0.677
8538	SSF-1048	GWI	BASE	1.625	1.625	1.625	1.625
8538	SSF-1048	INF	BASE	0.204	0.204	0.204	0.204
8538	SSF-1048	SFR	22276	3.503	3.649	3.775	3.839
8546	SSF-1100	GWI	BASE	1.302	1.302	1.302	1.302
8546	SSF-1100	INF	BASE	0.163	0.163	0.163	0.163
8546	SSF-1100	SFR	22276	2.521	2.626	2.717	2.763
8548	SSF-1042	GWI	BASE	3.024	3.024	3.024	3.024
8548	SSF-1042	INF	BASE	0.379	0.379	0.379	0.379
8548	SSF-1042	SFR	22276	5.855	6.099	6.309	6.417
8550	SSF-1063	GWI	BASE	3.377	3.377	3.377	3.377
8550	SSF-1063	INF	BASE	0.424	0.424	0.424	0.424
8550	SSF-1063	SFR	22276	3.920	4.083	4.224	4.296
8553	SSF-1125	GWI	BASE	1.972	1.972	1.972	1.972
8553	SSF-1125	INF	BASE	0.247	0.247	0.247	0.247
8553	SSF-1125	SFR	22276	3.329	3.467	3.587	3.648
8606	SSF-1096	GWI	BASE	0.370	0.370	0.370	0.370
8606	SSF-1096	INF	BASE	0.046	0.046	0.046	0.046
8606	SSF-1096	SFR	22276	0.073	0.076	0.078	0.080
8609	SSF-1094	GWI	BASE	0.370	0.370	0.370	0.370
8609	SSF-1094	INF	BASE	0.046	0.046	0.046	0.046
8609	SSF-1094	SFR	22276	2.013	2.097	2.169	2.206
8612	SSF-1097	GWI	BASE	0.370	0.370	0.370	0.370
8612	SSF-1097	INF	BASE	0.046	0.046	0.046	0.046
8612	SSF-1097	SFR	22276	0.066	0.069	0.071	0.073
8778	SSF-2437	GWI	BASE	2.581	2.581	2.581	2.581
8778	SSF-2437	IND	DU_WWTP	3.300	5.459	7.298	8.064
8796	SSF-2456	GWI	BASE	3.290	3.290	3.290	3.290
8796	SSF-2456	SFR	DU_WWTP	0.050	0.124	0.268	0.392
8800	SSF-2458	GWI	BASE	0.942	0.942	0.942	0.942
8800	SSF-2458	SFR	DU_WWTP	0.631	1.581	3.397	4.980
8806	SSF-2445	GWI	BASE	1.846	1.846	1.846	1.846
8806	SSF-2445	IND	DU_WWTP	0.000	6.243	6.795	6.912
8806	SSF-2445	MFR	DU_WWTP	3.058	7.658	16.456	24.124
8808	SSF-2446	GWI	BASE	0.096	0.096	0.096	0.096
8808	SSF-2446	MFR	DU_WWTP	0.122	0.306	0.658	0.965
8815	SSF-2442	GWI	BASE	7.886	7.886	7.886	7.886
8815	SSF-2442	MFR	DU_WWTP	10.081	25.246	54.252	79.530
8822	SSF-1842	GWI	BASE	10.058	10.058	10.058	10.058

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8822	SSF-1842	IND	DU_WWTP	12.858	21.270	28.435	31.420
8832	SSF-2433	GWI	BASE	0.490	0.490	0.490	0.490
8832	SSF-2433	IND	DU_WWTP	0.518	0.857	1.146	1.266
8838	SSF-2428	GWI	BASE	1.171	1.171	1.171	1.171
8838	SSF-2428	IND	DU_WWTP	1.288	2.131	2.849	3.148
12559	SSF-0826	GWI	BASE	3.290	3.290	3.290	3.290
12559	SSF-0826	MFR	DU_WWTP	15.709	39.338	84.536	123.924
12561	SSF-0824	COM	DU_WWTP	3.161	5.229	6.990	7.724
12561	SSF-0824	GWI	BASE	3.692	3.692	3.692	3.692
16723	SSF-2050	GWI	BASE	2.087	2.087	2.087	2.087
16723	SSF-2050	SFR	11719	4.866	5.069	5.244	5.333
16868	SSF-0502	GWI	BASE	8.321	8.321	8.321	8.321
16868	SSF-0502	MFR	11719	59.223	61.685	63.815	64.907
16959	SSF-0033	GWI	BASE	2.087	2.087	2.087	2.087
16959	SSF-0033	SFR	11719	2.903	3.023	3.128	3.181
16963	SSF-0164	GWI	BASE	2.087	2.087	2.087	2.087
16963	SSF-0164	SFR	11719	3.213	3.346	3.462	3.521
16964	SSF-0035	GWI	BASE	2.087	2.087	2.087	2.087
16964	SSF-0035	SFR	11719	2.541	2.646	2.738	2.785
16966	SSF-0163	GWI	BASE	2.087	2.087	2.087	2.087
16966	SSF-0163	SFR	11719	4.548	4.737	4.900	4.984
17238	SSF-1280	GWI	BASE	8.321	8.321	8.321	8.321
17238	SSF-1280	SFR	11719	1.564	1.629	1.685	1.714
17251	SSF-1277	GWI	BASE	8.321	8.321	8.321	8.321
17251	SSF-1277	SFR	11719	4.985	5.192	5.372	5.463
17962	SSF-1281	GWI	BASE	8.321	8.321	8.321	8.321
17962	SSF-1281	SFR	11719	1.056	1.099	1.137	1.157
18014	SSF-0497	GWI	BASE	5.310	5.310	5.310	5.310
18014	SSF-0497	SFR	11719	19.261	20.061	20.754	21.109
96389	SSF-0386	GWI	BASE	6.134	6.134	6.134	6.134
96389	SSF-0386	GWI	BASE	6.134	6.134	6.134	6.134
96389	SSF-0386	MFR	DU_WWTP	8.567	8.923	9.231	9.389
96393	SSF-0401	GWI	BASE	0.906	0.906	0.906	0.906
96393	SSF-0401	INF	BASE	0.114	0.114	0.114	0.114
96393	SSF-0401	SFR	22276	1.557	1.622	1.678	1.707
96395	SSF-0406	GWI	BASE	0.906	0.906	0.906	0.906
96395	SSF-0406	INF	BASE	0.114	0.114	0.114	0.114
96395	SSF-0406	SFR	22276	1.344	1.399	1.448	1.472
96396	SSF-0407	GWI	BASE	0.906	0.906	0.906	0.906
96396	SSF-0407	INF	BASE	0.114	0.114	0.114	0.114
96396	SSF-0407	SFR	22276	2.243	2.336	2.417	2.458
96399	SSF-0411	GWI	BASE	3.452	3.452	3.452	3.452
96399	SSF-0411	INF	BASE	0.430	0.430	0.430	0.430
96399	SSF-0411	SFR	22276	12.844	13.378	13.840	14.077
96404	SSF-0416	GWI	BASE	1.295	1.295	1.295	1.295
96404	SSF-0416	INF	BASE	0.157	0.157	0.157	0.157
96404	SSF-0416	SFR	22276	1.111	1.157	1.197	1.217
96405	SSF-0417	GWI	BASE	1.295	1.295	1.295	1.295
96405	SSF-0417	INF	BASE	0.157	0.157	0.157	0.157
96405	SSF-0417	SFR	22276	0.889	0.926	0.957	0.974
96406	SSF-0418	GWI	BASE	1.295	1.295	1.295	1.295
96406	SSF-0418	INF	BASE	0.157	0.157	0.157	0.157
96406	SSF-0418	SFR	22276	1.402	1.461	1.511	1.537
96407	SSF-0419	GWI	BASE	1.295	1.295	1.295	1.295
96407	SSF-0419	INF	BASE	0.157	0.157	0.157	0.157
96407	SSF-0419	SFR	22276	2.819	2.936	3.037	3.089
96408	SSF-0420	GWI	BASE	1.295	1.295	1.295	1.295
96408	SSF-0420	INF	BASE	0.157	0.157	0.157	0.157
96408	SSF-0420	SFR	22276	12.778	13.309	13.769	14.005
96415	SSF-0427	GWI	BASE	1.295	1.295	1.295	1.295
96415	SSF-0427	INF	BASE	0.157	0.157	0.157	0.157

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96415	SSF-0427	SFR	22276	0.634	0.660	0.683	0.695
96419	SSF-0431	GWI	BASE	1.295	1.295	1.295	1.295
96419	SSF-0431	INF	BASE	0.157	0.157	0.157	0.157
96419	SSF-0431	SFR	22276	4.300	4.478	4.633	4.712
96434	SSF-0467	GWI	BASE	1.390	1.390	1.390	1.390
96434	SSF-0467	INF	BASE	0.174	0.174	0.174	0.174
96434	SSF-0467	SFR	22276	2.379	2.478	2.564	2.608
96441	SSF-0120	GWI	BASE	1.668	1.668	1.668	1.668
96441	SSF-0120	SFR	DU_WWTP	3.318	3.456	3.576	3.637
96449	SSF-0129	COM	DU_WWTP	3.226	5.337	7.134	7.883
96449	SSF-0129	GWI	BASE	3.692	3.692	3.692	3.692
96450	SSF-0130	GWI	BASE	1.846	1.846	1.846	1.846
96468	SSF-0287	GWI	BASE	1.296	1.296	1.296	1.296
96468	SSF-0287	INF	BASE	0.162	0.162	0.162	0.162
96468	SSF-0287	SFR	22276	2.425	2.526	2.613	2.658
96475	SSF-0298	COM	DU_WWTP	2.353	2.556	2.782	2.830
96475	SSF-0298	GWI	BASE	10.830	10.830	10.830	10.830
96476	SSF-0299	GWI	BASE	10.830	10.830	10.830	10.830
96476	SSF-0299	IND	DU_WWTP	36.600	60.545	80.941	89.439
96484	SSF-0328	GWI	BASE	2.511	2.511	2.511	2.511
96484	SSF-0328	INF	BASE	0.315	0.315	0.315	0.315
96484	SSF-0328	SFR	22276	6.921	7.209	7.458	7.586
96490	SSF-0337	GWI	BASE	1.106	1.106	1.106	1.106
96490	SSF-0337	INF	BASE	0.139	0.139	0.139	0.139
96490	SSF-0337	SFR	22276	2.006	2.089	2.161	2.198
96497	SSF-0364	GWI	BASE	1.295	1.295	1.295	1.295
96497	SSF-0364	INF	BASE	0.157	0.157	0.157	0.157
96497	SSF-0364	SFR	22276	3.008	3.133	3.242	3.297
96500	SSF-0368	GWI	BASE	1.295	1.295	1.295	1.295
96500	SSF-0368	INF	BASE	0.157	0.157	0.157	0.157
96500	SSF-0368	SFR	22276	1.416	1.475	1.526	1.552
96503	SSF-0372	GWI	BASE	1.296	1.296	1.296	1.296
96503	SSF-0372	INF	BASE	0.162	0.162	0.162	0.162
96503	SSF-0372	SFR	22276	5.552	5.783	5.983	6.085
96507	SSF-0193	COM	DU_WWTP	0.667	1.104	1.476	1.631
96507	SSF-0193	GWI	BASE	0.942	0.942	0.942	0.942
96512	SSF-0198	COM	DU_WWTP	0.878	1.452	1.941	2.144
96512	SSF-0198	GWI	BASE	0.942	0.942	0.942	0.942
96516	SSF-0200	COM	DU_WWTP	0.252	0.417	0.558	0.616
96516	SSF-0200	GWI	BASE	0.293	0.293	0.293	0.293
96519	SSF-0205	COM	DU_WWTP	0.472	0.781	1.044	1.154
96519	SSF-0205	GWI	BASE	0.369	0.369	0.369	0.369
96521	SSF-0211	GWI	BASE	1.295	1.295	1.295	1.295
96521	SSF-0211	INF	BASE	0.157	0.157	0.157	0.157
96521	SSF-0211	MFR	22276	7.723	8.044	8.322	8.464
96523	SSF-0212	GWI	BASE	1.295	1.295	1.295	1.295
96523	SSF-0212	INF	BASE	0.157	0.157	0.157	0.157
96523	SSF-0212	SFR	22276	2.286	2.381	2.464	2.506
96525	SSF-0214	GWI	BASE	1.295	1.295	1.295	1.295
96525	SSF-0214	INF	BASE	0.157	0.157	0.157	0.157
96525	SSF-0214	SFR	22276	6.540	6.811	7.047	7.167
96527	SSF-0216	GWI	BASE	1.295	1.295	1.295	1.295
96527	SSF-0216	INF	BASE	0.157	0.157	0.157	0.157
96527	SSF-0216	SFR	22276	2.013	2.097	2.169	2.206
96528	SSF-0217	GWI	BASE	1.295	1.295	1.295	1.295
96528	SSF-0217	INF	BASE	0.157	0.157	0.157	0.157
96528	SSF-0217	SFR	22276	2.953	3.075	3.182	3.236
96529	SSF-0218	GWI	BASE	1.295	1.295	1.295	1.295
96529	SSF-0218	INF	BASE	0.157	0.157	0.157	0.157
96529	SSF-0218	SFR	22276	2.166	2.256	2.334	2.374
96530	SSF-0219	GWI	BASE	1.295	1.295	1.295	1.295

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96530	SSF-0219	INF	BASE	0.157	0.157	0.157	0.157
96530	SSF-0219	SFR	22276	3.096	3.225	3.336	3.393
96532	SSF-0221	GWI	BASE	1.295	1.295	1.295	1.295
96532	SSF-0221	INF	BASE	0.157	0.157	0.157	0.157
96532	SSF-0221	SFR	22276	3.652	3.803	3.935	4.002
96539	SSF-0232	GWI	BASE	1.295	1.295	1.295	1.295
96539	SSF-0232	INF	BASE	0.157	0.157	0.157	0.157
96539	SSF-0232	SFR	22276	2.092	2.179	2.254	2.293
96541	SSF-0234	GWI	BASE	1.295	1.295	1.295	1.295
96541	SSF-0234	INF	BASE	0.157	0.157	0.157	0.157
96541	SSF-0234	SFR	22276	1.712	1.784	1.845	1.877
96542	SSF-0235	GWI	BASE	1.295	1.295	1.295	1.295
96542	SSF-0235	INF	BASE	0.157	0.157	0.157	0.157
96542	SSF-0235	SFR	22276	0.662	0.689	0.713	0.725
96543	SSF-0236	GWI	BASE	1.295	1.295	1.295	1.295
96543	SSF-0236	INF	BASE	0.157	0.157	0.157	0.157
96543	SSF-0236	SFR	22276	1.250	1.302	1.346	1.370
96544	SSF-0238	GWI	BASE	1.295	1.295	1.295	1.295
96544	SSF-0238	INF	BASE	0.157	0.157	0.157	0.157
96544	SSF-0238	SFR	22276	1.828	1.904	1.970	2.004
96549	SSF-0244	GWI	BASE	1.296	1.296	1.296	1.296
96549	SSF-0244	INF	BASE	0.162	0.162	0.162	0.162
96549	SSF-0244	SFR	22276	1.017	1.059	1.096	1.115
96551	SSF-0246	GWI	BASE	1.296	1.296	1.296	1.296
96551	SSF-0246	INF	BASE	0.162	0.162	0.162	0.162
96551	SSF-0246	SFR	22276	4.459	4.645	4.805	4.887
96560	SSF-0255	GWI	BASE	1.296	1.296	1.296	1.296
96560	SSF-0255	INF	BASE	0.162	0.162	0.162	0.162
96560	SSF-0255	SFR	22276	3.725	3.880	4.014	4.083
96562	SSF-0257	GWI	BASE	1.296	1.296	1.296	1.296
96562	SSF-0257	INF	BASE	0.162	0.162	0.162	0.162
96562	SSF-0257	SFR	22276	0.593	0.617	0.639	0.650
96565	SSF-0260	GWI	BASE	1.296	1.296	1.296	1.296
96565	SSF-0260	INF	BASE	0.162	0.162	0.162	0.162
96565	SSF-0260	SFR	22276	1.854	1.931	1.998	2.032
96571	SSF-0268	GWI	BASE	1.295	1.295	1.295	1.295
96571	SSF-0268	INF	BASE	0.157	0.157	0.157	0.157
96571	SSF-0268	SFR	22276	1.222	1.273	1.317	1.339
96573	SSF-0270	GWI	BASE	1.295	1.295	1.295	1.295
96573	SSF-0270	INF	BASE	0.157	0.157	0.157	0.157
96573	SSF-0270	SFR	22276	0.935	0.974	1.007	1.025
96575	SSF-0274	GWI	BASE	1.296	1.296	1.296	1.296
96575	SSF-0274	INF	BASE	0.162	0.162	0.162	0.162
96575	SSF-0274	SFR	22276	2.469	2.572	2.660	2.706
96587	SSF-0237	GWI	BASE	1.295	1.295	1.295	1.295
96587	SSF-0237	INF	BASE	0.157	0.157	0.157	0.157
96587	SSF-0237	SFR	22276	1.402	1.461	1.511	1.537
96591	SSF-0089	GWI	BASE	0.880	0.880	0.880	0.880
96591	SSF-0089	SFR	DU_WWTP	0.888	0.925	0.956	0.973
96593	SSF-0091	GWI	BASE	1.876	1.876	1.876	1.876
96593	SSF-0091	SFR	DU_WWTP	2.161	2.251	2.329	2.369
96600	SSF-0098	GWI	BASE	1.564	1.564	1.564	1.564
96600	SSF-0098	INF	BASE	0.203	0.203	0.203	0.203
96600	SSF-0098	SFR	22276	4.535	4.724	4.887	4.970
96604	SSF-0102	GWI	BASE	3.290	3.290	3.290	3.290
96604	SSF-0102	MFR	DU_WWTP	6.205	15.539	33.393	48.951
96606	SSF-0104	GWI	BASE	3.290	3.290	3.290	3.290
96606	SSF-0104	MFR	DU_WWTP	4.814	12.054	25.904	37.974
96611	SSF-0109	GWI	BASE	3.527	3.527	3.527	3.527
96611	SSF-0109	INF	BASE	0.442	0.442	0.442	0.442
96611	SSF-0109	SFR	22276	10.953	11.408	11.802	12.004

Junction ID	GIS-ID	ALLOC_CODE	Pattern ID	Existing DWF Value (gpm)	2025 DWF Value (gpm)	2035 DWF Value (gpm)	Buildout DWF Value (gpm)
96612	SSF-0110	GWI	BASE	1.480	1.480	1.480	1.480
96612	SSF-0110	SFR	DU_WWTP	0.740	0.771	0.797	0.811
96623	SSF-0685	GWI	BASE	3.527	3.527	3.527	3.527
96623	SSF-0685	INF	BASE	0.442	0.442	0.442	0.442
96623	SSF-0685	SFR	22276	4.360	4.541	4.698	4.779
96656	SSF-0727	GWI	BASE	1.074	1.074	1.074	1.074
96656	SSF-0727	INF	BASE	0.135	0.135	0.135	0.135
96656	SSF-0727	SFR	22276	1.763	1.836	1.899	1.932
96663	SSF-0174	COM	DU_WWTP	3.690	6.105	8.161	9.018
96663	SSF-0174	GWI	BASE	3.692	3.692	3.692	3.692
96675	SSF-0189	GWI	BASE	1.295	1.295	1.295	1.295
96675	SSF-0189	INF	BASE	0.157	0.157	0.157	0.157
96675	SSF-0189	SFR	22276	1.472	1.533	1.586	1.613
96681	SSF-0006	GWI	BASE	1.668	1.668	1.668	1.668
96681	SSF-0006	SFR	DU_WWTP	1.720	1.792	1.854	1.886
96682	SSF-0007	GWI	BASE	1.668	1.668	1.668	1.668
96682	SSF-0007	SFR	DU_WWTP	0.599	0.624	0.645	0.656
96690	SSF-0015	GWI	BASE	1.668	1.668	1.668	1.668
96690	SSF-0015	SFR	DU_WWTP	2.108	2.195	2.271	2.310
96694	SSF-0020	GWI	BASE	2.167	2.167	2.167	2.167
96694	SSF-0020	INF	BASE	0.308	0.308	0.308	0.308
96694	SSF-0020	SFR	22276	2.504	2.608	2.699	2.745
96699	SSF-0025	GWI	BASE	2.167	2.167	2.167	2.167
96699	SSF-0025	INF	BASE	0.308	0.308	0.308	0.308
96699	SSF-0025	SFR	22276	4.158	4.331	4.481	4.557
96711	SSF-0043	GWI	BASE	0.964	0.964	0.964	0.964
96711	SSF-0043	INF	BASE	0.124	0.124	0.124	0.124
96711	SSF-0043	SFR	22276	0.907	0.944	0.977	0.994
96712	SSF-0044	GWI	BASE	0.964	0.964	0.964	0.964
96712	SSF-0044	INF	BASE	0.124	0.124	0.124	0.124
96712	SSF-0044	SFR	22276	2.588	2.696	2.789	2.837
96714	SSF-0047	GWI	BASE	0.964	0.964	0.964	0.964
96714	SSF-0047	INF	BASE	0.124	0.124	0.124	0.124
96714	SSF-0047	SFR	22276	2.294	2.389	2.472	2.514
96718	SSF-0052	GWI	BASE	0.964	0.964	0.964	0.964
96718	SSF-0052	INF	BASE	0.124	0.124	0.124	0.124
96718	SSF-0052	SFR	22276	3.262	3.398	3.515	3.576
96724	SSF-0058	GWI	BASE	0.964	0.964	0.964	0.964
96724	SSF-0058	INF	BASE	0.124	0.124	0.124	0.124
96724	SSF-0058	SFR	22276	1.465	1.526	1.578	1.605
96729	SSF-0063	GWI	BASE	0.964	0.964	0.964	0.964
96729	SSF-0063	INF	BASE	0.124	0.124	0.124	0.124
96729	SSF-0063	SFR	22276	2.317	2.413	2.497	2.539
96735	SSF-0072	GWI	BASE	0.964	0.964	0.964	0.964
96735	SSF-0072	INF	BASE	0.124	0.124	0.124	0.124
96735	SSF-0072	SFR	22276	1.232	1.283	1.328	1.350
96736	SSF-0073	GWI	BASE	0.964	0.964	0.964	0.964
96736	SSF-0073	INF	BASE	0.124	0.124	0.124	0.124
96736	SSF-0073	SFR	22276	2.736	2.849	2.948	2.998
96743	SSF-1076	GWI	BASE	2.523	2.523	2.523	2.523
96743	SSF-1076	INF	BASE	0.231	0.231	0.231	0.231
96743	SSF-1076	SFR	22276	3.523	3.669	3.796	3.861
96744	SSF-1078	GWI	BASE	2.523	2.523	2.523	2.523
96744	SSF-1078	INF	BASE	0.231	0.231	0.231	0.231
96744	SSF-1078	SFR	22276	2.548	2.654	2.746	2.793
96748	SSF-1082	GWI	BASE	2.523	2.523	2.523	2.523
96748	SSF-1082	INF	BASE	0.231	0.231	0.231	0.231
96748	SSF-1082	SFR	22276	1.298	1.352	1.398	1.422
96749	SSF-1083	GWI	BASE	2.523	2.523	2.523	2.523
96749	SSF-1083	INF	BASE	0.231	0.231	0.231	0.231
96749	SSF-1083	SFR	22276	2.149	2.238	2.315	2.355

Junction ID	GIS-ID	ALLOC_CODE	Pattern ID	Existing DWF Value (gpm)	2025 DWF Value (gpm)	2035 DWF Value (gpm)	Buildout DWF Value (gpm)
96756	SSF-1090	GWI	BASE	2.523	2.523	2.523	2.523
96756	SSF-1090	INF	BASE	0.231	0.231	0.231	0.231
96756	SSF-1090	SFR	22276	1.402	1.461	1.511	1.537
96764	SSF-1112	GWI	BASE	1.625	1.625	1.625	1.625
96764	SSF-1112	INF	BASE	0.204	0.204	0.204	0.204
96764	SSF-1112	SFR	22276	2.790	2.906	3.007	3.058
96777	SSF-1131	GWI	BASE	1.972	1.972	1.972	1.972
96777	SSF-1131	INF	BASE	0.247	0.247	0.247	0.247
96777	SSF-1131	SFR	22276	4.662	4.856	5.024	5.110
96782	SSF-1138	GWI	BASE	1.972	1.972	1.972	1.972
96782	SSF-1138	INF	BASE	0.247	0.247	0.247	0.247
96782	SSF-1138	SFR	22276	3.466	3.610	3.734	3.798
96799	SSF-1162	GWI	BASE	0.844	0.844	0.844	0.844
96799	SSF-1162	SFR	DU_WWTP	0.796	0.829	0.858	0.872
96817	SSF-1464	GWI	BASE	2.519	2.519	2.519	2.519
96817	SSF-1464	INF	BASE	0.339	0.339	0.339	0.339
96817	SSF-1464	SFR	22276	10.416	10.849	11.224	11.416
96837	SSF-0797	GWI	BASE	1.738	1.738	1.738	1.738
96837	SSF-0797	INF	BASE	0.218	0.218	0.218	0.218
96837	SSF-0797	SFR	22276	4.063	4.232	4.378	4.453
96845	SSF-0811	GWI	BASE	1.305	1.305	1.305	1.305
96845	SSF-0811	INF	BASE	0.161	0.161	0.161	0.161
96845	SSF-0811	SFR	22276	1.046	1.090	1.127	1.147
96846	SSF-0812	GWI	BASE	1.305	1.305	1.305	1.305
96846	SSF-0812	INF	BASE	0.161	0.161	0.161	0.161
96846	SSF-0812	SFR	22276	3.389	3.530	3.652	3.715
96857	SSF-1049	GWI	BASE	1.564	1.564	1.564	1.564
96857	SSF-1049	INF	BASE	0.203	0.203	0.203	0.203
96857	SSF-1049	SFR	22276	2.576	2.683	2.775	2.823
96858	SSF-1050	GWI	BASE	1.564	1.564	1.564	1.564
96858	SSF-1050	INF	BASE	0.203	0.203	0.203	0.203
96858	SSF-1050	SFR	22276	2.165	2.255	2.333	2.373
96859	SSF-1051	GWI	BASE	1.564	1.564	1.564	1.564
96859	SSF-1051	INF	BASE	0.203	0.203	0.203	0.203
96859	SSF-1051	SFR	22276	2.120	2.209	2.285	2.324
96860	SSF-1052	GWI	BASE	1.564	1.564	1.564	1.564
96860	SSF-1052	INF	BASE	0.203	0.203	0.203	0.203
96860	SSF-1052	SFR	22276	2.265	2.359	2.440	2.482
96866	SSF-1059	COM	22276	2.042	3.378	4.516	4.990
96866	SSF-1059	GWI	BASE	1.037	1.037	1.037	1.037
96866	SSF-1059	INF	BASE	0.163	0.163	0.163	0.163
96880	SSF-1290	GWI	BASE	2.167	2.167	2.167	2.167
96880	SSF-1290	INF	BASE	0.308	0.308	0.308	0.308
96880	SSF-1290	SFR	22276	1.689	1.759	1.820	1.851
96882	SSF-1292	GWI	BASE	2.167	2.167	2.167	2.167
96882	SSF-1292	INF	BASE	0.308	0.308	0.308	0.308
96882	SSF-1292	SFR	22276	3.783	3.940	4.076	4.146
96891	SSF-1301	GWI	BASE	2.167	2.167	2.167	2.167
96891	SSF-1301	INF	BASE	0.308	0.308	0.308	0.308
96891	SSF-1301	SFR	22276	4.733	4.930	5.100	5.187
96904	SSF-1314	GWI	BASE	2.523	2.523	2.523	2.523
96904	SSF-1314	INF	BASE	0.231	0.231	0.231	0.231
96904	SSF-1314	SFR	22276	3.085	3.214	3.325	3.381
96920	SSF-1418	GWI	BASE	3.527	3.527	3.527	3.527
96920	SSF-1418	INF	BASE	0.442	0.442	0.442	0.442
96920	SSF-1418	SFR	22276	1.136	1.183	1.224	1.245
96943	SSF-1442	GWI	BASE	1.295	1.295	1.295	1.295
96943	SSF-1442	INF	BASE	0.157	0.157	0.157	0.157
96943	SSF-1442	SFR	22276	1.643	1.711	1.770	1.801
96957	SSF-0573	GWI	BASE	3.115	3.115	3.115	3.115
96957	SSF-0573	INF	BASE	0.240	0.240	0.240	0.240

Junction ID	GIS-ID	ALLOC_CODE	Pattern ID	Existing DWF Value (gpm)	2025 DWF Value (gpm)	2035 DWF Value (gpm)	Buildout DWF Value (gpm)
96957	SSF-0573	MFR	22276	13.133	13.679	14.152	14.394
96958	SSF-0574	GWI	BASE	3.115	3.115	3.115	3.115
96958	SSF-0574	INF	BASE	0.240	0.240	0.240	0.240
96958	SSF-0574	MFR	22276	9.321	9.708	10.043	10.215
96983	SSF-0736	GWI	BASE	1.106	1.106	1.106	1.106
96983	SSF-0736	INF	BASE	0.139	0.139	0.139	0.139
96983	SSF-0736	SFR	22276	0.847	0.882	0.913	0.928
96987	SSF-0740	GWI	BASE	1.106	1.106	1.106	1.106
96987	SSF-0740	INF	BASE	0.139	0.139	0.139	0.139
96987	SSF-0740	SFR	22276	5.056	5.267	5.448	5.542
96988	SSF-0741	GWI	BASE	1.106	1.106	1.106	1.106
96988	SSF-0741	INF	BASE	0.139	0.139	0.139	0.139
96988	SSF-0741	SFR	22276	0.613	0.639	0.661	0.672
96990	SSF-0743	GWI	BASE	1.106	1.106	1.106	1.106
96990	SSF-0743	INF	BASE	0.139	0.139	0.139	0.139
96990	SSF-0743	SFR	22276	1.590	1.656	1.713	1.743
97012	SSF-0768	GWI	BASE	1.564	1.564	1.564	1.564
97012	SSF-0768	INF	BASE	0.203	0.203	0.203	0.203
97012	SSF-0768	SFR	22276	1.377	1.434	1.483	1.509
97013	SSF-0769	GWI	BASE	1.564	1.564	1.564	1.564
97013	SSF-0769	INF	BASE	0.203	0.203	0.203	0.203
97013	SSF-0769	SFR	22276	1.543	1.607	1.663	1.691
97014	SSF-0770	GWI	BASE	1.564	1.564	1.564	1.564
97014	SSF-0770	INF	BASE	0.203	0.203	0.203	0.203
97014	SSF-0770	SFR	22276	1.443	1.503	1.555	1.582
97015	SSF-0771	GWI	BASE	1.564	1.564	1.564	1.564
97015	SSF-0771	INF	BASE	0.203	0.203	0.203	0.203
97015	SSF-0771	SFR	22276	1.216	1.266	1.310	1.332
97019	SSF-0775	GWI	BASE	1.564	1.564	1.564	1.564
97019	SSF-0775	INF	BASE	0.203	0.203	0.203	0.203
97019	SSF-0775	SFR	22276	4.857	5.059	5.234	5.323
97029	SSF-0475	GWI	BASE	1.390	1.390	1.390	1.390
97029	SSF-0475	INF	BASE	0.174	0.174	0.174	0.174
97029	SSF-0475	SFR	22276	2.184	2.275	2.353	2.394
97051	SSF-0530	GWI	BASE	1.305	1.305	1.305	1.305
97051	SSF-0530	INF	BASE	0.161	0.161	0.161	0.161
97051	SSF-0530	SFR	22276	1.190	1.239	1.282	1.304
97052	SSF-0531	GWI	BASE	1.305	1.305	1.305	1.305
97052	SSF-0531	INF	BASE	0.161	0.161	0.161	0.161
97052	SSF-0531	SFR	22276	1.822	1.897	1.963	1.996
97071	SSF-0550	GWI	BASE	1.305	1.305	1.305	1.305
97071	SSF-0550	INF	BASE	0.161	0.161	0.161	0.161
97071	SSF-0550	SFR	22276	9.793	10.200	10.552	10.733
97077	SSF-1737	GWI	BASE	12.758	12.758	12.758	12.758
97077	SSF-1737	IND	DU_WWTP	7.440	8.082	8.797	8.948
97081	SSF-1742	GWI	BASE	12.758	12.758	12.758	12.758
97081	SSF-1742	IND	DU_WWTP	25.181	27.357	29.774	30.288
97098	SSF-1771	GWI	BASE	15.757	15.757	15.757	15.757
97098	SSF-1771	IND	DU_WWTP	30.221	32.832	35.733	36.350
97128	SSF-0849	GWI	BASE	1.451	1.451	1.451	1.451
97128	SSF-0849	INF	BASE	0.182	0.182	0.182	0.182
97128	SSF-0849	SFR	22276	2.371	2.470	2.555	2.599
97135	SSF-0856	GWI	BASE	1.451	1.451	1.451	1.451
97135	SSF-0856	INF	BASE	0.182	0.182	0.182	0.182
97135	SSF-0856	SFR	22276	4.933	5.138	5.315	5.406
97165	SSF-1696	COM	DU_WWTP	16.547	17.977	19.566	19.903
97165	SSF-1696	GWI	BASE	10.830	10.830	10.830	10.830
97167	SSF-1698	COM	DU_WWTP	1.041	1.131	1.231	1.252
97167	SSF-1698	GWI	BASE	10.830	10.830	10.830	10.830
97172	SSF-1719	GWI	BASE	3.290	3.290	3.290	3.290
97172	SSF-1719	MFR	DU_WWTP	0.454	1.136	2.441	3.578

Junction ID	GIS-ID	ALLOC_CODE	Pattern ID	Existing DWF Value (gpm)	2025 DWF Value (gpm)	2035 DWF Value (gpm)	Buildout DWF Value (gpm)
97173	SSF-1720	GWI	BASE	3.290	3.290	3.290	3.290
97173	SSF-1720	MFR	DU_WWTP	1.361	3.407	7.322	10.734
97175	SSF-1722	GWI	BASE	3.290	3.290	3.290	3.290
97175	SSF-1722	MFR	DU_WWTP	4.051	10.144	21.800	31.957
97180	SSF-1727	GWI	BASE	3.290	3.290	3.290	3.290
97180	SSF-1727	MFR	DU_WWTP	1.010	2.530	5.436	7.969
97192	SSF-1646	GWI	BASE	1.923	1.923	1.923	1.923
97192	SSF-1646	SFR	DU_WWTP	0.980	1.021	1.056	1.074
97193	SSF-1647	GWI	BASE	1.923	1.923	1.923	1.923
97193	SSF-1647	SFR	DU_WWTP	0.772	0.804	0.832	0.846
97196	SSF-1650	GWI	BASE	1.923	1.923	1.923	1.923
97196	SSF-1650	SFR	DU_WWTP	2.840	2.958	3.061	3.113
97198	SSF-1652	GWI	BASE	1.923	1.923	1.923	1.923
97198	SSF-1652	SFR	DU_WWTP	1.268	1.320	1.366	1.389
97199	SSF-1653	GWI	BASE	1.923	1.923	1.923	1.923
97199	SSF-1653	SFR	DU_WWTP	1.781	1.855	1.919	1.952
97211	SSF-1937	GWI	BASE	6.830	6.830	6.830	6.830
97211	SSF-1937	INF	BASE	0.857	0.857	0.857	0.857
97211	SSF-1937	SFR	22276	20.828	21.694	22.443	22.827
97214	SSF-1941	GWI	BASE	6.830	6.830	6.830	6.830
97214	SSF-1941	INF	BASE	0.857	0.857	0.857	0.857
97214	SSF-1941	SFR	22276	7.953	8.284	8.570	8.716
97231	SSF-1962	GWI	BASE	2.561	2.561	2.561	2.561
97231	SSF-1962	SFR	DU_WWTP	4.604	4.795	4.961	5.046
97236	SSF-1967	GWI	BASE	2.561	2.561	2.561	2.561
97236	SSF-1967	SFR	DU_WWTP	2.000	2.083	2.155	2.192
97243	SSF-0834	GWI	BASE	3.914	3.914	3.914	3.914
97243	SSF-0834	IND	DU_WWTP	4.294	4.665	5.078	5.165
97245	SSF-0836	GWI	BASE	1.106	1.106	1.106	1.106
97245	SSF-0836	INF	BASE	0.139	0.139	0.139	0.139
97245	SSF-0836	SFR	22276	3.612	3.762	3.892	3.958
97256	SSF-1268	GWI	BASE	1.310	1.310	1.310	1.310
97256	SSF-1268	INF	BASE	0.164	0.164	0.164	0.164
97256	SSF-1268	SFR	22276	1.925	2.005	2.075	2.110
97276	SSF-1578	GWI	BASE	0.360	0.360	0.360	0.360
97276	SSF-1578	SFR	DU_WWTP	0.165	0.171	0.177	0.180
97286	SSF-1947	GWI	BASE	6.830	6.830	6.830	6.830
97286	SSF-1947	INF	BASE	0.857	0.857	0.857	0.857
97286	SSF-1947	SFR	22276	10.898	11.351	11.743	11.944
97290	SSF-1591	GWI	BASE	2.970	2.970	2.970	2.970
97290	SSF-1591	SFR	DU_WWTP	3.418	3.560	3.683	3.746
97302	SSF-1603	GWI	BASE	2.970	2.970	2.970	2.970
97302	SSF-1603	SFR	DU_WWTP	3.078	3.206	3.316	3.373
97311	SSF-1626	GWI	BASE	1.295	1.295	1.295	1.295
97311	SSF-1626	INF	BASE	0.157	0.157	0.157	0.157
97311	SSF-1626	SFR	22276	2.328	2.425	2.508	2.551
97314	SSF-1629	GWI	BASE	1.295	1.295	1.295	1.295
97314	SSF-1629	INF	BASE	0.157	0.157	0.157	0.157
97314	SSF-1629	SFR	22276	1.310	1.364	1.411	1.435
97325	SSF-1639	GWI	BASE	1.923	1.923	1.923	1.923
97325	SSF-1639	SFR	DU_WWTP	2.291	2.386	2.469	2.511
97327	SSF-1641	GWI	BASE	1.923	1.923	1.923	1.923
97327	SSF-1641	SFR	DU_WWTP	0.962	1.002	1.037	1.055
97351	SSF-1213	GWI	BASE	3.527	3.527	3.527	3.527
97351	SSF-1213	INF	BASE	0.442	0.442	0.442	0.442
97351	SSF-1213	SFR	22276	2.626	2.735	2.830	2.878
97357	SSF-1231	GWI	BASE	3.914	3.914	3.914	3.914
97357	SSF-1231	IND	DU_WWTP	6.593	7.163	7.796	7.930
97359	SSF-1234	GWI	BASE	3.527	3.527	3.527	3.527
97359	SSF-1234	INF	BASE	0.442	0.442	0.442	0.442
97359	SSF-1234	SFR	22276	35.912	37.405	38.696	39.359

Junction ID	GIS-ID	ALLOC_CODE	Pattern ID	Existing DWF Value (gpm)	2025 DWF Value (gpm)	2035 DWF Value (gpm)	Buildout DWF Value (gpm)
97366	SSF-1243	GWI	BASE	1.310	1.310	1.310	1.310
97366	SSF-1243	INF	BASE	0.164	0.164	0.164	0.164
97366	SSF-1243	SFR	22276	0.740	0.770	0.797	0.811
97368	SSF-1245	GWI	BASE	1.310	1.310	1.310	1.310
97368	SSF-1245	INF	BASE	0.164	0.164	0.164	0.164
97368	SSF-1245	SFR	22276	1.503	1.566	1.620	1.647
97373	SSF-1250	GWI	BASE	1.310	1.310	1.310	1.310
97373	SSF-1250	INF	BASE	0.164	0.164	0.164	0.164
97373	SSF-1250	SFR	22276	1.739	1.812	1.874	1.906
97375	SSF-1252	GWI	BASE	1.310	1.310	1.310	1.310
97375	SSF-1252	INF	BASE	0.164	0.164	0.164	0.164
97375	SSF-1252	SFR	22276	2.006	2.090	2.162	2.199
97385	SSF-1262	GWI	BASE	1.310	1.310	1.310	1.310
97385	SSF-1262	INF	BASE	0.164	0.164	0.164	0.164
97385	SSF-1262	SFR	22276	0.539	0.562	0.581	0.591
97397	SSF-1389	GWI	BASE	8.321	8.321	8.321	8.321
97397	SSF-1389	SFR	11719	3.198	3.331	3.446	3.505
97399	SSF-1401	GWI	BASE	3.527	3.527	3.527	3.527
97399	SSF-1401	INF	BASE	0.442	0.442	0.442	0.442
97399	SSF-1401	SFR	22276	2.914	3.035	3.140	3.194
97400	SSF-1402	GWI	BASE	3.527	3.527	3.527	3.527
97400	SSF-1402	INF	BASE	0.442	0.442	0.442	0.442
97400	SSF-1402	SFR	22276	0.981	1.021	1.057	1.075
97405	SSF-1408	GWI	BASE	3.527	3.527	3.527	3.527
97405	SSF-1408	INF	BASE	0.442	0.442	0.442	0.442
97405	SSF-1408	SFR	22276	2.593	2.701	2.794	2.842
97409	SSF-1484	GWI	BASE	1.480	1.480	1.480	1.480
97409	SSF-1484	SFR	DU_WWTP	3.976	4.141	4.284	4.357
97411	SSF-1486	GWI	BASE	1.480	1.480	1.480	1.480
97411	SSF-1486	SFR	DU_WWTP	1.613	1.680	1.738	1.768
97438	SSF-1516	GWI	BASE	1.668	1.668	1.668	1.668
97438	SSF-1516	SFR	DU_WWTP	4.192	4.366	4.517	4.594
97459	SSF-1538	COM	22276	3.693	6.109	8.167	9.024
97459	SSF-1538	GWI	BASE	2.519	2.519	2.519	2.519
97459	SSF-1538	INF	BASE	0.339	0.339	0.339	0.339
97461	SSF-1540	COM	22276	0.525	0.868	1.160	1.282
97461	SSF-1540	GWI	BASE	2.519	2.519	2.519	2.519
97461	SSF-1540	INF	BASE	0.339	0.339	0.339	0.339
97467	SSF-0984	GWI	BASE	3.377	3.377	3.377	3.377
97467	SSF-0984	INF	BASE	0.424	0.424	0.424	0.424
97467	SSF-0984	SFR	22276	6.364	6.629	6.857	6.975
97476	SSF-0994	GWI	BASE	1.295	1.295	1.295	1.295
97476	SSF-0994	INF	BASE	0.157	0.157	0.157	0.157
97476	SSF-0994	SFR	22276	2.212	2.304	2.384	2.425
97478	SSF-0996	GWI	BASE	1.295	1.295	1.295	1.295
97478	SSF-0996	INF	BASE	0.157	0.157	0.157	0.157
97478	SSF-0996	SFR	22276	1.180	1.229	1.272	1.293
97483	SSF-1001	GWI	BASE	1.305	1.305	1.305	1.305
97483	SSF-1001	INF	BASE	0.161	0.161	0.161	0.161
97483	SSF-1001	SFR	22276	2.276	2.370	2.452	2.494
97487	SSF-1005	COM	22276	5.158	8.533	11.407	12.605
97487	SSF-1005	GWI	BASE	3.130	3.130	3.130	3.130
97487	SSF-1005	INF	BASE	0.491	0.491	0.491	0.491
97495	SSF-1016	GWI	BASE	10.551	10.551	10.551	10.551
97495	SSF-1016	IND	22276	20.432	33.799	45.185	49.929
97495	SSF-1016	INF	BASE	1.576	1.576	1.576	1.576
97508	SSF-1031	COM	11719	5.568	9.210	12.313	13.606
97508	SSF-1031	GWI	BASE	2.275	2.275	2.275	2.275
97516	SSF-1337	GWI	BASE	2.167	2.167	2.167	2.167
97516	SSF-1337	INF	BASE	0.308	0.308	0.308	0.308
97516	SSF-1337	SFR	22276	5.918	6.164	6.377	6.486

Junction ID	GIS-ID	ALLOC_CODE	Pattern ID	Existing DWF Value (gpm)	2025 DWF Value (gpm)	2035 DWF Value (gpm)	Buildout DWF Value (gpm)
97536	SSF-1371	GWI	BASE	0.880	0.880	0.880	0.880
97536	SSF-1371	SFR	DU_WWTP	0.841	0.876	0.907	0.922
97548	SSF-0903	GWI	BASE	2.167	2.167	2.167	2.167
97548	SSF-0903	INF	BASE	0.308	0.308	0.308	0.308
97548	SSF-0903	SFR	22276	1.302	1.356	1.403	1.427
97551	SSF-0906	GWI	BASE	2.167	2.167	2.167	2.167
97551	SSF-0906	INF	BASE	0.308	0.308	0.308	0.308
97551	SSF-0906	SFR	22276	2.135	2.224	2.300	2.340
97552	SSF-0907	GWI	BASE	2.167	2.167	2.167	2.167
97552	SSF-0907	INF	BASE	0.308	0.308	0.308	0.308
97552	SSF-0907	SFR	22276	1.754	1.827	1.890	1.922
97562	SSF-0917	GWI	BASE	1.564	1.564	1.564	1.564
97562	SSF-0917	INF	BASE	0.203	0.203	0.203	0.203
97562	SSF-0917	SFR	22276	2.409	2.509	2.596	2.640
97595	SSF-0950	GWI	BASE	0.906	0.906	0.906	0.906
97595	SSF-0950	INF	BASE	0.114	0.114	0.114	0.114
97595	SSF-0950	SFR	22276	3.260	3.396	3.513	3.573
97615	SSF-0974	GWI	BASE	1.305	1.305	1.305	1.305
97615	SSF-0974	INF	BASE	0.161	0.161	0.161	0.161
97615	SSF-0974	SFR	22276	0.739	0.769	0.796	0.810
97619	SSF-0978	GWI	BASE	3.377	3.377	3.377	3.377
97619	SSF-0978	INF	BASE	0.424	0.424	0.424	0.424
97619	SSF-0978	SFR	22276	9.332	9.720	10.055	10.227
97635	SSF-0635	GWI	BASE	1.564	1.564	1.564	1.564
97635	SSF-0635	INF	BASE	0.203	0.203	0.203	0.203
97635	SSF-0635	SFR	22276	5.695	5.932	6.137	6.242
97638	SSF-0638	GWI	BASE	1.564	1.564	1.564	1.564
97638	SSF-0638	INF	BASE	0.203	0.203	0.203	0.203
97638	SSF-0638	SFR	22276	1.993	2.076	2.147	2.184
97652	SSF-0654	COM	22276	5.544	9.171	12.260	13.547
97652	SSF-0654	GWI	BASE	1.822	1.822	1.822	1.822
97652	SSF-0654	INF	BASE	0.286	0.286	0.286	0.286
97653	SSF-0655	GWI	BASE	0.906	0.906	0.906	0.906
97653	SSF-0655	INF	BASE	0.114	0.114	0.114	0.114
97653	SSF-0655	SFR	22276	1.344	1.399	1.448	1.472
97676	SSF-0868	GWI	BASE	1.451	1.451	1.451	1.451
97676	SSF-0868	INF	BASE	0.182	0.182	0.182	0.182
97676	SSF-0868	SFR	22276	2.076	2.162	2.237	2.275
97689	SSF-1971	GWI	BASE	2.561	2.561	2.561	2.561
97689	SSF-1971	SFR	DU_WWTP	3.554	3.702	3.830	3.895
97696	SSF-1978	GWI	BASE	2.561	2.561	2.561	2.561
97696	SSF-1978	SFR	DU_WWTP	2.502	2.606	2.696	2.742
97699	SSF-1981	GWI	BASE	2.148	2.148	2.148	2.148
97699	SSF-1981	SFR	DU_WWTP	2.356	2.454	2.539	2.582
97716	SSF-2161	GWI	BASE	1.305	1.305	1.305	1.305
97716	SSF-2161	INF	BASE	0.161	0.161	0.161	0.161
97716	SSF-2161	SFR	22276	1.638	1.706	1.765	1.796
97742	SSF-0593	GWI	BASE	0.906	0.906	0.906	0.906
97742	SSF-0593	INF	BASE	0.114	0.114	0.114	0.114
97742	SSF-0593	SFR	22276	1.237	1.288	1.333	1.355
97743	SSF-0594	GWI	BASE	0.906	0.906	0.906	0.906
97743	SSF-0594	INF	BASE	0.114	0.114	0.114	0.114
97743	SSF-0594	SFR	22276	1.462	1.522	1.575	1.602
97745	SSF-0596	GWI	BASE	0.906	0.906	0.906	0.906
97745	SSF-0596	INF	BASE	0.114	0.114	0.114	0.114
97745	SSF-0596	SFR	22276	1.973	2.055	2.126	2.163
97750	SSF-0601	GWI	BASE	1.295	1.295	1.295	1.295
97750	SSF-0601	INF	BASE	0.157	0.157	0.157	0.157
97750	SSF-0601	SFR	22276	3.541	3.688	3.815	3.880
97752	SSF-0603	GWI	BASE	1.295	1.295	1.295	1.295
97752	SSF-0603	INF	BASE	0.157	0.157	0.157	0.157

Junction ID	GIS-ID	ALLOC_CODE	Pattern ID	Existing DWF Value (gpm)	2025 DWF Value (gpm)	2035 DWF Value (gpm)	Buildout DWF Value (gpm)
97752	SSF-0603	SFR	22276	1.430	1.490	1.541	1.567
97809	SSF-1997	GWI	BASE	2.148	2.148	2.148	2.148
97809	SSF-1997	SFR	DU_WWTP	3.235	3.370	3.486	3.546
97831	SSF-2055	GWI	BASE	2.148	2.148	2.148	2.148
97831	SSF-2055	SFR	DU_WWTP	3.386	3.527	3.648	3.711
97881	SSF-1780	GWI	BASE	13.717	13.717	13.717	13.717
97881	SSF-1780	IND	DU_WWTP	17.536	29.009	38.781	42.853
97888	SSF-1787	GWI	BASE	4.306	4.306	4.306	4.306
97888	SSF-1787	IND	DU_WWTP	3.710	4.030	4.386	4.462
97899	SSF-1808	GWI	BASE	24.261	24.261	24.261	24.261
97899	SSF-1808	IND	DU_WWTP	30.555	33.195	36.128	36.751
97914	SSF-1831	GWI	BASE	2.395	2.395	2.395	2.395
97914	SSF-1831	SFR	DU_WWTP	1.331	1.386	1.434	1.459
97916	SSF-1833	GWI	BASE	2.395	2.395	2.395	2.395
97916	SSF-1833	SFR	DU_WWTP	4.811	5.010	5.183	5.272
97945	SSF-2044	GWI	BASE	2.087	2.087	2.087	2.087
97945	SSF-2044	SFR	11719	4.057	4.225	4.371	4.446
97949	SSF-2048	GWI	BASE	2.087	2.087	2.087	2.087
97949	SSF-2048	SFR	11719	3.213	3.346	3.462	3.521
97953	SSF-0004	GWI	BASE	1.263	1.263	1.263	1.263
97953	SSF-0004	SFR	DU_WWTP	1.614	1.682	1.740	1.769
97958	SSF-0846	GWI	BASE	1.451	1.451	1.451	1.451
97958	SSF-0846	INF	BASE	0.182	0.182	0.182	0.182
97958	SSF-0846	SFR	22276	1.862	1.940	2.006	2.041
97960	SSF-1891	GWI	BASE	2.395	2.395	2.395	2.395
97960	SSF-1891	SFR	DU_WWTP	0.936	0.975	1.009	1.026
97966	SSF-1897	GWI	BASE	2.395	2.395	2.395	2.395
97966	SSF-1897	SFR	DU_WWTP	0.551	0.574	0.594	0.604
97967	SSF-1898	GWI	BASE	2.395	2.395	2.395	2.395
97967	SSF-1898	SFR	DU_WWTP	2.405	2.505	2.592	2.636
97972	SSF-1106	GWI	BASE	3.943	3.943	3.943	3.943
97972	SSF-1106	SFR	DU_WWTP	2.464	2.567	2.656	2.701
97975	SSF-1171	GWI	BASE	2.087	2.087	2.087	2.087
97975	SSF-1171	SFR	11719	0.947	0.987	1.021	1.038
97978	SSF-1217	GWI	BASE	2.395	2.395	2.395	2.395
97978	SSF-1217	SFR	DU_WWTP	0.783	0.816	0.844	0.858
97995	SSF-1857	GWI	BASE	3.943	3.943	3.943	3.943
97995	SSF-1857	SFR	DU_WWTP	2.209	2.300	2.380	2.421
97999	SSF-1885	GWI	BASE	2.395	2.395	2.395	2.395
97999	SSF-1885	SFR	DU_WWTP	2.991	3.115	3.223	3.278
98002	SSF-1888	GWI	BASE	2.395	2.395	2.395	2.395
98002	SSF-1888	SFR	DU_WWTP	1.544	1.608	1.664	1.692
98019	SSF-2152	GWI	BASE	2.395	2.395	2.395	2.395
98019	SSF-2152	SFR	DU_WWTP	1.654	1.722	1.782	1.812
98020	SSF-0892	GWI	BASE	2.395	2.395	2.395	2.395
98020	SSF-0892	SFR	DU_WWTP	3.426	3.569	3.692	3.755
98025	SSF-1339	GWI	BASE	2.087	2.087	2.087	2.087
98025	SSF-1339	SFR	11719	2.257	2.350	2.432	2.473
98028	SSF-1342	GWI	BASE	2.087	2.087	2.087	2.087
98028	SSF-1342	SFR	11719	3.368	3.508	3.629	3.691
98035	SSF-1349	GWI	BASE	2.087	2.087	2.087	2.087
98035	SSF-1349	SFR	11719	3.480	3.624	3.749	3.814
98045	SSF-1392	GWI	BASE	2.087	2.087	2.087	2.087
98045	SSF-1392	SFR	11719	2.231	2.324	2.404	2.445
98051	SSF-0278	GWI	BASE	2.395	2.395	2.395	2.395
98051	SSF-0278	SFR	DU_WWTP	1.143	1.191	1.232	1.253
98054	SSF-0281	GWI	BASE	2.395	2.395	2.395	2.395
98054	SSF-0281	SFR	DU_WWTP	2.565	2.672	2.764	2.811
98056	SSF-0309	GWI	BASE	2.395	2.395	2.395	2.395
98056	SSF-0309	SFR	DU_WWTP	1.475	1.536	1.589	1.617
98062	SSF-0780	GWI	BASE	3.943	3.943	3.943	3.943

Junction ID	GIS-ID	ALLOC_CODE	Pattern ID	Existing DWF Value (gpm)	2025 DWF Value (gpm)	2035 DWF Value (gpm)	Buildout DWF Value (gpm)
98062	SSF-0780	SFR	DU_WWTP	3.028	3.154	3.263	3.319
98064	SSF-0782	GWI	BASE	3.943	3.943	3.943	3.943
98064	SSF-0782	SFR	DU_WWTP	2.094	2.181	2.256	2.295
98069	SSF-1317	GWI	BASE	2.087	2.087	2.087	2.087
98069	SSF-1317	SFR	11719	1.947	2.027	2.097	2.133
98072	SSF-1320	GWI	BASE	2.087	2.087	2.087	2.087
98072	SSF-1320	SFR	11719	1.860	1.938	2.005	2.039
98073	SSF-1323	GWI	BASE	5.310	5.310	5.310	5.310
98073	SSF-1323	SFR	11719	4.057	4.225	4.371	4.446
98074	SSF-1324	GWI	BASE	5.310	5.310	5.310	5.310
98074	SSF-1324	SFR	11719	3.498	3.643	3.769	3.833
811572	SSF-2353	COM	22276	11.770	19.470	26.029	28.761
811572	SSF-2353	GWI	BASE	2.167	2.167	2.167	2.167
811572	SSF-2353	INF	BASE	0.308	0.308	0.308	0.308
811634	SSF-1028	GWI	BASE	0.569	0.569	0.569	0.569
811634	SSF-1028	INF	BASE	0.176	0.176	0.176	0.176
811634	SSF-1028	SFR	11679	1.955	2.036	2.106	2.142
812434	SSF-2390	GWI	BASE	5.149	5.149	5.149	5.149
812434	SSF-2390	INF	BASE	0.804	0.804	0.804	0.804

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
5006	SSF-2006	22276	0.948
6588	SSF-0440	DU_WWTP	0.420
6589	SSF-0157	DU_WWTP	2.079
6590	SSF-0149	DU_WWTP	0.969
6591	SSF-0441	DU_WWTP	0.594
6596	SSF-0507	DU_WWTP	1.549
6597	SSF-0508	DU_WWTP	1.551
6599	SSF-1570	DU_WWTP	1.111
6600	SSF-0156	DU_WWTP	0.328
6742	SSF-0514	11719	1.176
6743	SSF-0509	11719	0.852
6746	NoMatch	11719	12.208
6759	SSF-0518	11719	0.976
6760	SSF-2509	11719	0.574
6767	SSF-0511	11719	1.163
6768	SSF-0512	11719	1.060
6769	SSF-0513	11719	1.384
6812	NoMatch	11719	25.668
6868	SSF-0510	11719	0.985
6869	SSF-0506	DU_WWTP	1.511
6877	NoMatch	11719	15.516
6904	SSF-0201	DU_WWTP	0.372
6906	NoMatch	DU_WWTP	0.503
6909	SSF-0295	DU_WWTP	0.575
6910	SSF-0296	DU_WWTP	0.588
6911	SSF-0206	22276	0.861
6912	SSF-1923	22276	0.572
6913	SSF-1466	DU_WWTP	0.390
6914	SSF-1544	DU_WWTP	0.222
6915	SSF-1920	DU_WWTP	0.214
6916	SSF-1922	DU_WWTP	0.561
6917	SSF-0454	DU_WWTP	0.323
6919	SSF-0887	22276	2.421
6920	SSF-0884	22276	0.495
6921	SSF-0888	22276	0.468
6922	SSF-0889	22276	0.725
6923	SSF-0890	22276	0.668
6924	SSF-0880	22276	0.823
6925	SSF-0879	22276	0.657
6926	SSF-0883	22276	0.699
6927	SSF-0881	22276	1.045
6928	SSF-0882	22276	1.112
6929	SSF-0878	22276	0.721
6930	SSF-0877	22276	0.310

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
6931	SSF-0876	22276	0.508
6932	SSF-0875	22276	0.709
6933	SSF-1926	22276	0.031
6934	SSF-0885	22276	0.406
6935	SSF-0209	22276	0.821
6936	SSF-0208	22276	0.460
6937	SSF-0207	22276	0.779
6938	SSF-0225	22276	0.717
6939	SSF-0226	22276	0.751
6940	SSF-0227	22276	0.602
6941	NoMatch	22276	0.248
6942	SSF-0229	22276	0.614
6943	SSF-0292	22276	0.745
6944	SSF-0308	22276	0.560
6945	SSF-0307	22276	0.829
6946	SSF-0306	22276	0.654
6947	SSF-0610	22276	0.779
6948	SSF-0608	22276	0.750
6949	SSF-0607	22276	0.488
6950	SSF-0609	22276	0.418
6951	NoMatch	22276	0.472
6952	NoMatch	22276	0.361
6953	SSF-1093	22276	0.562
6954	SSF-1092	22276	0.859
6955	SSF-2638	22276	0.586
6956	SSF-0293	DU_WWTP	0.725
6957	SSF-0202	DU_WWTP	0.611
6958	SSF-0873	DU_WWTP	0.660
6959	SSF-1543	DU_WWTP	0.450
6960	SSF-0624	22276	0.533
6961	SSF-0625	22276	0.882
6962	SSF-0626	22276	0.572
6963	SSF-0627	22276	1.548
6964	SSF-2138	22276	0.539
6965	SSF-0618	22276	0.650
6966	SSF-0616	22276	0.503
6967	SSF-0617	22276	0.567
6968	SSF-0611	22276	0.503
6969	SSF-0612	22276	0.604
6970	SSF-0613	22276	0.604
6971	SSF-0614	22276	0.357
6972	SSF-0615	22276	0.421
6973	SSF-0628	22276	0.685
6974	SSF-0290	22276	0.705

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
6975	SSF-2478	22276	0.499
6976	SSF-0291	22276	8.471
6979	SSF-0559	22276	0.545
6980	SSF-0558	22276	0.606
6981	SSF-0564	22276	0.303
6982	SSF-0563	22276	0.298
6983	SSF-0562	22276	0.242
6984	SSF-0561	22276	0.149
6985	SSF-0560	22276	0.167
6986	SSF-0557	22276	0.198
6987	SSF-0762	22276	0.414
6988	SSF-0760	22276	0.645
6989	SSF-0556	22276	0.482
6990	SSF-0465	22276	0.171
6991	SSF-0464	22276	0.212
6992	SSF-0462	22276	0.686
6993	SSF-0457	22276	0.412
6994	SSF-0456	22276	0.596
6995	SSF-0455	22276	0.590
6996	SSF-0470	22276	0.626
6997	SSF-0474	22276	0.868
6998	SSF-0473	22276	0.427
6999	SSF-0472	22276	0.714
7000	SSF-0680	22276	0.524
7001	SSF-2242	22276	0.322
7002	SSF-0678	22276	0.402
7003	SSF-0677	22276	0.556
7004	SSF-0676	22276	0.430
7005	SSF-0151	22276	0.341
7006	SSF-0692	22276	0.271
7007	SSF-0691	22276	0.523
7008	SSF-1556	22276	0.291
7009	SSF-1560	22276	0.518
7010	SSF-1559	22276	0.614
7011	SSF-1557	22276	0.355
7012	SSF-1921	DU_WWTP	0.203
7013	SSF-1924	22276	0.620
7014	SSF-1916	DU_WWTP	0.247
7015	SSF-1918	DU_WWTP	0.175
7016	SSF-1917	DU_WWTP	0.721
7017	SSF-1919	DU_WWTP	0.412
7018	SSF-1925	22276	0.223
7020	SSF-0443	DU_WWTP	5.646
7021	SSF-0450	DU_WWTP	1.359

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
7022	SSF-0449	DU_WWTP	1.770
7023	SSF-0448	DU_WWTP	0.653
7024	SSF-0447	DU_WWTP	0.756
7025	SSF-0446	DU_WWTP	0.841
7026	SSF-0442	DU_WWTP	0.596
7027	SSF-0445	DU_WWTP	0.791
7035	NoMatch	DU_WWTP	0.417
7036	NoMatch	DU_WWTP	0.304
7037	SSF-0294	DU_WWTP	0.530
7038	SSF-0297	DU_WWTP	0.397
7039	NoMatch	DU_WWTP	0.343
7040	SSF-0389	DU_WWTP	0.275
7041	SSF-0303	DU_WWTP	0.522
7042	SSF-0302	DU_WWTP	0.687
7043	SSF-0301	DU_WWTP	0.753
7044	SSF-0300	DU_WWTP	0.593
7048	SSF-1825	DU_WWTP	0.900
7049	SSF-1826	DU_WWTP	1.020
7051	SSF-1827	DU_WWTP	1.182
7052	SSF-2017	22276	0.639
7053	SSF-0336	22276	0.781
7054	SSF-0395	22276	0.762
7055	SSF-0394	22276	0.838
7060	SSF-1859	DU_WWTP	0.651
7061	SSF-1858	DU_WWTP	0.422
7067	SSF-2397	DU_WWTP	0.789
7068	SSF-2401	DU_WWTP	0.689
7069	SSF-2403	DU_WWTP	0.696
7070	SSF-2308	DU_WWTP	1.345
7071	SSF-1791	DU_WWTP	0.758
7072	SSF-1795	DU_WWTP	0.496
7073	SSF-2250	DU_WWTP	0.185
7074	NoMatch	DU_WWTP	0.384
7075	SSF-1798	DU_WWTP	0.709
7076	SSF-1799	DU_WWTP	0.764
7077	SSF-1800	DU_WWTP	0.883
7078	SSF-1777	DU_WWTP	1.244
7079	SSF-1794	DU_WWTP	0.866
7080	SSF-1875	DU_WWTP	0.984
7081	SSF-1752	DU_WWTP	1.846
7082	SSF-1750	DU_WWTP	1.067
7083	SSF-1753	DU_WWTP	0.881
7084	SSF-1756	DU_WWTP	0.570
7085	SSF-1757	DU_WWTP	0.909

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
7086	SSF-1751	DU_WWTP	1.168
7087	SSF-1748	DU_WWTP	1.371
7088	SSF-1746	DU_WWTP	0.893
7089	SSF-1734	DU_WWTP	1.276
7093	SSF-2431	DU_WWTP	0.700
7097	SSF-1024	22276	0.764
7098	SSF-0318	22276	0.172
7099	NoMatch	22276	0.480
7100	SSF-0317	22276	0.761
7101	SSF-0316	22276	0.893
7102	SSF-1153	22276	0.523
7103	SSF-0315	22276	0.357
7104	SSF-0314	22276	0.787
7105	SSF-0399	22276	0.672
7106	SSF-2028	22276	0.978
7107	SSF-2029	22276	0.847
7108	SSF-2030	22276	0.945
7109	SSF-2031	22276	0.874
7110	SSF-2032	22276	1.057
7111	SSF-2005	DU_WWTP	0.591
7112	SSF-2004	DU_WWTP	1.272
7113	SSF-2127	DU_WWTP	0.716
7114	SSF-1861	DU_WWTP	0.433
7115	SSF-1860	DU_WWTP	0.629
7116	SSF-1621	DU_WWTP	0.943
7117	SSF-1615	DU_WWTP	0.926
7118	SSF-1614	DU_WWTP	1.223
7119	SSF-1613	DU_WWTP	0.842
7120	SSF-1612	DU_WWTP	0.588
7121	SSF-1685	DU_WWTP	0.937
7122	SSF-1915	DU_WWTP	1.106
7123	SSF-1704	DU_WWTP	0.678
7124	SSF-1709	DU_WWTP	0.782
7125	SSF-1708	DU_WWTP	0.808
7126	SSF-1707	DU_WWTP	0.961
7127	SSF-1703	DU_WWTP	1.117
7128	SSF-1702	DU_WWTP	1.282
7129	SSF-1701	DU_WWTP	0.842
7130	SSF-1712	DU_WWTP	1.031
7131	SSF-1209	DU_WWTP	0.231
7132	SSF-1208	DU_WWTP	0.584
7133	SSF-1207	DU_WWTP	0.804
7134	SSF-1206	DU_WWTP	0.497
7135	SSF-1202	DU_WWTP	0.796

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
7136	SSF-1161	DU_WWTP	0.487
7137	SSF-1160	DU_WWTP	0.513
7138	SSF-1159	DU_WWTP	0.887
7139	SSF-1158	DU_WWTP	0.704
7140	SSF-1157	DU_WWTP	0.314
7141	SSF-1226	DU_WWTP	0.253
7142	SSF-0350	22276	0.662
7143	SSF-0349	22276	0.273
7144	SSF-0348	22276	0.247
7145	SSF-0358	22276	0.290
7146	SSF-0360	22276	0.486
7147	SSF-0357	22276	0.771
7148	SSF-0361	22276	0.622
7149	SSF-0347	22276	0.342
7150	SSF-0353	22276	0.492
7151	SSF-0346	22276	0.247
7152	SSF-2011	22276	0.382
7153	SSF-2012	22276	0.379
7154	SSF-0345	22276	0.279
7155	SSF-0356	22276	0.316
7156	SSF-0359	22276	0.471
7157	SSF-0322	22276	0.550
7158	SSF-0323	22276	0.340
7159	SSF-2015	22276	0.253
7160	SSF-0324	22276	0.330
7161	SSF-0340	22276	0.775
7162	SSF-1776	DU_WWTP	1.387
7163	SSF-2009	22276	0.747
7164	SSF-2008	22276	0.803
7165	SSF-2007	22276	0.610
7166	SSF-0398	22276	0.722
7167	SSF-0397	22276	0.789
7168	SSF-0396	22276	0.644
7169	SSF-1227	DU_WWTP	0.134
7170	SSF-1228	DU_WWTP	0.214
7171	SSF-1221	DU_WWTP	0.223
7172	SSF-1222	DU_WWTP	0.290
7173	SSF-1223	DU_WWTP	0.332
7174	SSF-1224	DU_WWTP	0.226
7175	SSF-1225	DU_WWTP	0.211
7176	SSF-1815	DU_WWTP	4.092
7177	SSF-1616	DU_WWTP	0.588
7178	SSF-1619	DU_WWTP	0.372
7179	SSF-1620	DU_WWTP	0.408

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
7180	SSF-1205	DU_WWTP	0.458
7181	SSF-1204	DU_WWTP	0.459
7182	SSF-1203	DU_WWTP	0.580
7183	SSF-1706	DU_WWTP	0.728
7184	SSF-1705	DU_WWTP	1.031
7187	SSF-0828	DU_WWTP	0.413
7189	SSF-0404	22276	0.542
7190	SSF-0405	22276	0.877
7191	SSF-2018	22276	0.575
7192	SSF-0393	22276	0.406
7193	SSF-0392	22276	0.684
7194	SSF-0391	22276	1.012
7195	SSF-0390	22276	0.597
7196	SSF-0829	22276	0.816
7202	SSF-0145	11679	0.513
7203	SSF-0144	11679	0.275
7204	SSF-0143	11679	0.559
7205	SSF-0142	11679	0.766
7206	SSF-0141	11679	0.729
7207	SSF-0137	11679	0.416
7208	SSF-0136	11679	0.639
7209	SSF-0135	11679	0.544
7210	SSF-0134	11679	0.365
7211	SSF-0133	11679	0.422
7212	SSF-0132	11679	0.635
7213	SSF-0131	11679	0.876
7214	SSF-0527	11679	0.680
7215	SSF-1040	11719	0.821
7216	SSF-0519	11719	0.459
7217	SSF-0520	11719	0.237
7218	SSF-0521	11719	0.147
7219	SSF-0522	11719	0.166
7220	SSF-0523	11719	0.312
7221	SSF-0524	11719	1.058
7222	SSF-0525	11719	1.142
7228	SSF-0526	11719	1.169
7229	SSF-0515	11719	0.808
7230	SSF-2503	11719	0.829
7231	SSF-0516	11719	1.448
7232	SSF-0517	11719	1.262
7246	SSF-1830	DU_WWTP	0.594
7419	SSF-1507	DU_WWTP	0.355
7443	NoMatch	DU_WWTP	0.129
7444	SSF-1571	DU_WWTP	0.192

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
7446	SSF-1638	DU_WWTP	0.335
7448	SSF-1637	DU_WWTP	0.219
7450	SSF-1575	DU_WWTP	0.324
7452	SSF-1581	DU_WWTP	0.458
7454	SSF-1582	DU_WWTP	0.705
7456	SSF-1583	DU_WWTP	0.555
7458	SSF-1584	DU_WWTP	0.280
7460	SSF-1585	DU_WWTP	0.242
7462	SSF-1586	DU_WWTP	0.310
7464	SSF-1587	DU_WWTP	0.425
7466	SSF-1508	DU_WWTP	0.787
7468	SSF-1506	DU_WWTP	0.840
7470	SSF-1505	DU_WWTP	0.519
7631	SSF-1469	DU_WWTP	0.290
7632	SSF-1470	DU_WWTP	0.376
7634	SSF-1471	DU_WWTP	0.274
7636	SSF-1473	DU_WWTP	0.341
7638	SSF-1472	DU_WWTP	0.665
7640	SSF-0453	DU_WWTP	1.120
7642	SSF-1509	DU_WWTP	0.193
7735	SSF-1730	DU_WWTP	0.232
7737	SSF-1851	DU_WWTP	0.706
7739	SSF-1768	DU_WWTP	0.982
7747	SSF-1764	DU_WWTP	0.852
7749	SSF-1674	DU_WWTP	0.535
7751	SSF-0698	22276	0.515
7753	SSF-1070	DU_WWTP	0.414
7754	SSF-2642	DU_WWTP	0.230
7757	SSF-2111	DU_WWTP	0.390
7758	SSF-2109	DU_WWTP	0.233
7760	SSF-2272	DU_WWTP	0.103
7762	SSF-2124	DU_WWTP	0.771
7765	SSF-1813	DU_WWTP	0.738
7800	SSF-1986	DU_WWTP	0.256
7808	SSF-0911	22276	0.543
7810	SSF-1934	22276	0.423
7812	SSF-0548	22276	0.681
7814	SSF-1256	22276	0.140
7822	SSF-1177	22276	0.155
7826	SSF-1074	22276	0.336
7897	SSF-1850	DU_WWTP	0.535
7899	SSF-1849	DU_WWTP	0.639
7903	SSF-1804	DU_WWTP	0.962
7905	SSF-1848	DU_WWTP	0.665

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
7907	SSF-1847	DU_WWTP	0.444
7909	SSF-1844	DU_WWTP	0.467
7910	SSF-1843	DU_WWTP	0.717
7969	SSF-1762	DU_WWTP	0.970
7971	SSF-1763	DU_WWTP	0.995
8272	SSF-2621	DU_WWTP	0.188
8275	SSF-1673	DU_WWTP	0.561
8277	SSF-1672	DU_WWTP	0.352
8281	SSF-1574	DU_WWTP	0.301
8284	SSF-1912	DU_WWTP	0.438
8285	SSF-1911	DU_WWTP	0.439
8287	SSF-1914	DU_WWTP	0.505
8288	SSF-1913	DU_WWTP	0.494
8291	SSF-1910	DU_WWTP	0.547
8293	SSF-1909	DU_WWTP	0.386
8296	SSF-2110	DU_WWTP	0.516
8300	SSF-2118	DU_WWTP	0.198
8301	SSF-2119	DU_WWTP	0.205
8303	SSF-2121	DU_WWTP	0.524
8304	SSF-2122	DU_WWTP	0.417
8306	SSF-2123	DU_WWTP	0.559
8320	SSF-2107	DU_WWTP	0.284
8321	SSF-2108	DU_WWTP	0.343
8323	NoMatch	DU_WWTP	0.206
8330	SSF-2116	DU_WWTP	0.492
8332	SSF-2120	DU_WWTP	0.648
8335	SSF-2115	DU_WWTP	0.788
8337	SSF-2113	DU_WWTP	0.811
8338	SSF-1700	DU_WWTP	0.515
8340	SSF-2114	DU_WWTP	0.488
8343	SSF-2112	DU_WWTP	0.546
8407	SSF-1733	DU_WWTP	0.838
8409	SSF-1732	DU_WWTP	0.702
8411	SSF-1731	DU_WWTP	0.479
8472	SSF-1805	DU_WWTP	0.489
8497	SSF-1993	DU_WWTP	2.270
8498	SSF-1992	DU_WWTP	0.617
8501	SSF-1991	DU_WWTP	0.657
8503	SSF-1990	DU_WWTP	0.505
8504	SSF-1865	DU_WWTP	0.562
8506	SSF-1864	DU_WWTP	0.330
8507	SSF-1863	DU_WWTP	0.209
8509	SSF-1866	DU_WWTP	0.436
8513	SSF-1367	DU_WWTP	0.409

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
8515	SSF-1358	DU_WWTP	0.286
8516	SSF-1357	DU_WWTP	0.292
8518	SSF-1356	DU_WWTP	0.468
8519	SSF-0001	DU_WWTP	0.509
8522	SSF-1366	DU_WWTP	0.345
8524	SSF-1365	DU_WWTP	0.545
8528	SSF-1060	22276	0.690
8529	SSF-1187	22276	0.587
8531	SSF-1127	22276	1.903
8533	SSF-1184	22276	0.147
8534	SSF-1067	22276	0.296
8536	SSF-1185	22276	0.326
8538	SSF-1048	22276	0.835
8539	SSF-1044	22276	0.727
8541	SSF-1066	22276	0.559
8543	SSF-1065	22276	0.584
8545	SSF-1183	22276	0.391
8546	SSF-1100	22276	0.218
8548	SSF-1042	22276	0.695
8550	SSF-1063	22276	1.238
8553	SSF-1125	22276	0.392
8554	SSF-1124	22276	0.381
8556	SSF-1126	22276	0.542
8603	SSF-0549	22276	0.701
8606	SSF-1096	22276	0.468
8607	SSF-1095	22276	0.883
8609	SSF-1094	22276	0.553
8612	SSF-1097	22276	0.249
8614	SSF-1098	22276	0.110
8616	SSF-1099	22276	2.876
8778	SSF-2437	DU_WWTP	0.761
8779	SSF-1839	DU_WWTP	0.226
8781	SSF-2438	DU_WWTP	0.299
8783	SSF-2449	DU_WWTP	0.370
8784	SSF-2450	DU_WWTP	0.410
8786	SSF-2451	DU_WWTP	0.346
8788	SSF-2452	DU_WWTP	0.290
8790	SSF-2453	DU_WWTP	0.359
8792	SSF-2454	DU_WWTP	0.557
8794	SSF-2455	DU_WWTP	0.793
8796	SSF-2456	DU_WWTP	0.523
8798	SSF-2457	DU_WWTP	0.220
8800	SSF-2458	DU_WWTP	0.239
8803	SSF-2443	DU_WWTP	0.599

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
8806	SSF-2445	DU_WWTP	0.791
8808	SSF-2446	DU_WWTP	0.788
8810	SSF-2447	DU_WWTP	1.196
8812	SSF-2448	DU_WWTP	0.589
8815	SSF-2442	DU_WWTP	0.849
8819	SSF-2440	DU_WWTP	0.613
8822	SSF-1842	DU_WWTP	0.573
8824	SSF-2439	DU_WWTP	0.420
8830	SSF-2432	DU_WWTP	0.542
8832	SSF-2433	DU_WWTP	0.761
8834	SSF-2434	DU_WWTP	0.535
8838	SSF-2428	DU_WWTP	0.224
8840	SSF-2429	DU_WWTP	0.311
8844	SSF-2430	DU_WWTP	0.846
8847	SSF-2463	DU_WWTP	0.474
8856	SSF-2436	DU_WWTP	0.804
11715	SSF-0184	11719	0.451
11716	SSF-0185	11719	0.590
11717	SSF-0186	11719	0.805
12122	SSF-0451	DU_WWTP	0.186
12123	SSF-2466	DU_WWTP	0.190
12147	SSF-0505	11679	0.341
12554	SSF-0820	DU_WWTP	0.124
12555	SSF-0823	DU_WWTP	0.254
12556	SSF-0822	DU_WWTP	0.370
12557	SSF-0821	DU_WWTP	0.739
12558	SSF-0827	DU_WWTP	0.966
12559	SSF-0826	DU_WWTP	0.926
12560	SSF-0825	DU_WWTP	0.762
12561	SSF-0824	DU_WWTP	0.835
16721	SSF-0138	11719	0.767
16722	SSF-1623	11719	0.935
16723	SSF-2050	11719	1.002
16724	SSF-0030	11719	0.600
16865	SSF-0504	11719	0.182
16866	SSF-0503	11719	0.207
16867	SSF-0498	11719	0.968
16868	SSF-0502	11719	0.754
16956	SSF-2052	11719	0.732
16957	SSF-2049	11719	0.585
16958	SSF-2144	11719	0.289
16959	SSF-0033	11719	0.623
16960	SSF-0032	11719	0.567
16961	SSF-1173	11719	0.260

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
16962	SSF-0031	11719	0.323
16963	SSF-0164	11719	0.546
16964	SSF-0035	11719	0.714
16965	SSF-0034	11719	0.598
16966	SSF-0163	11719	0.876
16967	SSF-0170	11719	0.333
17238	SSF-1280	11719	0.870
17249	SSF-1279	11719	0.749
17250	SSF-1278	11719	0.407
17251	SSF-1277	11719	0.278
17667	SSF-1284	11719	0.382
17962	SSF-1281	11719	0.406
18012	SSF-0500	11719	0.483
18013	SSF-0499	11719	0.193
18014	SSF-0497	11719	0.471
20994	SSF-0581	22276	0.432
20996	SSF-2388	22276	0.411
20997	SSF-2387	22276	0.393
20998	SSF-2386	22276	0.373
20999	SSF-2385	22276	0.504
21007	SSF-1618	DU_WWTP	0.148
21008	SSF-1617	DU_WWTP	0.132
21767	SSF-1062	22276	0.587
21768	SSF-1045	22276	0.576
54881	SSF-1675	DU_WWTP	0.311
54882	SSF-1676	DU_WWTP	0.287
54883	SSF-1677	DU_WWTP	0.197
54884	SSF-1678	DU_WWTP	0.275
54885	SSF-1681	DU_WWTP	0.211
54886	SSF-1680	DU_WWTP	0.083
54887	SSF-1679	DU_WWTP	0.098
54888	SSF-1682	DU_WWTP	0.234
54889	SSF-1683	DU_WWTP	0.315
54890	SSF-2094	DU_WWTP	0.197
54891	SSF-2093	DU_WWTP	0.214
54892	SSF-2092	DU_WWTP	0.207
54893	SSF-2091	DU_WWTP	0.185
96381	SSF-0377	22276	0.314
96382	SSF-0378	22276	0.412
96383	SSF-0380	22276	0.327
96384	SSF-0381	22276	0.302
96385	SSF-0382	DU_WWTP	0.190
96386	SSF-0383	DU_WWTP	0.253
96387	SSF-0384	DU_WWTP	0.497

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
96388	SSF-0385	DU_WWTP	0.860
96389	SSF-0386	DU_WWTP	1.027
96390	SSF-0387	DU_WWTP	0.646
96392	SSF-0400	22276	0.652
96393	SSF-0401	22276	0.668
96394	SSF-0402	22276	0.499
96395	SSF-0406	22276	0.423
96396	SSF-0407	22276	0.315
96397	SSF-0409	22276	0.244
96398	SSF-0410	22276	0.489
96399	SSF-0411	22276	0.965
96400	SSF-0412	22276	0.388
96401	SSF-0413	22276	0.616
96402	SSF-0414	22276	0.784
96403	SSF-0415	22276	0.334
96404	SSF-0416	22276	0.672
96405	SSF-0417	22276	0.541
96406	SSF-0418	22276	0.732
96407	SSF-0419	22276	0.761
96408	SSF-0420	22276	0.633
96409	SSF-0421	22276	0.305
96410	SSF-0422	22276	0.297
96411	SSF-0423	22276	0.463
96412	SSF-0424	22276	0.676
96413	SSF-0425	22276	0.534
96414	SSF-0426	22276	0.317
96415	SSF-0427	22276	0.227
96416	SSF-0428	22276	0.206
96417	SSF-0429	22276	0.545
96418	SSF-0430	22276	0.549
96419	SSF-0431	22276	0.671
96420	SSF-0432	22276	0.401
96421	SSF-0433	22276	0.278
96422	SSF-0435	22276	0.358
96423	SSF-0436	22276	0.624
96424	SSF-0437	22276	0.318
96425	SSF-0438	22276	0.358
96426	SSF-0439	22276	0.468
96427	SSF-0458	22276	0.247
96428	SSF-0459	22276	0.299
96429	SSF-0460	22276	0.332
96430	SSF-0461	22276	0.259
96431	SSF-0463	22276	0.263
96432	SSF-0376	22276	0.326

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
96433	SSF-0466	22276	0.534
96434	SSF-0467	22276	0.521
96435	SSF-0468	22276	0.439
96436	SSF-0469	22276	0.292
96437	SSF-0471	22276	0.440
96438	SSF-0116	DU_WWTP	0.302
96439	SSF-0117	22276	0.435
96440	SSF-0119	DU_WWTP	0.261
96441	SSF-0120	DU_WWTP	0.437
96442	SSF-0121	22276	0.335
96443	SSF-0122	22276	0.430
96444	SSF-0123	22276	0.266
96445	SSF-0125	22276	0.408
96446	SSF-0126	DU_WWTP	0.418
96447	SSF-0127	DU_WWTP	0.380
96448	SSF-0128	DU_WWTP	0.418
96449	SSF-0129	DU_WWTP	0.530
96450	SSF-0130	DU_WWTP	0.306
96451	SSF-2204	DU_WWTP	0.386
96452	SSF-0150	22276	0.297
96454	SSF-0152	22276	0.205
96455	SSF-0153	22276	0.335
96456	SSF-0154	22276	0.293
96457	SSF-0155	22276	0.274
96458	SSF-0159	DU_WWTP	0.108
96459	SSF-0160	DU_WWTP	0.096
96460	SSF-0161	DU_WWTP	0.423
96461	SSF-0162	DU_WWTP	0.381
96462	SSF-0165	11719	0.351
96464	SSF-0167	DU_WWTP	0.383
96466	SSF-0169	DU_WWTP	0.343
96467	SSF-0286	22276	0.385
96468	SSF-0287	22276	0.750
96469	SSF-0288	22276	0.649
96470	SSF-0289	22276	0.491
96471	NoMatch	DU_WWTP	0.567
96472	NoMatch	DU_WWTP	0.642
96473	NoMatch	DU_WWTP	0.269
96474	NoMatch	DU_WWTP	0.300
96475	SSF-0298	DU_WWTP	1.047
96476	SSF-0299	DU_WWTP	0.805
96477	SSF-0304	DU_WWTP	0.664
96478	SSF-0305	DU_WWTP	0.422
96479	SSF-0320	22276	0.422

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
96480	SSF-0321	22276	0.654
96482	SSF-0325	22276	0.199
96483	SSF-0327	22276	0.643
96484	SSF-0328	22276	0.628
96485	SSF-0329	22276	0.363
96486	SSF-0330	22276	0.274
96487	SSF-0333	22276	0.336
96488	SSF-0334	22276	0.204
96489	SSF-0335	22276	0.295
96490	SSF-0337	22276	0.980
96491	SSF-0338	22276	0.613
96492	SSF-0341	22276	0.368
96493	SSF-0344	22276	0.437
96494	SSF-0354	22276	0.674
96495	SSF-0362	22276	0.292
96496	SSF-0363	22276	0.545
96497	SSF-0364	22276	0.777
96498	SSF-0365	22276	0.584
96499	SSF-0366	22276	0.430
96500	SSF-0368	22276	0.342
96501	SSF-0369	22276	0.202
96502	SSF-0371	22276	0.448
96503	SSF-0372	22276	0.408
96504	SSF-0373	22276	0.436
96505	SSF-0374	22276	0.539
96506	SSF-0375	22276	0.368
96507	SSF-0193	DU_WWTP	0.433
96508	SSF-0194	DU_WWTP	0.578
96509	SSF-0195	DU_WWTP	0.473
96510	SSF-0196	DU_WWTP	0.518
96511	SSF-0197	DU_WWTP	0.524
96512	SSF-0198	DU_WWTP	0.533
96513	NoMatch	DU_WWTP	0.259
96514	NoMatch	DU_WWTP	0.259
96515	NoMatch	DU_WWTP	0.350
96516	SSF-0200	DU_WWTP	0.395
96517	SSF-0203	DU_WWTP	0.262
96518	SSF-0204	DU_WWTP	0.454
96519	SSF-0205	DU_WWTP	0.371
96520	SSF-0210	22276	0.634
96521	SSF-0211	22276	0.816
96522	SSF-0171	22276	0.173
96523	SSF-0212	22276	0.644
96524	SSF-0213	22276	0.311

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
96525	SSF-0214	22276	0.434
96526	SSF-0215	22276	0.359
96527	SSF-0216	22276	0.495
96528	SSF-0217	22276	0.536
96529	SSF-0218	22276	0.635
96530	SSF-0219	22276	0.503
96531	SSF-0220	22276	0.899
96532	SSF-0221	22276	0.904
96533	SSF-0222	22276	0.283
96534	SSF-0223	22276	0.568
96536	SSF-0228	22276	0.767
96537	SSF-0230	22276	0.783
96538	SSF-0231	22276	1.012
96539	SSF-0232	22276	0.457
96540	SSF-0233	22276	0.449
96541	SSF-0234	22276	0.843
96542	SSF-0235	22276	0.233
96543	SSF-0236	22276	0.922
96544	SSF-0238	22276	0.308
96545	SSF-0239	22276	0.446
96546	SSF-0241	22276	0.474
96547	SSF-0242	22276	0.475
96548	SSF-0243	22276	0.872
96549	SSF-0244	22276	0.840
96550	SSF-0245	22276	0.537
96551	SSF-0246	22276	0.820
96552	SSF-0247	22276	0.346
96553	SSF-0248	22276	0.467
96554	SSF-0249	22276	0.346
96555	SSF-0250	22276	0.804
96556	SSF-0251	22276	0.270
96557	SSF-0252	22276	0.448
96558	SSF-0253	22276	0.650
96559	SSF-0254	22276	0.558
96560	SSF-0255	22276	0.757
96561	SSF-0256	22276	0.468
96562	SSF-0257	22276	0.263
96563	SSF-0258	22276	0.681
96564	SSF-0259	22276	0.735
96565	SSF-0260	22276	0.383
96566	SSF-0261	22276	0.632
96567	SSF-0262	22276	0.414
96568	SSF-0263	22276	0.397
96569	SSF-0266	22276	0.546

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
96570	SSF-0267	22276	0.408
96571	SSF-0268	22276	0.346
96572	SSF-0269	22276	0.409
96573	SSF-0270	22276	0.521
96574	SSF-0271	22276	0.441
96575	SSF-0274	22276	0.497
96576	SSF-0283	22276	0.438
96577	SSF-0284	22276	0.733
96578	SSF-0285	22276	0.348
96579	SSF-0078	11679	0.208
96580	SSF-0079	DU_WWTP	0.312
96581	SSF-0080	DU_WWTP	0.485
96582	SSF-0081	DU_WWTP	0.514
96583	SSF-0082	DU_WWTP	0.262
96584	SSF-0083	DU_WWTP	0.229
96585	SSF-0084	DU_WWTP	0.338
96586	SSF-0085	DU_WWTP	0.391
96587	SSF-0237	22276	0.807
96588	SSF-0086	DU_WWTP	0.141
96589	SSF-0087	DU_WWTP	0.306
96590	SSF-0088	DU_WWTP	0.273
96591	SSF-0089	DU_WWTP	0.491
96592	SSF-0090	DU_WWTP	0.303
96593	SSF-0091	DU_WWTP	0.193
96594	SSF-0092	DU_WWTP	0.201
96595	SSF-0093	22276	0.205
96596	SSF-0094	22276	0.343
96597	SSF-0095	22276	0.339
96598	SSF-0096	22276	0.350
96599	SSF-0097	22276	0.303
96600	SSF-0098	22276	0.441
96601	SSF-0099	22276	0.343
96603	SSF-0101	DU_WWTP	0.573
96604	SSF-0102	DU_WWTP	0.378
96605	SSF-0103	DU_WWTP	0.460
96606	SSF-0104	DU_WWTP	0.484
96607	SSF-0105	DU_WWTP	0.332
96611	SSF-0109	22276	0.228
96612	SSF-0110	DU_WWTP	0.299
96613	SSF-0111	DU_WWTP	0.290
96614	SSF-0112	DU_WWTP	0.225
96615	SSF-0113	DU_WWTP	0.280
96616	SSF-0114	DU_WWTP	0.195
96617	SSF-0115	DU_WWTP	0.173

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
96618	SSF-0679	22276	0.236
96619	SSF-0681	22276	0.390
96620	SSF-0682	22276	0.482
96621	SSF-0683	22276	0.356
96622	SSF-0684	22276	0.471
96623	SSF-0685	22276	0.344
96624	SSF-0686	22276	0.379
96625	SSF-0687	22276	0.463
96626	SSF-0688	22276	0.266
96627	SSF-0689	22276	0.297
96628	SSF-0690	22276	0.266
96629	SSF-0694	22276	0.466
96630	SSF-0695	22276	0.295
96631	SSF-0696	22276	0.421
96632	SSF-0697	22276	0.412
96634	SSF-0699	22276	0.568
96635	SSF-0700	22276	0.676
96636	SSF-0701	22276	0.404
96637	SSF-0702	22276	0.454
96638	SSF-0703	22276	0.296
96639	SSF-0704	22276	0.423
96640	SSF-0706	22276	0.501
96641	SSF-0707	22276	0.508
96642	SSF-0708	22276	0.272
96643	SSF-0709	22276	0.253
96644	SSF-0710	22276	0.286
96645	SSF-0711	22276	0.291
96646	SSF-0712	22276	0.364
96647	SSF-0713	22276	0.301
96648	SSF-0715	22276	0.477
96649	SSF-0718	22276	0.483
96650	SSF-0719	22276	0.505
96651	SSF-0720	22276	0.265
96652	SSF-0721	22276	0.344
96655	SSF-0726	22276	0.264
96656	SSF-0727	22276	0.415
96657	SSF-0728	22276	0.361
96658	SSF-0729	22276	0.449
96659	SSF-0731	22276	0.465
96660	SSF-0732	22276	0.314
96661	SSF-0172	22276	0.138
96662	SSF-0173	22276	0.443
96663	SSF-0174	DU_WWTP	0.963
96664	SSF-0175	22276	0.171

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
96665	SSF-0176	22276	0.432
96666	SSF-0177	22276	0.500
96667	SSF-0178	22276	0.454
96668	SSF-0179	22276	0.383
96669	SSF-0180	22276	0.238
96670	SSF-0181	22276	0.436
96671	SSF-0182	22276	0.202
96672	SSF-0183	22276	0.377
96673	SSF-0187	DU_WWTP	0.296
96674	SSF-0188	22276	0.539
96675	SSF-0189	22276	0.609
96676	SSF-0190	22276	0.320
96677	SSF-0191	22276	0.174
96678	SSF-0002	DU_WWTP	0.344
96679	SSF-0003	DU_WWTP	0.250
96680	SSF-0005	DU_WWTP	0.595
96681	SSF-0006	DU_WWTP	0.768
96682	SSF-0007	DU_WWTP	0.653
96683	SSF-0008	DU_WWTP	0.370
96684	SSF-0009	DU_WWTP	0.621
96685	SSF-0010	DU_WWTP	0.660
96686	SSF-0011	DU_WWTP	0.491
96687	SSF-0012	DU_WWTP	0.235
96688	SSF-0013	DU_WWTP	0.266
96689	SSF-0014	DU_WWTP	0.357
96690	SSF-0015	DU_WWTP	0.163
96691	SSF-0016	DU_WWTP	0.171
96692	SSF-0018	22276	0.297
96693	SSF-0019	22276	0.299
96694	SSF-0020	22276	0.304
96695	SSF-0021	22276	0.336
96696	SSF-0022	22276	0.367
96697	SSF-0023	22276	0.379
96698	SSF-0024	22276	0.530
96699	SSF-0025	22276	0.505
96700	SSF-0026	22276	0.624
96701	SSF-0027	22276	0.664
96702	SSF-0028	22276	0.302
96703	SSF-0029	22276	0.327
96705	SSF-0037	DU_WWTP	0.786
96706	SSF-0038	DU_WWTP	0.575
96708	SSF-0040	DU_WWTP	0.198
96709	SSF-0041	22276	0.283
96710	SSF-0042	22276	0.336

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
96711	SSF-0043	22276	0.277
96712	SSF-0044	22276	0.180
96713	SSF-0045	22276	0.290
96714	SSF-0047	22276	0.266
96715	SSF-0048	22276	0.306
96716	SSF-0050	22276	0.195
96717	SSF-0051	22276	0.486
96718	SSF-0052	22276	1.258
96719	SSF-0053	22276	0.530
96720	SSF-0054	22276	0.290
96721	SSF-0055	22276	0.417
96722	SSF-0056	22276	0.348
96723	SSF-0057	22276	0.380
96724	SSF-0058	22276	0.282
96725	SSF-0059	22276	0.274
96726	SSF-0060	22276	0.318
96727	SSF-0061	22276	0.399
96728	SSF-0062	22276	0.352
96729	SSF-0063	22276	0.336
96730	SSF-0064	22276	0.487
96731	SSF-0065	22276	0.365
96732	SSF-0068	22276	0.330
96733	SSF-0069	22276	0.498
96734	SSF-0070	22276	0.385
96735	SSF-0072	22276	0.336
96736	SSF-0073	22276	0.415
96737	SSF-0074	22276	0.446
96738	SSF-0075	11679	0.483
96739	SSF-0076	22276	0.466
96740	SSF-0077	11679	0.209
96742	SSF-1075	22276	0.413
96743	SSF-1076	22276	0.179
96744	SSF-1078	22276	0.372
96745	SSF-1079	22276	0.319
96746	SSF-1080	22276	0.323
96747	SSF-1081	22276	0.291
96748	SSF-1082	22276	0.384
96749	SSF-1083	22276	0.391
96750	SSF-1084	22276	0.293
96751	SSF-1085	22276	0.395
96752	SSF-1086	22276	0.621
96753	SSF-1087	22276	0.603
96754	SSF-1088	22276	0.467
96755	SSF-1089	22276	0.409

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
96756	SSF-1090	22276	0.763
96758	SSF-2206	DU_WWTP	0.314
96759	SSF-0017	22276	0.291
96760	SSF-2207	DU_WWTP	0.252
96762	SSF-1110	22276	0.500
96763	SSF-1111	22276	0.823
96764	SSF-1112	22276	0.605
96765	SSF-1113	22276	0.590
96766	SSF-1114	22276	0.554
96767	SSF-1115	22276	0.334
96768	SSF-1118	22276	0.813
96769	SSF-1119	22276	0.494
96770	SSF-1120	22276	0.338
96771	SSF-1121	22276	0.362
96772	SSF-1122	22276	0.448
96773	SSF-1123	22276	0.319
96774	SSF-1128	22276	0.435
96775	SSF-1129	22276	0.578
96776	SSF-1130	22276	0.348
96777	SSF-1131	22276	0.325
96778	SSF-1133	22276	0.294
96779	SSF-1134	22276	0.369
96780	SSF-1136	22276	0.366
96781	SSF-1137	22276	0.418
96782	SSF-1138	22276	0.416
96783	SSF-1140	22276	0.656
96784	SSF-1141	22276	0.597
96785	SSF-1142	22276	0.724
96786	SSF-1143	22276	0.640
96787	SSF-1144	22276	0.265
96788	SSF-1145	22276	0.719
96789	SSF-1146	22276	0.249
96790	SSF-1147	22276	0.182
96791	SSF-1148	22276	0.364
96792	SSF-1149	22276	0.277
96793	SSF-1150	22276	0.468
96794	SSF-1151	22276	0.771
96795	SSF-1152	22276	0.657
96796	SSF-1154	22276	0.486
96797	SSF-1155	DU_WWTP	0.805
96798	SSF-1156	DU_WWTP	0.529
96799	SSF-1162	DU_WWTP	0.499
96800	SSF-1163	DU_WWTP	0.542
96801	SSF-1164	DU_WWTP	0.417

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
96802	SSF-1165	DU_WWTP	0.221
96803	SSF-1166	DU_WWTP	0.419
96804	SSF-1167	DU_WWTP	0.447
96805	SSF-1168	DU_WWTP	0.232
96806	SSF-1169	DU_WWTP	0.231
96814	SSF-1461	22276	0.273
96815	SSF-1462	11719	0.198
96816	SSF-1463	22276	0.347
96817	SSF-1464	22276	0.311
96818	SSF-1465	22276	0.446
96820	SSF-1467	DU_WWTP	0.123
96821	SSF-1468	DU_WWTP	0.244
96823	SSF-1474	DU_WWTP	0.172
96824	SSF-1476	DU_WWTP	0.209
96825	SSF-1477	DU_WWTP	0.589
96826	SSF-1478	DU_WWTP	0.200
96827	SSF-1479	DU_WWTP	0.179
96828	SSF-1480	DU_WWTP	0.274
96829	SSF-1481	DU_WWTP	0.216
96830	SSF-1558	22276	0.333
96831	SSF-0791	22276	0.590
96832	SSF-0792	22276	0.346
96833	SSF-0793	22276	0.295
96834	SSF-0794	22276	0.316
96835	SSF-0795	22276	0.478
96836	SSF-0796	22276	0.385
96837	SSF-0797	22276	0.462
96838	SSF-0798	22276	0.286
96839	SSF-0805	22276	0.546
96840	SSF-0806	22276	0.205
96841	SSF-0807	22276	0.172
96842	SSF-0808	22276	0.124
96843	SSF-0809	22276	0.149
96844	SSF-0810	22276	0.454
96845	SSF-0811	22276	0.667
96846	SSF-0812	22276	0.315
96847	SSF-0813	22276	0.328
96848	SSF-0814	22276	0.424
96849	SSF-0815	22276	0.390
96850	SSF-1036	11719	0.278
96851	SSF-1037	11679	0.581
96852	SSF-1038	11679	0.442
96853	SSF-1039	11679	0.257
96854	SSF-1043	22276	0.577

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
96855	SSF-1046	22276	0.607
96856	SSF-1047	22276	0.390
96857	SSF-1049	22276	1.280
96858	SSF-1050	22276	0.847
96859	SSF-1051	22276	0.852
96860	SSF-1052	22276	0.929
96861	SSF-1053	22276	0.666
96862	SSF-1054	22276	0.421
96863	SSF-1055	22276	0.412
96864	SSF-1057	22276	0.086
96865	SSF-1058	22276	0.188
96866	SSF-1059	22276	0.443
96867	SSF-1061	22276	0.385
96869	SSF-1064	22276	0.631
96871	SSF-1068	22276	0.700
96872	SSF-1069	22276	0.460
96874	SSF-1071	DU_WWTP	0.663
96875	SSF-1072	DU_WWTP	0.658
96876	SSF-1073	22276	0.610
96877	SSF-1283	11719	0.334
96878	SSF-1285	DU_WWTP	0.536
96879	SSF-1286	DU_WWTP	0.747
96880	SSF-1290	22276	0.790
96881	SSF-1291	22276	0.716
96882	SSF-1292	22276	0.439
96883	SSF-1293	22276	0.346
96884	SSF-1294	22276	0.354
96885	SSF-1295	22276	0.256
96886	SSF-1296	22276	0.371
96887	SSF-1297	22276	0.332
96888	SSF-1298	22276	0.535
96889	SSF-1299	22276	0.410
96890	SSF-1300	22276	0.182
96891	SSF-1301	22276	0.326
96892	SSF-1302	22276	0.314
96893	SSF-1303	22276	0.270
96894	SSF-1304	22276	0.263
96895	SSF-1305	22276	0.206
96896	SSF-1306	22276	0.219
96897	SSF-1307	22276	0.506
96898	SSF-1308	22276	0.380
96899	SSF-1309	22276	0.356
96900	SSF-1310	22276	0.318
96901	SSF-1311	22276	0.402

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
96902	SSF-1312	22276	0.310
96903	SSF-1313	22276	0.940
96904	SSF-1314	22276	1.373
96905	SSF-1315	22276	0.690
96906	SSF-1316	22276	0.304
96907	SSF-1321	DU_WWTP	0.221
96908	SSF-1322	DU_WWTP	0.353
96909	SSF-1332	22276	0.339
96910	SSF-1333	22276	0.344
96911	SSF-1334	22276	0.288
96912	SSF-1335	22276	0.491
96913	SSF-1411	22276	0.435
96914	SSF-1412	22276	0.372
96915	SSF-1413	22276	0.297
96916	SSF-1414	22276	0.232
96917	SSF-1415	22276	0.337
96918	SSF-1416	22276	0.358
96919	SSF-1417	22276	0.334
96920	SSF-1418	22276	0.327
96921	SSF-1419	22276	0.269
96922	SSF-1420	22276	0.380
96923	SSF-1421	22276	0.238
96924	SSF-1422	22276	0.208
96925	SSF-1423	22276	0.277
96926	SSF-1424	22276	0.376
96927	SSF-1425	22276	0.684
96928	SSF-1426	22276	0.372
96929	SSF-1427	22276	0.417
96930	SSF-1428	22276	0.483
96931	SSF-1429	22276	0.685
96932	SSF-1430	22276	0.647
96933	SSF-1431	22276	0.336
96934	SSF-1432	22276	0.387
96935	SSF-1434	22276	0.276
96936	SSF-1435	22276	0.392
96937	SSF-1436	22276	0.361
96938	SSF-1437	22276	0.370
96939	SSF-1438	22276	0.321
96940	SSF-1439	22276	0.591
96941	SSF-1440	22276	0.278
96942	SSF-1441	22276	0.224
96943	SSF-1442	22276	0.435
96952	SSF-0568	22276	0.514
96953	SSF-0569	22276	0.601

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
96954	SSF-0570	22276	0.317
96955	SSF-0571	22276	0.416
96956	SSF-0572	22276	0.455
96957	SSF-0573	22276	0.401
96958	SSF-0574	22276	0.312
96959	SSF-0575	22276	0.411
96960	SSF-0576	22276	0.641
96961	SSF-0577	22276	0.571
96962	SSF-0578	22276	0.417
96963	SSF-0579	22276	0.314
96964	SSF-0580	22276	0.227
96965	SSF-0582	22276	0.299
96966	SSF-0583	22276	0.291
96967	SSF-0584	22276	0.258
96968	SSF-0585	22276	0.222
96969	SSF-0586	22276	0.218
96970	SSF-0587	22276	0.294
96971	SSF-0588	22276	0.304
96972	SSF-0590	22276	0.280
96982	SSF-0735	22276	0.414
96983	SSF-0736	22276	0.561
96984	SSF-0737	22276	0.480
96985	SSF-0738	22276	0.546
96986	SSF-0739	22276	0.294
96987	SSF-0740	22276	0.726
96988	SSF-0741	22276	0.544
96989	SSF-0742	22276	0.344
96990	SSF-0743	22276	0.599
96991	SSF-0745	22276	0.295
96992	SSF-0746	22276	0.464
96993	SSF-0747	22276	0.438
96994	SSF-0748	22276	0.360
96995	SSF-0749	22276	0.271
96996	SSF-0750	22276	0.224
96997	SSF-0751	22276	0.284
96998	SSF-0752	22276	0.476
96999	SSF-0753	22276	0.531
97000	SSF-0754	22276	0.517
97001	SSF-0755	22276	0.515
97002	SSF-0756	22276	0.429
97003	SSF-0757	22276	0.184
97006	SSF-0761	22276	0.430
97007	SSF-0763	22276	0.336
97008	SSF-0764	22276	0.347

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
97009	SSF-0765	22276	0.207
97010	SSF-0766	22276	0.309
97011	SSF-0767	22276	0.491
97012	SSF-0768	22276	0.339
97013	SSF-0769	22276	0.655
97014	SSF-0770	22276	0.397
97015	SSF-0771	22276	0.494
97016	SSF-0772	22276	0.352
97017	SSF-0773	22276	0.337
97018	SSF-0774	22276	0.280
97019	SSF-0775	22276	0.625
97020	SSF-0776	22276	0.313
97021	SSF-0777	22276	0.419
97022	SSF-0778	22276	0.559
97023	SSF-0786	22276	0.163
97024	SSF-0787	22276	0.575
97025	SSF-0788	22276	0.296
97026	SSF-0789	22276	0.332
97027	SSF-0790	22276	0.276
97028	SSF-1282	11719	0.336
97029	SSF-0475	22276	0.621
97030	SSF-0476	22276	0.384
97031	SSF-0477	22276	0.245
97032	SSF-0478	22276	0.484
97033	SSF-0479	22276	0.303
97051	SSF-0530	22276	0.563
97052	SSF-0531	22276	0.566
97053	SSF-0532	22276	0.401
97054	SSF-0533	22276	0.400
97055	SSF-0534	22276	0.231
97056	SSF-0535	22276	0.233
97057	SSF-0536	22276	0.630
97058	SSF-0537	22276	0.449
97059	SSF-0538	22276	0.233
97060	SSF-0539	22276	0.313
97061	SSF-0540	22276	0.311
97062	SSF-0541	22276	0.335
97063	SSF-0542	22276	0.302
97064	SSF-0543	22276	0.773
97065	SSF-0544	22276	0.287
97066	SSF-0545	22276	0.163
97067	SSF-0546	22276	0.391
97068	SSF-0547	22276	0.230
97071	SSF-0550	22276	0.756

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
97072	SSF-0551	22276	0.507
97073	SSF-2205	DU_WWTP	0.298
97074	SSF-0565	22276	0.458
97075	SSF-0566	22276	0.379
97076	SSF-0567	22276	0.223
97077	SSF-1737	DU_WWTP	0.876
97078	SSF-1738	DU_WWTP	0.646
97079	SSF-1739	DU_WWTP	0.460
97080	SSF-1741	DU_WWTP	0.557
97081	SSF-1742	DU_WWTP	0.654
97082	SSF-1743	DU_WWTP	0.792
97084	SSF-1749	DU_WWTP	0.545
97085	SSF-1754	DU_WWTP	0.424
97086	SSF-1755	DU_WWTP	0.665
97087	SSF-1758	DU_WWTP	0.849
97088	SSF-1759	DU_WWTP	0.488
97089	SSF-1760	DU_WWTP	0.467
97090	SSF-1761	DU_WWTP	0.634
97094	SSF-1765	DU_WWTP	0.735
97096	SSF-1769	DU_WWTP	0.597
97097	SSF-1770	DU_WWTP	0.283
97098	SSF-1771	DU_WWTP	0.465
97099	SSF-1772	DU_WWTP	0.703
97100	SSF-1773	DU_WWTP	0.728
97104	SSF-1845	DU_WWTP	0.502
97105	SSF-1846	DU_WWTP	0.562
97111	SSF-1853	DU_WWTP	0.561
97113	SSF-1862	DU_WWTP	0.407
97118	SSF-1867	DU_WWTP	0.309
97119	SSF-1868	22276	0.141
97121	SSF-1876	DU_WWTP	0.536
97122	SSF-1877	DU_WWTP	0.565
97123	SSF-1878	DU_WWTP	0.241
97124	SSF-1879	DU_WWTP	0.465
97125	SSF-1880	22276	0.246
97126	SSF-1881	22276	0.220
97127	SSF-0848	22276	0.187
97128	SSF-0849	22276	0.397
97129	SSF-0850	22276	0.397
97130	SSF-0851	22276	0.227
97131	SSF-0852	22276	0.255
97132	SSF-0853	22276	0.419
97133	SSF-0854	22276	0.527
97134	SSF-0855	22276	0.325

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
97135	SSF-0856	22276	0.528
97136	SSF-0857	22276	0.368
97137	SSF-0858	22276	0.549
97138	SSF-1656	DU_WWTP	0.574
97139	SSF-1657	DU_WWTP	0.431
97140	SSF-1658	DU_WWTP	0.289
97141	SSF-1659	DU_WWTP	0.440
97142	SSF-1660	DU_WWTP	0.367
97143	SSF-1661	DU_WWTP	0.454
97144	SSF-1662	DU_WWTP	0.302
97145	SSF-1663	DU_WWTP	0.236
97146	SSF-1664	DU_WWTP	0.288
97147	SSF-1665	DU_WWTP	0.238
97148	SSF-1666	DU_WWTP	0.210
97149	SSF-1667	DU_WWTP	0.408
97150	SSF-1668	DU_WWTP	0.424
97151	SSF-1669	DU_WWTP	0.272
97153	SSF-1671	DU_WWTP	0.380
97154	SSF-1684	DU_WWTP	0.389
97155	SSF-1686	DU_WWTP	0.372
97156	SSF-1687	DU_WWTP	0.625
97157	SSF-1688	DU_WWTP	0.457
97158	SSF-1689	DU_WWTP	0.209
97159	SSF-1691	DU_WWTP	0.885
97160	SSF-1692	DU_WWTP	0.350
97161	SSF-1693	DU_WWTP	0.599
97162	SSF-2590	DU_WWTP	0.341
97163	SSF-2592	DU_WWTP	0.303
97164	SSF-1695	DU_WWTP	0.518
97165	SSF-1696	DU_WWTP	0.454
97166	SSF-1697	DU_WWTP	0.323
97167	SSF-1698	DU_WWTP	0.486
97168	SSF-1699	DU_WWTP	0.442
97169	SSF-1710	DU_WWTP	0.519
97170	SSF-1711	DU_WWTP	0.278
97171	SSF-1718	DU_WWTP	0.656
97172	SSF-1719	DU_WWTP	0.232
97173	SSF-1720	DU_WWTP	0.463
97174	SSF-1721	DU_WWTP	0.261
97175	SSF-1722	DU_WWTP	0.575
97176	SSF-1723	DU_WWTP	0.255
97177	SSF-1724	DU_WWTP	0.430
97178	SSF-1725	DU_WWTP	0.291
97179	SSF-1726	DU_WWTP	0.311

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
97180	SSF-1727	DU_WWTP	0.741
97181	SSF-1728	DU_WWTP	0.528
97182	SSF-1729	DU_WWTP	0.697
97187	SSF-1735	DU_WWTP	0.848
97188	SSF-1736	DU_WWTP	0.861
97189	SSF-1643	DU_WWTP	0.239
97190	SSF-1644	DU_WWTP	0.212
97191	SSF-1645	DU_WWTP	0.235
97192	SSF-1646	DU_WWTP	0.297
97193	SSF-1647	DU_WWTP	0.408
97194	SSF-1648	DU_WWTP	0.311
97195	SSF-1649	DU_WWTP	0.297
97196	SSF-1650	DU_WWTP	0.339
97197	SSF-1651	DU_WWTP	0.468
97198	SSF-1652	DU_WWTP	0.645
97199	SSF-1653	DU_WWTP	0.343
97200	SSF-1654	DU_WWTP	0.641
97201	SSF-1927	22276	0.474
97202	SSF-1928	22276	0.395
97203	SSF-1929	22276	0.573
97204	SSF-1930	22276	0.417
97205	SSF-1931	22276	0.817
97206	SSF-1932	22276	0.374
97207	SSF-1933	22276	0.401
97209	SSF-1935	22276	0.395
97210	SSF-1936	22276	0.410
97211	SSF-1937	22276	0.493
97212	SSF-1938	22276	0.584
97213	SSF-1939	22276	0.481
97214	SSF-1941	22276	0.460
97215	SSF-1942	22276	0.331
97216	SSF-1943	22276	0.500
97217	SSF-1944	22276	1.028
97218	SSF-1945	22276	1.339
97219	SSF-1946	22276	0.297
97220	SSF-1948	22276	0.175
97221	SSF-1949	22276	0.347
97222	SSF-1950	22276	0.406
97224	SSF-1954	22276	0.695
97225	SSF-1955	22276	0.496
97226	SSF-1956	22276	0.264
97227	SSF-1957	22276	0.189
97228	SSF-1959	22276	0.647
97229	SSF-1960	22276	0.567

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
97230	SSF-1961	22276	0.725
97231	SSF-1962	DU_WWTP	0.415
97232	SSF-1963	DU_WWTP	0.338
97233	SSF-1964	DU_WWTP	0.625
97234	SSF-1965	DU_WWTP	0.378
97235	SSF-1966	DU_WWTP	0.344
97236	SSF-1967	DU_WWTP	0.602
97237	SSF-1968	DU_WWTP	0.336
97239	SSF-0830	22276	0.537
97240	SSF-0831	22276	0.481
97241	SSF-0832	22276	0.393
97242	SSF-0833	22276	0.368
97243	SSF-0834	DU_WWTP	0.567
97244	SSF-0835	22276	0.416
97245	SSF-0836	22276	0.303
97246	SSF-0837	22276	0.378
97247	SSF-0838	22276	0.400
97248	SSF-0839	22276	0.448
97249	SSF-0840	22276	0.397
97250	SSF-0841	22276	0.576
97251	SSF-0842	22276	0.496
97252	SSF-0843	22276	0.401
97253	SSF-0845	22276	0.373
97254	SSF-0847	22276	0.276
97255	SSF-1267	22276	0.656
97256	SSF-1268	22276	0.873
97257	SSF-1269	22276	0.860
97258	SSF-1270	22276	0.869
97259	SSF-1271	22276	0.850
97260	SSF-1272	22276	0.572
97261	SSF-1273	22276	0.631
97262	SSF-1274	22276	0.605
97263	SSF-1561	22276	0.672
97265	SSF-1564	DU_WWTP	0.491
97266	SSF-1565	DU_WWTP	0.497
97267	SSF-1566	DU_WWTP	0.351
97268	SSF-1567	22276	0.528
97269	SSF-1568	22276	0.323
97271	SSF-1572	DU_WWTP	0.249
97272	SSF-1573	DU_WWTP	0.327
97274	SSF-1576	DU_WWTP	0.259
97275	SSF-1577	DU_WWTP	0.626
97276	SSF-1578	DU_WWTP	0.250
97277	SSF-1579	DU_WWTP	0.398

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
97278	SSF-1580	DU_WWTP	0.258
97286	SSF-1947	22276	0.261
97287	SSF-1588	DU_WWTP	0.296
97288	SSF-1589	DU_WWTP	0.292
97289	SSF-1590	DU_WWTP	0.268
97290	SSF-1591	DU_WWTP	0.213
97291	SSF-1592	DU_WWTP	0.279
97292	SSF-1593	DU_WWTP	0.165
97293	SSF-1594	DU_WWTP	0.149
97294	SSF-1595	DU_WWTP	0.267
97295	SSF-1596	DU_WWTP	0.318
97296	SSF-1597	DU_WWTP	0.287
97297	SSF-1598	DU_WWTP	0.313
97298	SSF-1599	DU_WWTP	0.274
97299	SSF-1600	DU_WWTP	0.342
97300	SSF-1601	DU_WWTP	0.310
97301	SSF-1602	DU_WWTP	0.339
97302	SSF-1603	DU_WWTP	0.330
97303	SSF-1606	DU_WWTP	0.458
97304	SSF-1607	DU_WWTP	0.517
97305	SSF-1608	DU_WWTP	0.232
97306	SSF-1609	DU_WWTP	0.387
97310	SSF-1625	22276	0.456
97311	SSF-1626	22276	0.606
97312	SSF-1627	22276	0.488
97313	SSF-1628	22276	0.484
97314	SSF-1629	22276	0.685
97315	SSF-1630	22276	0.355
97316	SSF-1266	22276	0.353
97317	SSF-1631	22276	0.234
97318	SSF-1632	22276	0.622
97319	SSF-1633	22276	0.283
97320	SSF-1634	DU_WWTP	0.378
97321	SSF-1635	DU_WWTP	0.240
97322	SSF-1636	DU_WWTP	0.243
97325	SSF-1639	DU_WWTP	0.333
97326	SSF-1640	DU_WWTP	0.550
97327	SSF-1641	DU_WWTP	0.652
97328	SSF-1642	DU_WWTP	0.382
97329	SSF-1175	22276	0.187
97330	SSF-1176	22276	0.210
97332	SSF-1178	22276	0.457
97333	SSF-1179	22276	0.292
97334	SSF-1180	22276	0.242

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
97335	SSF-1181	22276	0.175
97336	SSF-1186	22276	0.350
97337	SSF-1189	22276	0.371
97338	SSF-1190	22276	0.738
97339	SSF-1191	22276	0.343
97340	SSF-1192	22276	0.450
97341	SSF-1193	22276	0.418
97342	SSF-1195	22276	0.352
97343	SSF-1196	22276	0.267
97344	SSF-1197	22276	0.280
97345	SSF-1198	22276	0.314
97346	SSF-1199	22276	0.258
97347	SSF-1200	22276	0.527
97348	SSF-1201	22276	0.611
97349	SSF-1210	22276	0.604
97350	SSF-1212	22276	0.672
97351	SSF-1213	22276	0.536
97352	SSF-1214	22276	0.569
97353	SSF-1215	22276	0.682
97354	SSF-1216	22276	0.441
97355	SSF-1229	DU_WWTP	0.335
97356	SSF-1230	DU_WWTP	0.235
97357	SSF-1231	DU_WWTP	0.092
97358	SSF-1233	22276	0.647
97359	SSF-1234	22276	0.413
97360	SSF-1235	22276	0.628
97361	SSF-1236	22276	0.881
97362	SSF-2208	DU_WWTP	0.245
97363	SSF-1240	22276	0.427
97364	SSF-1241	22276	0.389
97365	SSF-1242	22276	0.279
97366	SSF-1243	22276	0.307
97367	SSF-1244	22276	0.359
97368	SSF-1245	22276	0.350
97369	SSF-1246	22276	0.569
97370	SSF-1247	22276	0.284
97371	SSF-1248	22276	0.449
97372	SSF-1249	22276	0.473
97373	SSF-1250	22276	0.538
97374	SSF-1251	22276	0.553
97375	SSF-1252	22276	0.475
97376	SSF-1253	22276	0.268
97377	SSF-1254	22276	0.330
97378	SSF-1255	22276	0.301

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
97380	SSF-1257	22276	0.191
97381	SSF-1258	22276	0.230
97382	SSF-1259	22276	0.270
97383	SSF-1260	22276	0.267
97384	SSF-1261	22276	0.272
97385	SSF-1262	22276	0.315
97386	SSF-1263	22276	0.314
97387	SSF-1374	22276	0.204
97388	SSF-1375	22276	0.336
97389	SSF-1376	22276	0.389
97390	SSF-1377	22276	0.577
97391	SSF-1378	22276	0.336
97392	SSF-1379	22276	0.276
97393	SSF-1380	22276	0.329
97394	SSF-1381	22276	0.392
97395	SSF-1382	22276	0.343
97396	SSF-1388	11719	0.511
97397	SSF-1389	11719	0.444
97398	SSF-1400	22276	0.427
97399	SSF-1401	22276	0.483
97400	SSF-1402	22276	0.526
97401	SSF-1403	22276	0.385
97402	SSF-1405	22276	0.568
97403	SSF-1406	22276	0.303
97404	SSF-1407	22276	0.293
97405	SSF-1408	22276	0.520
97406	SSF-1409	22276	0.273
97407	SSF-1410	22276	0.369
97408	SSF-1483	11719	0.370
97409	SSF-1484	DU_WWTP	0.195
97410	SSF-1485	DU_WWTP	0.602
97411	SSF-1486	DU_WWTP	0.282
97412	SSF-1487	DU_WWTP	0.360
97413	SSF-1488	22276	0.224
97415	SSF-1491	DU_WWTP	0.425
97416	SSF-1492	DU_WWTP	0.439
97417	SSF-1493	DU_WWTP	0.300
97418	SSF-1494	DU_WWTP	0.167
97419	SSF-1495	DU_WWTP	0.258
97420	SSF-1496	DU_WWTP	0.438
97421	SSF-1497	22276	0.271
97422	SSF-1498	22276	0.259
97423	SSF-1499	DU_WWTP	0.233
97424	SSF-1500	22276	0.190

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
97427	SSF-1503	22276	0.253
97432	SSF-1510	DU_WWTP	0.464
97433	SSF-1511	DU_WWTP	0.340
97434	SSF-1512	DU_WWTP	0.239
97435	SSF-1513	DU_WWTP	0.348
97436	SSF-1514	DU_WWTP	0.110
97437	SSF-1515	DU_WWTP	0.358
97438	SSF-1516	DU_WWTP	0.408
97439	SSF-1517	DU_WWTP	0.322
97440	SSF-1518	DU_WWTP	0.253
97441	SSF-1519	DU_WWTP	0.202
97442	SSF-1520	DU_WWTP	0.279
97443	SSF-1521	DU_WWTP	0.298
97444	SSF-1522	DU_WWTP	0.161
97445	SSF-1523	DU_WWTP	0.161
97446	SSF-1524	DU_WWTP	0.106
97447	SSF-1525	DU_WWTP	0.109
97448	SSF-1526	DU_WWTP	0.221
97449	SSF-1527	DU_WWTP	0.165
97450	SSF-1528	DU_WWTP	0.209
97451	SSF-1529	DU_WWTP	0.193
97452	SSF-1531	22276	0.316
97453	SSF-1532	22276	0.186
97454	SSF-1533	22276	0.200
97455	SSF-1534	22276	0.151
97456	SSF-1535	22276	0.333
97457	SSF-1536	22276	0.331
97458	SSF-1537	22276	0.828
97459	SSF-1538	22276	0.337
97460	SSF-1539	22276	0.462
97461	SSF-1540	22276	0.563
97462	SSF-1541	22276	0.575
97463	SSF-0980	22276	0.660
97464	SSF-0981	22276	0.814
97465	SSF-0982	22276	0.554
97466	SSF-0983	22276	0.438
97467	SSF-0984	22276	0.611
97468	SSF-0985	22276	0.545
97470	SSF-0988	22276	0.412
97471	SSF-0989	22276	0.315
97472	SSF-0990	22276	0.261
97473	SSF-0991	22276	0.283
97474	SSF-0992	22276	0.526
97475	SSF-0993	22276	0.283

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
97476	SSF-0994	22276	0.710
97477	SSF-0995	22276	0.348
97478	SSF-0996	22276	0.414
97479	SSF-0997	22276	0.420
97480	SSF-0998	22276	0.261
97481	SSF-0999	22276	0.447
97482	SSF-1000	22276	0.546
97483	SSF-1001	22276	0.453
97484	SSF-1002	22276	0.508
97485	SSF-1003	22276	0.405
97486	SSF-1004	22276	0.570
97487	SSF-1005	22276	0.807
97488	SSF-1006	22276	0.481
97489	SSF-1007	22276	0.449
97490	SSF-1008	22276	0.627
97491	SSF-1009	22276	0.508
97492	SSF-1010	22276	0.354
97493	SSF-1011	22276	0.278
97494	SSF-1015	22276	0.683
97495	SSF-1016	22276	1.328
97496	SSF-1017	22276	0.591
97497	SSF-1018	22276	0.769
97498	SSF-1019	22276	0.834
97499	SSF-1020	22276	0.646
97500	SSF-1021	22276	0.960
97501	SSF-1022	22276	0.284
97502	SSF-1023	22276	0.436
97504	SSF-1026	11679	0.590
97505	SSF-1027	11679	0.816
97506	SSF-1029	11719	0.257
97507	SSF-1030	11719	0.321
97508	SSF-1031	11719	0.681
97509	SSF-1032	11719	0.372
97510	SSF-1033	11719	0.229
97511	SSF-1034	11719	0.285
97512	SSF-1035	11719	0.301
97513	SSF-2193	DU_WWTP	0.235
97514	SSF-2194	DU_WWTP	0.381
97515	SSF-1336	22276	0.454
97516	SSF-1337	22276	0.425
97517	SSF-1338	22276	0.388
97518	SSF-1353	DU_WWTP	0.421
97519	SSF-1354	DU_WWTP	0.486
97520	SSF-1355	DU_WWTP	0.571

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
97524	SSF-1359	DU_WWTP	0.250
97525	SSF-1360	DU_WWTP	0.465
97526	SSF-1361	DU_WWTP	0.484
97527	SSF-1362	DU_WWTP	0.217
97528	SSF-1363	DU_WWTP	0.336
97529	SSF-1364	DU_WWTP	0.483
97533	SSF-1368	DU_WWTP	0.395
97534	SSF-1369	DU_WWTP	0.230
97535	SSF-1370	22276	0.340
97536	SSF-1371	DU_WWTP	0.546
97537	SSF-1372	DU_WWTP	0.313
97538	SSF-1373	22276	0.468
97540	SSF-0894	22276	0.164
97541	SSF-0895	22276	0.246
97542	SSF-0896	22276	0.300
97543	SSF-0897	22276	0.306
97544	SSF-0899	22276	0.395
97545	SSF-0900	22276	0.449
97546	SSF-0901	22276	0.428
97547	SSF-0902	22276	0.178
97548	SSF-0903	22276	0.443
97549	SSF-0904	22276	0.285
97550	SSF-0905	22276	0.616
97551	SSF-0906	22276	0.374
97552	SSF-0907	22276	0.268
97553	SSF-0908	22276	0.863
97554	SSF-0909	22276	0.868
97555	SSF-0910	22276	0.876
97558	SSF-0912	22276	0.565
97559	SSF-0913	22276	0.443
97560	SSF-0914	22276	0.652
97561	SSF-0915	22276	0.713
97562	SSF-0917	22276	0.346
97563	SSF-0918	22276	0.466
97564	SSF-0919	22276	0.250
97565	SSF-0920	22276	0.537
97566	SSF-0921	22276	0.221
97567	SSF-0922	22276	0.458
97568	SSF-0923	22276	0.386
97569	SSF-0924	22276	0.396
97570	SSF-0925	22276	0.194
97571	SSF-0926	22276	0.454
97572	SSF-0927	22276	0.225
97573	SSF-0928	22276	0.551

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
97574	SSF-0929	22276	1.036
97575	SSF-0930	22276	0.487
97576	SSF-0931	22276	0.414
97577	SSF-0932	22276	0.303
97595	SSF-0950	22276	0.637
97596	SSF-0951	22276	0.694
97597	SSF-0952	22276	0.259
97598	SSF-0953	22276	0.512
97599	SSF-0954	22276	0.274
97600	SSF-0959	DU_WWTP	0.474
97601	SSF-0960	DU_WWTP	0.612
97602	SSF-0961	22276	0.635
97603	SSF-0962	22276	0.851
97604	SSF-0963	22276	0.509
97605	SSF-0964	22276	0.238
97606	SSF-0965	22276	0.286
97607	SSF-0966	22276	0.252
97608	SSF-0967	22276	0.340
97609	SSF-0968	22276	0.295
97610	SSF-0969	22276	0.344
97611	SSF-0970	22276	0.360
97612	SSF-0971	22276	0.414
97613	SSF-0972	22276	0.270
97614	SSF-0973	22276	0.397
97615	SSF-0974	22276	0.403
97616	SSF-0975	22276	0.307
97617	SSF-0976	22276	0.431
97618	SSF-0977	22276	0.332
97619	SSF-0978	22276	0.903
97620	SSF-0979	22276	0.479
97621	SSF-0605	22276	0.372
97622	SSF-0606	22276	0.330
97625	SSF-0619	22276	0.470
97626	SSF-0620	22276	0.564
97627	SSF-0621	22276	0.595
97628	SSF-0622	22276	0.556
97629	SSF-0629	22276	0.773
97630	SSF-0630	22276	0.428
97631	SSF-0631	22276	0.744
97632	SSF-0632	22276	0.225
97633	SSF-0633	22276	0.448
97634	SSF-0634	22276	0.540
97635	SSF-0635	22276	0.407
97636	SSF-0636	22276	0.311

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
97637	SSF-0637	22276	0.360
97638	SSF-0638	22276	0.473
97639	SSF-0639	22276	0.263
97640	SSF-0640	22276	0.491
97641	SSF-0641	22276	0.423
97642	SSF-0642	22276	0.398
97643	SSF-0643	22276	0.517
97644	SSF-0644	22276	0.619
97645	SSF-0645	22276	0.454
97646	SSF-0646	22276	0.386
97647	SSF-0647	22276	0.154
97648	SSF-0648	22276	0.211
97649	SSF-0649	22276	0.216
97650	SSF-0650	22276	0.318
97651	SSF-0653	22276	0.284
97652	SSF-0654	22276	0.183
97653	SSF-0655	22276	0.576
97654	SSF-0656	22276	0.376
97655	SSF-0657	22276	0.313
97656	SSF-0659	22276	0.786
97657	SSF-0660	22276	0.607
97658	SSF-0661	22276	0.322
97659	SSF-0662	22276	0.297
97660	SSF-0663	22276	0.302
97663	SSF-0816	22276	0.237
97664	SSF-0817	22276	0.190
97665	SSF-0818	22276	0.466
97666	SSF-0819	22276	0.215
97667	SSF-0859	22276	0.208
97668	SSF-0860	22276	0.265
97669	SSF-0861	22276	0.402
97670	SSF-0862	22276	0.277
97671	SSF-0863	22276	0.216
97672	SSF-0864	22276	0.428
97673	SSF-0865	22276	0.269
97674	SSF-0866	22276	0.448
97675	SSF-0867	22276	0.445
97676	SSF-0868	22276	0.453
97677	SSF-0869	22276	0.321
97678	SSF-0870	22276	0.283
97679	SSF-0871	22276	0.222
97680	SSF-0872	22276	0.153
97681	SSF-0874	DU_WWTP	0.384
97682	SSF-0604	22276	0.314

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
97683	SSF-1904	22276	0.560
97684	SSF-1905	DU_WWTP	0.483
97685	SSF-1906	DU_WWTP	0.927
97686	SSF-1907	DU_WWTP	0.402
97687	SSF-1969	DU_WWTP	0.764
97688	SSF-1970	DU_WWTP	0.503
97689	SSF-1971	DU_WWTP	0.349
97690	SSF-1972	DU_WWTP	0.352
97691	SSF-1974	DU_WWTP	0.503
97692	SSF-1975	DU_WWTP	0.350
97693	SSF-1976	DU_WWTP	0.272
97694	SSF-1977	DU_WWTP	0.342
97695	SSF-0623	22276	0.451
97696	SSF-1978	DU_WWTP	0.463
97697	SSF-1979	DU_WWTP	0.501
97698	SSF-1980	DU_WWTP	0.305
97699	SSF-1981	DU_WWTP	0.450
97700	SSF-1982	DU_WWTP	0.466
97701	SSF-1983	DU_WWTP	0.476
97702	SSF-1984	DU_WWTP	0.323
97703	SSF-1985	DU_WWTP	0.334
97706	SSF-2139	DU_WWTP	0.510
97707	SSF-2140	DU_WWTP	0.846
97708	SSF-2153	22276	0.263
97709	SSF-2154	22276	0.174
97710	SSF-2155	22276	0.218
97711	SSF-2156	22276	0.504
97712	SSF-2157	22276	0.256
97713	SSF-2158	22276	0.271
97714	SSF-2159	22276	0.247
97715	SSF-2160	22276	0.268
97716	SSF-2161	22276	0.369
97717	SSF-2162	22276	0.503
97718	SSF-2163	22276	0.713
97719	SSF-2165	22276	0.284
97720	SSF-2167	DU_WWTP	0.367
97721	SSF-2169	DU_WWTP	0.330
97722	SSF-2170	DU_WWTP	0.491
97723	SSF-2171	DU_WWTP	0.573
97724	SSF-2172	22276	0.615
97725	SSF-2173	22276	0.399
97726	SSF-2174	22276	0.695
97727	SSF-2175	22276	0.644
97728	SSF-2176	22276	0.303

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
97729	SSF-2177	22276	0.500
97730	SSF-2178	22276	0.305
97731	SSF-2179	22276	0.297
97732	SSF-2180	22276	0.443
97733	SSF-2181	22276	0.263
97734	SSF-2182	22276	0.292
97735	SSF-2191	DU_WWTP	0.152
97736	SSF-2192	DU_WWTP	0.208
97737	SSF-2211	22276	0.298
97738	SSF-2212	22276	0.283
97739	SSF-2213	22276	0.269
97740	SSF-0591	22276	0.280
97741	SSF-0592	22276	0.310
97742	SSF-0593	22276	0.426
97743	SSF-0594	22276	0.516
97744	SSF-0595	22276	0.385
97745	SSF-0596	22276	0.585
97746	SSF-0597	22276	0.554
97747	SSF-0598	22276	0.370
97748	SSF-0599	22276	0.371
97749	SSF-0600	22276	0.263
97750	SSF-0601	22276	0.233
97751	SSF-0602	22276	0.474
97752	SSF-0603	22276	0.404
97754	SSF-2089	DU_WWTP	0.352
97755	SSF-2090	DU_WWTP	0.212
97756	SSF-2095	DU_WWTP	0.454
97757	SSF-2096	DU_WWTP	0.738
97758	SSF-2097	DU_WWTP	0.518
97759	SSF-2098	DU_WWTP	0.329
97760	SSF-2099	DU_WWTP	0.306
97761	SSF-2100	DU_WWTP	0.309
97762	SSF-2101	DU_WWTP	0.135
97763	SSF-2102	DU_WWTP	0.079
97764	SSF-2103	DU_WWTP	0.375
97765	SSF-2104	DU_WWTP	0.346
97766	SSF-2105	DU_WWTP	0.443
97767	SSF-2106	DU_WWTP	0.251
97778	SSF-2117	DU_WWTP	0.332
97786	SSF-2126	22276	0.222
97787	SSF-2129	22276	0.316
97788	SSF-2130	22276	0.351
97789	SSF-2131	22276	0.210
97790	SSF-2132	22276	0.347

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
97791	SSF-2133	22276	0.592
97792	SSF-2134	22276	0.333
97793	SSF-2184	DU_WWTP	0.288
97794	SSF-2185	DU_WWTP	0.298
97795	SSF-2186	22276	0.177
97796	SSF-2187	22276	0.340
97797	SSF-2188	22276	0.049
97798	SSF-2562	22276	0.231
97799	SSF-2195	DU_WWTP	0.637
97800	SSF-2196	DU_WWTP	0.398
97801	SSF-2197	DU_WWTP	0.351
97802	SSF-2198	DU_WWTP	0.329
97803	SSF-2199	DU_WWTP	0.264
97804	SSF-2200	DU_WWTP	0.302
97805	SSF-2201	DU_WWTP	0.251
97806	SSF-2202	DU_WWTP	0.247
97807	SSF-1995	DU_WWTP	0.250
97808	SSF-1996	DU_WWTP	0.241
97809	SSF-1997	DU_WWTP	0.260
97810	SSF-1998	DU_WWTP	0.216
97811	SSF-1999	DU_WWTP	0.309
97812	SSF-2000	DU_WWTP	0.283
97813	SSF-2001	DU_WWTP	0.279
97814	SSF-2002	DU_WWTP	0.255
97815	SSF-2003	DU_WWTP	0.300
97816	SSF-2010	22276	0.326
97817	SSF-2013	DU_WWTP	0.182
97818	SSF-2016	22276	0.404
97819	SSF-2020	22276	0.164
97820	SSF-2021	22276	0.199
97821	SSF-2022	DU_WWTP	0.232
97822	SSF-2023	22276	0.735
97823	SSF-2024	22276	0.647
97824	SSF-2025	22276	0.653
97825	SSF-2026	22276	0.989
97826	SSF-2027	22276	1.004
97827	SSF-2033	22276	0.746
97828	SSF-2034	22276	0.468
97829	SSF-2053	DU_WWTP	0.294
97830	SSF-2054	DU_WWTP	0.222
97831	SSF-2055	DU_WWTP	0.403
97832	SSF-2056	DU_WWTP	0.370
97833	SSF-2057	DU_WWTP	0.291
97834	SSF-2058	DU_WWTP	0.317

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
97835	SSF-2059	DU_WWTP	0.387
97836	SSF-2060	DU_WWTP	0.315
97837	SSF-2061	DU_WWTP	0.291
97838	SSF-2062	DU_WWTP	0.478
97839	SSF-2063	DU_WWTP	0.235
97840	SSF-2064	DU_WWTP	0.158
97841	SSF-2065	DU_WWTP	0.050
97842	SSF-2066	DU_WWTP	0.348
97843	SSF-2067	DU_WWTP	0.584
97844	SSF-2068	DU_WWTP	0.495
97845	SSF-2069	DU_WWTP	0.353
97846	SSF-2070	DU_WWTP	0.788
97847	SSF-2071	DU_WWTP	0.588
97848	SSF-2072	DU_WWTP	0.316
97849	SSF-2073	DU_WWTP	0.731
97850	SSF-2074	DU_WWTP	0.595
97851	SSF-2075	DU_WWTP	0.289
97852	SSF-1994	DU_WWTP	0.357
97853	SSF-2076	DU_WWTP	0.463
97854	NoMatch	DU_WWTP	0.117
97855	SSF-2077	DU_WWTP	0.244
97856	SSF-2078	DU_WWTP	0.217
97857	SSF-2079	DU_WWTP	0.281
97858	SSF-2080	DU_WWTP	0.406
97859	SSF-2081	DU_WWTP	0.260
97860	SSF-2082	DU_WWTP	0.351
97861	SSF-2083	DU_WWTP	0.293
97862	SSF-2084	DU_WWTP	0.174
97863	SSF-2085	DU_WWTP	0.321
97864	SSF-2086	DU_WWTP	0.186
97865	SSF-2087	DU_WWTP	0.426
97866	SSF-2088	DU_WWTP	0.508
97867	SSF-1542	22276	0.271
97868	SSF-1545	22276	0.182
97869	SSF-1546	22276	0.277
97870	SSF-1547	22276	0.490
97871	SSF-1550	22276	0.243
97872	SSF-1551	22276	0.266
97873	SSF-1552	22276	0.553
97874	SSF-1553	22276	0.463
97875	SSF-1554	22276	0.261
97876	SSF-1555	22276	0.305
97877	SSF-1774	DU_WWTP	0.499
97878	SSF-1775	DU_WWTP	0.370

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
97879	SSF-1778	DU_WWTP	1.109
97880	SSF-1779	DU_WWTP	0.634
97881	SSF-1780	DU_WWTP	0.782
97882	SSF-1781	DU_WWTP	0.754
97883	SSF-1783	DU_WWTP	0.454
97884	SSF-2396	DU_WWTP	0.211
97887	SSF-1786	DU_WWTP	0.368
97888	SSF-1787	DU_WWTP	0.401
97889	SSF-1789	DU_WWTP	0.819
97890	SSF-1790	DU_WWTP	0.414
97891	SSF-1792	DU_WWTP	0.899
97892	SSF-1793	DU_WWTP	0.547
97893	SSF-1801	DU_WWTP	0.762
97894	SSF-1802	DU_WWTP	0.417
97895	SSF-1803	DU_WWTP	1.034
97898	SSF-1807	DU_WWTP	0.415
97899	SSF-1808	DU_WWTP	0.731
97900	SSF-1809	DU_WWTP	1.280
97901	SSF-1810	DU_WWTP	0.640
97902	SSF-1811	DU_WWTP	0.453
97903	SSF-1812	DU_WWTP	0.640
97905	SSF-1814	DU_WWTP	1.005
97906	SSF-1817	DU_WWTP	0.746
97907	SSF-1818	DU_WWTP	0.803
97908	SSF-1819	DU_WWTP	0.891
97909	SSF-1820	DU_WWTP	0.973
97910	SSF-1821	DU_WWTP	0.729
97911	SSF-1822	DU_WWTP	0.218
97912	SSF-1823	DU_WWTP	0.437
97913	SSF-1824	DU_WWTP	0.445
97914	SSF-1831	DU_WWTP	0.345
97915	SSF-1832	DU_WWTP	0.454
97916	SSF-1833	DU_WWTP	0.451
97917	SSF-1834	DU_WWTP	0.692
97918	SSF-1835	DU_WWTP	0.498
97919	SSF-1836	DU_WWTP	0.355
97920	SSF-1838	DU_WWTP	0.806
97921	SSF-1840	DU_WWTP	0.446
97922	SSF-1841	DU_WWTP	0.173
97929	SSF-1394	11719	0.400
97930	SSF-1395	11719	0.378
97931	SSF-1396	11719	0.552
97932	SSF-1397	11719	0.450
97933	SSF-1398	11719	0.193

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
97934	SSF-1399	11719	0.660
97935	SSF-1828	DU_WWTP	0.602
97936	SSF-1829	DU_WWTP	0.395
97937	SSF-2036	DU_WWTP	0.657
97938	SSF-2037	DU_WWTP	0.669
97939	SSF-2038	DU_WWTP	0.283
97940	SSF-2039	DU_WWTP	0.351
97941	SSF-2040	11719	0.439
97942	SSF-2041	11719	0.610
97943	SSF-2042	11719	0.397
97944	SSF-2043	11719	0.367
97945	SSF-2044	11719	0.868
97946	SSF-2045	11719	0.598
97947	SSF-2046	11719	0.373
97948	SSF-2047	11719	0.483
97949	SSF-2048	11719	0.455
97950	SSF-2051	11719	0.742
97951	SSF-1605	DU_WWTP	0.434
97952	SSF-1390	11719	0.300
97957	SSF-1041	11679	0.495
97958	SSF-0846	22276	0.391
97959	SSF-1890	DU_WWTP	0.563
97960	SSF-1891	DU_WWTP	0.647
97961	SSF-1892	DU_WWTP	0.868
97962	SSF-1893	DU_WWTP	0.474
97963	SSF-1894	DU_WWTP	0.404
97964	SSF-1895	DU_WWTP	0.666
97965	SSF-1896	DU_WWTP	0.349
97966	SSF-1897	DU_WWTP	0.752
97967	SSF-1898	DU_WWTP	0.923
97968	SSF-1331	11719	0.477
97969	SSF-2189	11719	0.201
97970	SSF-2190	11719	0.186
97971	SSF-1105	DU_WWTP	0.351
97972	SSF-1106	DU_WWTP	0.880
97973	SSF-1108	DU_WWTP	0.313
97974	SSF-1109	DU_WWTP	0.567
97975	SSF-1171	11719	0.549
97976	SSF-1172	11719	0.327
97977	SSF-1174	11719	0.290
97978	SSF-1217	DU_WWTP	0.514
97979	SSF-1218	DU_WWTP	0.582
97980	SSF-1219	DU_WWTP	0.490
97981	SSF-1220	DU_WWTP	0.252

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
97982	SSF-1232	11719	0.688
97983	SSF-1237	11719	0.342
97984	SSF-1238	11719	0.597
97985	SSF-1713	DU_WWTP	0.472
97986	SSF-1714	DU_WWTP	0.758
97987	SSF-1715	DU_WWTP	0.639
97988	SSF-1716	DU_WWTP	0.373
97989	SSF-1717	DU_WWTP	0.375
97990	SSF-1744	DU_WWTP	0.846
97991	SSF-1745	DU_WWTP	0.465
97992	SSF-1854	DU_WWTP	0.795
97993	SSF-1855	DU_WWTP	0.622
97994	SSF-1856	DU_WWTP	0.625
97995	SSF-1857	DU_WWTP	0.362
97996	SSF-1882	11719	0.400
97997	SSF-1883	11719	0.214
97998	SSF-1884	DU_WWTP	0.271
97999	SSF-1885	DU_WWTP	0.554
98000	SSF-1886	DU_WWTP	0.522
98001	SSF-1887	DU_WWTP	0.563
98002	SSF-1888	DU_WWTP	0.709
98003	SSF-1889	DU_WWTP	0.763
98004	SSF-1899	DU_WWTP	0.655
98005	SSF-1900	DU_WWTP	0.525
98006	SSF-1901	DU_WWTP	0.332
98007	SSF-1902	DU_WWTP	0.491
98008	SSF-1903	DU_WWTP	0.562
98009	SSF-2141	DU_WWTP	0.357
98010	SSF-2142	11719	0.258
98012	SSF-2145	11719	0.287
98013	SSF-2146	11719	0.138
98014	SSF-2147	11719	0.130
98017	SSF-2150	DU_WWTP	0.132
98018	SSF-2151	DU_WWTP	0.198
98019	SSF-2152	DU_WWTP	0.145
98020	SSF-0892	DU_WWTP	0.590
98021	SSF-0893	DU_WWTP	0.559
98022	SSF-1012	DU_WWTP	0.225
98023	SSF-1013	DU_WWTP	0.218
98024	SSF-1014	DU_WWTP	0.207
98025	SSF-1339	11719	0.335
98026	SSF-1340	11719	0.635
98027	SSF-1341	11719	0.166
98028	SSF-1342	11719	0.617

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
98029	SSF-1343	11719	0.284
98030	SSF-1344	11719	0.348
98031	SSF-1345	11719	0.161
98032	SSF-1346	11719	0.169
98033	SSF-1347	11719	0.311
98034	SSF-1348	11719	0.610
98035	SSF-1349	11719	0.866
98036	SSF-1350	11719	0.366
98037	SSF-1351	11719	0.271
98038	SSF-1352	11719	0.353
98039	SSF-1383	11719	0.501
98040	SSF-1384	11719	0.440
98041	SSF-1385	11719	0.327
98042	SSF-1386	11719	0.651
98043	SSF-1387	11719	0.873
98044	SSF-1391	11719	0.643
98045	SSF-1392	11719	0.542
98046	SSF-1393	11719	0.247
98047	SSF-1328	11719	0.542
98048	SSF-0275	DU_WWTP	0.448
98049	SSF-0276	DU_WWTP	0.542
98050	SSF-0277	DU_WWTP	0.652
98051	SSF-0278	DU_WWTP	0.667
98052	SSF-0279	DU_WWTP	0.669
98053	SSF-0280	DU_WWTP	0.378
98054	SSF-0281	DU_WWTP	0.562
98055	SSF-0282	DU_WWTP	0.520
98056	SSF-0309	DU_WWTP	0.651
98057	SSF-0310	DU_WWTP	0.439
98058	SSF-0311	DU_WWTP	0.361
98059	SSF-0312	DU_WWTP	0.308
98061	SSF-0779	DU_WWTP	0.448
98062	SSF-0780	DU_WWTP	0.702
98063	SSF-0781	DU_WWTP	0.354
98064	SSF-0782	DU_WWTP	0.353
98065	SSF-0785	DU_WWTP	0.332
98066	SSF-1287	DU_WWTP	0.489
98067	SSF-1288	DU_WWTP	0.288
98068	SSF-1289	DU_WWTP	0.361
98069	SSF-1317	11719	0.558
98070	SSF-1318	11719	0.358
98072	SSF-1320	11719	0.307
98073	SSF-1323	11719	0.501
98074	SSF-1324	11719	0.741

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
98075	SSF-1325	11719	0.649
98076	SSF-1326	11719	0.626
98077	SSF-1327	11719	0.379
98078	SSF-1329	11719	0.399
98079	SSF-1330	11719	0.270
98083	SSF-0118	22276	0.231
98084	SSF-0124	22276	0.226
98085	SSF-0158	DU_WWTP	0.285
98087	SSF-0049	22276	0.216
98090	SSF-0071	22276	0.224
98098	SSF-0733	22276	0.216
98105	SSF-0273	22276	0.332
98106	NoMatch	DU_WWTP	0.201
98121	SSF-0403	22276	0.251
98123	SSF-0434	22276	0.213
98125	SSF-0589	22276	0.261
98128	SSF-0744	22276	0.208
98129	SSF-0783	DU_WWTP	0.222
98130	SSF-0784	DU_WWTP	0.252
98131	SSF-1433	22276	0.132
98132	SSF-1475	DU_WWTP	0.131
98133	SSF-1482	DU_WWTP	0.126
98136	SSF-0801	22276	0.307
98137	SSF-0802	22276	0.319
98138	SSF-0803	22276	0.343
98140	SSF-1056	22276	0.229
98141	SSF-1077	22276	0.234
98142	SSF-1107	DU_WWTP	0.490
98143	SSF-1116	22276	0.216
98144	SSF-1117	22276	0.319
98145	SSF-1132	22276	0.250
98146	SSF-1135	22276	0.274
98147	SSF-1139	22276	0.293
98148	SSF-1170	DU_WWTP	0.371
98149	SSF-1182	22276	0.227
98151	SSF-1194	22276	0.266
98152	SSF-1211	22276	0.241
98153	SSF-1264	22276	0.233
98154	SSF-1265	22276	0.272
98155	SSF-2214	22276	0.220
98157	SSF-1604	DU_WWTP	0.214
98159	SSF-1940	22276	0.273
98160	SSF-1953	22276	0.149
98162	SSF-0844	22276	0.186

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
98163	SSF-1655	DU_WWTP	0.200
98164	SSF-1740	DU_WWTP	0.171
98165	SSF-1766	DU_WWTP	0.133
98166	SSF-1767	DU_WWTP	0.407
98167	SSF-2364	DU_WWTP	0.353
98168	SSF-1852	DU_WWTP	0.451
98175	SSF-2338	DU_WWTP	0.399
98178	SSF-2164	22276	0.190
98179	SSF-2166	22276	0.239
98180	SSF-2183	DU_WWTP	0.181
98181	SSF-2209	22276	0.158
98182	SSF-2210	22276	0.197
98183	SSF-0651	22276	0.302
98184	SSF-0652	22276	0.245
98185	SSF-0658	22276	0.227
98186	SSF-0898	22276	0.165
98187	SSF-0916	22276	0.209
98190	SSF-0958	22276	0.277
98192	SSF-1404	22276	0.135
98194	SSF-1504	22276	0.161
98195	SSF-1530	DU_WWTP	0.242
98198	SSF-2585	DU_WWTP	0.205
98203	SSF-2203	DU_WWTP	0.212
99950	SSF-2476	DU_WWTP	0.162
99958	SSF-2490	DU_WWTP	0.230
99960	SSF-2486	DU_WWTP	0.214
99962	SSF-2487	DU_WWTP	0.243
99964	SSF-2489	DU_WWTP	0.229
99970	SSF-2419	DU_WWTP	0.717
99972	SSF-2420	DU_WWTP	0.561
99974	SSF-2422	DU_WWTP	0.213
99976	SSF-2421	DU_WWTP	0.174
99986	SSF-2467	DU_WWTP	0.384
99988	SSF-2493	DU_WWTP	0.116
99990	SSF-2469	DU_WWTP	0.394
99992	SSF-2468	DU_WWTP	0.486
99994	SSF-2471	DU_WWTP	0.235
99996	SSF-2470	DU_WWTP	0.342
99998	SSF-2472	DU_WWTP	0.462
100000	SSF-2473	DU_WWTP	0.406
100004	SSF-2505	DU_WWTP	0.195
100006	SSF-2488	DU_WWTP	0.117
100017	SSF-2406	DU_WWTP	0.364
100019	SSF-2498	DU_WWTP	0.338

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
100023	SSF-2506	DU_WWTP	0.500
100026	SSF-2507	DU_WWTP	0.774
100027	SSF-2508	DU_WWTP	0.481
100031	SSF-2504	DU_WWTP	0.518
100032	SSF-2519	22276	0.426
100033	SSF-2520	22276	0.568
100034	SSF-2521	22276	0.778
100035	SSF-2522	22276	0.741
100036	SSF-2523	22276	0.285
100037	SSF-2524	22276	0.285
100038	SSF-2526	22276	0.244
100039	SSF-2525	22276	0.332
100040	SSF-2527	22276	0.345
100041	SSF-2512	22276	0.471
100042	SSF-2513	22276	0.435
100043	SSF-2518	22276	0.273
100044	SSF-2514	22276	0.379
100045	SSF-2517	22276	0.224
100046	SSF-2515	22276	0.234
100047	SSF-2516	22276	0.236
800456	SSF-2215	DU_WWTP	0.483
800457	SSF-1973	DU_WWTP	0.352
800462	SSF-2497	DU_WWTP	0.139
800480	SSF-2494	22276	0.215
800482	SSF-1690	DU_WWTP	0.959
800501	SSF-2128	DU_WWTP	0.573
800502	SSF-0957	22276	0.294
802250	SSF-2251	DU_WWTP	0.387
802251	SSF-2252	DU_WWTP	0.901
802252	SSF-2253	DU_WWTP	0.645
802253	SSF-2254	DU_WWTP	0.386
802261	SSF-2237	DU_WWTP	0.471
802272	SSF-2273	DU_WWTP	0.561
802273	SSF-2274	DU_WWTP	0.237
802274	SSF-2275	DU_WWTP	0.199
802275	SSF-2276	DU_WWTP	0.299
802282	SSF-2293	DU_WWTP	0.456
802283	SSF-2294	DU_WWTP	0.222
802284	SSF-2295	DU_WWTP	0.317
802285	SSF-2296	DU_WWTP	0.375
802294	SSF-2265	DU_WWTP	0.207
802295	SSF-2266	DU_WWTP	0.417
802296	SSF-2267	DU_WWTP	0.420
802299	SSF-2270	DU_WWTP	0.194

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
802314	SSF-2236	22276	0.402
802317	SSF-2243	22276	0.146
802360	SSF-2245	DU_WWTP	0.163
802361	SSF-2246	DU_WWTP	0.527
802362	SSF-2247	DU_WWTP	0.511
802363	SSF-2248	DU_WWTP	0.201
802373	SSF-2255	DU_WWTP	0.297
802374	SSF-2256	DU_WWTP	0.351
802375	SSF-2257	DU_WWTP	0.125
802376	SSF-2258	DU_WWTP	0.131
802377	SSF-2259	DU_WWTP	0.233
802378	SSF-2260	DU_WWTP	0.327
802379	SSF-2262	DU_WWTP	0.348
802380	SSF-2263	DU_WWTP	0.328
802381	SSF-2261	DU_WWTP	0.214
802382	SSF-2297	DU_WWTP	0.196
802383	SSF-2298	DU_WWTP	0.193
802384	SSF-2299	DU_WWTP	0.337
802385	SSF-2300	DU_WWTP	0.298
802386	SSF-2301	DU_WWTP	0.190
802387	SSF-2302	DU_WWTP	0.158
802388	SSF-2303	DU_WWTP	0.274
802389	SSF-2304	DU_WWTP	0.274
802390	SSF-2321	DU_WWTP	0.226
802391	SSF-2305	DU_WWTP	0.162
802392	SSF-2306	DU_WWTP	0.190
802393	SSF-2307	DU_WWTP	0.342
802434	SSF-2217	DU_WWTP	0.199
802435	SSF-2216	DU_WWTP	0.246
802455	SSF-2278	DU_WWTP	0.362
802456	SSF-2279	DU_WWTP	0.521
802457	SSF-2280	DU_WWTP	0.671
802458	SSF-2281	DU_WWTP	0.245
802459	SSF-2282	DU_WWTP	0.244
802460	SSF-2283	DU_WWTP	0.292
802461	SSF-2284	DU_WWTP	0.157
802462	SSF-2285	DU_WWTP	0.257
802463	SSF-2286	DU_WWTP	0.360
802464	SSF-2287	DU_WWTP	0.440
802465	SSF-2288	DU_WWTP	0.562
802466	SSF-2289	DU_WWTP	0.499
802467	SSF-2290	DU_WWTP	0.279
802468	SSF-2291	DU_WWTP	0.558
802469	SSF-2292	DU_WWTP	0.616

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
802470	SSF-1611	DU_WWTP	0.386
803888	SSF-0452	DU_WWTP	0.087
803895	SSF-2459	DU_WWTP	0.625
811536	SSF-2311	DU_WWTP	0.325
811552	SSF-2313	22276	0.325
811553	SSF-2312	22276	0.206
811556	SSF-2322	22276	1.005
811557	SSF-2368	22276	0.393
811560	SSF-2319	DU_WWTP	0.213
811561	SSF-2320	DU_WWTP	0.355
811564	SSF-2310	22276	0.235
811566	SSF-2348	22276	0.209
811567	SSF-2349	22276	0.182
811570	SSF-2351	22276	0.422
811571	SSF-2352	22276	0.154
811572	SSF-2353	22276	0.141
811573	SSF-2350	22276	0.324
811578	SSF-2329	DU_WWTP	0.163
811579	SSF-2336	DU_WWTP	0.106
811580	SSF-2327	DU_WWTP	0.236
811581	SSF-2326	DU_WWTP	0.326
811582	SSF-2328	DU_WWTP	0.307
811583	SSF-2330	DU_WWTP	0.289
811584	SSF-2331	DU_WWTP	0.273
811585	SSF-2332	DU_WWTP	0.293
811586	SSF-2333	DU_WWTP	0.346
811588	SSF-2335	DU_WWTP	0.234
811589	SSF-2334	DU_WWTP	0.246
811604	SSF-2341	22276	0.587
811605	SSF-2340	22276	0.274
811608	SSF-2249	22276	0.095
811610	SSF-2318	22276	0.239
811613	SSF-2316	22276	0.557
811614	SSF-2317	22276	0.371
811629	SSF-2314	DU_WWTP	0.502
811634	SSF-1028	11679	0.130
811637	SSF-2347	DU_WWTP	0.718
811638	SSF-2346	DU_WWTP	0.656
811639	SSF-2344	DU_WWTP	0.625
811640	SSF-2345	DU_WWTP	0.418
811641	SSF-2342	DU_WWTP	0.720
811642	SSF-2343	DU_WWTP	0.467
812434	SSF-2390	22276	0.195
812435	SSF-2389	22276	0.360

Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
812446	SSF-2384	22276	0.139
812458	SSF-2371	DU_WWTP	0.260
812459	SSF-2370	DU_WWTP	0.229
812462	SSF-2358	DU_WWTP	0.459
812465	SSF-2373	22276	0.263
812466	SSF-2374	22276	0.188
812470	SSF-2382	22276	0.372
812476	SSF-2357	22276	0.423
812479	SSF-2381	22276	0.261
812480	SSF-2380	22276	0.394
812481	SSF-2379	22276	0.512
812489	SSF-2369	DU_WWTP	0.173
812491	SSF-2366	DU_WWTP	0.285
812492	SSF-2367	DU_WWTP	0.393
812493	SSF-2365	DU_WWTP	0.436
812497	SSF-2363	DU_WWTP	0.358
812499	SSF-2361	DU_WWTP	0.776
812500	SSF-2360	DU_WWTP	0.675
812504	SSF-2354	11679	0.156
812505	SSF-2355	11679	0.298
812506	SSF-2356	11679	0.256
812513	SSF-2362	DU_WWTP	0.738
814115	SSF-2460	DU_WWTP	0.165
814118	SSF-2528	DU_WWTP	0.039
814120	SSF-2533	DU_WWTP	0.507
814127	SSF-2532	DU_WWTP	0.163
814128	SSF-2531	DU_WWTP	0.175
814129	SSF-2530	DU_WWTP	0.117
814130	SSF-2529	DU_WWTP	0.047
818899	SSF-2392	DU_WWTP	0.566
819859	SSF-2415	22276	0.692
819860	SSF-2416	22276	0.315
819864	SSF-2418	11719	0.499
819866	SSF-2372	DU_WWTP	0.565
819895	SSF-2395	DU_WWTP	0.504
819897	SSF-2394	DU_WWTP	0.435
819900	SSF-2393	DU_WWTP	0.391
819908	SSF-2405	DU_WWTP	0.690
819910	SSF-2407	DU_WWTP	0.574
819917	SSF-2404	DU_WWTP	0.888
819922	SSF-2414	DU_WWTP	0.329
819923	SSF-2413	DU_WWTP	0.600
819924	SSF-2412	DU_WWTP	0.401
819930	SSF-2499	DU_WWTP	0.492

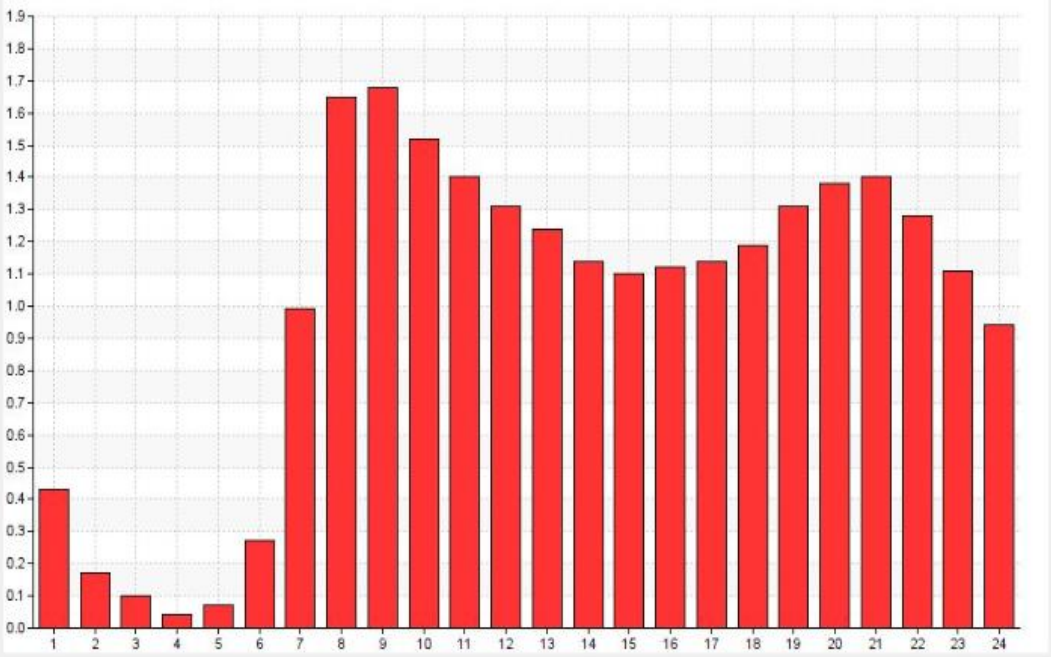
Junction ID	GIS-ID	Unit Hydrograph Group ID	Sewershed Area (acres)
24-0219	NoMatch	DU_WWTP	0.229
CH359	NoMatch	22276	0.298
CH3720	SSF-2608	22276	0.157
CH486	NoMatch	DU_WWTP	0.286
CH516	NoMatch	11719	0.292
CH59	NoMatch	22276	0.273

Flow Patterns:

11679

Pattern Type: 3: Hourly

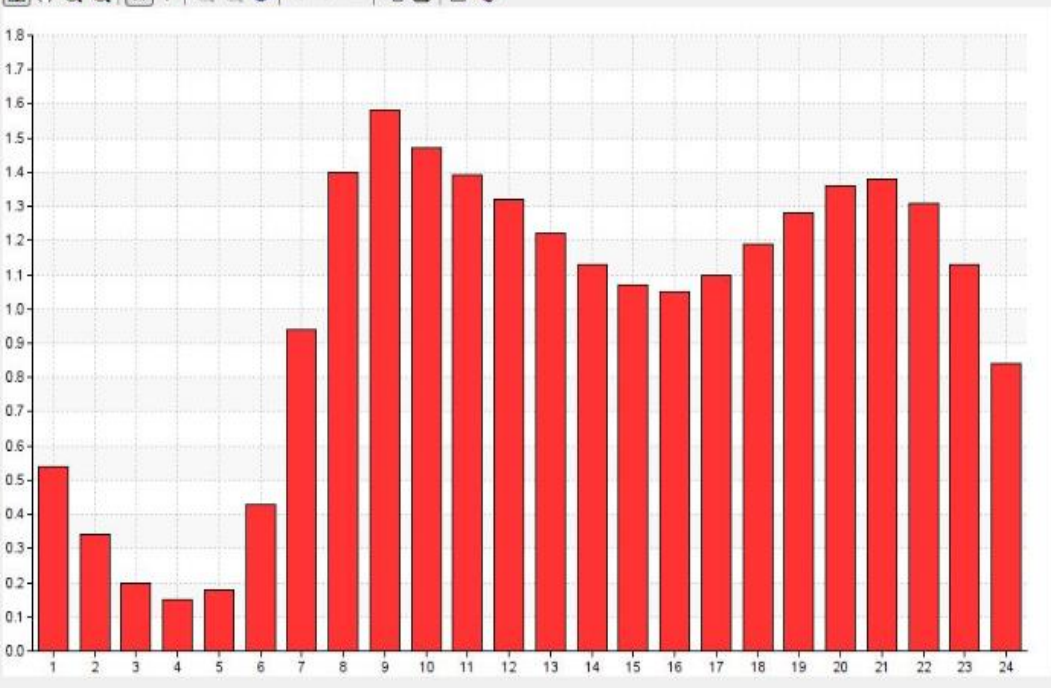
	Value
12 AM	0.430000000
1 AM	0.170000000
2 AM	0.100000000
3 AM	0.040000000
4 AM	0.070000000
5 AM	0.270000000
6 AM	0.990000000
7 AM	1.650000000
8 AM	1.680000000
9 AM	1.520000000
10 AM	1.400000000
11 AM	1.310000000
12 PM	1.240000000
1 PM	1.140000000
2 PM	1.100000000
3 PM	1.120000000
4 PM	1.140000000
5 PM	1.190000000
6 PM	1.310000000
7 PM	1.380000000
8 PM	1.400000000
9 PM	1.280000000
10 PM	1.110000000
11 PM	0.940000000



11719

Pattern Type: 3: Hourly

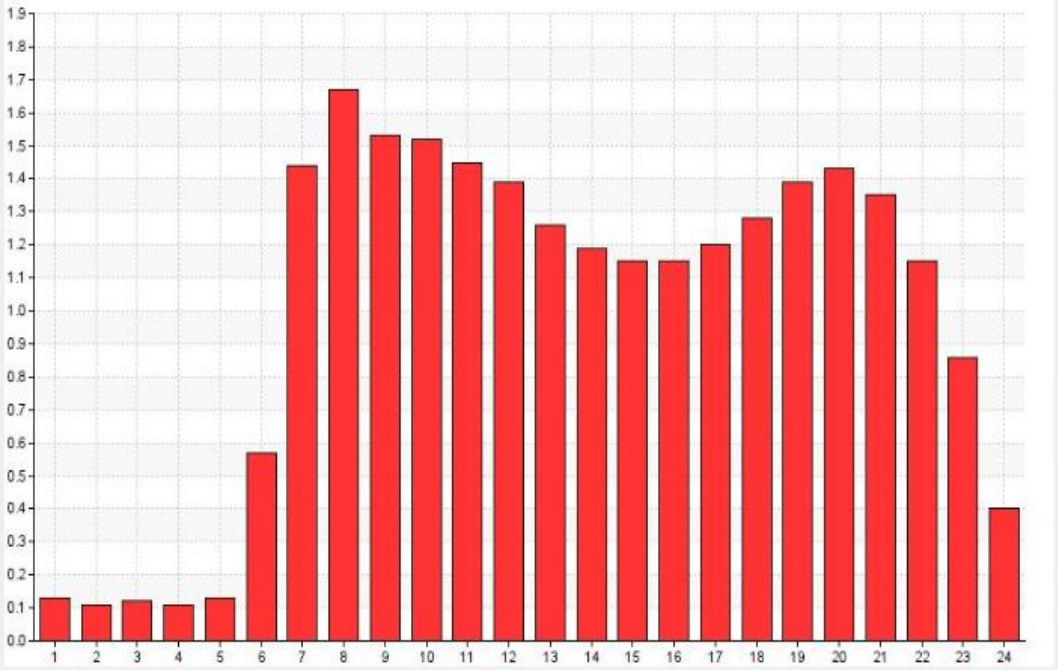
	Value
12 AM	0.540000000
1 AM	0.340000000
2 AM	0.200000000
3 AM	0.150000000
4 AM	0.180000000
5 AM	0.430000000
6 AM	0.940000000
7 AM	1.400000000
8 AM	1.580000000
9 AM	1.470000000
10 AM	1.390000000
11 AM	1.320000000
12 PM	1.220000000
1 PM	1.130000000
2 PM	1.070000000
3 PM	1.050000000
4 PM	1.100000000
5 PM	1.190000000
6 PM	1.280000000
7 PM	1.360000000
8 PM	1.380000000
9 PM	1.310000000
10 PM	1.130000000
11 PM	0.840000000



22276

Pattern Type: 3: Hourly

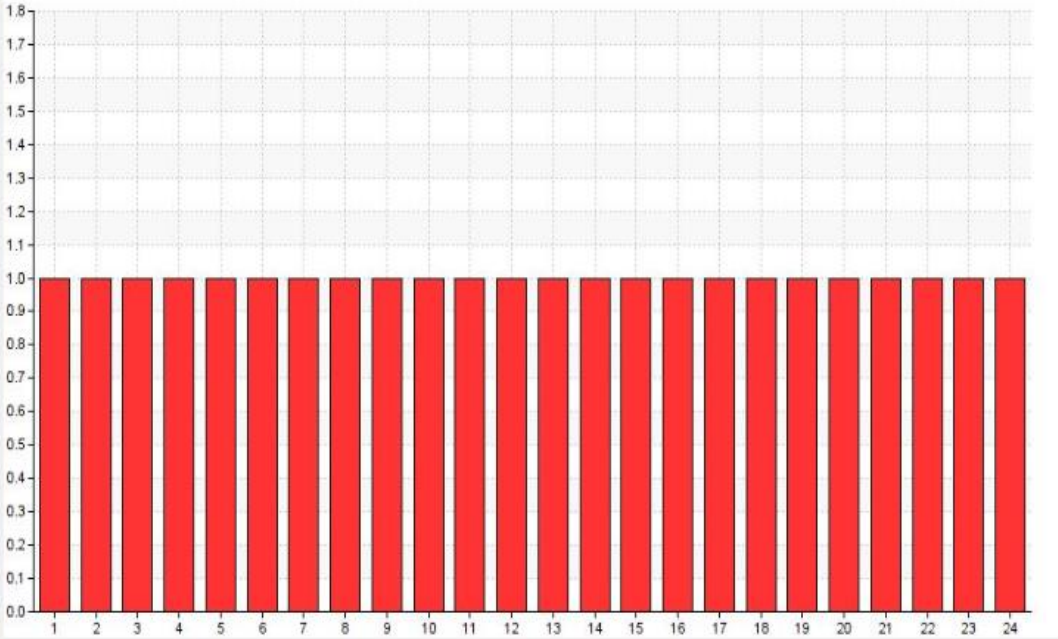
	Value
12 AM	0.130000000
1 AM	0.110000000
2 AM	0.120000000
3 AM	0.110000000
4 AM	0.130000000
5 AM	0.570000000
6 AM	1.440000000
7 AM	1.670000000
8 AM	1.530000000
9 AM	1.520000000
10 AM	1.450000000
11 AM	1.390000000
12 PM	1.260000000
1 PM	1.190000000
2 PM	1.150000000
3 PM	1.150000000
4 PM	1.200000000
5 PM	1.280000000
6 PM	1.390000000
7 PM	1.430000000
8 PM	1.350000000
9 PM	1.150000000
10 PM	0.860000000
11 PM	0.400000000



BASE

Pattern Type: 3: Hourly

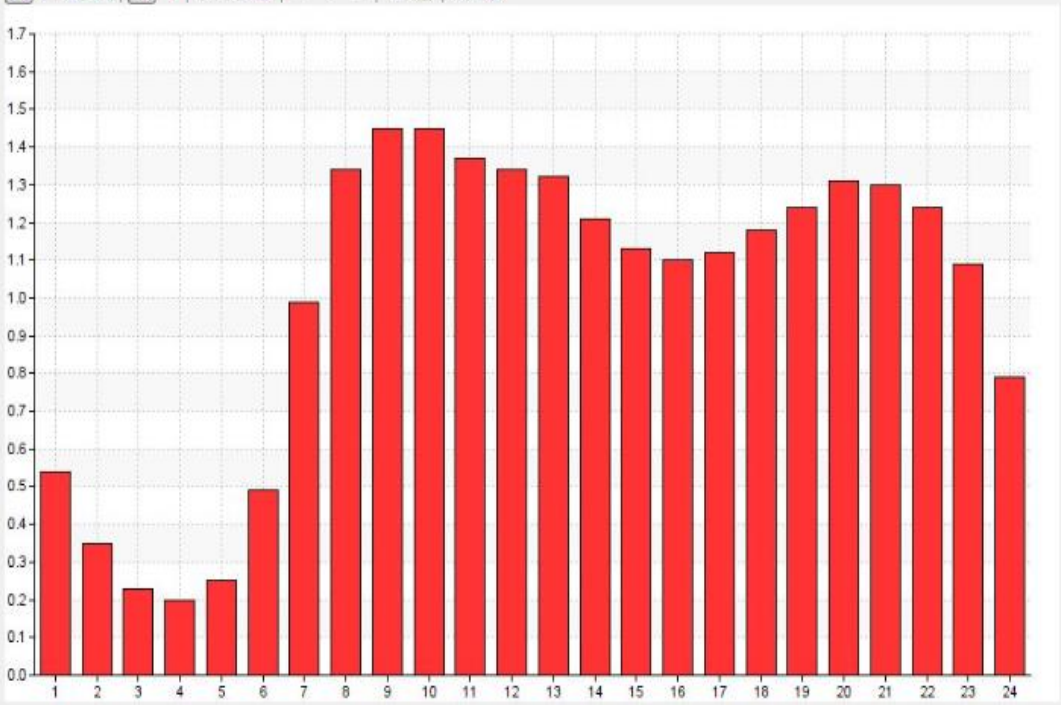
	Value
12 AM	1.000000000
1 AM	1.000000000
2 AM	1.000000000
3 AM	1.000000000
4 AM	1.000000000
5 AM	1.000000000
6 AM	1.000000000
7 AM	1.000000000
8 AM	1.000000000
9 AM	1.000000000
10 AM	1.000000000
11 AM	1.000000000
12 PM	1.000000000
1 PM	1.000000000
2 PM	1.000000000
3 PM	1.000000000
4 PM	1.000000000
5 PM	1.000000000
6 PM	1.000000000
7 PM	1.000000000
8 PM	1.000000000
9 PM	1.000000000
10 PM	1.000000000



DU_WWTP

Pattern Type: 3: Hourly

	Value
12 AM	0.540000000
1 AM	0.350000000
2 AM	0.230000000
3 AM	0.200000000
4 AM	0.250000000
5 AM	0.490000000
6 AM	0.990000000
7 AM	1.340000000
8 AM	1.450000000
9 AM	1.450000000
10 AM	1.370000000
11 AM	1.340000000
12 PM	1.320000000
1 PM	1.210000000
2 PM	1.130000000
3 PM	1.100000000
4 PM	1.120000000
5 PM	1.180000000
6 PM	1.240000000
7 PM	1.310000000
8 PM	1.300000000
9 PM	1.240000000
10 PM	1.090000000
11 PM	0.790000000



Unit Hydrograph Parameters:

11679

Response Type	R	T	K
Short-Term	0.003	0.5	1.0
Medium-Term	0.009	2.0	4.0
Long-Term	0.100	8.0	12.0

11719

Response Type	R	T	K
Short-Term	0.010	0.5	1.0
Medium-Term	0.070	2.0	4.0
Long-Term	0.200	8.0	12.0

22276

Response Type	R	T	K
Short-Term	0.006	0.5	1.0
Medium-Term	0.003	2.0	4.0
Long-Term	0.120	8.0	12.0

DU_WWTP

Response Type	R	T	K
Short-Term	0.008	0.5	1.0
Medium-Term	0.040	2.0	4.0
Long-Term	0.180	8.0	12.0

Appendix D
Modeling Results Summary

Junction Summary

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
100000	SSF-2473	12.6	12.6	12.6	12.6
100004	SSF-2505	10.0	9.9	9.9	9.9
100006	SSF-2488	10.0	10.0	10.0	10.0
100017	SSF-2406	5.4	5.4	5.4	5.4
100019	SSF-2498	8.4	8.4	8.4	8.4
100023	SSF-2506	10.0	10.0	10.0	10.0
100026	SSF-2507	10.8	10.8	10.8	10.8
100027	SSF-2508	11.0	11.0	11.0	11.0
100031	SSF-2504	5.2	5.2	5.2	5.2
100032	SSF-2519	1.3	1.3	1.3	1.3
100033	SSF-2520	4.7	4.7	4.7	4.7
100034	SSF-2521	11.7	11.7	11.7	11.7
100035	SSF-2522	7.9	7.9	7.9	7.9
100036	SSF-2523	5.8	5.8	5.8	5.8
100037	SSF-2524	8.9	8.9	8.9	8.9
100038	SSF-2526	3.2	3.2	3.2	3.2
100039	SSF-2525	5.6	5.6	5.6	5.6
100040	SSF-2527	12.3	12.3	12.3	12.3
100041	SSF-2512	10.3	10.3	10.3	10.3
100042	SSF-2513	2.3	2.3	2.3	2.3
100043	SSF-2518	10.1	10.1	10.1	10.1
100044	SSF-2514	15.2	15.2	15.2	15.2
100045	SSF-2517	9.7	9.7	9.7	9.7
100046	SSF-2515	6.7	6.7	6.7	6.7
100047	SSF-2516	7.3	7.3	7.3	7.3
11715	SSF-0184	9.8	9.8	9.8	9.8
11716	SSF-0185	11.3	11.3	11.3	11.3
11717	SSF-0186	7.7	7.7	7.7	7.7
12122	SSF-0451	15.7	15.5	15.5	15.4
12123	SSF-2466	16.8	16.6	16.5	16.5
12147	SSF-0505	6.0	6.0	6.0	6.0
12554	SSF-0820	13.9	13.9	13.9	13.9
12555	SSF-0823	18.9	18.8	18.7	18.6
12556	SSF-0822	17.3	17.3	17.1	17.1
12557	SSF-0821	19.3	19.2	19.1	19.0
12558	SSF-0827	13.9	13.8	13.7	13.6
12559	SSF-0826	15.0	15.0	14.9	14.8
12560	SSF-0825	17.5	17.5	17.5	17.4
12561	SSF-0824	12.1	12.1	12.0	12.0
16721	SSF-0138	10.0	10.0	10.0	9.8
16722	SSF-1623	5.9	6.0	5.9	5.9
16723	SSF-2050	15.9	15.9	15.9	15.9
16724	SSF-0030	8.2	8.2	8.2	8.2
16865	SSF-0504	6.8	6.8	6.8	6.8
16866	SSF-0503	11.9	11.9	11.9	11.9
16867	SSF-0498	7.6	7.6	7.6	7.6
16868	SSF-0502	10.4	10.4	10.4	10.4
16956	SSF-2052	11.3	11.3	11.3	11.3

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
16957	SSF-2049	9.3	9.3	9.3	9.3
16958	SSF-2144	5.4	5.4	5.4	5.4
16959	SSF-0033	11.3	11.3	11.3	11.3
16960	SSF-0032	7.9	7.9	7.9	7.9
16961	SSF-1173	9.2	9.2	9.2	9.2
16962	SSF-0031	4.9	4.9	4.9	4.9
16963	SSF-0164	10.0	10.0	10.0	10.0
16964	SSF-0035	9.9	9.9	9.9	9.9
16965	SSF-0034	9.0	9.0	9.0	9.0
16966	SSF-0163	8.1	8.1	8.1	8.1
16967	SSF-0170	7.7	7.7	7.7	7.7
17238	SSF-1280	9.8	9.8	9.8	9.8
17249	SSF-1279	9.5	9.5	9.5	9.5
17250	SSF-1278	11.6	11.6	11.6	11.6
17251	SSF-1277	14.9	14.9	14.9	14.9
17667	SSF-1284	8.1	8.1	8.1	8.1
17962	SSF-1281	11.7	11.7	11.7	11.7
18012	SSF-0500	21.6	21.6	21.6	21.6
18013	SSF-0499	19.8	19.9	19.9	19.9
18014	SSF-0497	9.4	9.4	9.4	9.4
20994	SSF-0581	2.8	2.8	2.8	2.8
20996	SSF-2388	11.9	11.9	11.9	11.9
20997	SSF-2387	12.8	12.9	12.9	12.9
20998	SSF-2386	13.9	13.9	13.9	13.9
20999	SSF-2385	14.8	14.9	14.9	14.9
21007	SSF-1618	11.0	11.0	11.0	11.0
21008	SSF-1617	9.9	9.9	9.9	9.9
21767	SSF-1062	8.5	8.5	8.5	8.5
21768	SSF-1045	8.5	8.5	8.5	8.5
24-0219	NoMatch	10.5	10.5	10.5	10.5
5006	SSF-2006	6.8	6.7	6.7	6.7
54881	SSF-1675	5.0	4.6	4.6	4.4
54882	SSF-1676	5.0	4.6	4.6	4.6
54883	SSF-1677	10.4	10.2	10.2	10.2
54884	SSF-1678	5.8	5.6	5.6	5.6
54885	SSF-1681	4.0	3.6	3.6	3.6
54886	SSF-1680	5.9	5.7	5.7	5.7
54887	SSF-1679	7.6	7.5	7.5	7.5
54888	SSF-1682	5.4	5.3	5.3	5.3
54889	SSF-1683	5.7	5.5	5.5	5.5
54890	SSF-2094	17.2	17.0	17.0	17.0
54891	SSF-2093	14.4	14.0	14.0	14.0
54892	SSF-2092	12.1	11.7	11.7	11.6
54893	SSF-2091	13.1	12.5	12.5	12.5
6588	SSF-0440	19.5	19.2	19.1	19.1
6589	SSF-0157	31.4	31.2	31.1	31.0
6590	SSF-0149	9.2	9.0	8.7	8.3
6591	SSF-0441	18.8	18.2	18.0	17.8

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
6596	SSF-0507	14.0	13.9	13.6	12.9
6597	SSF-0508	13.0	12.9	12.7	12.1
6599	SSF-1570	10.7	10.3	10.1	9.6
6600	SSF-0156	21.2	20.7	20.4	19.7
6742	SSF-0514	12.4	12.2	12.0	11.3
6743	SSF-0509	10.3	10.4	10.3	9.9
6746	NoMatch	3.7	2.3	0.7	0.0
6747	NoMatch	5.6	4.7	2.7	2.1
6750	NoMatch	4.8	4.8	4.8	4.8
6751	NoMatch	5.2	5.2	5.2	5.2
6752	NoMatch	10.0	10.0	10.0	10.0
6753	NoMatch	10.0	10.0	10.0	10.0
6754	NoMatch	10.0	10.0	10.0	10.0
6755	NoMatch	10.0	10.0	10.0	10.0
6756	NoMatch	10.0	10.0	10.0	10.0
6757	NoMatch	10.0	10.0	10.0	10.0
6758	NoMatch	4.6	4.6	4.6	4.6
6759	SSF-0518	9.2	9.0	8.7	7.7
6760	SSF-2509	9.3	9.2	8.8	7.9
6761	NoMatch	12.2	12.2	12.2	12.2
6762	NoMatch	11.3	11.3	11.3	11.3
6763	NoMatch	7.6	7.6	7.6	7.6
6764	NoMatch	4.0	4.0	4.0	4.0
6765	SSF-0140	10.1	10.1	10.1	10.1
6766	SSF-0139	10.0	9.9	9.8	8.7
6767	SSF-0511	9.5	9.4	9.1	8.2
6768	SSF-0512	11.8	11.6	11.3	10.5
6769	SSF-0513	10.0	9.9	9.6	8.8
6770	NoMatch	4.4	4.4	4.4	4.4
6771	NoMatch	6.0	6.0	6.0	6.0
6772	NoMatch	7.7	7.7	7.7	7.7
6773	NoMatch	8.8	8.8	8.8	8.8
6774	NoMatch	15.4	15.4	15.4	15.4
6775	NoMatch	14.6	14.6	14.6	14.6
6776	NoMatch	14.9	14.9	14.9	14.9
6777	NoMatch	8.1	8.1	8.1	8.1
6778	NoMatch	11.9	11.9	11.9	11.9
6779	NoMatch	11.1	11.1	11.1	11.1
6780	NoMatch	9.2	9.2	9.2	9.2
6781	NoMatch	7.0	7.0	7.0	7.0
6782	NoMatch	9.1	9.1	9.1	9.1
6783	NoMatch	8.2	8.2	8.2	8.2
6784	NoMatch	11.4	11.4	11.4	11.4
6785	NoMatch	10.0	10.0	10.0	10.0
6786	NoMatch	9.1	9.1	9.1	9.1
6787	NoMatch	5.2	5.2	5.2	5.2
6788	NoMatch	5.2	5.2	5.2	5.2
6789	NoMatch	7.6	7.6	7.6	7.6

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
6790	NoMatch	4.9	4.9	4.9	4.9
6791	NoMatch	6.0	6.0	6.0	6.0
6792	NoMatch	4.5	4.5	4.5	4.5
6793	NoMatch	5.0	5.0	5.0	5.0
6794	NoMatch	4.0	4.0	4.0	4.0
6795	NoMatch	10.0	10.0	10.0	10.0
6796	NoMatch	5.0	5.0	5.0	5.0
6797	NoMatch	11.5	11.5	11.5	11.5
6798	NoMatch	5.8	5.8	5.8	5.8
6799	NoMatch	6.0	6.0	6.0	6.0
6800	NoMatch	4.7	4.7	4.7	4.7
6801	NoMatch	16.9	16.9	16.9	16.9
6802	NoMatch	8.2	8.2	8.2	8.2
6803	NoMatch	6.9	6.9	6.9	6.9
6804	NoMatch	8.7	8.7	8.7	8.7
6812	NoMatch	5.5	4.6	1.6	0.4
6813	NoMatch	14.8	14.8	14.8	14.8
6814	NoMatch	10.4	10.4	10.4	10.4
6815	NoMatch	8.7	8.7	8.7	8.7
6816	NoMatch	3.9	3.9	3.9	3.9
6817	NoMatch	3.6	3.6	3.6	3.6
6818	NoMatch	8.7	8.7	8.7	8.7
6819	NoMatch	5.6	5.6	5.6	5.6
6820	NoMatch	7.6	7.6	7.6	7.6
6821	NoMatch	9.3	9.3	9.3	9.3
6822	NoMatch	12.5	12.5	12.5	12.5
6823	NoMatch	9.2	9.2	9.2	9.2
6824	NoMatch	12.0	12.0	12.0	12.0
6825	NoMatch	7.7	7.7	7.7	7.7
6826	NoMatch	8.3	8.3	8.3	8.3
6827	NoMatch	8.1	8.1	8.1	8.1
6828	NoMatch	8.3	8.3	8.3	8.3
6868	SSF-0510	12.2	12.2	11.9	11.0
6869	SSF-0506	16.6	16.5	16.2	15.4
6876	NoMatch	12.7	12.7	12.7	12.6
6877	NoMatch	5.6	1.8	1.3	1.6
6904	SSF-0201	6.8	6.8	6.7	6.7
6906	NoMatch	16.3	16.2	16.2	16.1
6909	SSF-0295	4.7	4.7	4.7	4.6
6910	SSF-0296	6.8	6.8	6.8	6.7
6911	SSF-0206	9.0	9.0	9.0	8.9
6912	SSF-1923	13.7	13.6	13.5	13.5
6913	SSF-1466	11.9	11.9	11.8	11.8
6914	SSF-1544	8.8	8.8	8.8	8.8
6915	SSF-1920	14.7	14.6	14.6	14.5
6916	SSF-1922	14.4	14.3	14.3	14.2
6917	SSF-0454	13.9	13.7	13.7	13.6
6918	SSF-0886	9.6	9.6	9.6	9.1

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
6919	SSF-0887	10.1	10.1	10.1	9.6
6920	SSF-0884	10.3	10.3	10.3	9.8
6921	SSF-0888	6.3	6.3	6.4	5.9
6922	SSF-0889	7.3	7.3	7.3	6.9
6923	SSF-0890	6.1	6.1	6.2	5.8
6924	SSF-0880	7.2	7.2	7.2	6.9
6925	SSF-0879	5.2	5.2	5.2	4.9
6926	SSF-0883	5.5	5.5	5.5	5.2
6927	SSF-0881	5.0	5.0	5.1	0.0
6928	SSF-0882	7.0	7.0	7.0	4.3
6929	SSF-0878	7.4	7.4	7.4	7.0
6930	SSF-0877	7.2	7.2	7.2	6.9
6931	SSF-0876	10.6	10.6	10.6	10.4
6932	SSF-0875	10.3	10.2	10.2	10.0
6933	SSF-1926	15.7	15.6	15.6	15.5
6934	SSF-0885	3.0	3.0	3.0	3.0
6935	SSF-0209	8.2	8.0	7.2	7.0
6936	SSF-0208	7.9	7.5	6.3	6.7
6937	SSF-0207	6.7	6.4	4.0	5.8
6938	SSF-0225	4.6	4.6	3.0	2.2
6939	SSF-0226	5.0	4.9	3.2	1.0
6940	SSF-0227	4.4	4.3	2.8	0.9
6941	NoMatch	6.7	6.6	5.4	4.8
6942	SSF-0229	5.6	5.5	4.4	3.3
6943	SSF-0292	7.0	7.1	7.1	7.0
6944	SSF-0308	6.9	6.9	6.9	6.9
6945	SSF-0307	10.2	10.2	10.2	10.2
6946	SSF-0306	4.8	4.8	4.8	4.8
6947	SSF-0610	3.7	3.7	3.7	3.7
6948	SSF-0608	8.0	8.0	8.0	8.0
6949	SSF-0607	6.1	6.1	6.1	6.1
6950	SSF-0609	5.5	5.5	5.5	5.5
6951	NoMatch	4.4	4.4	4.4	4.4
6952	NoMatch	4.2	4.2	4.2	4.2
6953	SSF-1093	3.2	3.2	3.2	3.2
6954	SSF-1092	9.4	9.4	9.4	9.4
6955	SSF-2638	8.9	8.9	8.9	8.8
6956	SSF-0293	6.3	6.3	6.3	6.3
6957	SSF-0202	5.6	5.6	5.6	5.6
6958	SSF-0873	5.8	5.8	5.8	5.8
6959	SSF-1543	5.6	5.6	5.6	5.6
6960	SSF-0624	5.1	5.1	5.1	5.1
6961	SSF-0625	8.8	8.8	8.8	8.8
6962	SSF-0626	15.1	15.1	15.1	15.1
6963	SSF-0627	9.9	9.7	9.7	9.7
6964	SSF-2138	15.9	15.8	15.8	15.8
6965	SSF-0618	13.7	13.6	13.6	13.6
6966	SSF-0616	11.2	11.2	11.2	11.1

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
6967	SSF-0617	10.1	10.0	10.0	10.0
6968	SSF-0611	10.8	10.7	10.7	10.7
6969	SSF-0612	10.8	10.7	10.6	10.6
6970	SSF-0613	9.1	9.0	9.0	9.0
6971	SSF-0614	8.0	7.9	7.9	7.9
6972	SSF-0615	7.5	7.5	7.4	7.4
6973	SSF-0628	14.5	14.3	14.3	14.3
6974	SSF-0290	6.1	6.1	6.1	6.1
6975	SSF-2478	9.6	9.7	9.7	9.7
6976	SSF-0291	5.3	5.3	5.3	5.3
6977	SSF-0553	13.8	13.9	13.9	13.9
6978	SSF-0555	8.7	9.5	9.5	9.5
6979	SSF-0559	8.7	7.9	7.9	7.5
6980	SSF-0558	7.8	4.5	4.7	4.4
6981	SSF-0564	7.2	7.2	7.1	7.1
6982	SSF-0563	7.8	7.1	7.1	7.1
6983	SSF-0562	11.8	10.6	10.5	10.5
6984	SSF-0561	11.3	9.9	9.7	9.7
6985	SSF-0560	10.3	8.8	8.5	8.5
6986	SSF-0557	9.6	7.7	7.3	7.3
6987	SSF-0762	10.8	8.8	8.2	8.2
6988	SSF-0760	11.7	9.6	9.0	9.0
6989	SSF-0556	13.6	11.3	10.6	10.6
6990	SSF-0465	4.0	1.0	0.0	0.0
6991	SSF-0464	4.8	1.2	0.1	0.0
6992	SSF-0462	15.9	14.7	13.3	13.2
6993	SSF-0457	10.6	10.6	10.6	10.6
6994	SSF-0456	10.6	9.7	9.5	9.4
6995	SSF-0455	13.9	12.8	12.4	12.3
6996	SSF-0470	10.8	9.8	9.3	9.1
6997	SSF-0474	10.6	9.5	8.9	8.7
6998	SSF-0473	12.5	11.3	10.6	10.4
6999	SSF-0472	20.9	19.6	18.8	18.5
7000	SSF-0680	9.9	8.5	7.6	7.4
7001	SSF-2242	14.0	12.6	11.6	11.3
7002	SSF-0678	13.8	12.4	11.3	11.0
7003	SSF-0677	12.0	10.3	9.2	8.8
7004	SSF-0676	13.6	11.4	10.2	9.8
7005	SSF-0151	18.1	15.6	14.3	13.9
7006	SSF-0692	17.0	15.3	13.9	13.5
7007	SSF-0691	9.7	0.0	0.0	1.2
7008	SSF-1556	9.6	3.9	2.6	5.1
7009	SSF-1560	10.4	4.6	3.2	5.9
7010	SSF-1559	10.6	9.2	7.5	7.0
7011	SSF-1557	9.5	8.8	7.0	6.5
7012	SSF-1921	14.5	14.4	14.4	14.3
7013	SSF-1924	13.6	13.5	13.4	13.4
7014	SSF-1916	16.9	16.8	16.7	16.7

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
7015	SSF-1918	16.5	16.4	16.4	16.3
7016	SSF-1917	15.1	15.0	15.0	14.9
7017	SSF-1919	15.4	15.3	15.2	15.2
7018	SSF-1925	15.6	15.5	15.5	15.4
7019	SSF-0444	15.4	13.1	12.1	11.1
7020	SSF-0443	18.5	17.0	16.4	15.7
7021	SSF-0450	18.6	16.9	16.5	16.1
7022	SSF-0449	20.6	18.7	5.7	5.5
7023	SSF-0448	18.9	16.9	15.3	15.2
7024	SSF-0447	20.8	18.7	0.0	17.1
7025	SSF-0446	19.0	16.9	0.0	15.2
7026	SSF-0442	17.8	16.9	16.4	16.0
7027	SSF-0445	18.1	16.5	16.3	16.1
7035	NoMatch	14.7	12.7	11.4	11.3
7036	NoMatch	10.0	9.9	9.1	8.5
7037	SSF-0294	5.3	5.2	5.2	5.1
7038	SSF-0297	2.4	2.4	2.3	2.3
7039	NoMatch	2.6	2.6	2.6	2.6
7040	SSF-0389	7.2	7.2	7.1	7.1
7041	SSF-0303	5.8	5.8	5.8	5.8
7042	SSF-0302	7.6	7.6	7.6	7.5
7043	SSF-0301	12.3	12.2	12.2	12.1
7044	SSF-0300	10.8	10.7	10.7	10.7
7047	SSF-2558	3.7	3.7	3.7	3.7
7048	SSF-1825	6.7	6.6	6.6	6.6
7049	SSF-1826	13.9	13.8	13.8	13.8
7051	SSF-1827	12.5	12.0	11.8	11.8
7052	SSF-2017	6.1	6.0	6.0	6.0
7053	SSF-0336	6.4	6.4	6.3	6.3
7054	SSF-0395	14.1	14.0	14.0	14.0
7055	SSF-0394	12.4	12.3	12.3	12.3
7060	SSF-1859	10.4	10.0	10.0	10.0
7061	SSF-1858	11.4	11.0	10.9	10.9
7063	NoMatch	22.5	22.5	22.5	22.5
7064	NoMatch	25.3	25.3	25.3	25.3
7065	NoMatch	19.4	19.4	19.4	19.4
7066	NoMatch	20.2	20.2	20.2	20.2
7067	SSF-2397	10.3	10.3	10.3	10.3
7068	SSF-2401	23.8	23.8	23.8	23.7
7069	SSF-2403	15.8	15.8	15.7	15.7
7070	SSF-2308	7.6	7.6	7.5	7.5
7071	SSF-1791	5.7	5.7	5.7	5.6
7072	SSF-1795	6.4	6.4	6.4	6.3
7073	SSF-2250	5.6	5.5	5.5	5.5
7074	NoMatch	6.3	6.2	6.2	6.2
7075	SSF-1798	5.3	5.3	5.2	5.2
7076	SSF-1799	3.3	3.2	3.2	3.2
7077	SSF-1800	3.5	3.4	3.4	3.4

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
7078	SSF-1777	6.3	6.3	6.0	4.5
7079	SSF-1794	8.1	8.0	7.6	6.3
7080	SSF-1875	8.7	8.7	7.9	6.7
7081	SSF-1752	9.1	8.9	7.9	7.2
7082	SSF-1750	8.4	8.2	3.7	0.0
7083	SSF-1753	9.4	9.4	8.7	8.1
7084	SSF-1756	10.2	10.2	10.2	9.9
7085	SSF-1757	10.2	10.1	10.1	10.1
7086	SSF-1751	9.1	8.9	8.3	0.0
7087	SSF-1748	12.3	12.2	11.9	11.6
7088	SSF-1746	10.6	10.5	10.4	10.3
7089	SSF-1734	11.5	11.4	11.4	11.3
7093	SSF-2431	12.1	11.6	11.6	11.5
7097	SSF-1024	10.8	10.8	10.8	10.7
7098	SSF-0318	15.3	15.3	15.3	15.3
7099	NoMatch	15.1	15.1	15.1	15.1
7100	SSF-0317	10.6	10.5	10.5	10.4
7101	SSF-0316	6.5	6.5	6.5	6.5
7102	SSF-1153	10.8	10.8	10.8	10.8
7103	SSF-0315	3.2	3.2	3.1	3.1
7104	SSF-0314	10.6	10.5	10.5	10.4
7105	SSF-0399	14.9	14.8	14.8	14.8
7106	SSF-2028	12.1	12.1	12.0	12.0
7107	SSF-2029	6.3	6.3	6.3	6.3
7108	SSF-2030	8.1	8.1	8.1	8.1
7109	SSF-2031	7.3	7.2	7.2	7.2
7110	SSF-2032	7.3	7.3	7.3	7.3
7111	SSF-2005	9.8	9.7	9.7	9.7
7112	SSF-2004	7.2	5.3	3.9	3.0
7113	SSF-2127	5.1	2.3	0.9	0.0
7114	SSF-1861	8.4	6.8	5.8	4.2
7115	SSF-1860	7.9	6.3	4.8	4.7
7116	SSF-1621	9.4	9.3	9.3	9.3
7117	SSF-1615	9.3	9.2	9.2	9.2
7118	SSF-1614	9.6	9.4	9.4	9.4
7119	SSF-1613	14.8	14.7	14.7	14.7
7120	SSF-1612	14.3	14.1	14.1	14.1
7121	SSF-1685	14.2	14.2	14.1	14.1
7122	SSF-1915	21.0	17.0	16.6	16.4
7123	SSF-1704	17.0	13.4	13.0	12.9
7124	SSF-1709	16.4	13.1	12.8	12.6
7125	SSF-1708	19.5	16.5	16.2	16.0
7126	SSF-1707	17.2	14.5	14.2	14.1
7127	SSF-1703	12.7	10.3	10.1	10.0
7128	SSF-1702	13.9	11.9	11.7	11.6
7129	SSF-1701	13.5	12.1	11.9	11.9
7130	SSF-1712	10.5	9.6	9.5	9.5
7131	SSF-1209	24.6	19.2	19.1	19.0

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
7132	SSF-1208	5.1	-2.1	-2.2	-2.2
7133	SSF-1207	15.5	7.6	7.5	7.4
7134	SSF-1206	14.2	6.2	6.1	6.0
7135	SSF-1202	12.4	5.0	4.9	4.8
7136	SSF-1161	6.7	6.6	6.6	6.6
7137	SSF-1160	11.0	11.0	11.0	10.9
7138	SSF-1159	8.7	8.6	8.6	8.6
7139	SSF-1158	7.3	6.8	6.8	6.7
7140	SSF-1157	9.7	9.7	9.7	9.7
7141	SSF-1226	8.1	7.9	7.8	7.7
7142	SSF-0350	6.5	6.5	6.5	6.5
7143	SSF-0349	7.0	7.0	7.0	7.0
7144	SSF-0348	7.0	6.9	6.9	6.9
7145	SSF-0358	18.4	18.4	18.4	18.4
7146	SSF-0360	13.5	13.5	13.5	13.5
7147	SSF-0357	4.4	4.4	4.4	4.3
7148	SSF-0361	9.8	9.7	9.7	9.7
7149	SSF-0347	4.9	4.9	4.9	4.9
7150	SSF-0353	7.5	7.5	7.5	7.5
7151	SSF-0346	8.8	8.8	8.8	8.7
7152	SSF-2011	9.6	9.6	9.6	9.6
7153	SSF-2012	10.0	10.0	10.0	10.0
7154	SSF-0345	2.6	2.6	2.6	2.5
7155	SSF-0356	10.6	10.6	10.5	10.5
7156	SSF-0359	13.3	13.3	13.2	13.2
7157	SSF-0322	5.8	5.8	5.8	5.8
7158	SSF-0323	6.1	6.1	6.1	6.1
7159	SSF-2015	6.2	6.2	6.1	6.1
7160	SSF-0324	6.7	6.7	6.7	6.7
7161	SSF-0340	8.3	8.3	8.3	8.3
7162	SSF-1776	8.5	8.4	0.0	6.4
7163	SSF-2009	7.9	7.9	7.9	7.8
7164	SSF-2008	7.4	7.3	7.3	7.3
7165	SSF-2007	6.0	5.9	5.9	5.9
7166	SSF-0398	10.1	10.1	10.0	10.0
7167	SSF-0397	13.2	13.2	13.2	13.1
7168	SSF-0396	14.6	14.6	14.5	14.5
7169	SSF-1227	8.1	3.1	3.0	3.0
7170	SSF-1228	4.7	0.2	0.1	0.1
7171	SSF-1221	4.3	0.0	0.0	0.0
7172	SSF-1222	4.5	0.3	0.3	0.1
7173	SSF-1223	5.8	1.8	1.7	1.4
7174	SSF-1224	4.9	1.6	1.4	1.0
7175	SSF-1225	8.2	6.0	5.7	5.3
7176	SSF-1815	4.0	4.0	4.0	0.0
7177	SSF-1616	7.1	7.0	7.0	7.0
7178	SSF-1619	8.6	8.5	8.5	8.5
7179	SSF-1620	12.9	7.1	7.0	7.0

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
7180	SSF-1205	11.2	5.3	5.2	5.1
7181	SSF-1204	13.0	6.5	6.4	6.4
7182	SSF-1203	13.5	6.7	6.6	6.5
7183	SSF-1706	7.2	7.2	7.2	7.2
7184	SSF-1705	5.2	5.2	5.2	5.2
7187	SSF-0828	7.5	7.4	7.4	7.4
7188	SSF-1837	13.0	12.5	12.4	12.3
7189	SSF-0404	12.6	12.6	12.5	12.5
7190	SSF-0405	9.9	9.9	9.9	9.8
7191	SSF-2018	5.7	5.7	5.7	5.7
7192	SSF-0393	12.7	12.7	12.6	12.6
7193	SSF-0392	11.2	11.1	11.1	11.1
7194	SSF-0391	10.9	10.8	10.8	10.8
7195	SSF-0390	7.8	7.7	7.7	6.8
7196	SSF-0829	8.1	8.0	7.9	7.0
7197	NoMatch	10.7	10.7	10.7	10.7
7198	NoMatch	11.0	10.9	0.0	0.0
7199	SSF-1451	8.5	8.5	8.3	6.8
7200	SSF-0147	7.6	7.6	7.3	5.8
7201	SSF-0146	6.6	6.6	6.3	4.8
7202	SSF-0145	6.6	6.6	6.3	4.8
7203	SSF-0144	2.9	2.9	2.6	1.2
7204	SSF-0143	8.4	8.4	8.2	6.8
7205	SSF-0142	7.9	7.8	7.6	6.2
7206	SSF-0141	8.5	8.4	8.2	6.9
7207	SSF-0137	9.7	9.6	9.4	8.3
7208	SSF-0136	9.9	9.8	9.6	8.6
7209	SSF-0135	6.8	6.6	6.8	6.3
7210	SSF-0134	9.9	9.8	9.9	9.7
7211	SSF-0133	8.8	8.7	8.5	7.7
7212	SSF-0132	9.2	9.1	9.0	8.5
7213	SSF-0131	12.6	12.5	12.1	10.5
7214	SSF-0527	6.8	6.6	6.2	4.8
7215	SSF-1040	8.1	7.7	7.3	5.9
7216	SSF-0519	9.2	8.8	8.4	7.0
7217	SSF-0520	9.3	8.9	8.4	7.1
7218	SSF-0521	9.3	8.9	8.5	7.2
7219	SSF-0522	9.4	9.0	8.7	7.3
7220	SSF-0523	14.5	14.2	13.8	12.5
7221	SSF-0524	13.7	13.4	13.1	11.8
7222	SSF-0525	14.0	13.7	13.3	12.1
7223	NoMatch	6.2	6.2	6.2	6.2
7224	NoMatch	10.6	10.6	10.6	10.6
7225	NoMatch	8.2	8.2	8.2	8.2
7226	SSF-0529	9.7	1.8	4.6	1.7
7227	SSF-0528	9.7	9.3	8.9	7.5
7228	SSF-0526	12.2	11.9	11.6	10.5
7229	SSF-0515	11.5	11.1	10.9	9.8

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
7230	SSF-2503	11.6	11.3	11.1	10.0
7231	SSF-0516	11.7	11.3	11.2	10.1
7232	SSF-0517	8.9	8.5	8.4	7.4
7233	NoMatch	6.7	0.0	1.6	0.1
7234	NoMatch	11.7	9.4	6.4	6.1
7235	NoMatch	6.7	4.8	1.6	1.5
7236	NoMatch	6.7	4.7	1.4	1.3
7237	NoMatch	4.3	2.9	0.0	0.0
7238	NoMatch	7.2	5.9	0.6	0.7
7239	NoMatch	6.1	4.9	0.0	0.0
7240	NoMatch	9.8	8.9	0.0	0.0
7241	NoMatch	9.0	9.0	9.0	9.0
7242	NoMatch	10.9	10.9	10.9	10.9
7243	NoMatch	9.6	9.6	9.6	9.6
7244	NoMatch	9.8	9.8	9.8	9.8
7245	NoMatch	11.7	9.4	6.4	6.2
7246	SSF-1830	9.5	9.5	9.5	9.5
7274	NoMatch	22.1	22.1	22.1	22.1
7275	NoMatch	20.7	20.7	20.7	20.7
7276	NoMatch	7.6	7.6	7.6	7.6
7277	NoMatch	11.5	11.5	11.5	11.5
7278	NoMatch	10.6	10.6	10.6	10.6
7279	NoMatch	6.4	6.4	6.4	6.4
7280	NoMatch	7.0	7.0	7.0	7.0
7281	NoMatch	9.7	9.7	9.7	9.7
7282	NoMatch	9.3	9.3	9.3	9.3
7283	NoMatch	11.0	11.0	11.0	11.0
7284	NoMatch	12.6	12.6	12.6	12.6
7285	NoMatch	12.4	12.4	12.4	12.4
7286	NoMatch	12.6	12.6	12.6	12.6
7287	NoMatch	13.4	13.4	13.4	13.4
7288	NoMatch	12.5	12.5	12.5	12.5
7289	NoMatch	8.6	8.6	8.6	8.6
7290	NoMatch	11.7	11.7	11.7	11.7
7291	NoMatch	12.4	12.4	12.4	12.4
7292	NoMatch	20.8	20.8	20.8	20.8
7293	NoMatch	13.0	13.0	13.0	13.0
7294	NoMatch	12.2	12.2	12.2	12.2
7295	NoMatch	11.7	11.7	11.7	11.7
7296	NoMatch	11.7	11.7	11.7	11.7
7297	NoMatch	11.6	11.6	11.6	11.6
7298	NoMatch	10.9	10.9	10.9	10.9
7299	NoMatch	11.7	11.7	11.7	11.7
7300	NoMatch	11.6	11.6	11.6	11.6
7301	NoMatch	11.6	11.6	11.6	11.6
7302	NoMatch	10.5	10.5	10.5	10.5
7303	NoMatch	10.6	10.6	10.6	10.6
7304	NoMatch	9.8	9.8	9.8	9.8

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
7305	NoMatch	10.8	10.8	10.8	10.8
7306	NoMatch	11.2	11.2	11.2	11.2
7307	NoMatch	10.7	10.7	10.7	10.7
7308	NoMatch	11.4	11.4	11.4	11.4
7309	NoMatch	11.4	11.4	11.4	11.4
7310	NoMatch	13.6	13.6	13.6	13.6
7311	NoMatch	12.6	12.6	12.6	12.6
7312	NoMatch	13.8	13.8	13.8	13.8
7313	NoMatch	13.6	13.6	13.6	13.6
7314	NoMatch	12.6	12.6	12.6	12.6
7315	NoMatch	11.4	11.4	11.4	11.4
7316	NoMatch	11.9	11.9	11.9	11.9
7317	NoMatch	10.7	10.7	10.7	10.7
7318	NoMatch	9.8	9.8	9.8	9.8
7319	NoMatch	10.9	10.9	10.9	10.9
7320	NoMatch	9.8	9.8	9.8	9.8
7321	NoMatch	16.2	16.2	16.2	16.2
7322	NoMatch	14.7	14.7	14.7	14.7
7323	NoMatch	15.0	15.0	15.0	15.0
7324	NoMatch	13.3	13.3	13.3	13.3
7325	NoMatch	8.3	8.3	8.3	8.3
7326	NoMatch	7.7	7.7	7.7	7.7
7327	NoMatch	6.2	6.2	6.2	6.2
7328	NoMatch	5.0	5.0	5.0	5.0
7329	NoMatch	6.2	6.2	6.2	6.2
7330	NoMatch	3.8	3.8	3.8	3.8
7331	NoMatch	2.4	2.4	2.4	2.4
7332	NoMatch	2.1	2.1	2.1	2.1
7333	NoMatch	6.6	6.6	6.6	6.6
7334	NoMatch	8.0	8.0	8.0	8.0
7335	NoMatch	17.3	17.3	17.3	17.3
7336	NoMatch	16.9	16.9	16.9	16.9
7337	NoMatch	16.4	16.4	16.4	16.4
7338	NoMatch	13.9	13.9	13.9	13.9
7339	NoMatch	12.0	12.0	12.0	12.0
7340	NoMatch	10.1	10.1	10.1	10.1
7341	NoMatch	10.0	10.0	10.0	10.0
7342	NoMatch	9.4	9.4	9.4	9.4
7343	NoMatch	9.3	9.3	9.3	9.3
7344	NoMatch	9.1	9.1	9.1	9.1
7345	NoMatch	12.0	12.0	12.0	12.0
7346	NoMatch	7.8	7.8	7.8	7.8
7347	NoMatch	1.8	1.8	1.8	1.8
7348	NoMatch	8.1	8.1	8.1	8.1
7349	NoMatch	9.2	9.2	9.2	9.2
7350	NoMatch	11.2	11.2	11.2	11.2
7351	NoMatch	8.5	8.5	8.5	8.5
7352	NoMatch	8.9	8.9	8.9	8.9

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
7353	NoMatch	18.5	18.5	18.5	18.5
7354	NoMatch	25.6	25.6	25.6	25.6
7355	NoMatch	11.9	11.9	11.9	11.9
7356	NoMatch	12.6	12.6	12.6	12.6
7357	NoMatch	16.5	16.5	16.5	16.5
7358	NoMatch	10.1	10.1	10.1	10.1
7359	NoMatch	12.4	12.4	12.4	12.4
7360	NoMatch	12.0	12.0	12.0	12.0
7361	NoMatch	12.4	12.4	12.4	12.4
7362	NoMatch	9.0	9.0	9.0	9.0
7363	NoMatch	13.2	13.2	13.2	13.2
7364	NoMatch	12.4	12.4	12.4	12.4
7365	NoMatch	13.7	13.7	13.7	13.7
7366	NoMatch	12.9	12.9	12.9	12.9
7367	NoMatch	16.0	16.0	16.0	16.0
7368	NoMatch	12.1	12.1	12.1	12.1
7370	NoMatch	13.4	13.4	13.4	13.4
7371	NoMatch	11.7	11.7	11.7	11.7
7372	NoMatch	19.9	19.9	19.9	19.9
7373	NoMatch	15.3	15.3	15.3	15.3
7374	NoMatch	5.5	5.5	5.5	5.5
7375	NoMatch	19.7	19.7	19.7	19.7
7376	NoMatch	10.0	10.0	10.0	10.0
7377	NoMatch	10.0	10.0	10.0	10.0
7378	NoMatch	10.0	10.0	10.0	10.0
7379	NoMatch	10.0	10.0	10.0	10.0
7380	NoMatch	10.0	10.0	10.0	10.0
7381	NoMatch	10.0	10.0	10.0	10.0
7382	NoMatch	8.8	8.8	8.8	8.8
7383	NoMatch	7.3	7.3	7.3	7.3
7384	NoMatch	7.5	7.5	7.5	7.5
7385	NoMatch	5.6	5.6	5.6	5.6
7386	NoMatch	7.8	7.8	7.8	7.8
7387	NoMatch	8.9	8.9	8.9	8.9
7388	NoMatch	7.4	7.4	7.4	7.4
7389	NoMatch	10.0	10.0	10.0	10.0
7390	NoMatch	10.0	10.0	10.0	10.0
7391	NoMatch	10.0	10.0	10.0	10.0
7392	NoMatch	10.0	10.0	10.0	10.0
7393	NoMatch	10.0	10.0	10.0	10.0
7416	NoMatch	20.1	20.1	20.1	20.1
7419	SSF-1507	14.9	6.9	6.8	6.8
7443	NoMatch	10.1	5.8	5.5	5.2
7444	SSF-1571	10.2	5.9	5.6	5.2
7446	SSF-1638	8.6	4.7	4.5	4.1
7448	SSF-1637	11.2	8.3	8.1	7.9
7450	SSF-1575	10.3	7.4	7.2	7.0
7452	SSF-1581	17.8	14.0	14.5	13.0

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
7454	SSF-1582	19.1	16.2	15.8	15.0
7456	SSF-1583	14.0	13.9	13.9	13.9
7458	SSF-1584	16.6	15.6	15.5	15.5
7460	SSF-1585	16.8	15.8	15.7	15.7
7462	SSF-1586	13.4	12.6	12.6	12.6
7464	SSF-1587	16.8	16.7	16.7	16.7
7466	SSF-1508	11.5	5.5	5.5	3.5
7468	SSF-1506	5.7	0.7	0.2	0.0
7470	SSF-1505	9.7	4.3	4.1	3.7
7631	SSF-1469	12.3	12.3	12.2	12.2
7632	SSF-1470	8.9	8.9	8.8	8.8
7634	SSF-1471	6.3	6.3	6.2	6.1
7636	SSF-1473	9.6	9.6	9.5	9.5
7638	SSF-1472	9.7	9.7	9.7	9.6
7640	SSF-0453	11.1	11.0	11.0	10.9
7642	SSF-1509	7.7	7.7	7.6	7.6
7652	NoMatch	18.6	18.6	18.6	18.6
7720	NoMatch	4.7	4.7	4.7	4.7
7722	NoMatch	10.0	10.0	10.0	10.0
7724	NoMatch	10.0	10.0	10.0	10.0
7727	NoMatch	10.0	10.0	10.0	10.0
7729	NoMatch	10.0	10.0	10.0	10.0
7735	SSF-1730	10.0	10.0	10.0	10.0
7737	SSF-1851	6.8	6.8	6.8	6.8
7739	SSF-1768	7.7	7.6	7.6	7.6
7741	SSF-1453	2.4	2.4	2.4	2.4
7742	SSF-1455	2.4	2.4	2.4	2.4
7744	SSF-1456	4.1	4.1	4.1	4.1
7747	SSF-1764	12.6	12.5	12.5	12.5
7749	SSF-1674	4.1	3.7	3.3	1.1
7751	SSF-0698	11.3	11.2	11.2	11.2
7753	SSF-1070	9.0	9.0	9.0	9.0
7754	SSF-2642	12.3	12.3	12.3	12.3
7757	SSF-2111	5.9	5.9	5.9	5.9
7758	SSF-2109	16.4	15.4	15.8	15.8
7760	SSF-2272	9.5	9.5	9.5	9.5
7762	SSF-2124	12.0	11.4	11.4	11.4
7765	SSF-1813	9.8	9.8	9.8	9.8
7767	NoMatch	16.0	16.0	16.0	16.0
7769	NoMatch	10.0	10.0	10.0	10.0
7771	NoMatch	11.3	11.3	11.3	11.3
7773	NoMatch	10.0	10.0	10.0	10.0
7774	NoMatch	10.0	10.0	10.0	10.0
7776	NoMatch	10.0	10.0	10.0	10.0
7778	NoMatch	10.0	10.0	10.0	10.0
7800	SSF-1986	7.0	7.0	7.0	7.0
7803	SSF-1989	8.4	8.4	8.4	8.4
7808	SSF-0911	11.3	11.3	11.3	11.3

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
7810	SSF-1934	0.0	7.6	7.6	7.5
7812	SSF-0548	9.8	9.8	9.8	9.8
7814	SSF-1256	6.5	6.5	6.5	6.5
7817	SSF-1275	10.8	10.8	10.8	10.8
7819	SSF-1101	6.5	6.5	6.5	6.5
7822	SSF-1177	8.3	8.3	8.3	8.3
7826	SSF-1074	14.5	14.5	14.5	14.5
7834	NoMatch	10.0	10.0	10.0	10.0
7837	NoMatch	10.0	10.0	10.0	10.0
7855	SSF-1806	-12.9	-13.7	-14.5	-14.6
7857	NoMatch	25.0	25.0	25.0	25.0
7861	SSF-0552	-500.0	-500.0	-500.0	-500.0
7863	SSF-2563	-68.4	-14.0	-12.0	-11.2
7865	SSF-1987	-158.0	-500.0	-500.0	-500.0
7866	NoMatch	-413.4	-500.0	-500.0	-500.0
7867	SSF-1102	-78.3	-500.0	-500.0	-500.0
7868	SSF-1563	-38.1	-69.0	-69.0	-69.0
7897	SSF-1850	6.7	6.7	6.7	6.7
7899	SSF-1849	10.6	10.5	10.5	10.5
7903	SSF-1804	10.7	10.6	10.6	10.6
7905	SSF-1848	12.1	12.0	12.0	12.0
7907	SSF-1847	9.5	9.4	9.4	9.4
7909	SSF-1844	9.2	9.2	9.2	9.1
7910	SSF-1843	9.4	9.3	9.3	9.3
7914	NoMatch	8.3	8.3	8.3	8.3
7915	NoMatch	10.6	10.6	10.6	10.6
7917	NoMatch	8.9	8.9	8.9	8.9
7919	NoMatch	9.2	9.2	9.2	9.2
7921	NoMatch	7.4	7.4	7.4	7.4
7923	NoMatch	9.8	9.8	9.8	9.8
7926	NoMatch	12.4	12.4	12.4	12.4
7928	NoMatch	9.2	9.2	9.2	9.2
7930	NoMatch	10.9	10.9	10.9	10.9
7933	NoMatch	10.0	10.0	10.0	10.0
7936	NoMatch	10.0	10.0	10.0	10.0
7938	NoMatch	10.0	10.0	10.0	10.0
7940	NoMatch	10.0	10.0	10.0	10.0
7942	NoMatch	10.0	10.0	10.0	10.0
7945	NoMatch	21.9	21.9	21.9	21.9
7948	NoMatch	10.0	10.0	10.0	10.0
7950	NoMatch	10.0	10.0	10.0	10.0
7951	NoMatch	10.0	10.0	10.0	10.0
7953	NoMatch	10.0	10.0	10.0	10.0
7955	NoMatch	10.0	10.0	10.0	10.0
7969	SSF-1762	9.2	9.1	9.1	9.1
7971	SSF-1763	10.9	10.9	10.9	10.9
7997	NoMatch	9.0	9.0	9.0	9.0
7999	NoMatch	10.0	10.0	10.0	10.0

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
800456	SSF-2215	6.8	6.8	6.8	6.8
800457	SSF-1973	8.7	8.7	8.7	8.7
800462	SSF-2497	9.2	9.2	9.2	9.2
800480	SSF-2494	10.0	10.0	10.0	10.0
800482	SSF-1690	8.9	8.9	8.9	8.9
8005	NoMatch	10.0	10.0	10.0	10.0
800501	SSF-2128	5.8	2.3	2.3	2.2
800502	SSF-0957	4.7	0.0	0.0	0.0
8006	NoMatch	24.6	24.6	24.6	24.6
802250	SSF-2251	11.7	11.7	11.6	11.6
802251	SSF-2252	12.1	12.1	12.1	12.1
802252	SSF-2253	8.7	8.7	8.7	8.7
802253	SSF-2254	8.8	8.8	8.8	8.8
802261	SSF-2237	6.1	6.1	6.1	6.1
802272	SSF-2273	9.3	9.3	9.3	9.3
802273	SSF-2274	10.0	10.0	10.0	10.0
802274	SSF-2275	10.0	9.5	9.7	9.7
802275	SSF-2276	10.0	10.0	10.0	10.0
802282	SSF-2293	9.2	9.2	9.2	9.2
802283	SSF-2294	8.7	8.7	8.7	8.7
802284	SSF-2295	5.6	5.6	5.6	5.6
802285	SSF-2296	11.2	11.2	11.2	11.2
802294	SSF-2265	11.6	11.3	11.3	11.3
802295	SSF-2266	8.7	8.7	8.7	8.7
802296	SSF-2267	6.3	6.3	6.3	6.3
802299	SSF-2270	5.9	6.0	6.0	6.0
802314	SSF-2236	9.5	9.3	6.2	4.9
802317	SSF-2243	6.5	6.5	6.5	6.5
802360	SSF-2245	5.4	5.4	5.4	5.4
802361	SSF-2246	3.7	3.7	3.7	3.7
802362	SSF-2247	5.4	5.4	5.4	5.4
802363	SSF-2248	3.6	3.6	3.6	3.6
802373	SSF-2255	12.4	12.0	12.0	12.0
802374	SSF-2256	12.4	12.0	12.0	12.0
802375	SSF-2257	13.3	12.9	12.9	12.9
802376	SSF-2258	14.6	14.2	14.2	14.2
802377	SSF-2259	14.0	13.8	13.8	13.8
802378	SSF-2260	10.6	10.4	10.4	10.4
802379	SSF-2262	9.2	9.2	9.2	9.2
802380	SSF-2263	7.6	7.6	7.6	7.6
802381	SSF-2261	4.9	4.4	4.4	4.4
802382	SSF-2297	9.3	9.3	9.3	9.3
802383	SSF-2298	8.7	8.7	8.7	8.7
802384	SSF-2299	7.4	7.4	7.4	7.4
802385	SSF-2300	8.0	8.0	8.0	8.0
802386	SSF-2301	8.7	8.7	8.7	8.7
802387	SSF-2302	8.8	8.8	8.8	8.8
802388	SSF-2303	8.3	8.3	8.3	8.3

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
802389	SSF-2304	7.3	7.3	7.3	7.3
802390	SSF-2321	5.9	5.9	5.9	5.9
802391	SSF-2305	5.7	5.7	5.7	5.7
802392	SSF-2306	7.1	7.1	7.1	7.1
802393	SSF-2307	6.7	6.7	6.7	6.6
802434	SSF-2217	5.1	5.1	5.1	5.1
802435	SSF-2216	7.5	7.5	7.5	7.5
802455	SSF-2278	6.2	6.0	6.0	6.0
802456	SSF-2279	9.2	9.1	9.1	9.1
802457	SSF-2280	8.9	8.8	8.8	8.8
802458	SSF-2281	6.2	6.0	6.0	6.0
802459	SSF-2282	7.5	7.5	7.5	7.5
802460	SSF-2283	6.6	6.6	6.6	6.6
802461	SSF-2284	6.5	6.5	6.5	6.5
802462	SSF-2285	8.2	8.2	8.2	8.2
802463	SSF-2286	6.8	6.8	6.8	6.8
802464	SSF-2287	6.9	6.9	6.9	6.9
802465	SSF-2288	8.6	8.5	8.5	8.5
802466	SSF-2289	7.0	7.0	7.0	7.0
802467	SSF-2290	8.7	8.7	8.7	8.7
802468	SSF-2291	5.4	5.4	5.4	5.4
802469	SSF-2292	7.1	7.1	7.1	7.1
802470	SSF-1611	10.1	9.9	9.9	9.9
803888	SSF-0452	16.5	16.3	16.2	16.2
803895	SSF-2459	19.5	19.4	19.4	19.3
811536	SSF-2311	5.9	5.9	5.9	5.9
811552	SSF-2313	6.2	6.2	6.2	6.2
811553	SSF-2312	2.5	2.5	2.5	2.5
811556	SSF-2322	2.3	2.3	2.3	2.3
811557	SSF-2368	5.3	5.3	5.3	5.2
811560	SSF-2319	8.0	8.0	8.0	8.0
811561	SSF-2320	6.4	6.4	6.4	6.4
811564	SSF-2310	8.3	8.3	8.3	8.3
811566	SSF-2348	3.7	3.7	3.7	3.7
811567	SSF-2349	3.7	3.7	3.7	3.7
811570	SSF-2351	9.9	9.9	9.8	9.8
811571	SSF-2352	10.8	10.8	10.7	10.7
811572	SSF-2353	9.4	9.4	9.4	9.4
811573	SSF-2350	9.0	8.9	8.9	8.9
811578	SSF-2329	8.4	8.4	8.4	8.4
811579	SSF-2336	6.9	6.9	6.9	6.9
811580	SSF-2327	7.7	7.7	7.7	7.7
811581	SSF-2326	9.9	9.9	9.9	9.9
811582	SSF-2328	8.6	8.6	8.6	8.6
811583	SSF-2330	5.3	5.3	5.3	5.3
811584	SSF-2331	8.6	8.6	8.6	8.6
811585	SSF-2332	8.6	8.6	8.6	8.6
811586	SSF-2333	8.3	8.3	8.3	8.3

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
811588	SSF-2335	14.1	14.1	14.1	14.1
811589	SSF-2334	3.7	3.7	3.7	3.7
811604	SSF-2341	10.3	10.3	10.3	10.3
811605	SSF-2340	9.3	9.3	9.3	9.3
811608	SSF-2249	5.0	5.0	5.0	5.0
811610	SSF-2318	8.8	8.7	8.7	8.7
811613	SSF-2316	9.8	9.7	9.7	9.7
811614	SSF-2317	7.2	7.2	7.2	7.2
811629	SSF-2314	8.8	8.8	8.8	8.8
811634	SSF-1028	6.8	6.8	6.5	5.1
811637	SSF-2347	10.3	10.3	10.3	10.3
811638	SSF-2346	9.9	9.9	9.9	9.9
811639	SSF-2344	8.8	8.8	8.8	8.8
811640	SSF-2345	7.6	7.6	7.6	7.6
811641	SSF-2342	12.0	12.0	12.0	12.0
811642	SSF-2343	7.8	7.9	7.8	7.8
812434	SSF-2390	9.9	10.0	10.0	10.0
812435	SSF-2389	10.8	10.9	10.9	10.9
812446	SSF-2384	5.6	5.6	5.6	5.6
812458	SSF-2371	6.5	6.5	6.5	6.5
812459	SSF-2370	6.4	6.4	6.4	6.4
812462	SSF-2358	5.6	5.3	5.2	4.9
812465	SSF-2373	4.6	4.6	4.6	4.6
812466	SSF-2374	4.6	4.6	4.6	4.6
812470	SSF-2382	12.1	12.1	12.1	12.1
812476	SSF-2357	5.8	5.8	5.8	5.8
812479	SSF-2381	10.0	10.0	10.0	10.0
812480	SSF-2380	9.9	9.9	9.9	9.9
812481	SSF-2379	10.0	10.0	10.0	10.0
812489	SSF-2369	52.4	52.4	52.4	52.4
812491	SSF-2366	3.3	3.3	3.3	3.3
812492	SSF-2367	4.2	4.2	4.2	4.2
812493	SSF-2365	5.3	5.3	5.3	5.3
812497	SSF-2363	6.8	6.8	6.8	6.8
812499	SSF-2361	8.1	8.1	8.1	8.1
812500	SSF-2360	10.2	10.2	10.2	10.2
812504	SSF-2354	12.4	12.4	12.4	12.2
812505	SSF-2355	9.4	9.4	9.4	9.4
812506	SSF-2356	7.5	7.5	7.5	7.5
812511	SSF-1452	7.9	7.8	7.6	6.1
812513	SSF-2362	8.0	8.0	8.0	8.0
814115	SSF-2460	20.0	20.0	20.0	20.0
814118	SSF-2528	17.9	17.8	17.7	17.7
814120	SSF-2533	16.9	15.5	15.3	15.2
814127	SSF-2532	16.9	15.5	15.3	15.2
814128	SSF-2531	16.8	15.5	15.4	15.2
814129	SSF-2530	16.5	15.6	15.5	15.4
814130	SSF-2529	18.0	17.2	17.0	16.9

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
8150	NoMatch	10.0	10.0	10.0	10.0
8151	NoMatch	10.0	10.0	10.0	10.0
8161	NoMatch	10.0	10.0	10.0	10.0
8162	NoMatch	10.0	10.0	10.0	10.0
8164	NoMatch	10.0	10.0	10.0	10.0
8166	NoMatch	10.0	10.0	10.0	10.0
8168	NoMatch	10.0	10.0	10.0	10.0
8169	NoMatch	10.0	10.0	10.0	10.0
8171	NoMatch	10.0	10.0	10.0	10.0
8173	NoMatch	10.0	10.0	10.0	10.0
8174	NoMatch	10.0	10.0	10.0	10.0
8175	NoMatch	4.7	6.5	6.5	6.5
8176	NoMatch	7.4	7.4	7.4	7.4
8177	NoMatch	7.3	7.3	7.3	7.3
8179	NoMatch	10.0	10.0	10.0	10.0
8180	NoMatch	10.0	10.0	10.0	10.0
8183	NoMatch	10.0	10.0	10.0	10.0
8184	NoMatch	10.0	10.0	10.0	10.0
8186	NoMatch	10.0	10.0	10.0	10.0
8188	NoMatch	10.0	10.0	10.0	10.0
818899	SSF-2392	10.3	10.3	10.3	10.3
8190	NoMatch	10.0	10.0	10.0	10.0
8192	NoMatch	10.0	10.0	10.0	10.0
8194	NoMatch	10.0	10.0	10.0	10.0
8196	NoMatch	10.0	10.0	10.0	10.0
8198	NoMatch	10.0	10.0	10.0	10.0
819859	SSF-2415	9.5	9.5	9.4	9.4
819860	SSF-2416	10.0	9.9	9.9	9.9
819864	SSF-2418	7.9	8.0	8.0	8.0
819866	SSF-2372	5.1	5.1	5.1	5.1
819868	SSF-2376	7.0	7.0	7.0	5.8
819895	SSF-2395	6.5	6.5	6.5	6.5
819897	SSF-2394	9.3	9.3	9.3	9.3
819900	SSF-2393	9.2	9.2	9.2	9.2
819908	SSF-2405	16.7	16.7	16.7	16.7
819910	SSF-2407	9.4	9.4	9.4	9.4
819917	SSF-2404	8.8	8.8	8.8	8.8
819922	SSF-2414	4.9	4.9	4.9	4.9
819923	SSF-2413	3.7	3.7	3.7	3.6
819924	SSF-2412	7.7	7.7	7.7	7.7
819930	SSF-2499	6.7	6.7	6.7	6.7
8201	NoMatch	7.5	7.5	7.5	7.5
8204	NoMatch	10.0	10.0	10.0	10.0
8207	NoMatch	10.0	10.0	10.0	10.0
8208	NoMatch	25.3	25.3	25.3	25.3
8211	NoMatch	10.0	10.0	10.0	10.0
8214	NoMatch	17.3	17.3	17.3	17.3
8215	NoMatch	11.4	11.4	11.4	11.4

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
8217	NoMatch	10.0	10.0	10.0	10.0
8221	NoMatch	10.0	10.0	10.0	10.0
8223	NoMatch	10.0	10.0	10.0	10.0
8225	NoMatch	10.0	10.0	10.0	10.0
8227	NoMatch	10.0	10.0	10.0	10.0
8233	NoMatch	10.6	10.6	10.6	10.6
8235	NoMatch	10.0	10.0	10.0	10.0
8244	NoMatch	10.0	10.0	10.0	10.0
8245	NoMatch	10.0	10.0	10.0	10.0
8249	NoMatch	10.0	10.0	10.0	10.0
8259	NoMatch	9.8	9.8	9.8	9.8
8260	NoMatch	6.5	6.5	6.5	6.5
8262	NoMatch	4.5	4.5	4.5	4.5
8272	SSF-2621	10.3	10.3	10.3	10.3
8275	SSF-1673	8.3	7.0	6.8	5.8
8277	SSF-1672	8.1	5.5	5.2	4.3
8281	SSF-1574	9.8	5.7	5.4	4.8
8284	SSF-1912	11.1	11.1	11.1	11.1
8285	SSF-1911	9.4	9.4	9.4	9.4
8287	SSF-1914	6.3	6.3	6.2	6.2
8288	SSF-1913	6.6	6.6	6.6	6.6
8291	SSF-1910	10.3	10.3	10.3	10.3
8293	SSF-1909	8.8	8.8	8.8	8.8
8296	SSF-2110	5.8	5.8	5.8	5.8
8298	SSF-1460	4.2	4.2	4.2	4.2
8300	SSF-2118	13.1	12.7	12.7	12.7
8301	SSF-2119	10.9	10.3	10.3	10.3
8303	SSF-2121	13.5	12.9	12.9	12.9
8304	SSF-2122	13.1	12.5	12.5	12.4
8306	SSF-2123	16.1	15.5	15.4	15.4
8310	SSF-1450	11.1	11.1	11.1	11.1
8311	SSF-1448	5.4	5.4	5.4	5.2
8315	SSF-1454	5.3	5.3	5.3	5.3
8320	SSF-2107	9.7	9.7	9.7	9.7
8321	SSF-2108	10.2	10.2	10.2	10.2
8323	NoMatch	8.2	8.2	8.2	8.2
8330	SSF-2116	12.0	11.6	11.6	11.6
8332	SSF-2120	3.0	2.4	2.4	2.4
8335	SSF-2115	7.6	7.1	7.1	7.1
8337	SSF-2113	10.3	9.8	9.8	9.8
8338	SSF-1700	14.0	13.7	13.7	13.7
8340	SSF-2114	5.4	4.9	4.9	4.9
8343	SSF-2112	16.5	16.0	16.0	16.0
8346	NoMatch	10.0	10.0	10.0	10.0
8347	NoMatch	10.0	10.0	10.0	10.0
8350	NoMatch	10.0	10.0	10.0	10.0
8353	NoMatch	10.0	10.0	10.0	10.0
8355	NoMatch	10.0	10.0	10.0	10.0

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
8357	NoMatch	10.0	10.0	10.0	10.0
8358	NoMatch	10.0	10.0	10.0	10.0
8360	NoMatch	10.0	10.0	10.0	10.0
8363	NoMatch	10.0	10.0	10.0	10.0
8365	NoMatch	10.0	10.0	10.0	10.0
8366	NoMatch	10.0	10.0	10.0	10.0
8369	NoMatch	10.0	10.0	10.0	10.0
8371	NoMatch	10.0	10.0	10.0	10.0
8373	NoMatch	10.0	10.0	10.0	10.0
8407	SSF-1733	9.9	9.9	9.9	9.9
8409	SSF-1732	9.8	9.8	9.7	9.7
8411	SSF-1731	9.8	9.8	9.7	9.7
8419	NoMatch	10.0	10.0	10.0	10.0
8472	SSF-1805	12.7	12.7	12.7	12.7
8475	NoMatch	20.0	20.0	20.0	20.0
8476	NoMatch	20.0	20.0	20.0	20.0
8478	NoMatch	6.1	6.1	6.1	6.1
8479	NoMatch	10.0	10.0	10.0	10.0
8481	NoMatch	10.0	10.0	10.0	10.0
8483	NoMatch	10.0	10.0	10.0	10.0
8485	NoMatch	10.0	10.0	10.0	10.0
8486	NoMatch	10.0	10.0	10.0	10.0
8488	NoMatch	10.0	10.0	10.0	10.0
8490	NoMatch	23.8	23.8	23.8	23.8
8491	NoMatch	25.0	25.0	25.0	25.0
8497	SSF-1993	11.1	11.1	11.1	11.1
8498	SSF-1992	10.3	10.3	10.3	10.3
8501	SSF-1991	19.6	19.6	19.6	19.6
8503	SSF-1990	12.2	12.2	12.2	12.2
8504	SSF-1865	6.6	6.6	6.6	5.2
8506	SSF-1864	10.8	10.7	10.7	10.1
8507	SSF-1863	8.8	8.6	8.6	7.7
8509	SSF-1866	7.6	6.9	6.9	6.0
8513	SSF-1367	8.4	5.1	4.9	4.2
8515	SSF-1358	9.6	7.8	9.5	8.6
8516	SSF-1357	9.3	9.5	9.5	7.6
8518	SSF-1356	8.7	6.9	6.8	1.7
8519	SSF-0001	8.7	8.6	8.6	8.5
8522	SSF-1366	7.9	5.1	4.9	4.3
8524	SSF-1365	8.9	4.4	6.5	5.6
8528	SSF-1060	6.5	6.5	6.5	6.5
8529	SSF-1187	11.8	11.8	11.8	11.8
8531	SSF-1127	7.2	7.2	7.2	7.2
8533	SSF-1184	12.1	12.1	12.1	12.1
8534	SSF-1067	14.7	14.7	14.7	14.6
8536	SSF-1185	11.6	11.6	11.6	11.6
8538	SSF-1048	12.7	12.6	12.6	12.6
8539	SSF-1044	7.8	7.7	7.7	7.7

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
8541	SSF-1066	8.5	8.5	8.5	8.5
8543	SSF-1065	12.3	12.2	12.3	12.2
8545	SSF-1183	8.7	8.7	8.7	8.7
8546	SSF-1100	8.2	8.2	8.2	8.2
8548	SSF-1042	6.7	6.5	6.6	6.2
8550	SSF-1063	12.3	12.3	12.3	12.3
8553	SSF-1125	7.7	7.7	7.7	7.6
8554	SSF-1124	7.9	7.9	7.9	7.9
8556	SSF-1126	6.6	6.6	6.6	6.6
8603	SSF-0549	8.7	8.6	8.6	8.6
8606	SSF-1096	4.3	4.4	4.3	4.3
8607	SSF-1095	3.7	3.8	3.7	3.7
8609	SSF-1094	2.9	3.0	2.9	2.9
8612	SSF-1097	8.6	8.6	8.6	8.6
8614	SSF-1098	6.0	6.1	6.0	6.0
8616	SSF-1099	4.0	4.1	4.0	4.0
8778	SSF-2437	9.0	8.7	8.7	8.6
8779	SSF-1839	8.8	8.6	8.6	8.6
8781	SSF-2438	11.4	11.1	11.0	10.9
8783	SSF-2449	14.8	14.3	14.2	14.1
8784	SSF-2450	15.5	14.9	14.8	14.8
8786	SSF-2451	14.9	14.3	14.1	14.1
8788	SSF-2452	11.0	10.5	10.5	10.4
8790	SSF-2453	11.3	10.8	10.8	10.7
8792	SSF-2454	13.3	12.9	12.8	12.8
8794	SSF-2455	13.3	13.0	12.9	12.9
8796	SSF-2456	18.5	18.3	18.2	18.2
8798	SSF-2457	16.6	16.3	16.2	16.2
8800	SSF-2458	17.9	17.7	17.6	17.5
8803	SSF-2443	13.4	12.9	12.8	12.7
8804	SSF-2444	13.8	13.4	13.3	13.2
8806	SSF-2445	14.0	13.6	13.5	13.4
8808	SSF-2446	15.2	14.8	14.7	14.7
8810	SSF-2447	10.9	10.5	10.4	10.4
8812	SSF-2448	12.6	12.1	12.0	11.9
8815	SSF-2442	12.5	12.0	11.9	11.9
8819	SSF-2440	12.0	11.6	11.5	11.4
8820	SSF-2441	12.6	12.1	11.9	11.9
8822	SSF-1842	7.4	7.4	7.3	7.3
8824	SSF-2439	11.7	11.4	11.3	11.3
8830	SSF-2432	12.4	11.9	11.8	11.8
8832	SSF-2433	12.7	12.2	12.1	12.0
8834	SSF-2434	10.1	9.5	9.5	9.4
8836	SSF-2464	12.1	12.0	12.0	11.9
8838	SSF-2428	12.7	12.5	12.4	12.4
8840	SSF-2429	12.8	12.6	12.5	12.4
8842	SSF-2465	12.1	11.8	11.7	11.7
8844	SSF-2430	10.9	10.4	10.3	10.3

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
8847	SSF-2463	12.7	12.2	12.1	12.1
8849	SSF-2462	11.8	11.4	11.3	11.3
8851	SSF-2435	11.6	11.2	11.1	11.1
8856	SSF-2436	10.9	10.6	10.6	10.6
96381	SSF-0377	8.6	8.6	8.6	8.6
96382	SSF-0378	8.8	8.8	8.8	8.8
96383	SSF-0380	7.3	7.2	7.2	7.2
96384	SSF-0381	11.7	11.7	11.7	11.7
96385	SSF-0382	15.5	15.5	15.5	15.5
96386	SSF-0383	17.5	17.5	17.5	17.5
96387	SSF-0384	9.9	9.9	9.9	9.9
96388	SSF-0385	6.0	6.0	6.0	6.0
96389	SSF-0386	6.0	6.0	6.0	6.0
96390	SSF-0387	7.5	7.5	7.5	7.5
96392	SSF-0400	4.5	4.5	4.5	4.5
96393	SSF-0401	6.0	5.9	5.9	5.9
96394	SSF-0402	6.3	6.3	6.3	6.3
96395	SSF-0406	6.0	6.0	6.0	6.0
96396	SSF-0407	10.1	10.0	10.0	10.0
96397	SSF-0409	10.2	10.2	10.2	10.2
96398	SSF-0410	9.5	9.5	9.5	9.5
96399	SSF-0411	6.4	6.4	6.4	6.4
96400	SSF-0412	8.6	8.6	8.6	8.6
96401	SSF-0413	10.5	10.5	10.5	10.5
96402	SSF-0414	10.9	10.9	10.9	10.9
96403	SSF-0415	8.7	8.6	8.6	8.6
96404	SSF-0416	10.5	10.5	10.5	10.5
96405	SSF-0417	9.4	9.4	9.4	9.4
96406	SSF-0418	9.6	9.6	9.6	9.6
96407	SSF-0419	6.7	6.7	6.7	6.7
96408	SSF-0420	9.0	9.0	8.9	8.9
96409	SSF-0421	16.3	16.3	16.3	16.3
96410	SSF-0422	11.5	11.5	11.5	11.4
96411	SSF-0423	17.8	17.7	17.7	17.7
96412	SSF-0424	7.0	7.0	7.0	6.9
96413	SSF-0425	3.0	3.0	3.0	3.0
96414	SSF-0426	6.7	6.6	6.6	6.6
96415	SSF-0427	12.3	12.3	12.3	12.3
96416	SSF-0428	7.5	7.5	7.5	7.5
96417	SSF-0429	11.5	11.5	11.5	11.5
96418	SSF-0430	7.2	7.2	7.2	7.2
96419	SSF-0431	10.9	10.9	10.9	10.9
96420	SSF-0432	16.0	16.0	16.0	16.0
96421	SSF-0433	10.5	10.5	10.5	10.5
96422	SSF-0435	8.0	8.0	8.0	8.0
96423	SSF-0436	7.2	7.2	7.2	7.2
96424	SSF-0437	7.9	7.9	7.9	7.9
96425	SSF-0438	8.8	8.8	8.8	8.8

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
96426	SSF-0439	5.4	5.4	5.4	5.4
96427	SSF-0458	6.6	6.6	6.6	6.6
96428	SSF-0459	7.3	7.3	6.3	6.2
96429	SSF-0460	4.9	4.7	3.3	3.2
96430	SSF-0461	7.5	6.7	5.3	5.2
96431	SSF-0463	12.8	12.8	12.8	12.8
96432	SSF-0376	9.0	9.0	9.0	9.0
96433	SSF-0466	9.0	9.0	9.0	9.0
96434	SSF-0467	7.9	7.9	7.9	7.9
96435	SSF-0468	9.2	9.2	9.2	9.2
96436	SSF-0469	7.8	7.8	7.8	7.8
96437	SSF-0471	8.9	8.9	8.9	8.9
96438	SSF-0116	9.8	9.8	9.8	9.8
96439	SSF-0117	7.0	7.0	7.0	7.0
96440	SSF-0119	6.1	6.1	6.1	6.1
96441	SSF-0120	9.1	9.1	9.1	9.1
96442	SSF-0121	6.8	6.8	6.8	6.8
96443	SSF-0122	5.4	5.4	5.4	5.4
96444	SSF-0123	15.1	15.1	15.1	15.1
96445	SSF-0125	17.6	17.6	17.6	17.6
96446	SSF-0126	12.3	12.3	12.3	12.3
96447	SSF-0127	9.1	9.1	9.1	9.1
96448	SSF-0128	9.3	9.3	9.3	9.3
96449	SSF-0129	10.0	10.0	10.0	10.0
96450	SSF-0130	7.6	7.6	7.6	7.6
96451	SSF-2204	5.4	5.4	5.4	5.4
96452	SSF-0150	10.0	10.0	10.0	10.0
96454	SSF-0152	6.6	6.6	6.6	6.6
96455	SSF-0153	6.3	6.3	6.3	6.3
96456	SSF-0154	8.4	8.4	8.4	8.4
96457	SSF-0155	7.4	7.4	7.4	7.3
96458	SSF-0159	15.5	15.5	15.5	15.5
96459	SSF-0160	15.7	15.7	15.7	15.7
96460	SSF-0161	10.1	10.1	10.1	10.1
96461	SSF-0162	9.8	9.8	9.8	9.8
96462	SSF-0165	5.5	5.5	5.5	5.5
96464	SSF-0167	11.9	12.0	12.0	12.0
96466	SSF-0169	7.9	7.9	7.9	7.9
96467	SSF-0286	8.1	8.1	8.1	8.1
96468	SSF-0287	6.0	6.0	6.0	6.0
96469	SSF-0288	10.6	10.6	10.6	10.6
96470	SSF-0289	7.9	7.9	7.9	7.9
96471	NoMatch	6.7	6.7	6.7	6.7
96472	NoMatch	8.1	8.1	8.1	8.1
96473	NoMatch	9.4	9.4	9.4	9.4
96474	NoMatch	9.6	9.6	9.6	9.6
96475	SSF-0298	10.7	10.7	10.7	10.7
96476	SSF-0299	9.8	9.8	9.8	9.7

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
96477	SSF-0304	4.3	4.3	4.3	4.3
96478	SSF-0305	4.8	4.8	4.8	4.8
96479	SSF-0320	6.5	6.5	6.5	6.5
96480	SSF-0321	4.7	4.7	4.7	4.7
96482	SSF-0325	8.8	8.8	8.8	8.8
96483	SSF-0327	4.3	4.3	4.3	4.3
96484	SSF-0328	3.9	3.8	3.8	3.8
96485	SSF-0329	4.8	4.8	4.8	4.8
96486	SSF-0330	5.5	5.5	5.5	5.5
96487	SSF-0333	5.6	5.6	5.6	5.6
96488	SSF-0334	5.8	5.8	5.8	5.8
96489	SSF-0335	5.8	5.8	5.8	5.8
96490	SSF-0337	7.6	7.6	7.6	7.6
96491	SSF-0338	6.0	6.0	6.0	6.0
96492	SSF-0341	5.9	5.9	5.9	5.9
96493	SSF-0344	5.9	5.9	5.9	5.9
96494	SSF-0354	10.0	10.0	10.0	10.0
96495	SSF-0362	10.8	10.8	10.8	10.8
96496	SSF-0363	13.3	13.3	13.3	13.3
96497	SSF-0364	9.0	9.0	9.0	9.0
96498	SSF-0365	11.3	11.2	11.2	11.2
96499	SSF-0366	8.6	8.5	8.5	8.5
96500	SSF-0368	7.7	7.7	7.6	7.6
96501	SSF-0369	8.0	8.0	8.0	8.0
96502	SSF-0371	6.5	6.5	6.4	6.4
96503	SSF-0372	8.2	8.2	8.2	8.2
96504	SSF-0373	9.5	9.5	9.5	9.5
96505	SSF-0374	11.9	11.9	11.9	11.9
96506	SSF-0375	15.3	15.3	15.3	15.3
96507	SSF-0193	8.1	8.1	8.1	8.1
96508	SSF-0194	8.6	8.6	8.6	8.5
96509	SSF-0195	2.8	2.8	2.8	2.8
96510	SSF-0196	10.7	10.7	10.7	10.7
96511	SSF-0197	10.3	10.3	10.3	10.3
96512	SSF-0198	11.7	11.7	11.7	11.7
96513	NoMatch	5.5	5.5	5.5	5.5
96514	NoMatch	4.2	4.2	4.2	4.2
96515	NoMatch	4.4	4.4	4.4	4.4
96516	SSF-0200	6.1	6.1	6.1	6.1
96517	SSF-0203	3.7	3.7	3.7	3.7
96518	SSF-0204	4.2	4.2	4.2	4.2
96519	SSF-0205	4.9	4.9	4.9	4.9
96520	SSF-0210	6.2	6.2	3.0	2.9
96521	SSF-0211	5.6	5.6	5.6	5.6
96522	SSF-0171	8.5	8.5	8.5	8.5
96523	SSF-0212	7.0	7.0	7.0	7.0
96524	SSF-0213	5.4	5.4	5.4	5.4
96525	SSF-0214	5.1	5.1	5.1	5.1

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
96526	SSF-0215	5.7	5.7	5.7	5.7
96527	SSF-0216	11.8	11.6	11.5	11.5
96528	SSF-0217	17.4	17.3	17.2	17.2
96529	SSF-0218	3.0	3.0	3.0	3.0
96530	SSF-0219	5.6	5.6	5.6	5.6
96531	SSF-0220	7.6	7.6	7.6	7.6
96532	SSF-0221	4.1	4.1	4.1	4.1
96533	SSF-0222	5.0	5.0	5.0	5.0
96534	SSF-0223	3.6	3.6	3.6	3.6
96536	SSF-0228	6.0	5.9	3.1	1.3
96537	SSF-0230	6.3	6.3	6.3	6.3
96538	SSF-0231	4.2	4.2	4.1	3.9
96539	SSF-0232	5.6	5.3	1.8	1.1
96540	SSF-0233	5.0	4.9	3.4	3.0
96541	SSF-0234	12.7	12.7	12.7	12.7
96542	SSF-0235	4.2	3.8	1.0	0.5
96543	SSF-0236	5.7	5.7	5.7	5.7
96544	SSF-0238	8.2	8.2	8.2	8.2
96545	SSF-0239	6.0	6.0	6.0	6.0
96546	SSF-0241	7.9	7.9	7.9	7.9
96547	SSF-0242	7.5	7.5	7.5	7.5
96548	SSF-0243	9.0	9.0	9.0	9.0
96549	SSF-0244	5.5	5.4	5.4	5.4
96550	SSF-0245	11.6	11.6	11.6	11.6
96551	SSF-0246	13.6	13.6	13.6	13.6
96552	SSF-0247	7.9	7.9	7.9	7.9
96553	SSF-0248	10.2	10.2	10.2	10.2
96554	SSF-0249	6.4	6.4	6.4	6.4
96555	SSF-0250	15.5	15.5	15.4	15.4
96556	SSF-0251	8.4	8.4	8.4	8.4
96557	SSF-0252	6.7	6.7	6.7	6.7
96558	SSF-0253	8.9	8.9	8.9	8.9
96559	SSF-0254	8.5	8.5	8.5	8.5
96560	SSF-0255	5.0	4.9	4.9	4.9
96561	SSF-0256	7.0	7.0	7.0	7.0
96562	SSF-0257	9.7	9.0	8.6	8.5
96563	SSF-0258	7.2	7.2	7.2	7.2
96564	SSF-0259	8.3	8.3	8.3	8.3
96565	SSF-0260	9.7	9.6	9.6	9.6
96566	SSF-0261	6.4	6.4	6.4	6.4
96567	SSF-0262	6.8	6.8	6.8	6.8
96568	SSF-0263	4.9	4.8	4.8	4.8
96569	SSF-0266	9.3	9.3	9.3	9.3
96570	SSF-0267	10.2	10.2	10.2	10.2
96571	SSF-0268	7.2	7.2	7.2	7.2
96572	SSF-0269	9.9	9.9	9.9	9.9
96573	SSF-0270	7.9	7.9	7.9	7.9
96574	SSF-0271	11.1	11.1	11.1	11.1

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
96575	SSF-0274	8.1	8.1	8.1	8.1
96576	SSF-0283	6.7	6.7	6.7	6.7
96577	SSF-0284	5.3	5.3	5.3	5.3
96578	SSF-0285	4.0	4.0	4.0	4.0
96579	SSF-0078	10.5	10.5	10.5	10.1
96580	SSF-0079	6.3	6.3	6.3	6.3
96581	SSF-0080	3.7	3.7	3.7	3.7
96582	SSF-0081	12.9	12.9	12.9	12.9
96583	SSF-0082	5.8	5.8	5.8	5.8
96584	SSF-0083	4.8	4.8	4.8	4.8
96585	SSF-0084	7.9	7.9	7.9	7.9
96586	SSF-0085	10.5	10.5	10.5	10.5
96587	SSF-0237	7.7	7.7	7.7	7.7
96588	SSF-0086	9.7	9.7	9.7	9.7
96589	SSF-0087	6.2	6.2	6.2	6.2
96590	SSF-0088	10.6	10.6	10.6	10.6
96591	SSF-0089	7.9	7.9	7.9	7.9
96592	SSF-0090	3.7	3.7	3.7	3.7
96593	SSF-0091	15.0	15.0	15.0	15.0
96594	SSF-0092	17.3	17.3	17.3	17.3
96595	SSF-0093	7.4	7.4	7.4	7.4
96596	SSF-0094	6.9	6.9	6.9	6.9
96597	SSF-0095	36.2	36.2	36.2	36.2
96598	SSF-0096	8.3	8.3	8.3	8.3
96599	SSF-0097	7.7	7.7	7.7	7.7
96600	SSF-0098	8.8	8.8	8.8	8.8
96601	SSF-0099	11.5	11.5	11.5	11.5
96603	SSF-0101	10.3	10.3	10.3	10.3
96604	SSF-0102	11.8	11.7	11.7	11.6
96605	SSF-0103	12.4	12.4	12.3	12.3
96606	SSF-0104	13.7	13.7	13.6	13.5
96607	SSF-0105	6.9	6.9	6.9	6.9
96611	SSF-0109	4.2	4.2	4.2	4.2
96612	SSF-0110	8.9	8.9	8.9	8.9
96613	SSF-0111	13.2	13.2	13.2	13.2
96614	SSF-0112	8.8	8.8	8.8	8.8
96615	SSF-0113	9.0	9.0	9.0	9.0
96616	SSF-0114	5.7	5.7	5.7	5.7
96617	SSF-0115	7.0	7.0	7.0	7.0
96618	SSF-0679	7.0	7.0	7.0	7.0
96619	SSF-0681	8.5	8.5	8.3	8.1
96620	SSF-0682	5.7	4.8	4.3	4.1
96621	SSF-0683	5.2	5.2	5.1	5.0
96622	SSF-0684	15.7	14.9	14.5	14.4
96623	SSF-0685	8.5	8.4	8.4	8.4
96624	SSF-0686	10.8	10.8	10.8	10.8
96625	SSF-0687	10.9	10.9	10.9	10.9
96626	SSF-0688	11.2	11.2	11.2	11.2

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
96627	SSF-0689	9.4	9.4	9.4	9.4
96628	SSF-0690	6.8	6.8	6.8	6.8
96629	SSF-0694	8.5	8.2	8.2	8.2
96630	SSF-0695	9.7	9.5	9.5	9.5
96631	SSF-0696	11.3	11.1	11.0	11.0
96632	SSF-0697	7.4	7.2	7.1	7.1
96634	SSF-0699	8.5	8.5	8.5	8.5
96635	SSF-0700	3.6	3.5	3.5	3.5
96636	SSF-0701	8.5	8.5	8.5	8.5
96637	SSF-0702	6.1	6.1	6.1	6.1
96638	SSF-0703	5.6	5.6	5.6	5.6
96639	SSF-0704	7.7	7.7	7.7	7.7
96640	SSF-0706	8.0	8.0	8.0	8.0
96641	SSF-0707	7.9	7.9	7.9	7.9
96642	SSF-0708	9.1	9.1	9.1	9.1
96643	SSF-0709	7.6	7.6	7.6	7.6
96644	SSF-0710	7.7	7.7	7.7	7.7
96645	SSF-0711	6.5	6.5	6.5	6.5
96646	SSF-0712	8.1	8.1	8.1	8.1
96647	SSF-0713	8.5	8.5	8.5	8.5
96648	SSF-0715	9.5	9.5	9.5	9.5
96649	SSF-0718	7.0	7.0	7.0	7.0
96650	SSF-0719	10.1	10.1	10.1	10.1
96651	SSF-0720	12.7	12.7	12.7	12.7
96652	SSF-0721	14.5	14.5	14.5	14.5
96655	SSF-0726	6.8	6.8	6.8	6.8
96656	SSF-0727	13.5	13.5	13.5	13.5
96657	SSF-0728	8.4	8.4	8.4	8.4
96658	SSF-0729	16.1	16.1	16.1	16.1
96659	SSF-0731	14.5	14.5	14.5	14.5
96660	SSF-0732	12.8	12.8	12.8	12.8
96661	SSF-0172	8.9	8.9	8.9	8.9
96662	SSF-0173	9.4	9.4	9.4	9.4
96663	SSF-0174	11.5	11.5	11.5	11.5
96664	SSF-0175	12.0	12.0	11.9	11.9
96665	SSF-0176	12.6	12.6	12.6	12.6
96666	SSF-0177	12.3	12.3	12.3	12.3
96667	SSF-0178	12.3	12.3	12.3	12.3
96668	SSF-0179	11.5	11.5	11.5	11.5
96669	SSF-0180	10.0	10.0	10.0	10.0
96670	SSF-0181	8.8	8.8	8.8	8.8
96671	SSF-0182	8.2	8.2	8.2	8.2
96672	SSF-0183	7.7	7.7	7.7	7.7
96673	SSF-0187	4.4	4.4	4.4	4.4
96674	SSF-0188	3.8	3.8	3.8	3.8
96675	SSF-0189	4.2	4.2	4.2	4.2
96676	SSF-0190	6.6	6.6	6.6	6.6
96677	SSF-0191	6.6	6.6	6.6	6.6

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
96678	SSF-0002	8.2	8.2	8.2	8.2
96679	SSF-0003	10.9	10.9	10.9	10.9
96680	SSF-0005	8.3	8.3	8.3	8.3
96681	SSF-0006	7.6	7.6	7.6	7.6
96682	SSF-0007	9.5	9.5	9.5	9.5
96683	SSF-0008	12.0	12.0	12.0	12.0
96684	SSF-0009	7.7	7.7	7.7	7.7
96685	SSF-0010	8.6	8.6	8.6	8.6
96686	SSF-0011	8.8	8.8	8.8	8.8
96687	SSF-0012	6.2	6.2	6.2	6.2
96688	SSF-0013	8.4	8.4	8.4	8.4
96689	SSF-0014	8.3	8.3	8.3	8.3
96690	SSF-0015	8.5	8.5	8.5	8.5
96691	SSF-0016	7.8	7.9	7.9	7.9
96692	SSF-0018	11.4	11.3	11.3	11.3
96693	SSF-0019	12.6	12.5	12.5	12.5
96694	SSF-0020	9.8	9.7	9.7	9.7
96695	SSF-0021	6.8	6.8	6.8	6.8
96696	SSF-0022	7.6	7.5	7.5	7.5
96697	SSF-0023	7.1	7.1	7.1	7.0
96698	SSF-0024	7.1	6.9	6.9	6.9
96699	SSF-0025	15.2	15.2	15.2	15.2
96700	SSF-0026	9.0	9.0	9.0	9.0
96701	SSF-0027	11.5	11.5	11.5	11.5
96702	SSF-0028	8.7	8.7	8.7	8.7
96703	SSF-0029	7.0	7.0	7.0	7.0
96705	SSF-0037	9.7	9.7	9.7	9.7
96706	SSF-0038	10.5	10.5	10.5	10.5
96708	SSF-0040	4.6	4.6	4.6	4.6
96709	SSF-0041	10.7	10.7	10.7	10.7
96710	SSF-0042	8.4	8.4	8.4	8.4
96711	SSF-0043	10.2	10.2	10.2	10.2
96712	SSF-0044	11.7	11.7	11.7	11.7
96713	SSF-0045	12.8	12.8	12.8	12.8
96714	SSF-0047	9.4	9.4	9.4	9.4
96715	SSF-0048	15.8	15.8	15.8	15.8
96716	SSF-0050	14.2	14.2	14.2	14.2
96717	SSF-0051	13.4	13.4	13.4	13.4
96718	SSF-0052	13.1	13.1	13.1	13.1
96719	SSF-0053	13.0	13.0	13.0	13.0
96720	SSF-0054	7.0	7.0	7.0	7.0
96721	SSF-0055	7.2	7.2	7.2	7.2
96722	SSF-0056	8.5	8.5	8.5	8.5
96723	SSF-0057	7.4	7.4	7.4	7.4
96724	SSF-0058	7.0	7.0	7.0	7.0
96725	SSF-0059	7.2	7.2	7.2	7.2
96726	SSF-0060	6.8	6.8	6.8	6.8
96727	SSF-0061	7.2	7.2	7.2	7.2

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
96728	SSF-0062	9.3	9.3	9.3	9.3
96729	SSF-0063	6.1	6.1	6.1	6.1
96730	SSF-0064	10.0	10.0	10.0	10.0
96731	SSF-0065	7.7	7.7	7.6	7.6
96732	SSF-0068	8.2	8.2	8.2	8.2
96733	SSF-0069	7.6	7.6	7.6	7.6
96734	SSF-0070	7.1	7.1	7.1	7.1
96735	SSF-0072	19.9	19.9	19.9	19.9
96736	SSF-0073	6.6	6.6	6.6	6.6
96737	SSF-0074	5.4	5.5	5.4	5.4
96738	SSF-0075	6.7	6.7	6.7	5.6
96739	SSF-0076	8.1	8.1	8.1	8.1
96740	SSF-0077	5.7	5.7	5.7	4.8
96742	SSF-1075	13.5	13.5	13.5	13.5
96743	SSF-1076	13.9	13.9	13.9	13.9
96744	SSF-1078	9.0	9.0	9.0	9.0
96745	SSF-1079	8.9	8.9	8.9	8.9
96746	SSF-1080	8.8	8.8	8.8	8.8
96747	SSF-1081	8.9	8.9	8.9	8.9
96748	SSF-1082	11.1	11.1	11.1	11.1
96749	SSF-1083	9.6	9.6	9.6	9.6
96750	SSF-1084	8.2	8.2	8.2	8.2
96751	SSF-1085	9.3	9.3	9.3	9.3
96752	SSF-1086	9.8	9.8	9.8	9.8
96753	SSF-1087	11.6	11.6	11.6	11.6
96754	SSF-1088	10.1	10.1	10.1	10.1
96755	SSF-1089	9.8	9.8	9.8	9.8
96756	SSF-1090	10.3	10.3	10.3	10.3
96758	SSF-2206	13.6	13.6	13.6	13.6
96759	SSF-0017	4.6	4.5	4.5	4.5
96760	SSF-2207	6.7	6.7	6.7	6.7
96762	SSF-1110	6.8	6.8	6.8	6.8
96763	SSF-1111	11.1	11.0	11.0	11.0
96764	SSF-1112	10.8	10.8	10.8	10.8
96765	SSF-1113	15.1	15.1	15.1	15.1
96766	SSF-1114	15.1	15.1	15.1	15.1
96767	SSF-1115	12.2	12.2	12.2	12.2
96768	SSF-1118	8.1	8.1	8.1	8.1
96769	SSF-1119	8.6	8.6	8.6	8.6
96770	SSF-1120	6.9	6.9	6.9	6.9
96771	SSF-1121	7.5	7.5	7.5	7.5
96772	SSF-1122	11.9	11.9	11.9	11.9
96773	SSF-1123	5.6	5.6	5.6	5.6
96774	SSF-1128	6.3	6.3	6.3	6.3
96775	SSF-1129	11.7	11.7	11.7	11.7
96776	SSF-1130	8.6	8.6	8.6	8.6
96777	SSF-1131	5.4	5.4	5.4	5.4
96778	SSF-1133	4.4	4.4	4.4	4.4

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
96779	SSF-1134	5.1	5.1	5.1	5.1
96780	SSF-1136	10.3	10.3	10.3	10.3
96781	SSF-1137	10.6	10.6	10.6	10.6
96782	SSF-1138	7.9	7.9	7.9	7.9
96783	SSF-1140	11.1	11.1	11.1	11.1
96784	SSF-1141	12.1	12.1	12.1	12.1
96785	SSF-1142	11.1	11.1	11.1	11.1
96786	SSF-1143	4.7	4.7	4.7	4.7
96787	SSF-1144	6.6	6.6	6.6	6.6
96788	SSF-1145	11.4	11.4	11.4	11.4
96789	SSF-1146	8.1	8.1	8.1	8.1
96790	SSF-1147	9.7	9.7	9.7	9.7
96791	SSF-1148	8.0	7.9	7.9	7.9
96792	SSF-1149	7.5	7.5	7.5	7.5
96793	SSF-1150	11.3	11.3	11.3	11.3
96794	SSF-1151	8.7	8.7	8.7	8.7
96795	SSF-1152	6.3	6.3	6.3	6.3
96796	SSF-1154	7.8	7.8	7.8	7.8
96797	SSF-1155	10.8	10.8	10.8	10.8
96798	SSF-1156	10.8	10.8	10.8	10.8
96799	SSF-1162	7.8	7.8	7.8	7.8
96800	SSF-1163	6.8	6.8	6.8	6.8
96801	SSF-1164	12.0	12.0	12.0	12.0
96802	SSF-1165	6.6	6.6	6.6	6.6
96803	SSF-1166	5.0	5.0	5.0	5.0
96804	SSF-1167	4.5	4.5	4.5	4.5
96805	SSF-1168	4.2	4.2	4.2	4.2
96806	SSF-1169	8.0	8.0	8.0	8.0
96810	SSF-1457	6.2	6.2	6.2	6.2
96811	SSF-1458	3.8	3.8	3.8	3.8
96812	SSF-1459	6.8	6.8	6.8	6.8
96814	SSF-1461	3.8	3.8	3.8	3.8
96815	SSF-1462	7.9	7.9	7.9	7.9
96816	SSF-1463	7.1	7.1	7.1	7.1
96817	SSF-1464	7.8	7.8	7.8	7.8
96818	SSF-1465	8.3	8.3	8.3	8.1
96820	SSF-1467	6.9	6.9	6.9	6.9
96821	SSF-1468	5.0	5.0	5.0	5.0
96823	SSF-1474	7.9	7.9	7.9	7.9
96824	SSF-1476	16.2	16.2	16.2	16.2
96825	SSF-1477	13.1	13.1	13.1	13.1
96826	SSF-1478	10.2	10.2	10.2	10.2
96827	SSF-1479	7.1	7.1	7.1	7.1
96828	SSF-1480	7.9	7.9	7.9	7.9
96829	SSF-1481	5.1	5.1	5.1	5.1
96830	SSF-1558	8.4	8.3	8.3	7.9
96831	SSF-0791	7.7	7.7	7.7	7.7
96832	SSF-0792	9.1	9.1	9.1	9.1

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
96833	SSF-0793	7.6	7.6	7.6	7.6
96834	SSF-0794	9.3	9.3	9.3	9.3
96835	SSF-0795	8.2	8.2	8.2	8.2
96836	SSF-0796	10.2	10.2	10.2	10.2
96837	SSF-0797	9.2	9.2	8.8	8.7
96838	SSF-0798	7.7	7.7	7.7	7.7
96839	SSF-0805	7.7	7.7	7.7	7.7
96840	SSF-0806	11.8	11.8	11.8	11.8
96841	SSF-0807	9.9	9.9	9.9	9.9
96842	SSF-0808	5.4	5.3	5.3	5.3
96843	SSF-0809	8.0	8.0	8.0	8.0
96844	SSF-0810	8.5	8.5	8.5	8.5
96845	SSF-0811	10.5	10.5	10.5	10.5
96846	SSF-0812	10.3	10.3	10.3	10.3
96847	SSF-0813	12.7	12.7	12.7	12.7
96848	SSF-0814	12.5	12.5	12.5	12.5
96849	SSF-0815	8.3	8.3	8.3	8.3
96850	SSF-1036	6.8	6.8	6.8	6.8
96851	SSF-1037	12.9	12.9	12.9	12.9
96852	SSF-1038	8.6	8.5	8.5	8.5
96853	SSF-1039	6.3	6.2	6.2	5.0
96854	SSF-1043	8.1	8.1	8.1	8.1
96855	SSF-1046	6.7	6.7	6.7	6.7
96856	SSF-1047	7.9	7.9	7.9	7.9
96857	SSF-1049	10.8	10.8	10.8	10.7
96858	SSF-1050	10.9	10.9	10.9	10.9
96859	SSF-1051	9.5	9.5	9.5	9.5
96860	SSF-1052	8.7	8.7	8.7	8.7
96861	SSF-1053	7.1	7.1	7.1	7.1
96862	SSF-1054	9.3	9.3	9.3	9.3
96863	SSF-1055	8.9	8.9	8.9	8.9
96864	SSF-1057	9.0	9.0	9.0	9.0
96865	SSF-1058	6.9	6.9	6.9	6.9
96866	SSF-1059	7.0	7.0	7.0	7.0
96867	SSF-1061	6.5	6.5	6.5	6.5
96869	SSF-1064	9.3	9.2	9.2	9.2
96871	SSF-1068	14.6	14.6	14.6	14.6
96872	SSF-1069	11.7	11.7	11.7	11.7
96874	SSF-1071	9.5	9.5	9.5	9.5
96875	SSF-1072	9.4	9.4	9.4	9.4
96876	SSF-1073	13.7	13.6	13.6	13.6
96877	SSF-1283	8.5	8.6	8.6	8.6
96878	SSF-1285	6.7	6.7	6.2	5.2
96879	SSF-1286	9.1	9.1	9.1	9.1
96880	SSF-1290	22.6	22.6	22.5	22.5
96881	SSF-1291	15.3	15.3	15.3	15.3
96882	SSF-1292	10.9	10.9	10.8	10.8
96883	SSF-1293	10.8	10.8	10.8	10.8

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
96884	SSF-1294	10.2	10.2	10.2	10.1
96885	SSF-1295	9.2	9.2	9.2	9.2
96886	SSF-1296	8.4	8.4	8.4	8.4
96887	SSF-1297	5.4	5.4	5.4	5.4
96888	SSF-1298	6.4	6.4	6.4	6.4
96889	SSF-1299	8.3	8.3	8.3	8.3
96890	SSF-1300	9.1	9.1	9.1	9.1
96891	SSF-1301	10.0	10.0	10.0	10.0
96892	SSF-1302	6.8	6.8	6.8	6.8
96893	SSF-1303	10.9	10.9	10.9	10.9
96894	SSF-1304	12.9	12.9	12.9	12.9
96895	SSF-1305	13.4	13.4	13.4	13.4
96896	SSF-1306	13.1	13.1	13.1	13.1
96897	SSF-1307	12.7	12.7	12.7	12.7
96898	SSF-1308	11.1	11.1	11.1	11.1
96899	SSF-1309	10.1	10.1	10.1	10.1
96900	SSF-1310	8.7	8.7	8.7	8.7
96901	SSF-1311	6.1	6.1	6.1	6.1
96902	SSF-1312	8.2	8.2	8.2	8.2
96903	SSF-1313	7.8	7.8	7.8	7.8
96904	SSF-1314	11.2	11.2	11.2	11.2
96905	SSF-1315	8.7	8.7	8.7	8.7
96906	SSF-1316	10.7	10.7	10.7	10.7
96907	SSF-1321	7.8	7.8	7.8	7.8
96908	SSF-1322	7.0	7.0	7.0	7.0
96909	SSF-1332	9.3	9.3	9.3	9.3
96910	SSF-1333	12.6	12.6	12.6	12.6
96911	SSF-1334	13.8	13.8	13.8	13.8
96912	SSF-1335	15.2	15.2	15.2	15.2
96913	SSF-1411	6.4	6.4	6.4	6.4
96914	SSF-1412	6.4	6.4	6.4	6.3
96915	SSF-1413	6.3	6.3	6.3	6.3
96916	SSF-1414	4.8	4.8	4.8	4.8
96917	SSF-1415	5.4	5.4	5.4	5.4
96918	SSF-1416	8.1	8.1	8.1	8.1
96919	SSF-1417	9.3	9.3	9.3	9.3
96920	SSF-1418	6.3	6.3	6.3	6.3
96921	SSF-1419	8.1	8.1	8.1	8.1
96922	SSF-1420	6.4	6.4	6.4	6.4
96923	SSF-1421	6.4	6.4	6.4	6.4
96924	SSF-1422	5.6	5.6	5.6	5.6
96925	SSF-1423	4.3	4.3	4.3	4.3
96926	SSF-1424	4.6	4.6	4.6	4.6
96927	SSF-1425	6.3	6.3	6.3	6.3
96928	SSF-1426	8.0	8.0	8.0	8.0
96929	SSF-1427	6.1	6.1	6.1	6.1
96930	SSF-1428	6.8	6.8	6.8	6.8
96931	SSF-1429	12.4	12.4	12.4	12.4

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
96932	SSF-1430	8.2	8.2	8.2	8.2
96933	SSF-1431	8.4	8.4	8.4	8.4
96934	SSF-1432	6.2	6.2	6.2	6.2
96935	SSF-1434	3.6	3.6	3.6	3.6
96936	SSF-1435	5.7	5.7	5.7	5.7
96937	SSF-1436	5.1	5.1	5.1	5.1
96938	SSF-1437	5.9	5.9	5.9	5.9
96939	SSF-1438	6.7	6.7	6.7	6.7
96940	SSF-1439	7.1	7.1	7.1	7.1
96941	SSF-1440	4.0	4.0	4.0	4.0
96942	SSF-1441	5.0	5.0	5.0	5.0
96943	SSF-1442	8.2	8.1	8.1	8.1
96944	SSF-1444	9.2	9.2	9.2	9.2
96945	SSF-1445	4.6	4.6	4.6	4.6
96946	SSF-1446	2.4	2.4	2.4	2.4
96947	SSF-1447	6.0	6.0	6.0	6.0
96950	NoMatch	6.9	6.9	6.9	6.3
96952	SSF-0568	6.9	6.9	6.9	6.9
96953	SSF-0569	8.0	7.9	7.9	7.9
96954	SSF-0570	6.7	6.7	6.7	6.7
96955	SSF-0571	8.8	8.7	8.7	8.7
96956	SSF-0572	8.6	8.6	8.6	8.6
96957	SSF-0573	8.5	8.5	8.5	8.5
96958	SSF-0574	7.9	7.9	7.9	7.9
96959	SSF-0575	7.2	7.2	7.2	7.2
96960	SSF-0576	8.3	8.3	8.3	8.3
96961	SSF-0577	6.8	6.8	6.8	6.8
96962	SSF-0578	10.6	10.6	10.6	10.6
96963	SSF-0579	8.6	8.6	8.6	8.6
96964	SSF-0580	6.5	6.5	6.5	6.5
96965	SSF-0582	6.6	6.6	6.6	6.6
96966	SSF-0583	8.6	8.6	8.6	8.6
96967	SSF-0584	10.5	10.5	10.5	10.5
96968	SSF-0585	6.0	6.0	6.0	6.0
96969	SSF-0586	7.0	7.0	7.0	7.0
96970	SSF-0587	6.3	6.3	6.3	6.3
96971	SSF-0588	6.1	6.1	6.1	6.1
96972	SSF-0590	8.5	8.5	8.5	8.5
96982	SSF-0735	6.3	6.3	6.3	6.3
96983	SSF-0736	8.2	8.2	8.2	8.2
96984	SSF-0737	11.6	11.6	11.6	11.6
96985	SSF-0738	12.7	12.7	12.7	12.7
96986	SSF-0739	7.6	7.6	7.6	7.6
96987	SSF-0740	11.8	11.8	11.8	11.8
96988	SSF-0741	12.9	12.9	12.9	12.9
96989	SSF-0742	10.6	10.6	10.6	10.6
96990	SSF-0743	7.4	7.4	7.4	7.4
96991	SSF-0745	7.3	7.3	7.3	7.3

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
96992	SSF-0746	9.5	9.5	9.5	9.5
96993	SSF-0747	8.4	8.4	8.4	8.4
96994	SSF-0748	8.2	8.2	8.2	8.2
96995	SSF-0749	8.3	8.3	8.2	8.2
96996	SSF-0750	7.0	7.0	7.0	7.0
96997	SSF-0751	9.3	9.3	9.3	9.3
96998	SSF-0752	9.7	9.7	9.7	9.7
96999	SSF-0753	7.8	7.7	7.7	7.7
97000	SSF-0754	1.7	1.7	1.7	1.7
97001	SSF-0755	4.7	4.7	4.7	4.7
97002	SSF-0756	5.4	5.4	5.4	5.4
97003	SSF-0757	5.1	5.1	5.1	5.1
97006	SSF-0761	5.0	5.0	5.0	5.0
97007	SSF-0763	7.9	7.9	7.9	7.9
97008	SSF-0764	6.6	6.6	6.6	6.6
97009	SSF-0765	8.4	8.4	8.4	8.4
97010	SSF-0766	6.1	6.1	6.1	6.1
97011	SSF-0767	7.6	7.6	7.6	7.6
97012	SSF-0768	6.1	6.1	6.1	6.1
97013	SSF-0769	10.4	10.4	10.4	10.4
97014	SSF-0770	11.8	11.8	11.8	11.8
97015	SSF-0771	8.2	8.2	8.2	8.2
97016	SSF-0772	6.0	6.0	6.0	6.0
97017	SSF-0773	7.8	7.8	7.8	7.8
97018	SSF-0774	9.3	9.3	9.3	9.3
97019	SSF-0775	10.1	10.1	10.1	10.1
97020	SSF-0776	7.3	7.3	7.3	7.3
97021	SSF-0777	6.8	6.8	6.8	6.8
97022	SSF-0778	8.4	8.4	8.4	8.4
97023	SSF-0786	10.1	10.1	10.1	10.0
97024	SSF-0787	10.7	10.7	10.7	10.7
97025	SSF-0788	6.7	6.7	6.7	6.7
97026	SSF-0789	6.4	6.4	6.4	6.4
97027	SSF-0790	10.5	10.5	10.5	10.5
97028	SSF-1282	5.4	5.4	5.4	5.4
97029	SSF-0475	7.3	7.3	7.3	7.3
97030	SSF-0476	7.3	7.3	7.3	7.3
97031	SSF-0477	7.1	7.1	7.1	7.1
97032	SSF-0478	11.5	11.5	11.5	11.5
97033	SSF-0479	7.1	7.1	7.1	7.1
97051	SSF-0530	7.7	7.6	7.6	7.6
97052	SSF-0531	14.7	14.7	14.7	14.7
97053	SSF-0532	7.2	7.2	7.2	7.2
97054	SSF-0533	8.9	8.9	8.9	8.9
97055	SSF-0534	7.7	7.7	7.7	7.7
97056	SSF-0535	8.3	8.3	8.3	8.3
97057	SSF-0536	16.4	16.4	16.4	16.4
97058	SSF-0537	7.9	7.9	7.9	7.9

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
97059	SSF-0538	9.4	9.4	9.4	9.4
97060	SSF-0539	8.0	8.0	8.0	8.0
97061	SSF-0540	8.2	8.2	8.2	8.2
97062	SSF-0541	3.6	3.6	3.6	3.6
97063	SSF-0542	8.5	8.5	8.5	8.5
97064	SSF-0543	8.9	8.9	8.9	8.9
97065	SSF-0544	7.8	7.8	7.8	7.8
97066	SSF-0545	10.8	10.8	10.8	10.8
97067	SSF-0546	12.0	12.0	12.0	12.0
97068	SSF-0547	11.1	11.1	11.1	11.1
97071	SSF-0550	10.2	10.2	10.2	10.2
97072	SSF-0551	10.2	10.2	10.2	10.1
97073	SSF-2205	8.0	8.0	8.0	8.0
97074	SSF-0565	7.2	7.1	7.1	7.1
97075	SSF-0566	6.3	6.3	6.3	6.3
97076	SSF-0567	6.4	6.4	6.4	6.4
97077	SSF-1737	10.8	10.8	10.8	10.8
97078	SSF-1738	9.6	9.6	9.6	9.6
97079	SSF-1739	6.8	6.8	6.8	6.8
97080	SSF-1741	12.9	12.9	12.9	12.9
97081	SSF-1742	13.4	13.4	13.4	13.3
97082	SSF-1743	15.9	15.9	15.9	15.9
97084	SSF-1749	5.6	5.6	5.6	5.6
97085	SSF-1754	8.0	8.0	7.9	7.9
97086	SSF-1755	7.2	7.2	7.2	7.2
97087	SSF-1758	10.5	10.5	10.5	10.5
97088	SSF-1759	8.0	8.0	8.0	8.0
97089	SSF-1760	6.8	6.8	6.8	6.8
97090	SSF-1761	9.5	9.5	9.5	9.5
97094	SSF-1765	10.6	10.5	10.5	10.5
97096	SSF-1769	10.2	10.2	10.2	10.2
97097	SSF-1770	5.8	5.8	5.8	5.8
97098	SSF-1771	11.0	11.0	10.9	10.9
97099	SSF-1772	6.2	6.2	6.2	6.2
97100	SSF-1773	9.8	9.8	9.8	9.8
97104	SSF-1845	9.4	9.4	9.4	9.4
97105	SSF-1846	5.0	5.0	5.0	5.0
97111	SSF-1853	7.5	7.5	7.4	7.4
97113	SSF-1862	4.2	0.0	0.0	0.0
97118	SSF-1867	5.6	5.6	5.6	5.6
97119	SSF-1868	4.4	4.4	4.4	4.4
97121	SSF-1876	10.3	10.3	10.3	9.9
97122	SSF-1877	8.9	8.9	8.9	5.6
97123	SSF-1878	19.9	19.9	19.9	19.9
97124	SSF-1879	13.5	13.5	13.5	13.5
97125	SSF-1880	14.7	14.7	14.7	14.7
97126	SSF-1881	7.4	7.4	7.4	7.4
97127	SSF-0848	8.1	8.1	8.0	8.0

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
97128	SSF-0849	7.4	7.4	7.4	7.4
97129	SSF-0850	10.0	10.0	10.0	10.0
97130	SSF-0851	5.8	5.8	5.8	5.6
97131	SSF-0852	10.1	10.1	9.8	9.3
97132	SSF-0853	7.6	7.6	7.6	7.6
97133	SSF-0854	7.4	7.4	7.4	7.2
97134	SSF-0855	4.8	4.7	3.2	2.0
97135	SSF-0856	4.8	4.3	2.7	1.5
97136	SSF-0857	7.3	4.6	4.6	3.4
97137	SSF-0858	6.9	6.9	6.3	2.3
97138	SSF-1656	6.8	6.8	6.8	6.8
97139	SSF-1657	10.3	10.3	10.3	10.3
97140	SSF-1658	7.6	7.6	7.6	7.6
97141	SSF-1659	6.0	6.0	6.0	6.0
97142	SSF-1660	9.8	9.8	9.8	9.8
97143	SSF-1661	16.3	16.3	16.3	16.3
97144	SSF-1662	6.3	6.3	6.3	6.2
97145	SSF-1663	7.5	7.5	7.5	7.5
97146	SSF-1664	8.3	8.3	8.3	8.3
97147	SSF-1665	11.3	8.3	8.1	7.8
97148	SSF-1666	10.1	10.1	10.1	10.1
97149	SSF-1667	7.7	7.7	7.7	7.7
97150	SSF-1668	7.8	7.8	7.8	7.8
97151	SSF-1669	8.4	8.4	8.4	8.4
97153	SSF-1671	9.1	9.1	9.1	9.1
97154	SSF-1684	17.9	17.9	17.9	17.9
97155	SSF-1686	3.8	3.8	3.8	3.8
97156	SSF-1687	7.8	7.8	7.8	7.8
97157	SSF-1688	5.3	5.3	5.3	5.3
97158	SSF-1689	3.8	3.8	3.8	3.8
97159	SSF-1691	11.0	11.0	11.0	11.0
97160	SSF-1692	7.7	7.7	7.7	7.7
97161	SSF-1693	7.6	7.6	7.6	7.6
97162	SSF-2590	5.9	5.9	5.9	5.9
97163	SSF-2592	5.9	5.9	5.9	5.9
97164	SSF-1695	6.0	6.0	5.9	5.9
97165	SSF-1696	5.7	5.7	5.7	5.7
97166	SSF-1697	5.8	5.8	5.8	5.8
97167	SSF-1698	6.6	6.6	6.5	6.5
97168	SSF-1699	8.0	8.0	8.0	8.0
97169	SSF-1710	10.6	10.6	10.6	10.6
97170	SSF-1711	8.7	8.7	8.7	8.7
97171	SSF-1718	5.7	5.6	5.6	5.6
97172	SSF-1719	10.6	10.6	10.6	10.5
97173	SSF-1720	11.3	11.3	11.3	11.2
97174	SSF-1721	11.2	11.2	11.2	11.2
97175	SSF-1722	9.4	9.4	9.4	9.3
97176	SSF-1723	8.1	8.1	8.1	8.1

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
97177	SSF-1724	9.8	9.8	9.8	9.8
97178	SSF-1725	8.1	8.1	8.1	8.1
97179	SSF-1726	5.2	5.2	5.2	5.2
97180	SSF-1727	8.6	8.6	8.6	8.6
97181	SSF-1728	5.3	5.3	5.3	5.3
97182	SSF-1729	5.4	5.4	5.4	5.4
97187	SSF-1735	11.3	11.3	11.3	11.2
97188	SSF-1736	12.1	12.1	12.1	12.1
97189	SSF-1643	4.1	4.1	4.1	4.1
97190	SSF-1644	6.4	6.4	6.4	6.4
97191	SSF-1645	6.3	6.3	6.3	6.3
97192	SSF-1646	5.5	5.5	5.5	5.5
97193	SSF-1647	7.9	7.9	7.9	7.9
97194	SSF-1648	8.0	8.0	8.0	8.0
97195	SSF-1649	14.6	14.6	14.6	14.6
97196	SSF-1650	19.6	19.6	19.6	19.6
97197	SSF-1651	9.5	9.5	9.5	9.5
97198	SSF-1652	9.6	9.6	9.6	9.6
97199	SSF-1653	7.9	7.9	7.9	7.9
97200	SSF-1654	8.6	8.6	8.6	8.6
97201	SSF-1927	5.6	5.6	5.6	5.6
97202	SSF-1928	3.1	3.1	3.1	3.1
97203	SSF-1929	8.6	8.6	8.6	8.6
97204	SSF-1930	9.0	9.0	9.0	9.0
97205	SSF-1931	6.9	6.9	6.9	6.9
97206	SSF-1932	8.4	8.4	8.4	8.4
97207	SSF-1933	8.8	14.6	14.6	14.5
97209	SSF-1935	10.5	10.5	10.5	10.5
97210	SSF-1936	0.0	10.5	10.5	10.5
97211	SSF-1937	0.0	8.9	8.8	8.8
97212	SSF-1938	11.4	11.4	11.4	11.4
97213	SSF-1939	8.2	8.2	8.2	8.2
97214	SSF-1941	4.6	11.7	11.7	11.7
97215	SSF-1942	15.0	14.9	14.9	14.9
97216	SSF-1943	10.0	10.0	10.0	10.0
97217	SSF-1944	9.4	9.4	9.4	9.4
97218	SSF-1945	9.0	9.0	9.0	9.0
97219	SSF-1946	10.0	10.2	10.2	10.2
97220	SSF-1948	13.0	13.0	13.0	13.0
97221	SSF-1949	9.3	9.3	9.3	9.3
97222	SSF-1950	8.2	8.2	8.2	8.2
97224	SSF-1954	8.8	8.8	8.8	8.8
97225	SSF-1955	7.7	7.7	7.7	7.7
97226	SSF-1956	19.8	19.8	19.8	19.8
97227	SSF-1957	12.3	12.3	12.3	12.3
97228	SSF-1959	15.3	15.2	15.2	15.2
97229	SSF-1960	5.5	5.5	5.5	5.5
97230	SSF-1961	6.6	6.5	6.5	6.5

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
97231	SSF-1962	6.5	6.5	6.5	6.5
97232	SSF-1963	14.6	14.6	14.6	14.6
97233	SSF-1964	12.5	12.5	12.5	12.5
97234	SSF-1965	8.6	8.6	8.6	8.6
97235	SSF-1966	6.2	6.2	6.2	6.2
97236	SSF-1967	12.5	12.5	12.5	12.5
97237	SSF-1968	8.1	8.1	8.1	8.1
97239	SSF-0830	26.6	26.6	26.6	26.6
97240	SSF-0831	9.3	9.3	9.3	9.3
97241	SSF-0832	9.4	9.4	9.4	9.4
97242	SSF-0833	10.6	10.6	10.6	10.6
97243	SSF-0834	7.4	7.5	6.9	5.9
97244	SSF-0835	18.0	18.0	18.0	18.0
97245	SSF-0836	21.3	21.3	21.3	21.3
97246	SSF-0837	12.2	12.2	12.2	12.2
97247	SSF-0838	10.5	10.5	10.5	10.5
97248	SSF-0839	4.8	4.8	4.8	4.8
97249	SSF-0840	4.5	4.5	4.5	4.5
97250	SSF-0841	9.9	9.9	9.9	9.9
97251	SSF-0842	8.1	8.1	8.1	8.1
97252	SSF-0843	8.5	8.5	8.5	8.5
97253	SSF-0845	11.2	11.1	11.1	11.1
97254	SSF-0847	8.8	8.8	8.8	8.8
97255	SSF-1267	7.4	7.4	7.4	7.4
97256	SSF-1268	13.7	13.7	13.7	13.7
97257	SSF-1269	10.1	10.1	10.1	10.1
97258	SSF-1270	11.7	11.7	11.7	11.7
97259	SSF-1271	15.0	15.0	15.0	15.0
97260	SSF-1272	14.6	14.6	14.6	14.6
97261	SSF-1273	7.4	7.3	7.3	7.3
97262	SSF-1274	14.6	14.6	14.6	14.6
97263	SSF-1561	7.9	7.9	7.9	7.9
97265	SSF-1564	11.9	11.9	11.9	11.9
97266	SSF-1565	10.4	10.4	10.4	10.4
97267	SSF-1566	9.2	9.2	9.2	9.2
97268	SSF-1567	10.2	10.2	10.2	10.2
97269	SSF-1568	5.2	5.2	5.2	5.2
97271	SSF-1572	6.3	6.3	6.3	6.3
97272	SSF-1573	11.5	11.5	11.5	11.5
97274	SSF-1576	5.3	5.3	5.3	5.3
97275	SSF-1577	7.3	7.3	7.3	7.3
97276	SSF-1578	13.1	13.1	13.1	13.1
97277	SSF-1579	5.1	5.1	5.1	5.1
97278	SSF-1580	5.1	5.1	5.1	5.1
97286	SSF-1947	10.1	10.1	10.1	10.1
97287	SSF-1588	7.5	7.5	7.5	7.5
97288	SSF-1589	8.6	8.6	8.6	8.6
97289	SSF-1590	8.5	8.5	8.5	8.5

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
97290	SSF-1591	9.3	9.3	9.3	9.3
97291	SSF-1592	8.6	8.6	8.6	8.6
97292	SSF-1593	8.5	8.5	8.5	8.5
97293	SSF-1594	8.0	8.0	8.0	8.0
97294	SSF-1595	8.2	8.2	8.2	8.2
97295	SSF-1596	8.0	8.0	8.0	8.0
97296	SSF-1597	7.9	7.9	7.9	7.9
97297	SSF-1598	7.8	7.8	7.8	7.8
97298	SSF-1599	8.0	8.0	8.0	8.0
97299	SSF-1600	7.8	7.8	7.8	7.8
97300	SSF-1601	8.2	8.2	8.2	8.2
97301	SSF-1602	8.6	8.6	8.6	8.6
97302	SSF-1603	8.0	8.0	8.0	8.0
97303	SSF-1606	8.0	8.0	8.0	8.0
97304	SSF-1607	8.0	8.1	8.1	8.1
97305	SSF-1608	6.0	6.0	6.0	6.0
97306	SSF-1609	8.1	8.1	8.1	8.1
97310	SSF-1625	6.4	6.3	6.3	6.3
97311	SSF-1626	9.7	9.7	9.7	9.7
97312	SSF-1627	7.8	7.8	7.8	7.8
97313	SSF-1628	5.8	5.8	5.8	5.8
97314	SSF-1629	6.9	6.9	6.9	6.9
97315	SSF-1630	8.4	8.4	8.4	8.4
97316	SSF-1266	6.6	6.6	6.6	6.6
97317	SSF-1631	6.4	6.4	6.4	6.4
97318	SSF-1632	18.0	17.9	17.9	17.9
97319	SSF-1633	7.9	7.9	7.9	7.9
97320	SSF-1634	13.9	13.9	13.9	13.9
97321	SSF-1635	4.6	4.6	4.6	4.6
97322	SSF-1636	10.0	9.8	9.6	9.3
97325	SSF-1639	12.5	12.5	12.5	12.5
97326	SSF-1640	12.1	12.1	12.1	12.1
97327	SSF-1641	12.2	12.2	12.2	12.2
97328	SSF-1642	12.1	12.1	12.1	12.1
97329	SSF-1175	8.4	8.4	8.4	8.4
97330	SSF-1176	10.5	10.5	10.5	10.5
97332	SSF-1178	10.9	10.9	10.9	10.9
97333	SSF-1179	9.4	9.4	9.4	9.4
97334	SSF-1180	6.6	6.6	6.6	6.6
97335	SSF-1181	7.1	7.1	7.1	7.1
97336	SSF-1186	5.5	5.5	5.5	5.5
97337	SSF-1189	5.9	5.9	5.9	5.9
97338	SSF-1190	18.7	18.7	18.7	18.7
97339	SSF-1191	5.1	5.1	5.1	5.1
97340	SSF-1192	8.9	8.9	8.8	8.8
97341	SSF-1193	4.9	4.9	4.9	4.9
97342	SSF-1195	5.4	5.4	5.4	5.4
97343	SSF-1196	6.4	6.4	6.4	6.4

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
97344	SSF-1197	9.1	9.1	9.1	9.1
97345	SSF-1198	13.0	13.0	12.9	12.9
97346	SSF-1199	8.8	8.8	8.8	8.8
97347	SSF-1200	8.3	8.3	8.3	8.3
97348	SSF-1201	5.0	5.0	5.0	5.0
97349	SSF-1210	9.6	9.5	9.5	9.5
97350	SSF-1212	17.4	15.3	15.4	15.2
97351	SSF-1213	20.4	19.7	19.6	19.4
97352	SSF-1214	21.4	21.2	21.1	21.1
97353	SSF-1215	15.3	15.0	15.0	15.0
97354	SSF-1216	8.2	8.0	8.0	8.0
97355	SSF-1229	5.8	5.8	5.8	5.8
97356	SSF-1230	7.6	7.6	7.4	6.4
97357	SSF-1231	6.7	6.7	6.2	5.2
97358	SSF-1233	5.7	5.5	5.5	5.5
97359	SSF-1234	9.8	9.6	9.6	9.6
97360	SSF-1235	8.6	8.4	8.4	8.4
97361	SSF-1236	8.3	8.0	8.0	8.0
97362	SSF-2208	11.5	11.5	11.5	11.5
97363	SSF-1240	14.8	14.8	14.8	14.8
97364	SSF-1241	14.8	14.8	14.8	14.8
97365	SSF-1242	15.3	15.3	15.3	15.3
97366	SSF-1243	14.3	14.3	14.3	14.3
97367	SSF-1244	12.7	12.7	12.7	12.7
97368	SSF-1245	7.0	7.0	7.0	7.0
97369	SSF-1246	8.4	8.4	8.4	8.4
97370	SSF-1247	9.7	9.7	9.7	9.7
97371	SSF-1248	7.9	7.9	7.9	7.9
97372	SSF-1249	12.6	12.6	12.6	12.6
97373	SSF-1250	14.1	14.1	14.1	14.1
97374	SSF-1251	4.7	4.7	4.7	4.7
97375	SSF-1252	7.5	7.5	7.5	7.5
97376	SSF-1253	16.1	16.1	16.1	16.1
97377	SSF-1254	14.0	14.0	14.0	14.0
97378	SSF-1255	13.2	13.2	13.2	13.2
97380	SSF-1257	9.0	9.0	9.0	9.0
97381	SSF-1258	11.2	11.2	11.2	11.2
97382	SSF-1259	10.6	10.6	10.6	10.6
97383	SSF-1260	6.9	6.9	6.9	6.9
97384	SSF-1261	8.1	8.1	8.1	8.1
97385	SSF-1262	6.9	6.9	6.9	6.9
97386	SSF-1263	8.0	8.0	8.0	8.0
97387	SSF-1374	3.9	3.9	3.9	3.9
97388	SSF-1375	6.6	6.6	6.6	6.6
97389	SSF-1376	6.5	6.5	6.5	6.5
97390	SSF-1377	6.2	6.2	6.2	6.2
97391	SSF-1378	7.8	7.8	7.8	7.8
97392	SSF-1379	10.5	10.4	10.4	10.4

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
97393	SSF-1380	8.1	8.1	8.1	8.0
97394	SSF-1381	7.5	7.5	7.5	7.5
97395	SSF-1382	7.0	7.0	7.0	7.0
97396	SSF-1388	10.6	10.6	10.6	10.6
97397	SSF-1389	13.9	14.0	14.0	13.9
97398	SSF-1400	1.7	1.4	1.4	1.4
97399	SSF-1401	2.8	2.6	2.6	2.6
97400	SSF-1402	5.7	5.5	5.5	5.5
97401	SSF-1403	5.9	5.9	5.9	5.9
97402	SSF-1405	7.5	7.4	7.4	7.4
97403	SSF-1406	79.6	79.6	79.6	79.6
97404	SSF-1407	7.1	7.1	7.1	7.1
97405	SSF-1408	10.8	10.7	10.7	10.7
97406	SSF-1409	7.3	7.3	7.3	7.3
97407	SSF-1410	5.8	5.8	5.8	5.8
97408	SSF-1483	9.0	9.0	9.0	9.0
97409	SSF-1484	12.8	8.7	8.7	8.5
97410	SSF-1485	9.9	9.9	9.9	9.9
97411	SSF-1486	14.8	14.8	14.8	14.8
97412	SSF-1487	3.5	3.5	3.5	3.5
97413	SSF-1488	8.6	8.6	8.6	8.5
97415	SSF-1491	9.8	9.8	9.8	9.8
97416	SSF-1492	8.6	8.6	8.6	8.6
97417	SSF-1493	8.8	8.8	8.8	8.8
97418	SSF-1494	8.2	8.2	8.2	8.2
97419	SSF-1495	8.2	8.2	8.2	8.2
97420	SSF-1496	8.1	8.1	8.1	8.1
97421	SSF-1497	13.1	13.1	13.1	13.1
97422	SSF-1498	16.2	16.2	16.2	16.2
97423	SSF-1499	6.0	5.9	5.9	5.9
97424	SSF-1500	8.5	8.5	8.5	8.5
97427	SSF-1503	15.2	15.2	15.2	15.2
97432	SSF-1510	8.7	8.7	8.7	8.6
97433	SSF-1511	10.6	10.6	10.6	10.6
97434	SSF-1512	8.7	8.7	8.7	8.7
97435	SSF-1513	7.4	7.4	7.4	7.4
97436	SSF-1514	10.0	10.0	10.0	10.0
97437	SSF-1515	11.6	11.6	11.6	11.6
97438	SSF-1516	7.8	7.8	7.8	7.8
97439	SSF-1517	8.8	8.8	8.8	8.8
97440	SSF-1518	7.1	7.1	7.1	7.1
97441	SSF-1519	5.9	6.0	6.0	5.9
97442	SSF-1520	6.0	6.0	6.0	6.0
97443	SSF-1521	8.7	8.7	8.7	8.7
97444	SSF-1522	7.8	7.8	7.8	7.8
97445	SSF-1523	6.7	6.7	6.7	6.7
97446	SSF-1524	6.1	6.1	6.1	6.1
97447	SSF-1525	5.4	5.4	5.4	5.4

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
97448	SSF-1526	4.8	4.8	4.8	4.8
97449	SSF-1527	5.5	5.5	5.5	5.5
97450	SSF-1528	5.6	5.6	5.6	5.6
97451	SSF-1529	5.4	5.4	5.4	5.4
97452	SSF-1531	5.2	5.2	5.2	5.2
97453	SSF-1532	11.7	11.7	11.7	11.7
97454	SSF-1533	8.2	8.2	8.2	8.2
97455	SSF-1534	9.4	9.4	9.4	9.4
97456	SSF-1535	5.7	5.7	5.6	5.6
97457	SSF-1536	11.4	11.4	11.4	11.4
97458	SSF-1537	10.2	10.2	10.2	10.2
97459	SSF-1538	9.6	9.6	9.6	9.6
97460	SSF-1539	8.7	8.7	8.7	8.7
97461	SSF-1540	7.2	7.2	7.2	7.2
97462	SSF-1541	6.1	6.1	6.1	6.1
97463	SSF-0980	10.1	10.1	10.1	10.1
97464	SSF-0981	9.9	9.9	9.9	9.9
97465	SSF-0982	8.0	8.0	8.0	8.0
97466	SSF-0983	9.6	9.6	9.6	9.6
97467	SSF-0984	17.7	17.7	17.7	17.7
97468	SSF-0985	16.0	16.0	16.0	16.0
97470	SSF-0988	7.5	7.5	7.5	7.5
97471	SSF-0989	7.4	7.4	7.4	7.4
97472	SSF-0990	10.5	10.5	10.5	10.5
97473	SSF-0991	6.4	6.4	6.4	6.4
97474	SSF-0992	5.9	5.9	5.9	5.9
97475	SSF-0993	6.4	6.4	6.4	6.4
97476	SSF-0994	11.5	11.5	11.5	11.5
97477	SSF-0995	7.9	7.9	7.9	7.9
97478	SSF-0996	8.4	8.4	8.4	8.4
97479	SSF-0997	6.5	6.5	6.5	6.4
97480	SSF-0998	6.6	6.6	6.6	6.6
97481	SSF-0999	7.8	7.8	7.8	7.8
97482	SSF-1000	8.6	8.6	8.6	8.6
97483	SSF-1001	7.4	7.4	7.4	7.4
97484	SSF-1002	8.0	8.0	8.0	8.0
97485	SSF-1003	7.4	7.4	7.4	7.4
97486	SSF-1004	9.2	9.2	9.2	9.2
97487	SSF-1005	7.7	7.7	7.7	7.7
97488	SSF-1006	9.1	9.1	9.1	9.1
97489	SSF-1007	8.8	8.8	8.8	8.8
97490	SSF-1008	7.5	7.5	7.5	7.5
97491	SSF-1009	7.0	7.0	7.0	7.0
97492	SSF-1010	6.8	6.8	6.8	6.8
97493	SSF-1011	6.9	6.9	6.9	6.9
97494	SSF-1015	6.5	6.5	6.5	6.4
97495	SSF-1016	6.9	6.8	6.8	6.8
97496	SSF-1017	9.2	9.2	9.2	9.2

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
97497	SSF-1018	9.6	9.6	9.6	9.5
97498	SSF-1019	9.8	9.8	9.7	9.7
97499	SSF-1020	8.0	8.0	8.0	8.0
97500	SSF-1021	7.6	7.6	7.6	7.6
97501	SSF-1022	8.7	8.7	8.7	8.7
97502	SSF-1023	13.1	13.1	13.1	13.1
97504	SSF-1026	10.2	10.2	10.2	10.2
97505	SSF-1027	8.3	8.3	8.3	7.7
97506	SSF-1029	8.0	8.0	8.0	8.0
97507	SSF-1030	7.0	7.0	7.0	7.0
97508	SSF-1031	9.2	9.2	9.2	9.2
97509	SSF-1032	7.1	7.1	7.1	7.1
97510	SSF-1033	7.1	7.1	7.1	7.1
97511	SSF-1034	8.4	8.4	8.4	8.4
97512	SSF-1035	7.1	7.1	7.1	7.1
97513	SSF-2193	9.8	9.8	9.8	9.8
97514	SSF-2194	12.2	12.2	12.2	12.2
97515	SSF-1336	14.1	14.1	14.1	14.1
97516	SSF-1337	11.9	11.9	11.9	11.9
97517	SSF-1338	8.1	8.1	8.1	8.1
97518	SSF-1353	5.6	5.6	5.6	5.6
97519	SSF-1354	8.5	8.5	8.5	8.5
97520	SSF-1355	9.7	8.9	7.5	7.6
97524	SSF-1359	10.2	10.2	10.2	10.2
97525	SSF-1360	9.0	9.0	9.0	9.0
97526	SSF-1361	8.6	8.6	8.6	8.6
97527	SSF-1362	8.2	8.2	8.2	8.2
97528	SSF-1363	9.1	9.1	9.1	9.1
97529	SSF-1364	7.8	7.8	7.8	7.8
97533	SSF-1368	11.6	11.6	11.6	11.6
97534	SSF-1369	13.1	13.1	13.1	13.1
97535	SSF-1370	7.8	7.8	7.8	7.7
97536	SSF-1371	10.4	10.4	10.4	10.4
97537	SSF-1372	13.4	13.4	13.4	13.4
97538	SSF-1373	6.6	6.6	6.6	6.6
97540	SSF-0894	11.3	11.2	11.1	11.1
97541	SSF-0895	10.3	10.3	10.3	10.2
97542	SSF-0896	7.9	7.8	7.8	7.8
97543	SSF-0897	8.7	8.7	8.7	8.7
97544	SSF-0899	15.3	15.3	15.3	15.3
97545	SSF-0900	14.5	14.5	14.5	14.5
97546	SSF-0901	9.4	9.4	9.3	9.3
97547	SSF-0902	6.8	6.7	6.7	6.7
97548	SSF-0903	7.1	7.0	7.0	6.9
97549	SSF-0904	9.0	8.9	8.9	8.8
97550	SSF-0905	5.5	5.4	5.3	5.3
97551	SSF-0906	15.0	14.9	14.9	14.8
97552	SSF-0907	13.6	13.5	13.5	13.5

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
97553	SSF-0908	10.6	10.6	10.6	10.6
97554	SSF-0909	12.4	12.4	12.4	12.4
97555	SSF-0910	12.9	12.9	12.9	12.9
97558	SSF-0912	6.0	6.0	6.0	6.0
97559	SSF-0913	10.4	10.4	10.4	10.4
97560	SSF-0914	8.0	8.0	8.0	8.0
97561	SSF-0915	6.6	6.6	6.6	6.6
97562	SSF-0917	14.9	14.9	14.9	14.9
97563	SSF-0918	8.5	8.5	8.5	8.5
97564	SSF-0919	7.3	7.3	7.3	7.3
97565	SSF-0920	7.1	7.1	7.1	7.1
97566	SSF-0921	9.1	9.1	9.1	9.1
97567	SSF-0922	6.6	6.6	6.6	6.6
97568	SSF-0923	8.0	8.0	8.0	8.0
97569	SSF-0924	10.3	10.3	10.3	10.3
97570	SSF-0925	5.9	5.9	5.9	5.9
97571	SSF-0926	7.8	7.8	7.8	7.8
97572	SSF-0927	3.2	3.2	3.2	3.2
97573	SSF-0928	4.4	4.4	4.4	4.4
97574	SSF-0929	7.7	7.7	7.7	7.7
97575	SSF-0930	7.9	7.9	7.9	7.9
97576	SSF-0931	8.1	8.1	8.1	8.1
97577	SSF-0932	6.9	6.9	6.9	6.9
97595	SSF-0950	10.3	10.3	10.3	10.3
97596	SSF-0951	12.0	12.0	12.0	12.0
97597	SSF-0952	5.7	5.7	5.7	5.7
97598	SSF-0953	8.2	8.2	8.2	8.2
97599	SSF-0954	5.9	5.9	5.9	5.9
97600	SSF-0959	4.8	4.9	4.8	4.8
97601	SSF-0960	8.5	8.5	8.5	8.5
97602	SSF-0961	7.7	7.7	7.7	7.7
97603	SSF-0962	7.7	7.7	7.7	7.7
97604	SSF-0963	10.0	10.0	10.0	10.0
97605	SSF-0964	6.1	6.1	6.1	6.1
97606	SSF-0965	5.3	5.3	5.3	5.2
97607	SSF-0966	6.9	6.9	6.9	6.9
97608	SSF-0967	8.4	8.4	8.4	8.4
97609	SSF-0968	10.6	10.6	10.6	10.6
97610	SSF-0969	8.5	8.5	8.5	8.5
97611	SSF-0970	7.5	7.5	7.5	7.5
97612	SSF-0971	7.9	7.9	7.9	7.9
97613	SSF-0972	6.8	6.8	6.8	6.8
97614	SSF-0973	4.7	4.7	4.7	4.7
97615	SSF-0974	10.5	10.5	10.5	10.5
97616	SSF-0975	6.5	6.5	5.4	4.9
97617	SSF-0976	4.9	4.9	4.9	4.4
97618	SSF-0977	9.3	9.3	9.3	9.3
97619	SSF-0978	13.3	13.3	13.3	13.3

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
97620	SSF-0979	9.6	9.6	9.6	9.6
97621	SSF-0605	5.8	5.8	5.8	5.8
97622	SSF-0606	7.2	7.2	7.2	7.2
97625	SSF-0619	5.4	5.4	5.4	5.4
97626	SSF-0620	7.6	7.6	7.6	7.6
97627	SSF-0621	10.1	10.0	10.0	10.0
97628	SSF-0622	8.7	8.7	8.7	8.7
97629	SSF-0629	10.4	10.4	10.4	10.4
97630	SSF-0630	8.3	8.3	8.3	8.3
97631	SSF-0631	8.2	8.2	8.2	8.2
97632	SSF-0632	7.3	7.3	7.3	7.3
97633	SSF-0633	7.9	7.9	7.8	7.8
97634	SSF-0634	8.0	8.0	8.0	8.0
97635	SSF-0635	7.9	7.9	7.9	7.9
97636	SSF-0636	8.4	8.3	8.3	8.3
97637	SSF-0637	7.4	7.4	7.4	7.4
97638	SSF-0638	7.1	7.1	7.1	7.1
97639	SSF-0639	6.9	6.9	6.9	6.9
97640	SSF-0640	11.6	11.6	11.6	11.6
97641	SSF-0641	8.0	8.0	8.0	8.0
97642	SSF-0642	10.1	10.1	10.1	10.1
97643	SSF-0643	8.0	8.0	8.0	8.0
97644	SSF-0644	6.3	6.3	6.3	6.3
97645	SSF-0645	7.9	7.9	7.9	7.9
97646	SSF-0646	7.9	7.9	7.9	7.9
97647	SSF-0647	7.5	7.5	7.5	7.5
97648	SSF-0648	6.3	6.3	6.3	6.3
97649	SSF-0649	8.7	8.7	8.7	8.7
97650	SSF-0650	10.7	10.7	10.7	10.7
97651	SSF-0653	4.8	4.8	4.8	4.8
97652	SSF-0654	10.1	10.1	10.1	9.9
97653	SSF-0655	9.2	9.2	9.2	9.2
97654	SSF-0656	6.7	6.7	6.7	6.7
97655	SSF-0657	8.9	8.9	8.9	8.9
97656	SSF-0659	9.7	9.7	9.7	9.7
97657	SSF-0660	9.1	9.1	9.1	9.1
97658	SSF-0661	8.4	8.4	8.4	8.4
97659	SSF-0662	12.8	12.8	12.8	12.8
97660	SSF-0663	9.2	9.2	9.2	9.2
97663	SSF-0816	7.9	7.9	7.9	7.9
97664	SSF-0817	7.7	7.7	7.7	7.7
97665	SSF-0818	9.3	9.3	9.3	9.3
97666	SSF-0819	6.7	6.7	6.7	6.7
97667	SSF-0859	8.2	8.2	8.1	7.6
97668	SSF-0860	5.2	5.2	4.8	4.4
97669	SSF-0861	4.9	4.9	4.1	3.4
97670	SSF-0862	5.6	4.3	2.9	2.5
97671	SSF-0863	7.9	7.9	7.9	7.9

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
97672	SSF-0864	6.1	0.0	0.0	0.3
97673	SSF-0865	8.5	8.5	8.5	8.5
97674	SSF-0866	6.9	6.9	6.9	6.9
97675	SSF-0867	0.6	0.5	0.5	0.5
97676	SSF-0868	5.9	5.9	5.9	5.9
97677	SSF-0869	12.4	12.4	12.4	12.4
97678	SSF-0870	5.7	5.7	5.7	5.7
97679	SSF-0871	7.6	7.5	7.5	7.5
97680	SSF-0872	26.7	26.7	26.7	26.7
97681	SSF-0874	4.9	4.9	4.9	4.9
97682	SSF-0604	6.9	6.9	6.9	6.9
97683	SSF-1904	10.0	10.0	10.0	10.0
97684	SSF-1905	10.5	10.5	10.5	10.5
97685	SSF-1906	8.0	8.0	7.9	7.9
97686	SSF-1907	10.9	10.9	10.9	10.9
97687	SSF-1969	13.2	13.2	13.2	13.2
97688	SSF-1970	7.1	7.1	7.1	7.1
97689	SSF-1971	5.4	4.8	4.7	4.3
97690	SSF-1972	5.5	5.5	5.5	5.5
97691	SSF-1974	9.3	9.3	9.3	9.3
97692	SSF-1975	8.5	8.5	8.5	8.5
97693	SSF-1976	17.4	17.4	17.4	17.4
97694	SSF-1977	8.9	5.3	5.3	4.6
97695	SSF-0623	9.8	9.8	9.8	9.8
97696	SSF-1978	16.1	16.1	16.1	16.1
97697	SSF-1979	8.5	8.5	8.5	8.5
97698	SSF-1980	10.9	10.9	10.9	10.9
97699	SSF-1981	6.8	6.8	6.8	6.8
97700	SSF-1982	8.0	8.0	8.0	8.0
97701	SSF-1983	6.8	6.8	6.8	6.8
97702	SSF-1984	4.8	4.8	4.8	4.8
97703	SSF-1985	5.8	5.8	5.8	5.8
97706	SSF-2139	3.7	3.7	3.7	3.7
97707	SSF-2140	4.9	4.9	4.9	4.9
97708	SSF-2153	5.0	5.0	5.0	5.0
97709	SSF-2154	6.8	6.8	6.8	6.8
97710	SSF-2155	7.0	7.0	7.0	7.0
97711	SSF-2156	8.7	8.7	8.7	8.7
97712	SSF-2157	7.9	7.9	7.9	7.9
97713	SSF-2158	9.1	9.1	9.1	9.1
97714	SSF-2159	8.3	8.3	8.3	8.3
97715	SSF-2160	8.2	8.2	8.2	8.2
97716	SSF-2161	9.8	9.8	9.8	9.8
97717	SSF-2162	12.6	12.6	12.6	12.6
97718	SSF-2163	13.6	13.6	13.6	13.6
97719	SSF-2165	5.4	5.4	5.4	5.4
97720	SSF-2167	6.4	6.4	6.4	6.4
97721	SSF-2169	5.1	5.1	5.1	5.1

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
97722	SSF-2170	6.0	6.0	6.0	6.0
97723	SSF-2171	7.1	7.1	7.1	7.1
97724	SSF-2172	8.6	8.6	8.6	8.6
97725	SSF-2173	10.0	10.0	10.0	10.0
97726	SSF-2174	8.0	8.0	8.0	8.0
97727	SSF-2175	8.2	8.2	8.2	8.2
97728	SSF-2176	10.4	10.4	10.4	10.4
97729	SSF-2177	7.5	7.5	7.5	7.5
97730	SSF-2178	6.4	6.4	6.4	6.4
97731	SSF-2179	7.0	7.0	7.0	7.0
97732	SSF-2180	5.7	5.7	5.7	5.7
97733	SSF-2181	4.9	4.9	4.9	4.9
97734	SSF-2182	4.7	4.7	4.7	4.7
97735	SSF-2191	11.4	11.4	11.4	11.4
97736	SSF-2192	9.3	9.3	9.3	9.3
97737	SSF-2211	9.4	9.4	9.4	9.4
97738	SSF-2212	10.5	10.5	10.5	10.5
97739	SSF-2213	8.9	8.9	8.9	8.9
97740	SSF-0591	6.6	6.6	6.6	6.6
97741	SSF-0592	5.6	5.6	5.6	5.6
97742	SSF-0593	6.8	6.8	6.8	6.8
97743	SSF-0594	7.6	7.6	7.6	7.6
97744	SSF-0595	6.4	6.4	6.4	6.4
97745	SSF-0596	4.3	4.3	4.3	4.3
97746	SSF-0597	6.9	6.9	6.9	6.9
97747	SSF-0598	8.4	8.4	8.4	8.4
97748	SSF-0599	8.5	8.5	8.5	8.5
97749	SSF-0600	5.9	5.9	5.9	5.9
97750	SSF-0601	6.3	6.3	6.3	6.3
97751	SSF-0602	8.2	8.2	8.1	8.1
97752	SSF-0603	8.5	8.5	8.5	8.5
97754	SSF-2089	7.2	7.2	7.2	7.2
97755	SSF-2090	12.3	12.3	12.3	12.3
97756	SSF-2095	5.1	5.1	5.1	5.1
97757	SSF-2096	8.8	8.8	8.8	8.8
97758	SSF-2097	7.3	7.3	7.3	7.3
97759	SSF-2098	6.7	6.7	6.7	6.7
97760	SSF-2099	11.9	11.9	11.9	11.9
97761	SSF-2100	5.5	5.5	5.5	5.5
97762	SSF-2101	9.2	9.2	9.2	9.2
97763	SSF-2102	10.3	10.3	10.3	10.3
97764	SSF-2103	7.3	7.3	7.3	7.3
97765	SSF-2104	8.7	8.7	8.7	8.7
97766	SSF-2105	10.6	10.6	10.6	10.6
97767	SSF-2106	6.3	6.3	6.3	6.3
97778	SSF-2117	14.6	14.6	14.6	14.6
97786	SSF-2126	5.0	5.0	5.0	5.0
97787	SSF-2129	4.3	4.3	4.3	4.3

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
97788	SSF-2130	8.9	8.9	8.9	8.9
97789	SSF-2131	12.8	12.8	12.8	12.8
97790	SSF-2132	4.8	4.8	4.7	4.6
97791	SSF-2133	3.6	3.1	1.8	1.4
97792	SSF-2134	8.3	6.8	5.6	5.2
97793	SSF-2184	9.2	9.2	9.2	9.2
97794	SSF-2185	9.0	9.0	9.0	9.0
97795	SSF-2186	9.2	9.2	9.2	9.2
97796	SSF-2187	4.4	4.4	4.4	4.4
97797	SSF-2188	6.8	6.8	6.8	6.8
97798	SSF-2562	10.1	10.1	10.1	10.1
97799	SSF-2195	14.1	14.1	14.1	14.1
97800	SSF-2196	11.2	11.2	11.2	11.2
97801	SSF-2197	10.9	10.9	10.9	10.9
97802	SSF-2198	6.2	6.2	6.2	6.2
97803	SSF-2199	5.7	5.7	5.7	5.7
97804	SSF-2200	5.8	5.8	5.8	5.8
97805	SSF-2201	5.9	5.9	5.9	5.9
97806	SSF-2202	6.0	6.0	6.0	6.0
97807	SSF-1995	7.8	7.8	7.8	7.8
97808	SSF-1996	11.2	11.2	11.2	11.2
97809	SSF-1997	8.3	8.3	8.3	8.3
97810	SSF-1998	6.5	6.5	6.5	6.5
97811	SSF-1999	6.6	6.6	6.6	6.6
97812	SSF-2000	8.6	8.6	8.6	8.6
97813	SSF-2001	11.1	11.1	11.1	11.1
97814	SSF-2002	6.3	6.3	6.3	6.3
97815	SSF-2003	9.3	9.3	9.3	9.3
97816	SSF-2010	9.0	9.0	9.0	9.0
97817	SSF-2013	7.1	7.1	7.1	7.1
97818	SSF-2016	8.0	8.0	8.0	8.0
97819	SSF-2020	10.2	10.2	10.2	10.2
97820	SSF-2021	6.7	6.7	6.7	6.7
97821	SSF-2022	7.0	7.0	7.0	7.0
97822	SSF-2023	4.7	4.7	4.7	4.7
97823	SSF-2024	7.7	7.6	7.6	7.6
97824	SSF-2025	12.1	12.1	12.1	12.1
97825	SSF-2026	8.4	8.4	8.4	8.4
97826	SSF-2027	3.7	3.7	3.7	3.7
97827	SSF-2033	7.7	7.7	7.6	7.6
97828	SSF-2034	7.6	7.6	7.6	7.6
97829	SSF-2053	9.3	9.3	9.3	9.3
97830	SSF-2054	10.8	10.8	10.8	10.8
97831	SSF-2055	11.3	11.3	11.3	11.3
97832	SSF-2056	6.3	6.3	6.3	6.3
97833	SSF-2057	16.3	16.3	16.3	16.3
97834	SSF-2058	9.8	9.8	9.8	9.8
97835	SSF-2059	6.6	6.6	6.6	6.6

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
97836	SSF-2060	11.8	11.8	11.8	11.8
97837	SSF-2061	12.7	12.7	12.7	12.7
97838	SSF-2062	9.2	9.2	9.2	9.2
97839	SSF-2063	3.6	3.6	3.6	3.6
97840	SSF-2064	4.1	4.1	4.1	4.1
97841	SSF-2065	7.6	7.6	7.6	7.6
97842	SSF-2066	16.1	16.1	16.1	16.1
97843	SSF-2067	6.2	6.2	6.2	6.2
97844	SSF-2068	10.5	10.5	10.5	10.5
97845	SSF-2069	11.1	11.1	11.1	11.1
97846	SSF-2070	9.2	9.2	9.2	9.2
97847	SSF-2071	10.9	10.9	10.9	10.9
97848	SSF-2072	8.1	8.1	8.1	8.1
97849	SSF-2073	13.0	13.0	13.0	13.0
97850	SSF-2074	7.5	7.5	7.5	7.5
97851	SSF-2075	14.5	14.5	14.5	14.5
97852	SSF-1994	12.8	12.8	12.8	12.8
97853	SSF-2076	11.5	11.5	11.5	11.5
97854	NoMatch	18.8	18.8	18.8	18.8
97855	SSF-2077	10.1	10.1	10.1	10.1
97856	SSF-2078	17.7	17.7	17.7	17.7
97857	SSF-2079	9.3	9.3	9.3	9.3
97858	SSF-2080	12.2	12.2	12.2	12.2
97859	SSF-2081	7.7	7.7	7.7	7.7
97860	SSF-2082	7.4	7.4	7.4	7.4
97861	SSF-2083	6.5	6.5	6.5	6.5
97862	SSF-2084	9.6	9.6	9.6	9.6
97863	SSF-2085	6.5	6.5	6.5	6.5
97864	SSF-2086	6.3	6.3	6.3	6.3
97865	SSF-2087	8.8	8.8	8.8	8.8
97866	SSF-2088	9.1	9.1	9.1	9.1
97867	SSF-1542	11.2	11.2	11.2	11.2
97868	SSF-1545	6.7	6.7	6.7	6.7
97869	SSF-1546	9.8	9.8	9.8	9.8
97870	SSF-1547	8.3	8.3	8.3	8.3
97871	SSF-1550	9.4	9.4	9.4	9.4
97872	SSF-1551	8.1	8.1	8.1	8.1
97873	SSF-1552	6.6	6.6	6.6	6.6
97874	SSF-1553	6.6	6.6	6.6	6.3
97875	SSF-1554	4.9	4.9	4.9	4.9
97876	SSF-1555	8.4	8.4	8.4	8.4
97877	SSF-1774	10.9	10.9	10.9	10.9
97878	SSF-1775	5.9	5.9	5.9	5.9
97879	SSF-1778	3.9	3.9	3.9	3.9
97880	SSF-1779	9.4	9.4	9.4	9.4
97881	SSF-1780	3.9	3.8	3.8	3.8
97882	SSF-1781	7.0	6.9	6.9	6.9
97883	SSF-1783	13.1	13.1	13.1	13.1

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
97884	SSF-2396	8.1	8.1	8.1	8.1
97887	SSF-1786	7.6	7.6	7.6	7.6
97888	SSF-1787	10.8	10.8	10.8	10.8
97889	SSF-1789	4.5	4.5	4.5	4.5
97890	SSF-1790	4.6	4.6	4.6	4.6
97891	SSF-1792	5.7	5.7	5.7	5.7
97892	SSF-1793	5.2	5.2	5.2	5.2
97893	SSF-1801	18.7	18.8	18.7	18.7
97894	SSF-1802	12.4	12.4	12.4	12.4
97895	SSF-1803	12.3	12.3	12.3	12.3
97898	SSF-1807	5.6	5.6	5.6	5.6
97899	SSF-1808	8.5	8.5	8.5	8.5
97900	SSF-1809	11.7	11.7	11.7	11.7
97901	SSF-1810	9.4	9.4	9.4	9.4
97902	SSF-1811	10.2	10.2	10.2	10.2
97903	SSF-1812	8.9	8.9	8.9	8.9
97905	SSF-1814	15.9	15.9	15.9	15.9
97906	SSF-1817	11.5	11.4	11.4	11.4
97907	SSF-1818	9.8	9.8	9.8	9.8
97908	SSF-1819	10.3	10.3	10.3	10.3
97909	SSF-1820	11.0	11.0	11.0	11.0
97910	SSF-1821	11.1	11.0	11.0	11.0
97911	SSF-1822	6.8	6.8	6.8	6.8
97912	SSF-1823	6.5	6.5	6.5	6.5
97913	SSF-1824	5.3	5.3	5.3	5.3
97914	SSF-1831	11.4	11.2	11.1	11.0
97915	SSF-1832	8.7	8.7	8.7	8.7
97916	SSF-1833	8.4	8.3	8.2	8.2
97917	SSF-1834	6.9	6.9	6.9	6.9
97918	SSF-1835	6.5	6.5	6.5	6.5
97919	SSF-1836	4.8	4.8	4.8	4.8
97920	SSF-1838	10.4	10.4	10.4	10.4
97921	SSF-1840	8.2	8.2	8.2	8.2
97922	SSF-1841	6.2	6.2	6.2	6.2
97927	SSF-1610	7.1	7.1	7.1	6.3
97928	SSF-1443	5.9	5.9	5.9	5.9
97929	SSF-1394	7.8	7.8	7.8	7.8
97930	SSF-1395	7.3	7.3	7.3	7.3
97931	SSF-1396	11.6	11.6	11.6	11.6
97932	SSF-1397	13.0	13.1	13.1	13.1
97933	SSF-1398	8.1	8.1	8.1	8.1
97934	SSF-1399	8.1	8.1	8.1	8.1
97935	SSF-1828	10.4	10.4	10.4	10.4
97936	SSF-1829	9.4	9.4	9.4	9.4
97937	SSF-2036	6.8	6.8	6.8	6.8
97938	SSF-2037	6.1	6.1	6.1	6.1
97939	SSF-2038	5.7	5.7	5.7	5.7
97940	SSF-2039	7.2	7.2	7.2	7.2

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
97941	SSF-2040	7.6	7.6	7.6	7.6
97942	SSF-2041	6.2	6.2	6.2	6.2
97943	SSF-2042	5.5	5.5	5.5	5.5
97944	SSF-2043	7.5	7.5	7.5	7.5
97945	SSF-2044	10.5	10.5	10.5	10.5
97946	SSF-2045	9.3	9.3	9.3	9.3
97947	SSF-2046	13.3	13.3	13.3	13.3
97948	SSF-2047	10.2	10.2	10.2	10.2
97949	SSF-2048	7.9	7.9	7.9	7.9
97950	SSF-2051	11.6	11.6	11.6	11.6
97951	SSF-1605	7.6	7.6	7.6	7.6
97952	SSF-1390	4.4	4.4	4.4	4.4
97953	SSF-0004	7.4	7.4	7.4	7.4
97954	SSF-1988	6.9	6.9	6.9	6.9
97957	SSF-1041	8.5	8.4	8.2	6.8
97958	SSF-0846	10.1	10.1	10.1	10.1
97959	SSF-1890	14.9	14.9	14.9	14.9
97960	SSF-1891	17.7	17.7	17.7	17.7
97961	SSF-1892	19.9	19.9	19.9	19.9
97962	SSF-1893	15.0	14.9	14.9	14.9
97963	SSF-1894	16.0	16.0	16.0	16.0
97964	SSF-1895	18.2	18.2	18.2	18.2
97965	SSF-1896	11.5	11.5	11.5	11.5
97966	SSF-1897	18.2	18.1	18.1	18.1
97967	SSF-1898	19.1	19.1	19.1	19.1
97968	SSF-1331	7.8	7.8	7.8	7.8
97969	SSF-2189	3.9	3.9	3.9	3.9
97970	SSF-2190	5.5	5.5	5.5	5.5
97971	SSF-1105	3.9	3.9	3.9	3.9
97972	SSF-1106	7.5	7.5	7.5	7.5
97973	SSF-1108	6.8	6.8	6.8	6.8
97974	SSF-1109	5.2	5.2	5.2	5.2
97975	SSF-1171	8.1	8.1	8.1	8.1
97976	SSF-1172	6.2	6.2	6.2	6.2
97977	SSF-1174	8.1	8.1	8.1	8.1
97978	SSF-1217	8.0	8.0	8.0	8.0
97979	SSF-1218	6.2	6.2	6.2	6.2
97980	SSF-1219	7.8	7.8	7.8	7.8
97981	SSF-1220	7.7	7.7	7.7	7.7
97982	SSF-1232	14.7	14.7	14.7	14.7
97983	SSF-1237	5.9	5.9	5.9	5.9
97984	SSF-1238	6.6	6.6	6.6	6.6
97985	SSF-1713	8.8	8.8	8.8	8.8
97986	SSF-1714	6.2	6.2	6.2	6.2
97987	SSF-1715	7.1	7.1	7.1	7.1
97988	SSF-1716	7.8	7.8	7.8	7.8
97989	SSF-1717	8.6	8.6	8.6	8.6
97990	SSF-1744	15.3	15.3	15.3	15.3

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
97991	SSF-1745	15.8	15.8	15.8	15.8
97992	SSF-1854	5.8	5.8	5.8	5.8
97993	SSF-1855	7.3	7.3	7.3	7.3
97994	SSF-1856	6.6	6.6	6.5	6.5
97995	SSF-1857	8.5	8.5	8.5	8.5
97996	SSF-1882	15.0	15.0	15.0	15.0
97997	SSF-1883	15.0	15.0	15.0	15.0
97998	SSF-1884	14.0	14.0	14.0	14.0
97999	SSF-1885	16.0	16.0	16.0	16.0
98000	SSF-1886	20.9	20.9	20.9	20.9
98001	SSF-1887	16.1	16.0	16.0	16.0
98002	SSF-1888	17.0	17.0	16.9	16.9
98003	SSF-1889	15.0	15.0	15.0	15.0
98004	SSF-1899	16.9	16.9	16.9	16.9
98005	SSF-1900	23.9	23.8	23.8	23.8
98006	SSF-1901	21.0	21.0	21.0	21.0
98007	SSF-1902	18.3	18.3	18.3	18.3
98008	SSF-1903	17.1	17.0	17.0	17.0
98009	SSF-2141	7.5	7.5	7.5	7.5
98010	SSF-2142	7.5	7.5	7.5	7.5
98012	SSF-2145	4.7	4.7	4.7	4.7
98013	SSF-2146	5.5	5.5	5.5	5.5
98014	SSF-2147	4.4	4.4	4.4	4.4
98017	SSF-2150	11.1	11.1	11.1	11.1
98018	SSF-2151	13.0	13.0	13.0	13.0
98019	SSF-2152	13.1	13.1	13.1	13.1
98020	SSF-0892	2.1	2.1	2.1	2.1
98021	SSF-0893	4.3	4.3	4.3	4.3
98022	SSF-1012	7.6	7.6	7.6	7.6
98023	SSF-1013	7.0	7.0	7.0	7.0
98024	SSF-1014	6.1	6.1	6.1	6.1
98025	SSF-1339	8.9	8.9	8.9	8.9
98026	SSF-1340	10.3	10.3	10.3	10.3
98027	SSF-1341	7.2	7.2	7.2	7.2
98028	SSF-1342	10.0	10.0	10.0	10.0
98029	SSF-1343	7.5	7.5	7.5	7.5
98030	SSF-1344	7.3	7.3	7.3	7.3
98031	SSF-1345	6.1	6.1	6.1	6.1
98032	SSF-1346	5.7	5.7	5.7	5.7
98033	SSF-1347	9.5	9.5	9.5	9.5
98034	SSF-1348	8.0	8.0	8.0	8.0
98035	SSF-1349	11.7	11.7	11.7	11.7
98036	SSF-1350	7.4	7.4	7.4	7.4
98037	SSF-1351	7.4	7.4	7.3	7.3
98038	SSF-1352	7.3	7.3	7.3	7.3
98039	SSF-1383	9.7	9.7	9.7	9.7
98040	SSF-1384	6.3	6.3	6.3	6.3
98041	SSF-1385	6.8	6.8	6.8	6.8

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
98042	SSF-1386	7.5	7.5	7.5	7.5
98043	SSF-1387	13.2	13.2	13.2	13.2
98044	SSF-1391	7.9	7.9	7.9	7.9
98045	SSF-1392	10.3	10.3	10.3	10.3
98046	SSF-1393	10.4	10.4	10.4	10.4
98047	SSF-1328	6.9	6.9	6.9	6.9
98048	SSF-0275	7.4	7.4	7.4	7.4
98049	SSF-0276	5.5	5.5	5.5	5.5
98050	SSF-0277	7.3	7.3	7.3	7.3
98051	SSF-0278	7.5	7.5	7.5	7.5
98052	SSF-0279	6.2	6.1	6.1	6.1
98053	SSF-0280	5.7	5.7	5.7	5.7
98054	SSF-0281	7.8	7.8	7.8	7.8
98055	SSF-0282	7.7	7.7	7.7	7.7
98056	SSF-0309	10.0	9.9	9.9	9.9
98057	SSF-0310	6.8	6.8	6.8	6.8
98058	SSF-0311	5.1	5.1	5.1	5.1
98059	SSF-0312	5.8	5.8	5.8	5.8
98061	SSF-0779	14.1	14.1	14.1	14.1
98062	SSF-0780	7.4	7.4	7.4	7.4
98063	SSF-0781	7.0	7.0	7.0	7.0
98064	SSF-0782	13.8	13.8	13.8	13.8
98065	SSF-0785	7.6	7.6	7.6	7.6
98066	SSF-1287	10.3	10.3	10.3	10.3
98067	SSF-1288	6.5	6.5	6.5	6.5
98068	SSF-1289	4.3	4.3	4.3	4.3
98069	SSF-1317	8.0	8.0	8.0	8.0
98070	SSF-1318	6.9	6.9	6.9	6.9
98072	SSF-1320	5.2	5.2	5.2	5.2
98073	SSF-1323	10.5	10.5	10.5	10.5
98074	SSF-1324	8.5	8.5	8.5	8.5
98075	SSF-1325	10.8	10.8	10.8	10.8
98076	SSF-1326	7.1	7.1	7.1	7.1
98077	SSF-1327	7.1	7.1	7.1	7.1
98078	SSF-1329	9.3	9.4	9.4	9.4
98079	SSF-1330	9.9	9.9	9.9	9.9
98083	SSF-0118	4.3	4.3	4.3	4.3
98084	SSF-0124	4.5	4.4	4.4	4.4
98085	SSF-0158	2.8	2.8	2.8	2.8
98087	SSF-0049	7.1	7.1	7.1	7.1
98090	SSF-0071	4.7	4.7	4.7	4.7
98098	SSF-0733	7.3	7.3	7.3	7.3
98105	SSF-0273	3.4	3.4	3.4	3.4
98106	NoMatch	4.9	4.9	4.9	4.9
98121	SSF-0403	10.0	10.0	10.0	10.0
98123	SSF-0434	3.5	3.5	3.5	3.5
98125	SSF-0589	6.5	6.5	6.5	6.5
98128	SSF-0744	5.5	5.5	5.5	5.5

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
98129	SSF-0783	9.3	9.3	9.3	9.3
98130	SSF-0784	5.7	5.7	5.7	5.7
98131	SSF-1433	3.8	3.8	3.8	3.8
98132	SSF-1475	14.1	14.1	14.1	14.1
98133	SSF-1482	3.0	3.0	3.0	3.0
98136	SSF-0801	5.0	5.0	5.0	5.0
98137	SSF-0802	12.5	12.5	12.5	12.5
98138	SSF-0803	12.1	12.1	12.1	12.1
98140	SSF-1056	9.5	9.5	9.5	9.5
98141	SSF-1077	9.2	9.2	9.2	9.2
98142	SSF-1107	8.4	8.4	8.4	8.4
98143	SSF-1116	6.5	6.5	6.5	6.5
98144	SSF-1117	9.1	9.1	9.1	9.1
98145	SSF-1132	6.3	6.3	6.3	6.3
98146	SSF-1135	4.3	4.3	4.3	4.3
98147	SSF-1139	6.9	6.9	6.9	6.9
98148	SSF-1170	3.9	3.9	3.9	3.9
98149	SSF-1182	11.1	11.1	11.1	11.1
98151	SSF-1194	10.5	10.5	10.5	10.5
98152	SSF-1211	5.8	5.8	5.8	5.8
98153	SSF-1264	2.8	2.8	2.8	2.8
98154	SSF-1265	5.9	5.9	5.9	5.9
98155	SSF-2214	4.2	4.2	4.2	4.2
98157	SSF-1604	7.8	7.8	7.8	7.8
98159	SSF-1940	12.0	12.0	12.0	12.0
98160	SSF-1953	6.1	6.1	6.1	6.1
98162	SSF-0844	7.7	7.7	7.7	7.7
98163	SSF-1655	7.8	7.8	7.8	7.8
98164	SSF-1740	7.5	7.5	7.5	7.5
98165	SSF-1766	7.2	7.2	7.2	7.2
98166	SSF-1767	7.9	7.9	7.9	7.9
98167	SSF-2364	4.1	4.1	4.1	4.1
98168	SSF-1852	32.3	32.3	32.3	32.3
98175	SSF-2338	6.8	6.9	6.9	6.9
98178	SSF-2164	7.7	7.7	7.7	7.7
98179	SSF-2166	10.0	10.0	10.0	10.0
98180	SSF-2183	6.5	6.5	6.5	6.5

Junction ID	GIS ID	Existing Freeboard (ft)	2025 Freeboard (ft)	2035 Freeboard (ft)	Buildout Freeboard (ft)
98181	SSF-2209	2.4	2.4	2.4	2.4
98182	SSF-2210	5.5	5.5	5.5	5.5
98183	SSF-0651	5.0	5.0	5.0	5.0
98184	SSF-0652	5.5	5.5	5.5	5.5
98185	SSF-0658	8.6	8.6	8.6	8.6
98186	SSF-0898	11.9	11.9	11.9	11.9
98187	SSF-0916	6.8	6.8	6.8	6.8
98190	SSF-0958	8.1	8.1	8.1	8.1
98192	SSF-1404	5.8	5.8	5.8	5.8
98194	SSF-1504	10.9	10.9	10.9	10.9
98195	SSF-1530	7.2	7.2	7.2	7.2
98198	SSF-2585	15.2	15.2	15.2	15.2
98203	SSF-2203	8.2	8.2	8.2	8.2
99950	SSF-2476	4.7	4.7	4.7	4.7
99958	SSF-2490	9.9	9.9	9.9	9.9
99960	SSF-2486	10.0	10.0	10.0	10.0
99962	SSF-2487	10.0	10.0	10.0	10.0
99964	SSF-2489	11.5	11.5	11.5	11.5
99970	SSF-2419	10.4	10.4	10.4	10.4
99972	SSF-2420	7.6	7.6	7.6	7.6
99974	SSF-2422	7.6	7.6	7.6	7.6
99976	SSF-2421	7.4	7.4	7.4	7.4
99986	SSF-2467	5.0	4.9	4.9	4.9
99988	SSF-2493	27.1	27.1	27.1	27.1
99990	SSF-2469	27.4	27.4	27.4	27.4
99992	SSF-2468	28.8	28.8	28.8	28.8
99994	SSF-2471	15.2	15.2	15.2	15.2
99996	SSF-2470	19.1	19.1	19.1	19.1
99998	SSF-2472	17.1	17.1	17.1	17.1
A2	NoMatch	6.7	6.8	6.8	6.8
A3	NoMatch	8.7	9.1	9.1	9.1
A4	NoMatch	10.0	10.4	10.4	10.4
A5	NoMatch	9.3	9.8	9.8	9.7
CH359	NoMatch	12.6	12.6	12.6	12.6
CH3720	SSF-2608	8.0	8.0	8.0	8.0
CH486	NoMatch	6.4	6.4	6.4	6.4
CH516	NoMatch	6.4	6.4	6.4	6.4
CH59	NoMatch	7.6	7.6	7.6	7.6
DU-IPS_FM1	NoMatch	-104.5	-109.1	-112.2	-500.0
DU-IPS_FM2	NoMatch	5.0	5.0	5.0	5.0
F1	NoMatch	7.1	7.6	7.6	7.6
F2	NoMatch	12.3	16.7	16.7	16.7
F3	NoMatch	10.3	14.0	14.0	14.0
F4	NoMatch	8.3	12.4	12.4	12.4
F5	NoMatch	2.4	6.7	6.7	6.6
LTPS_FM0	SSF-2461	-46.5	-72.3	-86.3	-104.9
LTPS_FM1	NoMatch	-30.6	-64.0	-75.5	-91.7
LTPS_FM2	NoMatch	-33.8	-64.9	-75.2	-91.4

Conduit Summary

Conduit ID	GIS ID	Length (ft)	Diameter (in)	Slope	Existing Condition			2025 Condition			2035 Condition			Buildout Condition		
					Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category	Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category	Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category	Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category
1291	SSL-00145	113	60	0.0016	3,004	1444	OK	4839	0	OK	5098	0	OK	5230	0	OK
1292	SSL-00128	62	66	0.0040	1,631	963	OK	3268	0	DS	3335	0	DS	3367	0	DS
1293	SSL-00430	250	30	0.0044	780	0	OK	722	0	OK	782	0	OK	789	0	OK
1300	SSL-00493	635	42	0.0004	1,665	1065	OK	3307	0	DS	3379	0	DS	3412	0	IS
1301	SSL-01563	245	42	0.0038	668	0	OK	965	0	DS	1016	0	DS	1032	0	IS
1303	SSL-00126	165	66	0.0005	1,711	1133	OK	3367	0	DS	3450	0	DS	3489	0	DS
1304	SSL-00127	40	66	0.0063	1,773	0	OK	1761	0	OK	1744	0	OK	1903	0	IS
1444	SSL-00497	453	42	0.0004	333,160	0	OK	9867	212265	OK	15012	207120	OK	624	0	OK
1446	NoMatch	300	8	0.0067	1,655	1165	OK	3295	0	DS	3365	0	DS	3398	0	DS
1448	NoMatch	210	15	0.0090	872	0	OK	901	0	IS	903	0	IS	923	0	IS
1449	NoMatch	210	15	0.0090	645	0	OK	1054	0	HS	1049	0	HS	1097	0	HS
1450	NoMatch	106	15	0.0090	1,648	1195	OK	3287	0	DS	3356	0	DS	3388	0	DS
1451	NoMatch	104	15	0.0091	648	0	OK	1109	0	LS	1112	0	LS	1100	0	HS
1452	NoMatch	167	15	0.0091	850	0	IS	1145	0	HS	1206	0	HS	1225	0	HS
1453	NoMatch	88	15	0.0149	12	3463	OK	1645	1830	OK	1240	2235	HH, Backwater	3979	0	HH, Backwater
1454	NoMatch	162	15	0.0149	890	0	OK	1183	0	HH	1246	0	HH	1248	0	HH
1455	NoMatch	143	15	0.0151	1,785	0	OK	1772	0	OK	1758	0	OK	1920	0	OK
1456	NoMatch	246	42	0.0008	1,655	0	OK	1632	0	OK	1628	0	OK	1784	0	IS
1457	NoMatch	75	21	0.0009	657	0	DS	956	0	DS	1005	0	DS	1021	0	DS
1458	NoMatch	325	12	0.0010	1,754	0	OK	1743	0	OK	1724	0	OK	1888	0	OK
1459	NoMatch	401	21	0.0010	4,161	2295	OK	9112	16098	OK	12004	13206	OK	25599	0	OK
1460	NoMatch	78	21	0.0010	893	13	OK	1188	0	HS	1251	0	HS	1253	0	HS
1461	SSL-00129	280	15	0.0095	546	0	IS	637	0	IS	643	0	IS	658	0	IH
1462	SSL-01558	482	42	0.0004	748	0	OK	833	0	OK	846	0	OK	860	0	OK
1463	SSL-00494	416	42	0.0004	64	3574	OK	612	3026	HH, Backwater	1252	2386	HH, Backwater	3973	0	HH, Backwater
1464	SSL-00495	586	42	0.0004	161	22	OK	237	0	OK	382	0	OK	506	0	OK
1465	NoMatch	149	18	0.0054	585	0	OK	674	0	IS	681	0	IS	696	0	HS
1466	NoMatch	161	18	0.0012	1,332	86	DH, Backwater	1729	0	IS	1733	0	IS	1736	0	IS
1467	NoMatch	68	18	0.0010	305	83	OK	687	0	IS	696	0	IS	705	0	IS
1468	NoMatch	79	18	0.0014	1,068	91	OK	1378	0	IS	1451	0	IS	1459	0	IS
1469	NoMatch	423	18	0.0014	320	103	OK	703	0	IS	712	0	IS	721	0	IS
1470	NoMatch	98	18	0.0022	1,671	0	OK	1649	0	OK	1626	0	OK	1795	0	IS
1471	NoMatch	180	18	0.0012	544	0	IS	635	0	IS	641	0	IS	655	0	IS
1472	NoMatch	258	18	0.0028	3,618	2254	OK	5645	227	OK	5980	0	OK	6151	0	OK
1473	NoMatch	225	18	0.0189	1,331	119	DH, Backwater	1720	0	IS	1723	0	IS	1725	0	IS
1474	NoMatch	360	18	0.0130	1,065	99	OK	1223	0	OK	1359	0	OK	1440	0	OK
1475	NoMatch	450	18	0.0271	35	3671	OK	706	3001	IH, Backwater	1250	2457	IH, Backwater	3974	0	IH, Backwater
1476	NoMatch	340	18	0.0230	1,088	128	OK	1398	0	OK	1472	0	OK	1480	0	OK
1477	NoMatch	447	18	0.0088	1,022	117	OK	1171	0	OK	1318	0	IH	1403	0	IH
1478	NoMatch	380	18	0.0100	19	3696	OK	1785	1930	OK	1248	2467	IH, Backwater	3978	0	IH, Backwater
1479	NoMatch	350	18	0.0070	4,349	2401	OK	9807	16552	OK	13161	13198	OK	26621	0	OK
1480	NoMatch	315	18	0.0090	1,051	115	OK	1207	0	OK	1342	0	IS	1421	0	HS
1481	NoMatch	450	15	0.0420	973	13	OK	1114	0	OK	1194	0	OK	1236	0	OK
1482	NoMatch	450	15	0.0400	1,063	149	OK	1374	0	OK	1447	0	OK	1453	0	OK
1483	NoMatch	410	15	0.0430	949	17	IH, Backwater	1089	0	HH	1166	0	HH	1207	0	HS
1484	NoMatch	151	15	0.0111	1,061	156	OK	1372	0	DS	1445	0	DS	1451	0	DS
1485	NoMatch	300	15	0.0231	4	3743	OK	872	2874	OK	1238	2509	HH, Backwater	3977	0	HH, Backwater
1486	NoMatch	449	15	0.0100	1,041	151	OK	1195	0	OK	1328	0	IS	1406	0	HH
1487	NoMatch	220	12	0.0160	671	166	OK	968	0	DS	1020	0	IS	1035	0	IS
1488	NoMatch	35	12	0.0360	523	0	IH	614	0	IS	619	0	IH	633	0	IH
1489	NoMatch	265	12	0.0358	410	0	OK	506	0	OK	507	0	OK	555	0	IS
1490	NoMatch	88	12	0.0251	1,060	200	OK	1373	0	IS	1444	0	IS	1451	0	IS
1491	NoMatch	189	12	0.0122	344	216	OK	727	0	DS	738	0	DH	747	0	DS
1492	NoMatch	178	12	0.0307	350	227	OK	734	0	OK	744	0	OK	754	0	OK

Conduit ID	GIS ID	Length (ft)	Diameter (in)	Slope	Existing Condition			2025 Condition			2035 Condition			Buildout Condition		
					Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category	Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category	Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category	Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category
1493	NoMatch	116	12	0.0104	446	236	OK	830	0	IS	845	0	IS	856	0	IS
1494	NoMatch	130	12	0.0090	1,058	220	OK	1369	0	IS	1442	0	IS	1448	0	IS
1495	NoMatch	335	12	0.0299	967	90	OK	1107	0	IH	1185	0	IH	1226	0	IS
1496	NoMatch	37	12	0.1441	548	0	OK	575	0	HS	599	0	HS	611	0	HS
1497	SSL-00501	503	42	0.0002	1,328	238	DH, Backwater	1725	0	IS	1729	0	IS	1731	0	IS
1498	NoMatch	51	18	0.0422	1,344	255	OK	1745	0	OK	1752	0	OK	1756	0	OK
1499	NoMatch	171	12	0.0084	465	0	IS	560	0	IH	564	0	IS	578	0	IS
1507	NoMatch	302	8	0.0107	1,072	235	OK	1230	77	OK	1367	0	OK	1449	0	OK
1508	NoMatch	387	12	0.0105	674	224	OK	973	0	DS	1025	0	DS	1040	0	DS
1509	NoMatch	184	12	0.0362	773	0	OK	854	0	HS	871	0	HS	885	0	HS
1510	NoMatch	118	12	0.0884	246	0	OK	287	0	DS	299	0	DS	305	0	DS
1511	NoMatch	87	12	0.0838	775	236	OK	1072	0	OK	1130	0	OK	1148	0	OK
1512	NoMatch	67	8	0.0049	325	271	OK	708	0	IH	717	0	IH	726	0	IH
1513	NoMatch	203	10	0.0389	1,657	4	OK	1635	26	OK	1625	36	OK	1785	0	IS
1514	NoMatch	70	10	0.0151	313	33	OK	388	0	IH	452	0	HS	454	0	HS
1515	NoMatch	394	10	0.0128	1,059	284	OK	1373	0	IH	1443	0	IS	1450	0	IS
1516	NoMatch	152	10	0.0149	300	295	OK	681	0	IS	690	0	IS	700	0	IS
1517	NoMatch	165	10	0.0245	695	272	OK	991	0	DH	1045	0	DS	1061	0	DS
1518	NoMatch	117	10	0.0520	1,334	301	OK	1713	0	IS	1716	0	IS	1718	0	IS
1519	NoMatch	174	10	0.0155	1,680	38	OK	1657	61	OK	1635	84	OK	1800	0	OK
1520	NoMatch	432	10	0.0324	523	105	OK	612	15	OK	674	0	IS	705	0	IH
1521	NoMatch	416	10	0.0189	692	291	OK	988	0	DH	1041	0	DS	1057	0	DS
1522	NoMatch	247	10	0.0191	896	286	OK	1190	0	DH	1253	0	DS	1255	0	DS
1523	NoMatch	124	10	0.0238	532	109	OK	623	18	OK	685	0	IS	713	0	IS
1562	SSL-00496	280	27	0.0075	761	300	OK	1057	4	IH, Backwater	1115	0	IS	1132	0	IS
1563	SSL-00491	634	42	0.0004	401	0	OK	384	0	OK	400	0	OK	453	0	IH
1569	NoMatch	82	8	0.0806	366	336	OK	751	0	OK	762	0	OK	772	0	OK
1570	NoMatch	278	8	0.0245	274	0	OK	310	0	OK	324	0	OK	331	0	OK
1571	NoMatch	364	10	0.0056	1,767	103	OK	1754	116	OK	1739	132	OK	1937	0	LS
1595	SSL-00492	696	42	0.0004	1,687	46	OK	1663	70	OK	1641	92	OK	1799	0	OK
1605	SSL-00442	360	30	0.0005	772	307	OK	1069	10	DH, Backwater	1127	0	DS	1144	0	DS
1607	SSL-00280	253	10	0.0273	516	109	OK	602	23	OK	660	0	HS	690	0	HS
1608	SSL-00204	321	12	0.0310	511	110	OK	596	25	OK	655	0	IS	684	0	HS
1609	SSL-00146	502	10	0.0043	246	0	OK	262	0	OK	272	0	OK	274	0	OK
1610	SSL-01996	20	10	0.3105	846	165	OK	956	56	IH, Backwater	1038	0	IH	1069	0	IS
1611	SSL-01984	232	36	0.0011	221	0	OK	257	0	OK	268	0	OK	274	0	OK
1612	SSL-00440	169	30	0.0050	319	0	OK	348	0	OK	366	0	OK	369	0	OK
1613	SSL-00890	104	18	0.0059	749	319	OK	1046	23	IH, Backwater	1103	0	IS	1120	0	IS
1614	SSL-00892	115	18	0.0008	72	0	OK	71	0	OK	74	0	OK	76	0	OK
1615	SSL-00893	290	18	0.0012	905	311	OK	1199	16	IH, Backwater	1263	0	IS	1264	0	IS
1616	SSL-00894	400	18	0.0016	463	66	IH, Backwater	558	0	IS	561	0	IS	576	0	IS
1617	SSL-00895	352	18	0.0010	317	26	OK	346	0	IH	386	0	HS	389	0	HS
1618	SSL-00889	307	18	0.0016	179	158	OK	379	0	OK	379	0	OK	382	0	OK
1619	SSL-02497	407	18	0.0014	91	0	OK	98	0	OK	105	0	OK	107	0	OK
1620	SSL-00887	395	18	0.0035	677	323	OK	974	26	DH, Backwater	1027	0	DS	1042	0	DS
1621	SSL-01567	502	18	0.0016	240	0	OK	268	0	DS	266	0	DS	268	0	DS
1622	SSL-00886	475	18	0.0007	851	194	OK	963	83	OK	1045	0	OK	1078	0	OK
1623	SSL-00884	154	18	0.0020	360	377	OK	744	0	DH	755	0	DS	764	0	DS
1624	SSL-00883	93	18	0.0032	175	177	OK	377	0	DH	377	0	DH	378	0	DH
1625	SSL-00882	338	18	0.0009	110	2	OK	125	0	OK	130	0	OK	132	0	OK
1626	SSL-00885	445	18	0.0020	185	185	OK	374	0	OK	387	0	OK	390	0	OK
1627	SSL-00891	16	10	0.4125	470	68	OK	518	19	OK	544	0	OK	557	0	OK
1628	SSL-01592	414	18	0.0013	188	53	OK	224	18	OK	248	0	OK	259	0	OK
1629	SSL-00197	56	12	0.0084	250	27	OK	276	0	OK	274	3	OK	293	0	OK

Conduit ID	GIS ID	Length (ft)	Diameter (in)	Slope	Existing Condition			2025 Condition			2035 Condition			Buildout Condition		
					Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category	Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category	Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category	Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category
1630	SSL-00200	295	12	0.0040	213	23	OK	233	3	OK	231	6	OK	252	0	OK
1631	SSL-01573	379	12	0.0043	31	2	OK	29	4	OK	41	0	IS	47	0	IS
1632	SSL-00212	133	10	0.0047	539	397	OK	924	12	IH, Backwater	932	3	IH, Backwater	947	0	IH
1633	SSL-01575	280	10	0.0040	158	190	OK	348	0	OK	354	0	OK	357	0	OK
1634	SSL-00213	272	10	0.0040	212	199	OK	403	8	OK	416	0	OK	420	0	OK
1635	SSL-00215	430	10	0.0043	465	79	OK	514	31	OK	539	5	OK	552	0	OK
1636	SSL-00967	16	10	0.0069	251	98	OK	292	57	OK	336	13	OK	355	0	OK
1637	SSL-00291	319	10	0.0071	19	388	OK	411	0	OK	412	0	OK	413	0	OK
1638	SSL-00292	247	10	0.0071	764	85	OK	803	46	OK	837	13	OK	854	0	OK
1639	SSL-00293	254	10	0.0055	150	5407	OK	3316	2241	DH, Backwater	5078	479	IS, Backwater	5560	0	IS, Backwater
1640	SSL-00428	338	10	0.0029	911	357	OK	1206	63	IH, Backwater	1271	0	IH	1272	0	IH
1641	SSL-00553	434	10	0.0674	682	362	OK	979	66	IH, Backwater	1032	13	IH, Backwater	1047	0	IH
1642	SSL-00597	185	8	0.0215	161	199	OK	352	9	OK	360	1	OK	363	0	OK
1643	SSL-00598	200	8	0.0373	703	112	OK	791	24	OK	802	13	OK	815	0	OK
1644	NoMatch	326	18	0.0018	210	210	OK	401	19	OK	414	6	OK	417	3	OK
1645	NoMatch	183	18	0.0020	4,819	4729	OK	8490	1058	OK	9226	323	OK	9541	7	OK
1646	SSL-01855	409	18	0.0018	301	42	OK	319	24	OK	332	11	HS, Backwater	335	8	HS, Backwater
1647	SSL-01856	401	18	0.0017	440	84	OK	482	42	OK	504	20	OK	516	8	OK
1648	NoMatch	400	18	0.0021	0	9	OK	0	9	OK	0	9	OK	0	9	OK
1650	SSL-00190	154	10	0.0047	0	9	OK	0	9	OK	0	9	OK	0	9	OK
1651	SSL-00191	230	10	0.0099	242	110	OK	281	70	OK	324	28	OK	342	10	OK
1652	SSL-00189	220	10	0.0070	0	14	OK	0	14	OK	0	14	OK	0	14	OK
1653	SSL-00155	252	10	0.0032	270	74	OK	296	49	IH, Backwater	324	21	IH, Backwater	330	14	IH, Backwater
1654	SSL-00607	290	10	0.0056	82	209	OK	272	19	OK	275	16	OK	277	14	OK
1655	SSL-00606	297	10	0.0040	268	73	OK	292	49	OK	322	19	OK	327	14	IH, Backwater
1656	SSL-00615	203	8	0.0723	103	31	OK	111	23	OK	115	19	OK	118	16	OK
1657	SSL-00613	500	15	0.0066	0	19	OK	0	19	OK	0	19	OK	0	19	OK
1658	SSL-00605	127	10	0.0439	358	424	OK	743	39	DH, Backwater	754	28	DH, Backwater	763	19	DH, Backwater
1659	SSL-00604	241	10	0.0483	100	34	OK	107	27	OK	112	22	OK	114	20	OK
1660	SSL-00603	267	10	0.0304	185	91	OK	220	56	OK	244	32	OK	255	21	OK
1661	SSL-00602	178	10	0.0308	0	22	OK	0	22	OK	0	22	OK	0	22	OK
1662	SSL-01576	423	10	0.0352	228	77	OK	265	40	OK	276	29	OK	282	23	OK
1663	SSL-00601	161	10	0.0609	365	83	OK	389	59	OK	383	65	OK	424	24	OK
1664	SSL-00600	65	10	0.0600	10	24	OK	9	25	OK	9	25	OK	9	25	OK
1665	SSL-00599	225	10	0.0996	410	92	OK	447	56	OK	465	38	OK	474	29	OK
1666	SSL-00614	411	15	0.0040	223	166	OK	332	57	OK	351	38	OK	360	29	OK
1667	SSL-00281	14	10	0.0229	2	424	OK	393	32	OK	393	32	OK	393	32	OK
1668	NoMatch	98	10	0.0041	1,248	451	OK	1425	274	OK	1577	122	OK	1666	33	OK
1669	SSL-00276	550	8	0.0656	209	63	OK	222	50	OK	231	41	OK	236	37	OK
1670	SSL-01594	110	8	0.0455	208	244	OK	399	54	OK	411	41	OK	415	37	OK
1671	NoMatch	370	8	0.0730	139	163	FM	253	49	FM	265	37	FM	264	38	FM
1672	SSL-00277	360	8	0.0450	209	138	OK	246	101	OK	288	59	OK	306	42	OK
1673	SSL-00538	90	8	0.0111	207	178	OK	314	70	OK	332	52	OK	341	43	OK
1674	SSL-00540	83	12	0.0058	430	114	OK	469	75	OK	489	56	OK	499	45	OK
1675	SSL-01572	390	12	0.0053	203	224	OK	364	63	IH, Backwater	370	56	IH, Backwater	380	46	IH, Backwater
1676	SSL-00541	136	12	0.0268	105	232	OK	145	191	OK	223	114	OK	289	47	OK
1677	SSL-00542	127	12	0.0057	231	186	OK	341	76	OK	360	57	OK	369	48	OK
1678	SSL-00549	133	12	0.0058	202	182	OK	309	75	OK	327	57	OK	335	48	OK
1679	SSL-00543	79	12	0.0062	90	245	OK	280	55	OK	284	51	OK	286	49	OK
1680	SSL-00552	51	12	0.0071	415	209	OK	474	149	OK	543	80	OK	573	50	OK
1681	SSL-00544	108	12	0.0064	57	84	OK	56	85	OK	62	79	OK	91	50	IH, Backwater
1682	SSL-00550	197	12	0.0063	195	253	OK	249	199	OK	343	105	OK	397	51	IH, Backwater
1683	SSL-00546	128	12	0.0058	753	62	OK	706	108	OK	732	83	OK	762	53	OK
1684	SSL-00551	227	12	0.0055	413	193	OK	510	97	OK	510	96	OK	551	55	DH, Backwater

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1685	SSL-00548	224	12	0.0022	246	104	OK	293	57	OK	291	59	OK	294	56	OK
1686	SSL-00443	84	10	0.0052	25	61	OK	25	61	OK	27	58	OK	28	57	OK
1687	SSL-00448	297	12	0.0163	130	80	OK	140	69	OK	146	63	OK	149	60	OK
1688	SSL-00449	308	12	0.0335	0	61	OK	0	61	OK	0	61	OK	0	61	OK
1689	SSL-01571	400	12	0.0040	0	64	OK	0	64	OK	0	64	OK	0	64	OK
1690	SSL-00451	178	12	0.0046	1,684	181	OK	1660	204	OK	1638	226	OK	1799	65	OK
1691	SSL-00452	250	12	0.0044	220	120	OK	256	84	OK	267	73	OK	272	68	OK
1692	SSL-00453	224	12	0.0045	411	227	OK	470	168	OK	539	99	OK	569	69	OK
1693	SSL-00460	219	12	0.0037	724	0	OK	479	93	OK	501	71	OK	503	70	OK
1694	SSL-00464	172	12	0.0038	173	137	OK	206	104	OK	228	82	OK	238	72	OK
1695	SSL-00664	239	12	0.0043	8	77	OK	9	76	OK	11	74	OK	12	73	OK
1696	SSL-02236	184	12	0.0039	127	106	OK	142	91	OK	155	78	OK	158	75	OK
1697	SSL-02235	95	12	0.0032	216	127	OK	251	92	OK	262	81	OK	268	75	OK
1698	SSL-00665	256	12	0.0027	33	77	OK	32	78	OK	34	76	OK	34	76	OK
1699	SSL-00666	240	12	0.0006	205	215	OK	312	108	OK	331	90	OK	339	81	OK
1700	SSL-00675	150	12	0.0013	179	112	OK	196	95	OK	204	87	OK	208	83	OK
1701	NoMatch	63	12	0.0287	0	4056	OK	361	3695	OK	1215	2841	HH, Backwater	3973	83	HH, Backwater
1702	SSL-00677	216	12	0.0011	211	124	OK	232	103	OK	229	106	OK	250	85	OK
1703	SSL-00678	160	12	0.0046	209	133	OK	242	101	OK	252	91	OK	257	85	OK
1704	SSL-00684	34	12	0.0068	155	285	OK	344	95	OK	350	89	OK	353	86	OK
1705	SSL-00692	421	12	0.0034	85	283	OK	275	93	OK	279	90	OK	280	88	OK
1706	SSL-00693	138	10	0.0096	0	88	OK	0	88	OK	0	88	OK	0	88	OK
1707	SSL-01997	18	36	0.0011	393	95	OK	376	112	OK	391	97	OK	399	89	OK
1708	SSL-01998	430	36	0.0011	186	120	OK	202	104	OK	211	96	OK	215	92	OK
1709	SSL-01985	217	30	0.0024	301	132	OK	326	107	OK	340	93	IS, Backwater	339	94	HS, Backwater
1710	SSL-01991	120	42	0.0016	165	295	OK	355	104	OK	361	98	OK	364	95	OK
1711	SSL-01990	62	36	0.0016	206	131	OK	224	112	OK	233	103	OK	238	98	OK
1712	SSL-01993	346	36	0.0011	93	296	OK	284	106	OK	287	102	OK	290	100	OK
1713	SSL-01994	288	36	0.0011	259	105	OK	252	113	OK	260	105	OK	265	100	OK
1714	SSL-01995	109	36	0.0011	53	518	OK	476	95	OK	475	96	IH, Backwater	467	105	HS, Backwater
1715	SSL-01986	157	30	0.0013	323	215	OK	362	176	OK	408	131	OK	429	109	HS, Backwater
1716	SSL-01988	14	30	0.0007	642	0	OK	406	135	OK	422	119	OK	431	111	OK
1717	SSL-01989	28	15	0.0311	1	112	OK	1	111	OK	1	111	OK	1	111	OK
1718	SSL-00433	452	30	0.0007	1,815	269	OK	1812	272	OK	1801	283	OK	1971	114	OK
1719	SSL-01564	500	30	0.0005	27	144	OK	41	130	OK	53	119	OK	57	114	OK
1720	SSL-00437	450	30	0.0009	91	251	OK	121	221	OK	178	164	OK	227	115	OK
1721	SSL-00436	358	30	0.0071	227	195	OK	263	159	OK	291	131	OK	304	118	OK
1722	SSL-00435	84	30	0.0043	563	525	OK	981	107	IH, Backwater	967	121	HH, Backwater	969	119	IH, Backwater
1723	SSL-00434	410	30	0.0011	548	186	OK	575	158	IH, Backwater	600	133	HH, Backwater	612	122	HH, Backwater
1724	SSL-00432	253	30	0.0002	97	140	OK	103	134	OK	112	126	OK	115	122	OK
1725	SSL-00438	443	30	-0.0003	321	527	OK	706	143	IH, Backwater	715	133	IH, Backwater	724	124	IH, Backwater
1735	NoMatch	22	30	0.0059	178	155	OK	194	139	OK	202	131	OK	206	126	OK
1736	NoMatch	25	30	0.1160	364	178	OK	389	153	OK	405	137	OK	413	129	OK
1737	SSL-08459	315	10	0.0040	182	160	OK	198	143	OK	206	135	OK	211	131	OK
1738	NoMatch	14	10	0.0086	37	142	OK	44	135	OK	46	133	OK	47	132	OK
1739	SSL-00279	267	10	0.0394	1,659	256	OK	1636	279	OK	1614	301	OK	1783	132	IH, Backwater
1740	SSL-00278	83	10	0.0042	102	152	OK	108	145	OK	117	136	OK	121	133	OK
1741	SSL-00283	245	8	0.0703	183	161	OK	198	145	OK	206	137	OK	211	133	OK
1742	SSL-00288	240	8	0.0135	29	164	OK	43	150	OK	54	138	OK	59	134	OK
1743	SSL-00287	400	8	0.0041	171	169	OK	194	146	OK	202	138	OK	207	134	OK
1744	SSL-00286	250	8	0.0042	146	198	OK	172	172	OK	197	147	OK	208	135	OK
1745	NoMatch	580	8	-0.0114	176	165	OK	192	149	OK	200	141	OK	204	137	OK
1747	SSL-01915	375	10	0.0034	392	189	OK	418	163	OK	435	146	OK	444	138	OK
1749	SSL-00327	298	10	0.0031	171	188	FM	219	140	FM	213	146	FM	221	139	FM

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1750	SSL-01574	468	10	0.0028	377	184	OK	395	166	IH, Backwater	411	149	HH, Backwater	420	141	HH, Backwater
1758	NoMatch	306	10	0.0027	176	169	OK	192	153	OK	200	145	OK	204	141	OK
1759	NoMatch	246	10	0.0036	174	170	OK	190	154	OK	198	146	OK	202	142	OK
1760	NoMatch	47	10	0.0055	3	143	OK	4	142	OK	4	142	OK	4	142	OK
1761	SSL-02411	500	8	0.0252	359	192	OK	383	167	OK	399	152	OK	407	144	OK
1762	SSL-02415	114	8	0.0044	96	211	OK	127	180	OK	152	155	OK	163	144	OK
1763	SSL-01846	452	8	0.0040	79	250	OK	188	141	IH, Backwater	193	136	IH, Backwater	183	146	IH, Backwater
1764	SSL-02303	315	10	0.0037	385	201	OK	411	175	OK	428	158	OK	436	150	OK
1765	SSL-01849	363	10	0.0031	189	167	OK	198	158	OK	205	151	OK	206	150	OK
1766	SSL-02246	86	10	0.0053	24	155	OK	26	154	OK	27	153	OK	27	152	OK
1767	SSL-02245	22	10	0.0073	5	157	OK	8	154	OK	8	154	OK	8	154	OK
1768	SSL-01851	306	10	0.0028	45	318	OK	206	158	OK	208	156	OK	209	154	OK
1769	SSL-01853	369	10	0.0028	112	230	OK	147	195	OK	174	168	OK	187	156	OK
1770	SSL-01852	375	10	0.0028	452	568	OK	837	184	HH, Backwater	852	168	HH, Backwater	865	156	HH, Backwater
1771	SSL-01854	376	10	0.0059	41	585	OK	434	192	OK	436	190	OK	468	157	OK
1772	SSL-01838	160	15	0.0015	151	192	OK	173	169	OK	180	162	OK	184	158	OK
1773	SSL-01837	434	15	0.0016	141	219	OK	166	194	OK	190	169	OK	201	158	OK
1774	SSL-01810	499	15	0.0015	16	167	OK	20	163	OK	22	161	OK	23	159	OK
1775	SSL-01825	392	10	0.0033	370	209	OK	395	184	OK	411	168	OK	419	160	OK
1776	SSL-01813	400	10	0.0029	109	235	OK	143	201	OK	170	174	OK	183	161	OK
1777	SSL-01814	89	10	0.0034	1	162	OK	1	162	OK	1	162	OK	1	162	OK
1778	SSL-01809	450	15	0.0017	189	192	OK	205	175	OK	214	167	OK	218	162	OK
1779	SSL-01806	470	15	0.0016	58	564	OK	452	170	IH, Backwater	460	162	IH, Backwater	458	164	IH, Backwater
1780	SSL-01807	471	15	0.0016	21	558	OK	413	166	OK	414	165	OK	414	165	OK
1781	SSL-01790	374	15	0.0020	292	228	OK	331	189	OK	347	174	OK	355	165	OK
1790	SSL-01031	470	10	0.0026	164	166	OK	150	180	OK	147	184	OK	165	166	OK
1791	SSL-01607	488	10	0.0031	453	373	OK	525	300	OK	614	212	OK	659	167	OK
1792	SSL-00302	488	10	0.0028	462	377	OK	535	304	OK	625	214	OK	671	168	OK
1793	SSL-00301	370	10	0.0156	168	234	OK	201	201	OK	222	180	OK	232	170	OK
1794	SSL-00298	378	10	0.0031	153	205	OK	175	183	OK	183	175	OK	187	171	OK
1795	SSL-00299	394	10	0.0030	3	173	OK	3	173	OK	4	172	OK	4	172	OK
1796	NoMatch	390	10	0.0151	241	214	OK	265	190	OK	276	178	OK	283	172	OK
1797	SSL-02099	390	10	0.0132	43	635	OK	436	242	OK	467	211	OK	506	172	OK
1798	SSL-02100	253	10	0.0230	2	174	OK	3	174	OK	3	174	OK	3	174	OK
1799	SSL-02102	256	10	0.0231	100	243	OK	132	211	OK	157	187	OK	168	175	OK
1800	SSL-02103	500	10	0.0230	1,442	668	OK	1878	232	OK	1916	194	OK	1932	177	OK
1801	SSL-02093	500	10	0.0230	230	290	OK	277	242	OK	322	198	OK	342	178	OK
1802	SSL-00898	162	10	0.0543	278	236	OK	315	200	OK	329	185	OK	336	178	OK
1803	SSL-00897	332	10	0.0300	356	227	OK	380	203	OK	395	187	OK	403	180	OK
1804	SSL-02383	10	10	0.4160	88	251	OK	122	216	OK	147	192	OK	158	181	OK
1805	SSL-01923	330	10	0.0097	708	293	OK	795	205	OK	807	194	OK	820	181	OK
1806	SSL-01924	284	12	0.0044	131	212	OK	139	204	OK	154	189	OK	162	181	OK
1807	SSL-01921	329	12	0.0038	1	181	OK	1	181	OK	1	181	OK	1	181	OK
1808	SSL-01621	345	15	0.0084	139	203	OK	143	198	OK	154	187	OK	159	182	OK
1809	SSL-01620	400	15	0.0081	327	224	OK	348	203	OK	361	189	OK	369	182	OK
1810	SSL-01619	500	15	0.0077	135	212	OK	141	206	OK	156	191	OK	164	183	OK
1811	SSL-01618	153	12	0.0180	224	295	OK	271	248	OK	315	204	OK	334	185	OK
1812	SSL-01643	416	12	0.0174	114	217	OK	128	204	OK	138	194	OK	141	190	OK
1813	SSL-02260	447	12	0.0390	120	228	OK	135	213	OK	156	192	OK	158	191	OK
1814	SSL-02147	293	21	0.0013	92	261	OK	125	229	OK	149	204	OK	161	193	OK
1815	SSL-02150	286	21	0.0010	62	601	OK	457	206	IH, Backwater	465	199	IH, Backwater	469	195	IH, Backwater
1816	SSL-02151	316	21	0.0013	119	224	OK	138	205	OK	144	199	OK	147	196	OK
1817	SSL-02149	338	21	0.0016	2	198	OK	1	199	OK	1	199	OK	1	199	OK
1818	SSL-02148	350	21	0.0016	11	203	OK	13	201	OK	14	200	OK	14	200	OK

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1819	SSL-02146	475	21	0.0015	80	395	OK	269	205	OK	272	202	OK	274	200	OK
1820	SSL-01649	425	21	0.0016	115	229	OK	133	210	OK	139	204	OK	142	201	OK
1821	SSL-01650	427	21	0.0012	716	484	OK	830	370	OK	959	241	HS, Backwater	998	202	IH, Backwater
1822	SSL-01653	548	21	0.0013	22	597	OK	414	205	OK	416	204	OK	416	203	OK
1823	SSL-01216	196	12	0.0132	55	235	OK	70	220	OK	79	210	IH, Backwater	85	204	HH, Backwater
1824	SSL-01215	341	14	0.0035	109	226	OK	116	219	OK	125	210	OK	130	205	OK
1825	SSL-01569	365	15	0.0030	88	224	OK	94	218	OK	103	210	OK	107	206	OK
1826	SSL-01214	289	15	0.0032	1,776	339	OK	1763	352	OK	1747	368	OK	1907	208	IH, Backwater
1827	SSL-01159	242	10	0.0104	132	239	OK	153	218	OK	160	211	OK	163	208	OK
1828	SSL-01157	256	10	0.0700	459	416	OK	533	343	OK	622	254	OK	667	209	OK
1829	SSL-01161	398	10	0.0151	89	220	OK	97	212	OK	100	209	OK	100	209	OK
1830	SSL-01160	193	10	0.0028	35	605	OK	428	212	OK	430	211	OK	431	210	OK
1831	SSL-01233	26	10	0.0238	329	252	OK	350	232	OK	364	218	OK	371	210	OK
1832	SSL-00343	131	8	0.0047	94	223	OK	100	217	OK	104	213	OK	106	210	OK
1833	SSL-00344	89	8	0.0040	685	477	OK	791	371	OK	975	188	IH, Backwater	951	211	IH, Backwater
1834	SSL-00347	156	8	0.0888	1,103	612	OK	1416	299	OK	1493	221	OK	1503	212	OK
1835	SSL-00346	142	10	0.0035	108	233	OK	121	220	OK	126	214	OK	129	212	OK
1836	SSL-00345	280	10	0.0031	118	230	OK	127	221	OK	132	215	OK	135	213	OK
1837	SSL-00349	400	10	0.0031	127	215	OK	121	221	OK	126	216	OK	129	213	OK
1838	SSL-00350	144	10	0.0035	87	254	OK	108	233	OK	121	220	OK	127	213	OK
1839	SSL-00340	157	10	0.0604	36	223	OK	42	217	OK	44	215	OK	45	214	OK
1840	SSL-00338	111	10	0.0518	32	296	OK	110	217	OK	112	216	OK	113	215	OK
1841	SSL-00339	238	8	0.0620	110	233	OK	119	224	OK	124	219	OK	126	217	OK
1842	SSL-00341	248	8	0.0053	1,106	618	OK	1419	305	OK	1497	227	OK	1507	217	OK
1843	SSL-00334	117	10	0.0220	457	425	OK	530	352	OK	619	263	OK	664	218	OK
1844	SSL-00333	135	10	0.0036	106	239	OK	119	225	OK	124	220	OK	127	218	OK
1845	SSL-00348	134	10	0.0035	88	353	OK	117	324	OK	174	267	OK	223	218	OK
1846	SSL-01601	313	10	0.0031	117	240	OK	122	235	OK	132	225	OK	137	220	OK
1847	SSL-00308	193	10	0.0033	2	223	OK	4	221	OK	4	220	OK	4	220	OK
1848	SSL-00304	113	10	0.0037	237	299	OK	272	264	OK	301	234	OK	315	221	OK
1849	SSL-00306	130	10	0.0008	107	236	OK	116	228	OK	120	223	OK	123	221	OK
1850	SSL-02204	150	10	0.0044	1,438	710	OK	1873	275	OK	1911	237	OK	1927	221	OK
1851	SSL-00322	302	10	0.0031	105	237	OK	114	229	OK	118	224	OK	120	222	OK
1852	SSL-01836	479	15	0.0016	1,008	0	FM	727	236	FM	750	212	FM	740	222	FM
1853	SSL-01834	467	15	0.0017	299	332	OK	342	289	OK	388	243	OK	409	222	OK
1854	SSL-00387	491	8	0.0040	15	228	OK	16	227	OK	18	225	OK	19	224	OK
1855	SSL-00386	234	8	0.0040	98	250	OK	116	233	OK	121	227	OK	124	225	OK
1856	SSL-00385	194	8	0.0040	74	269	OK	91	252	OK	110	233	OK	118	225	OK
1857	SSL-00384	267	10	0.0028	1,168	664	OK	1494	337	OK	1588	243	OK	1606	226	OK
1858	SSL-00383	365	10	0.0028	72	283	OK	98	257	OK	120	235	OK	129	226	OK
1859	SSL-00382	364	10	0.0028	23	230	OK	25	227	OK	26	226	OK	27	226	OK
1860	SSL-00381	212	10	0.0028	70	273	OK	91	253	OK	109	235	OK	117	227	OK
1861	SSL-00172	25	12	0.0216	233	287	OK	256	264	OK	279	240	OK	293	227	OK
1862	SSL-01227	111	12	0.0054	53	243	OK	59	237	OK	65	231	OK	69	227	OK
1863	SSL-01228	113	12	0.0053	199	319	OK	237	280	OK	274	244	OK	291	227	OK
1864	SSL-01235	110	12	0.0022	285	289	OK	323	251	OK	338	236	OK	345	229	OK
1865	SSL-01229	257	12	0.0049	56	233	OK	57	232	OK	59	230	OK	60	229	OK
1866	SSL-01570	149	12	0.0093	67	275	OK	87	255	OK	105	237	OK	113	230	OK
1867	SSL-01230	106	12	0.0139	79	262	OK	94	247	OK	106	235	OK	111	230	OK
1868	SSL-01232	184	12	0.0135	24	260	OK	37	247	OK	48	236	OK	52	231	OK
1869	SSL-01870	500	10	0.0028	771	344	OK	852	263	HH, Backwater	868	247	HH, Backwater	883	232	HH, Backwater
1870	SSL-01861	500	10	0.0030	84	259	OK	96	247	OK	104	239	OK	107	236	OK
1871	SSL-01622	385	15	0.0096	671	494	OK	773	392	OK	876	289	OK	928	236	IH, Backwater
1872	SSL-01625	65	10	0.2534	4	236	OK	3	237	OK	3	237	OK	3	237	OK

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1873	SSL-01626	306	10	0.0265	256	266	OK	273	249	OK	283	239	OK	285	237	OK
1874	SSL-01627	87	15	0.0100	15	630	OK	407	238	OK	408	237	OK	408	237	OK
1875	SSL-01647	326	15	0.0024	69	254	OK	81	242	OK	84	239	OK	86	237	OK
1876	SSL-01211	209	15	0.0029	61	281	OK	81	261	OK	98	245	OK	105	237	OK
1877	SSL-01212	400	15	0.0025	86	262	OK	104	245	OK	108	240	OK	111	237	OK
1878	SSL-01651	490	12	0.0096	112	258	OK	118	252	OK	128	242	OK	133	238	OK
1879	SSL-01648	280	12	0.0409	2	239	OK	2	239	OK	3	238	OK	3	238	OK
1880	SSL-00300	98	10	0.0168	83	263	OK	101	245	OK	105	241	OK	107	239	OK
1881	NoMatch	20	10	0.0120	61	247	OK	64	243	OK	67	241	OK	68	239	OK
1882	SSL-01032	120	10	0.0035	42	245	OK	44	243	OK	46	240	OK	47	239	OK
1886	SSL-02452	317	36	0.0011	122	271	OK	145	249	OK	151	243	OK	154	240	OK
1887	SSL-00388	218	10	0.0094	249	245	OK	241	253	OK	249	245	OK	253	241	OK
1888	SSL-00332	399	10	0.0031	547	769	OK	1024	291	IH, Backwater	967	348	IS, Backwater	1074	241	IH, Backwater
1889	SSL-00325	96	10	0.0039	1	242	OK	1	242	OK	1	242	OK	1	242	OK
1890	SSL-02305	420	10	0.0028	116	273	OK	138	251	OK	144	245	OK	147	242	OK
1891	SSL-00380	288	10	0.0141	68	260	OK	78	249	OK	81	246	OK	83	245	OK
1892	SSL-00379	90	10	0.0080	84	257	OK	91	250	OK	94	247	OK	96	245	OK
1893	SSL-00378	469	10	0.0155	844	357	OK	920	281	IH, Backwater	939	262	IH, Backwater	955	245	IH, Backwater
1894	SSL-01584	499	10	0.0044	62	260	OK	71	250	OK	74	247	OK	76	246	OK
1895	SSL-00377	90	10	0.0046	112	251	OK	110	253	OK	115	248	OK	117	246	OK
1896	NoMatch	415	18	0.0173	5	250	OK	6	249	OK	6	248	OK	7	248	OK
1897	SSL-00136	453	27	0.0008	253	292	OK	279	266	OK	276	269	OK	296	249	OK
1898	SSL-01562	481	27	0.0011	338	305	OK	369	274	OK	368	276	OK	393	250	OK
1899	SSL-00134	463	27	0.0011	53	279	OK	59	273	OK	77	256	IH, Backwater	82	250	IH, Backwater
1900	SSL-00131	87	27	0.0009	104	270	OK	111	263	OK	120	254	OK	124	250	OK
1901	SSL-00132	511	27	0.0010	7	251	OK	7	251	OK	8	251	OK	8	250	OK
1902	SSL-01560	500	27	0.0010	0	251	OK	0	251	OK	0	251	OK	0	251	OK
1903	SSL-00144	316	27	0.0009	27	256	OK	29	254	OK	31	253	OK	31	252	OK
1904	SSL-00142	237	27	0.0014	847	329	OK	874	302	HH, Backwater	903	272	HH, Backwater	923	253	HH, Backwater
1905	SSL-00141	86	27	0.0003	91	265	OK	97	259	OK	101	255	OK	103	253	OK
1906	SSL-01568	232	18	0.0856	3	253	OK	2	254	OK	2	254	OK	2	254	OK
1907	SSL-00139	79	18	0.4600	6	255	OK	6	254	OK	6	254	OK	6	254	OK
1908	SSL-00138	290	27	0.0075	27	257	OK	29	256	OK	30	255	OK	31	254	OK
1909	SSL-01561	269	27	0.0180	100	267	OK	111	256	OK	113	254	OK	113	254	OK
1910	SSL-00137	497	27	0.0025	208	186	FM	120	274	FM	133	260	FM	139	254	FM
1911	SSL-00508	274	36	0.0003	14	254	OK	12	255	OK	13	255	OK	13	254	OK
1912	SSL-00506	136	36	0.0007	77	250	OK	69	259	OK	71	256	OK	73	255	OK
1913	SSL-00505	71	36	0.0001	44	270	OK	55	259	OK	58	256	OK	59	255	OK
1914	SSL-00504	59	36	0.0005	735	393	OK	811	317	OK	851	276	OK	872	255	OK
1915	SSL-00503	86	36	0.0005	5	252	OK	2	256	OK	2	256	OK	2	256	OK
1916	SSL-00502	450	36	0.0005	47	269	OK	53	264	OK	55	261	OK	60	256	OK
1917	SSL-01559	501	36	0.0005	102	284	OK	120	266	OK	125	260	OK	128	258	OK
1918	NoMatch	466	15	0.0029	64	267	OK	60	272	OK	69	262	OK	73	258	OK
1919	NoMatch	318	15	0.0021	62	281	OK	60	283	OK	66	277	OK	84	258	IS, Backwater
1920	NoMatch	317	15	0.0451	60	327	OK	75	312	OK	103	283	OK	128	259	OK
1921	SSL-00511	280	17	0.0081	77	309	OK	116	270	IH, Backwater	115	271	HH, Backwater	126	260	HH, Backwater
1922	SSL-01637	50	24	0.0208	62	268	OK	65	265	OK	68	262	OK	69	260	OK
1923	SSL-00509	502	36	0.0005	1	355	OK	100	257	IH, Backwater	93	264	HH, Backwater	96	261	HH, Backwater
1924	SSL-00510	500	36	0.0005	45	270	OK	46	270	OK	50	265	OK	53	262	OK
1925	NoMatch	203	36	0.0005	50	278	OK	55	272	OK	63	264	OK	65	263	IH, Backwater
1926	SSL-00500	515	42	0.0004	0	264	OK	0	264	OK	0	264	OK	0	264	OK
1927	SSL-00140	244	27	0.0012	65	279	OK	74	269	OK	77	266	OK	79	264	OK
1928	NoMatch	219	27	0.0007	73	270	OK	72	271	OK	75	267	OK	77	266	OK
1929	NoMatch	436	27	0.0007	191	355	OK	228	317	OK	264	282	OK	280	266	OK

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1930	NoMatch	234	27	0.0007	128	298	OK	151	275	OK	157	269	OK	161	266	OK
1931	NoMatch	458	27	0.0009	73	270	OK	73	270	OK	76	267	OK	78	266	OK
1932	NoMatch	261	27	0.0007	47	296	OK	60	283	OK	72	272	OK	77	267	OK
1933	NoMatch	109	27	0.0007	4	266	OK	2	268	OK	2	268	OK	2	268	OK
1934	NoMatch	420	27	0.0007	40	280	OK	48	272	OK	50	270	OK	51	269	OK
1935	NoMatch	403	24	0.0020	60	276	OK	63	273	OK	66	270	OK	67	269	OK
1936	NoMatch	45	18	0.0176	65	279	OK	70	273	OK	73	270	OK	75	269	OK
1937	NoMatch	251	18	0.0068	14	5851	OK	3338	2528	OK	4572	1293	OK	5596	269	OK
1938	NoMatch	450	18	0.0290	44	284	OK	55	273	OK	57	271	OK	58	269	OK
1939	NoMatch	96	27	0.0006	26	275	OK	30	271	OK	31	270	OK	32	269	OK
1940	NoMatch	126	27	0.0007	218	303	OK	237	285	OK	246	275	OK	251	270	OK
1941	SSL-00507	260	36	0.0008	284	420	OK	400	304	OK	427	277	OK	434	270	OK
1942	NoMatch	199	18	0.0072	89	282	OK	95	276	OK	98	272	OK	100	270	OK
1943	SSL-00499	293	36	0.0022	69	274	OK	68	275	OK	71	272	OK	73	270	OK
1944	SSL-01884	379	10	0.0027	59	285	OK	69	275	OK	72	272	OK	73	271	OK
1946	NoMatch	476	10	0.0021	42	276	OK	44	274	OK	46	272	OK	47	271	OK
1947	NoMatch	378	15	0.0356	8	272	OK	8	272	OK	9	271	OK	9	271	OK
1948	SSL-00214	564	42	0.0004	2	272	OK	2	272	OK	2	272	OK	2	272	OK
1949	SSL-00130	470	21	0.0047	2	272	OK	2	272	OK	2	272	OK	2	272	OK
1950	NoMatch	250	18	0.0189	79	294	OK	91	283	OK	99	275	OK	102	272	OK
1951	SSL-00431	245	30	0.0002	37	277	OK	39	275	OK	41	273	OK	42	272	OK
1978	NoMatch	420	24	0.0015	69	288	OK	80	277	OK	83	274	OK	85	272	OK
1979	NoMatch	500	24	0.0033	32	275	OK	30	277	OK	33	274	OK	35	272	OK
1980	NoMatch	361	24	0.0030	48	287	OK	58	277	OK	60	275	OK	61	274	OK
1981	NoMatch	524	24	0.0015	846	320	OK	875	290	HH, Backwater	879	286	HH, Backwater	891	274	HH, Backwater
1982	NoMatch	515	24	0.0032	3	275	OK	3	275	OK	3	274	OK	3	274	OK
1983	NoMatch	427	24	0.0015	32	284	OK	39	277	OK	41	275	OK	42	274	OK
1984	NoMatch	420	24	0.0015	40	302	OK	52	290	OK	62	280	OK	67	275	OK
1985	NoMatch	420	24	0.0136	58	284	OK	56	285	OK	62	279	OK	66	275	OK
1986	NoMatch	387	24	0.0015	10	282	OK	15	277	OK	16	276	OK	16	276	OK
1987	NoMatch	329	24	0.0016	70	272	OK	61	281	OK	64	278	OK	65	277	OK
1988	NoMatch	497	23	0.0016	53	288	OK	53	289	OK	59	283	OK	62	280	OK
1989	NoMatch	289	24	0.0016	5	303	OK	21	286	OK	26	281	HH, Backwater	28	280	HH, Backwater
1990	NoMatch	262	24	0.0015	54	289	OK	53	290	OK	59	284	OK	62	281	OK
1991	NoMatch	222	12	0.0263	48	293	OK	57	284	OK	60	282	OK	61	281	OK
1992	NoMatch	273	24	0.0010	199	472	OK	254	417	OK	302	368	HH, Backwater	390	281	HH, Backwater
1993	NoMatch	265	24	0.0020	2	282	OK	3	281	OK	3	281	OK	3	281	OK
1994	NoMatch	296	24	0.0018	46	297	OK	58	285	OK	60	283	OK	62	281	OK
1995	NoMatch	265	24	0.0138	43	286	OK	45	285	OK	47	283	OK	48	282	OK
1996	NoMatch	301	24	0.0023	47	337	OK	59	325	OK	81	302	OK	101	283	OK
1997	NoMatch	302	24	0.0015	11	287	OK	12	285	OK	14	284	OK	14	283	OK
1998	NoMatch	492	24	0.0013	71	301	OK	84	289	OK	87	285	OK	89	284	OK
1999	NoMatch	328	24	0.0013	50	293	OK	50	293	OK	56	287	OK	58	284	OK
2000	NoMatch	358	24	0.0020	45	300	OK	57	289	OK	59	286	OK	61	284	OK
2001	NoMatch	256	24	0.0019	35	291	OK	39	287	OK	40	286	OK	41	285	OK
2002	NoMatch	103	24	0.0022	7	287	OK	7	286	OK	8	286	OK	9	285	OK
2003	NoMatch	303	24	0.0012	47	298	OK	55	289	OK	58	287	OK	59	286	OK
2004	NoMatch	264	24	0.0016	46	298	OK	55	289	OK	57	287	OK	58	286	OK
2005	NoMatch	319	24	0.0013	47	291	OK	49	289	OK	51	287	OK	52	286	OK
2006	NoMatch	279	24	0.0023	55	284	OK	50	289	OK	52	287	OK	53	286	OK
2007	NoMatch	450	24	0.0020	5	319	OK	39	285	IH, Backwater	38	286	IH, Backwater	37	286	IH, Backwater
2008	NoMatch	383	24	0.0014	52	294	OK	56	290	OK	58	288	OK	60	286	OK
2009	NoMatch	471	24	0.0008	37	294	OK	43	289	OK	44	287	OK	45	286	OK
2010	NoMatch	250	24	0.0010	43	297	OK	50	290	OK	53	288	OK	54	286	OK

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2011	NoMatch	287	24	0.0007	59	282	OK	51	290	OK	53	288	OK	54	287	OK
2012	NoMatch	307	24	0.0023	2	287	OK	2	287	OK	2	287	OK	2	287	OK
2013	NoMatch	249	24	0.0097	67	290	OK	66	291	OK	69	288	OK	70	287	OK
2014	NoMatch	486	24	0.0014	2	348	OK	3	347	OK	4	346	OK	63	287	OK
2015	NoMatch	296	24	0.0022	51	287	OK	48	289	OK	49	289	OK	50	288	OK
2016	NoMatch	411	24	0.0016	49	294	OK	51	292	OK	53	290	OK	54	288	OK
2017	NoMatch	457	24	0.0009	37	298	OK	39	295	OK	43	291	OK	46	289	OK
2018	NoMatch	306	24	0.0017	7	290	OK	7	289	OK	7	289	OK	8	289	OK
2019	NoMatch	377	24	0.0017	34	293	OK	35	291	OK	37	290	OK	37	289	OK
2020	NoMatch	401	24	0.0013	24	293	OK	25	292	OK	26	291	OK	26	291	OK
2021	NoMatch	298	24	0.0019	46	297	OK	44	298	OK	49	294	OK	52	291	OK
2022	NoMatch	462	24	0.0019	37	289	OK	29	297	OK	33	293	OK	35	291	OK
2023	NoMatch	409	24	0.0016	49	292	OK	47	294	OK	49	292	OK	50	291	OK
2024	NoMatch	314	24	0.0015	49	292	OK	47	294	OK	49	292	OK	50	291	OK
2025	NoMatch	320	24	0.0015	158	292	OK	147	304	OK	141	309	OK	159	292	OK
2026	NoMatch	227	24	0.0015	129	321	OK	147	303	OK	154	296	OK	158	292	OK
2027	NoMatch	531	24	0.0024	51	306	OK	61	296	OK	63	294	OK	64	292	OK
2028	NoMatch	130	18	0.0015	30	307	OK	33	303	OK	41	296	IH, Backwater	44	293	IH, Backwater
2029	NoMatch	335	18	0.0030	23	296	OK	24	294	OK	25	294	OK	26	293	OK
2030	NoMatch	520	18	0.0030	28	315	OK	43	300	OK	47	296	OK	50	293	OK
2031	NoMatch	515	18	0.0030	3	295	OK	3	294	OK	3	294	OK	4	294	OK
2032	NoMatch	520	18	0.0023	33	310	OK	37	305	OK	46	297	IH, Backwater	49	294	IH, Backwater
2033	NoMatch	522	18	0.0035	4	293	OK	3	294	OK	3	294	OK	3	294	OK
2034	NoMatch	431	18	0.0033	35	310	OK	39	306	IH, Backwater	47	297	IH, Backwater	50	294	IH, Backwater
2035	NoMatch	432	18	0.0030	39	299	OK	41	297	OK	43	295	OK	44	294	OK
2036	NoMatch	452	18	0.0029	2	295	OK	2	295	OK	2	295	OK	2	295	OK
2037	NoMatch	470	18	0.0034	41	305	OK	48	298	OK	50	296	OK	51	295	OK
2038	NoMatch	476	18	0.0032	7	295	OK	6	297	OK	6	296	OK	7	296	OK
2039	NoMatch	242	18	0.0074	4	330	OK	42	292	DH, Backwater	41	294	DH, Backwater	38	296	DH, Backwater
2040	NoMatch	326	18	0.0026	96	338	OK	118	316	OK	131	303	OK	137	296	OK
2041	NoMatch	256	18	0.0027	104	317	OK	117	304	OK	122	299	OK	125	296	OK
2042	NoMatch	384	18	0.0034	3	374	OK	79	298	OK	79	298	OK	79	298	OK
2043	NoMatch	234	18	0.0015	36	307	OK	38	305	OK	43	300	OK	45	298	OK
2044	NoMatch	149	18	0.0062	22	300	OK	22	300	OK	23	299	OK	23	298	OK
2045	NoMatch	380	15	0.0019	31	302	OK	33	300	OK	34	299	OK	34	299	OK
2046	NoMatch	377	15	0.0019	111	313	OK	117	307	OK	122	302	OK	125	299	OK
2047	NoMatch	380	15	0.0015	23	302	OK	25	300	OK	26	299	OK	26	299	OK
2048	NoMatch	329	15	0.0020	29	303	OK	31	302	OK	32	300	OK	33	300	OK
2049	NoMatch	269	15	0.0020	45	353	OK	57	342	OK	79	319	OK	98	300	OK
2050	NoMatch	269	12	0.0723	4	377	OK	81	300	OK	81	300	OK	81	300	OK
2051	NoMatch	260	12	0.0342	43	300	OK	40	303	OK	42	301	OK	43	300	OK
2052	NoMatch	390	12	0.0348	66	315	OK	76	305	OK	79	302	OK	81	300	OK
2053	NoMatch	273	10	0.0242	35	305	OK	37	303	OK	38	302	OK	39	301	OK
2054	NoMatch	225	10	0.0114	2	301	OK	2	301	OK	3	301	OK	3	301	OK
2055	NoMatch	247	10	0.0149	28	315	OK	30	313	OK	38	305	OK	42	301	OK
2056	NoMatch	300	10	0.0824	48	466	OK	209	305	OK	211	303	OK	213	301	OK
2057	NoMatch	310	10	0.0039	26	307	OK	29	304	OK	30	303	OK	31	302	OK
2058	NoMatch	314	10	0.0033	16	307	OK	19	305	OK	20	303	OK	22	302	OK
2060	NoMatch	627	12	-0.0605	242	331	OK	263	310	OK	271	302	OK	271	302	OK
2061	NoMatch	376	10	0.0029	29	314	OK	41	303	OK	41	303	OK	41	302	OK
2062	NoMatch	108	12	0.0893	36	308	OK	38	305	OK	40	304	OK	41	303	OK
2063	NoMatch	350	12	0.0630	0	303	OK	0	303	OK	0	303	OK	0	303	OK
2064	NoMatch	187	12	0.0526	36	308	OK	38	306	OK	40	304	OK	40	303	OK
2065	NoMatch	92	18	0.0070	23	321	OK	34	309	OK	38	306	OK	40	304	OK

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2066	NoMatch	168	18	0.0072	36	310	OK	40	306	OK	42	305	OK	43	304	OK
2067	NoMatch	31	18	0.3590	33	322	OK	41	314	OK	48	307	OK	51	304	OK
2068	NoMatch	400	18	0.0020	29	309	OK	32	306	OK	33	305	OK	34	304	OK
2069	NoMatch	335	18	0.0025	3	305	OK	4	305	OK	4	305	OK	4	305	OK
2070	NoMatch	300	18	0.0022	31	302	OK	23	310	OK	27	306	OK	28	305	OK
2071	NoMatch	343	18	0.0023	85	346	OK	106	325	OK	120	311	OK	126	305	OK
2072	NoMatch	409	18	0.0022	20	308	OK	21	307	OK	21	306	OK	22	305	OK
2073	NoMatch	391	18	0.0023	28	309	OK	26	310	OK	29	307	OK	31	305	OK
2075	NoMatch	546	20	0.0050	29	314	OK	34	309	OK	36	307	OK	37	306	OK
2076	NoMatch	216	16	0.0034	5	309	OK	7	307	OK	7	306	OK	7	306	OK
2077	NoMatch	317	12	0.0025	50	322	OK	61	311	OK	63	308	OK	65	307	OK
2078	NoMatch	310	12	0.0068	17	315	OK	23	309	OK	24	308	OK	25	307	OK
2079	NoMatch	394	10	0.0295	6	310	OK	8	308	OK	9	308	OK	9	307	OK
2080	NoMatch	383	10	0.0150	28	311	OK	29	309	OK	30	308	OK	31	308	OK
2081	NoMatch	524	12	0.0022	16	318	OK	23	311	OK	25	309	OK	26	308	OK
2082	NoMatch	194	12	0.0022	18	310	OK	19	309	OK	20	309	OK	20	308	OK
2083	NoMatch	234	12	0.0022	30	312	OK	31	310	OK	33	309	OK	33	308	OK
2084	NoMatch	305	12	0.0022	27	311	OK	28	310	OK	29	309	OK	30	308	OK
2085	NoMatch	191	12	0.0022	3	310	OK	4	309	OK	4	309	OK	4	309	OK
2086	NoMatch	235	8	0.0151	1	309	OK	1	309	OK	1	309	OK	1	309	OK
2087	NoMatch	130	12	0.0166	4	310	OK	5	309	OK	5	309	OK	5	309	OK
2088	NoMatch	195	12	0.0108	22	319	OK	30	311	OK	32	310	OK	32	309	OK
2089	NoMatch	170	12	0.0129	25	312	OK	26	311	OK	27	310	OK	27	310	OK
2090	NoMatch	365	12	0.0111	32	314	OK	33	312	OK	35	310	OK	36	310	OK
2091	NoMatch	185	12	0.0195	32	317	OK	33	315	OK	37	312	OK	39	310	OK
2092	NoMatch	266	12	0.0022	29	313	OK	30	311	OK	31	310	OK	32	310	OK
2093	NoMatch	146	12	0.0022	26	318	OK	30	315	OK	33	312	OK	35	310	OK
2094	NoMatch	108	12	0.0022	42	310	OK	39	313	OK	41	311	OK	42	310	OK
2095	NoMatch	245	12	0.0022	25	313	OK	24	314	OK	26	312	OK	27	311	OK
2096	NoMatch	326	12	0.0022	30	328	OK	38	321	OK	44	314	OK	47	311	OK
2097	NoMatch	47	12	0.0643	34	309	OK	26	317	OK	30	313	OK	31	311	OK
2098	NoMatch	524	12	0.0022	35	311	OK	33	313	OK	34	312	OK	35	311	OK
2099	NoMatch	490	23	0.0018	15	312	OK	14	312	OK	15	312	OK	15	311	OK
2100	NoMatch	311	23	0.0013	35	316	OK	37	314	OK	39	313	OK	40	312	OK
5301	NoMatch	50	72	0.0134	23	319	OK	25	318	OK	26	317	OK	26	317	OK
7415	NoMatch	28	8	0.2821	3	325	OK	7	322	OK	7	321	OK	11	317	IH, Backwater
7442	SSL-01695	10	10	0.0230	10	320	OK	12	318	OK	13	317	OK	13	317	OK
7445	SSL-01690	213	10	0.0037	3	323	OK	5	320	OK	6	320	OK	8	317	OK
7447	SSL-01689	230	10	0.0016	23	323	OK	26	319	OK	27	318	OK	28	317	OK
7449	SSL-01687	59	10	0.0075	7	318	OK	7	318	OK	7	318	OK	7	318	OK
7451	SSL-01686	356	10	0.0037	10	344	OK	15	340	OK	33	321	IH, Backwater	37	318	HS, Backwater
7453	SSL-01516	361	10	0.0032	36	321	OK	38	320	OK	39	318	OK	40	318	OK
7455	SSL-01517	299	10	0.0034	145	382	OK	170	357	OK	196	331	OK	209	318	OK
7457	SSL-01518	136	10	0.0291	19	321	OK	21	319	OK	22	319	OK	22	318	OK
7459	SSL-01519	60	10	0.0063	1	319	OK	1	319	OK	2	319	OK	2	319	OK
7461	SSL-01520	160	10	0.0056	17	325	OK	20	322	OK	22	320	OK	24	319	OK
7463	SSL-01610	145	10	0.0051	19	325	OK	21	322	OK	24	320	OK	25	319	OK
7465	SSL-01484	262	10	0.0373	5	320	OK	6	319	OK	6	319	OK	6	319	OK
7467	SSL-01483	424	10	0.0048	57	328	OK	62	323	OK	64	320	OK	65	319	OK
7469	SSL-01482	343	10	0.0108	16	322	OK	17	321	OK	17	320	OK	18	320	OK
7471	SSL-01481	177	10	0.0272	3	320	OK	3	320	OK	3	320	OK	3	320	OK
7472	SSL-01213	264	15	0.0002	14	322	OK	15	321	OK	15	320	OK	16	320	OK
7630	SSL-01450	225	12	0.0027	4	338	OK	16	326	OK	17	325	OK	22	320	OK
7633	SSL-01448	115	12	0.0030	9	321	OK	9	321	OK	9	320	OK	10	320	OK

Conduit ID	GIS ID	Length (ft)	Diameter (in)	Slope	Existing Condition			2025 Condition			2035 Condition			Buildout Condition		
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7635	SSL-01452	120	12	0.0030	216	320	OK	204	332	OK	212	325	OK	216	320	OK
7637	SSL-01451	178	12	0.0028	35	329	OK	40	323	OK	42	321	OK	43	320	OK
7641	SSL-01485	44	12	0.2266	115	336	OK	121	330	OK	127	324	OK	130	321	OK
7643	SSL-01486	123	12	0.0169	17	326	OK	19	324	OK	21	322	OK	22	321	OK
7644	SSL-01449	399	12	0.0056	216	321	OK	204	333	OK	212	325	OK	216	321	OK
7750	SSL-00700	206	8	0.0168	20	324	OK	21	323	OK	21	322	OK	22	322	OK
7785	NoMatch	1032	6	-0.0552	5	329	OK	11	323	OK	12	322	OK	13	322	OK
7789	NoMatch	606	6	-0.0092	17	326	OK	18	325	OK	20	323	OK	21	322	OK
7802	NoMatch	475	4	-0.0547	20	324	OK	21	323	OK	22	322	OK	22	322	OK
7807	SSL-00916	142	8	0.0040	4	323	OK	4	323	OK	4	322	OK	4	322	OK
7809	NoMatch	68	99	0.0259	12	330	OK	18	324	OK	19	323	OK	19	322	OK
7813	NoMatch	34	8	0.1958	5	349	OK	7	347	OK	9	346	OK	32	322	OK
7816	NoMatch	1832	6	-0.0437	24	326	OK	25	325	OK	26	324	OK	27	323	OK
7821	SSL-01173	50	99	0.3203	19	325	OK	20	325	OK	21	324	OK	22	323	OK
7824	SSL-01106	3232	8	-0.0014	18	326	OK	19	325	OK	20	324	OK	20	324	OK
7825	SSL-01086	41	99	0.0039	12	329	OK	15	326	OK	17	325	OK	17	324	OK
7828	NoMatch	167	6	-0.1037	15	328	OK	16	327	OK	18	325	OK	19	324	OK
7838	NoMatch	284	18	0.0000	21	323	OK	18	325	OK	19	324	OK	20	324	OK
7895	SSL-01826	425	10	0.0064	82	317	OK	71	328	OK	73	326	OK	74	324	OK
7896	SSL-01908	115	8	0.0229	199	350	OK	212	337	OK	221	329	OK	225	324	OK
7898	SSL-01907	351	8	0.0055	229	468	OK	339	359	OK	358	340	OK	373	324	OK
7902	SSL-01872	331	8	0.0100	15	327	OK	16	326	OK	17	325	OK	18	325	OK
7904	SSL-01906	107	8	0.0033	0	325	OK	0	325	OK	0	325	OK	0	325	OK
7906	SSL-01904	329	8	0.0026	16	327	OK	17	326	OK	18	325	OK	19	325	OK
7908	SSL-01903	323	8	0.0060	39	326	OK	38	328	OK	39	326	OK	40	325	OK
7911	SSL-01902	111	8	0.0020	18	326	OK	17	327	OK	18	326	OK	18	326	OK
7912	SSL-01898	125	8	0.0097	78	319	OK	67	330	OK	70	327	OK	72	326	OK
7913	NoMatch	15	8	0.1507	46	328	OK	45	329	OK	47	327	OK	48	326	OK
7916	NoMatch	26	8	0.0574	15	329	OK	15	329	OK	17	327	OK	18	326	OK
7918	NoMatch	258	8	0.0054	7	327	OK	7	327	OK	8	326	OK	8	326	OK
7920	NoMatch	257	8	0.0058	9	328	OK	9	327	OK	10	327	OK	10	326	OK
7922	NoMatch	118	8	0.0315	194	460	OK	301	353	OK	319	335	OK	327	327	OK
7924	NoMatch	200	8	0.0190	12	328	OK	12	328	OK	13	327	OK	13	327	OK
7925	NoMatch	220	8	0.0059	3	328	OK	3	328	OK	4	327	OK	4	327	OK
7927	NoMatch	161	8	0.0357	10	330	OK	10	329	OK	12	328	OK	12	327	OK
7929	NoMatch	216	8	0.0726	18	325	OK	15	328	OK	15	328	OK	16	327	OK
7931	NoMatch	116	8	0.1112	5	328	OK	6	328	OK	6	328	OK	6	328	OK
7932	NoMatch	76	8	0.0389	293	363	OK	317	339	OK	328	328	OK	329	328	OK
7934	NoMatch	324	8	0.0113	11	329	OK	11	329	OK	12	328	OK	12	328	OK
7935	NoMatch	91	6	0.0275	1	328	OK	1	328	OK	1	328	OK	1	328	OK
7937	NoMatch	90	6	0.0387	1	328	OK	1	328	OK	1	328	OK	1	328	OK
7939	NoMatch	93	6	0.1400	13	330	OK	13	329	OK	14	328	OK	14	328	OK
7941	NoMatch	193	8	0.0040	4	337	OK	8	333	OK	9	332	OK	13	328	IH, Backwater
7943	NoMatch	151	8	0.0353	6	330	OK	6	329	OK	7	329	OK	8	328	OK
7944	NoMatch	374	8	0.0044	12	332	OK	13	330	OK	14	329	OK	15	328	OK
7946	NoMatch	99	8	0.0055	8	329	OK	8	329	OK	8	329	OK	9	328	OK
7947	NoMatch	315	8	0.0070	15	330	OK	16	330	OK	17	329	OK	17	328	OK
7949	NoMatch	55	8	0.1136	4	335	OK	5	334	OK	6	333	OK	11	329	OK
7952	NoMatch	314	8	0.0198	185	416	OK	222	379	OK	257	344	OK	273	329	OK
7954	NoMatch	401	8	0.0214	216	329	OK	204	341	OK	212	333	OK	216	329	OK
7956	NoMatch	333	8	0.0300	17	331	OK	18	330	OK	19	329	OK	19	329	OK
7968	SSL-01815	435	8	0.0040	15	325	OK	10	330	OK	11	330	OK	11	329	OK
7970	SSL-01821	434	8	0.0040	2	330	OK	2	330	OK	2	329	OK	2	329	OK
7972	SSL-01820	435	8	0.0040	2	330	OK	3	330	OK	3	330	OK	3	329	OK

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7996	NoMatch	117	8	0.0438	8	335	OK	12	331	OK	13	330	OK	13	330	OK
7998	NoMatch	150	8	0.1099	9	331	OK	9	330	OK	10	330	OK	10	330	OK
8004	NoMatch	253	8	0.1427	2	341	OK	7	336	OK	7	336	OK	7	336	OK
8149	NoMatch	210	15	0.0238	207	392	OK	220	379	OK	229	370	OK	234	365	OK
8160	NoMatch	204	15	0.0000	2	366	OK	2	366	OK	2	366	OK	2	366	OK
8163	NoMatch	227	15	0.0000	48	379	OK	54	373	OK	57	370	OK	61	366	OK
8165	NoMatch	177	15	0.0014	9	368	OK	10	367	OK	10	367	OK	10	366	OK
8167	NoMatch	200	8	0.0500	16	368	OK	15	368	OK	16	367	OK	17	367	OK
8170	NoMatch	265	8	0.0943	9	372	OK	13	368	OK	14	368	OK	14	367	OK
8172	NoMatch	500	8	0.0580	12	369	OK	13	368	OK	14	368	OK	14	367	OK
8174	NoMatch	302	8	0.0099	10	371	OK	11	370	OK	12	369	OK	13	368	OK
8175	NoMatch	479	8	0.0533	7	370	OK	8	368	OK	9	368	OK	9	368	OK
8178	NoMatch	500	8	0.0500	101	419	OK	127	393	OK	144	376	OK	152	368	OK
8181	NoMatch	500	8	0.0600	2	369	OK	2	369	OK	2	368	OK	2	368	OK
8182	NoMatch	204	8	0.0735	11	375	OK	16	370	OK	17	369	OK	17	368	OK
8185	NoMatch	200	8	0.0450	10	370	OK	10	369	OK	11	369	OK	11	369	OK
8187	NoMatch	219	8	0.1749	3	370	OK	3	369	OK	3	369	OK	4	369	OK
8189	NoMatch	209	8	0.1258	10	370	OK	10	370	OK	11	369	OK	11	369	OK
8191	NoMatch	152	8	0.0263	25	373	OK	26	371	OK	27	370	OK	28	370	OK
8193	NoMatch	172	8	0.1337	32	374	OK	34	372	OK	35	371	OK	36	370	OK
8195	NoMatch	179	8	0.0838	727	481	OK	812	396	OK	825	384	OK	838	370	OK
8197	NoMatch	263	8	0.0380	15	377	OK	21	372	OK	22	371	OK	22	370	OK
8199	NoMatch	131	8	0.1145	22	369	OK	19	372	OK	19	372	OK	20	371	OK
8200	NoMatch	37	8	0.0754	10	375	OK	11	374	OK	11	373	OK	11	373	OK
8202	NoMatch	168	8	0.0649	13	380	OK	16	376	OK	18	374	OK	19	373	OK
8203	NoMatch	107	8	0.1028	30	378	OK	32	375	OK	34	374	OK	34	373	OK
8205	NoMatch	129	8	0.0543	26	375	OK	26	375	OK	27	374	OK	27	374	OK
8206	NoMatch	266	8	0.1248	5	378	OK	8	375	OK	8	375	OK	9	374	OK
8209	NoMatch	130	8	-0.0245	12	377	OK	13	375	OK	14	375	OK	15	374	OK
8210	NoMatch	145	8	0.0061	15	382	OK	19	378	OK	21	376	OK	22	375	OK
8212	NoMatch	125	8	0.0480	15	367	OK	6	377	OK	6	376	OK	7	376	OK
8213	NoMatch	177	8	0.0079	1	377	OK	1	377	OK	1	377	OK	1	377	OK
8216	NoMatch	198	8	0.1919	39	386	OK	45	380	OK	47	378	OK	48	377	OK
8220	NoMatch	279	8	0.1147	36	385	OK	42	380	OK	44	378	OK	44	377	OK
8222	NoMatch	173	8	0.0289	15	379	OK	16	378	OK	17	377	OK	17	377	OK
8224	NoMatch	228	8	0.1228	4	380	OK	4	379	OK	4	379	OK	5	379	OK
8226	NoMatch	190	8	0.1053	5	378	OK	4	379	OK	4	379	OK	5	379	OK
8228	NoMatch	62	8	0.0000	4	377	OK	2	379	OK	2	379	OK	2	379	OK
8232	NoMatch	297	8	0.0036	12	386	OK	18	380	OK	19	379	OK	19	379	OK
8234	NoMatch	128	15	0.0513	1	379	OK	1	379	OK	1	379	OK	1	379	OK
8236	NoMatch	127	15	0.0059	2	380	OK	2	380	OK	2	379	OK	2	379	OK
8242	NoMatch	353	8	0.0043	5	380	OK	5	380	OK	5	380	OK	5	380	OK
8243	NoMatch	158	8	0.0633	3	381	OK	3	380	OK	4	380	OK	4	380	OK
8248	NoMatch	145	8	0.0759	0	384	OK	0	384	OK	0	384	OK	3	380	IH, Backwater
8250	NoMatch	78	8	0.1282	91	427	OK	114	403	OK	129	388	OK	137	380	OK
8258	NoMatch	176	8	0.1131	6	380	OK	5	381	OK	5	381	OK	5	381	OK
8261	NoMatch	168	8	0.0924	17	382	OK	17	382	OK	18	381	OK	18	381	OK
8263	NoMatch	82	15	0.0244	8	382	OK	8	382	OK	9	381	OK	9	381	OK
8266	NoMatch	500	8	0.0700	3	381	OK	3	381	OK	3	381	OK	3	381	OK
8267	NoMatch	36	8	0.0970	1	382	OK	2	381	OK	2	381	OK	2	381	OK
8268	NoMatch	187	8	0.0267	7	383	OK	7	382	OK	8	382	OK	9	381	OK
8269	NoMatch	160	15	0.0313	0	381	OK	0	381	OK	0	381	OK	0	381	OK
8271	SSL-01080	404	8	0.0397	60	377	OK	53	384	OK	55	382	OK	56	381	OK
8273	SSL-08521	63	8	0.0191	27	386	OK	28	384	OK	30	383	OK	30	382	OK

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8274	SSL-01745	375	10	0.0034	1	382	OK	1	382	OK	1	382	OK	1	382	OK
8276	SSL-01738	142	10	0.0040	168	484	OK	216	436	OK	253	399	OK	270	382	OK
8280	SSL-01736	114	10	0.0129	21	384	OK	21	384	OK	22	383	OK	22	382	OK
8282	NoMatch	114	10	0.0046	4	384	OK	4	384	OK	4	384	OK	4	384	OK
8283	SSL-01982	103	12	0.0022	1	384	OK	1	384	OK	1	384	OK	1	384	OK
8286	SSL-01980	162	12	0.0022	2	384	OK	2	384	OK	2	384	OK	2	384	OK
8289	SSL-01979	271	12	0.0022	2	384	OK	2	384	OK	2	384	OK	2	384	OK
8290	SSL-01978	280	12	0.0022	7	387	OK	8	386	OK	9	385	OK	9	385	OK
8292	SSL-01977	211	12	0.0148	40	391	OK	43	388	OK	45	386	OK	46	385	OK
8294	SSL-01976	140	12	0.0295	13	389	OK	14	388	OK	15	387	OK	16	386	OK
8295	SSL-01669	387	12	0.0148	2	386	OK	1	386	OK	1	386	OK	1	386	OK
8297	SSL-01549	87	10	0.0040	256	431	OK	282	405	OK	278	408	OK	300	387	OK
8299	SSL-01645	382	18	0.0135	8	391	OK	10	389	OK	11	388	OK	11	387	OK
8302	SSL-01641	182	18	0.0030	5	388	OK	5	388	OK	6	388	OK	6	388	OK
8305	SSL-01640	177	18	0.0028	10	388	OK	9	388	OK	10	388	OK	10	388	OK
8307	SSL-01629	316	18	0.0028	22	395	OK	28	390	OK	29	388	OK	30	388	OK
8308	SSL-01628	424	18	0.0028	2	389	OK	2	388	OK	2	388	OK	2	388	OK
8309	SSL-01434	395	10	0.0028	1	389	OK	1	388	OK	1	388	OK	1	388	OK
8312	SSL-01555	361	10	0.0031	88	390	OK	84	394	OK	88	390	OK	90	388	OK
8313	SSL-01552	196	8	0.0038	4	390	OK	4	389	OK	5	389	OK	5	389	OK
8314	SSL-01551	300	8	0.0024	172	491	OK	220	443	OK	257	406	OK	274	389	IH, Backwater
8316	SSL-01550	121	8	0.0021	10	396	OK	15	392	OK	16	391	OK	17	390	OK
8319	SSL-01671	270	12	0.0156	19	396	OK	21	394	OK	23	392	OK	24	391	OK
8322	NoMatch	166	12	0.0261	24	399	OK	29	393	OK	31	392	OK	31	391	OK
8324	SSL-01981	30	12	0.0023	3	391	OK	3	391	OK	4	391	OK	4	391	OK
8327	SSL-01433	150	10	0.0039	4	391	OK	4	392	OK	4	392	OK	4	392	OK
8328	SSL-01668	272	12	0.0107	2	394	OK	3	393	OK	4	392	OK	4	392	OK
8329	SSL-01646	78	18	0.0135	25	391	OK	22	394	OK	23	393	OK	23	393	OK
8331	SSL-01644	313	18	0.0032	1	394	OK	1	394	OK	1	394	OK	1	394	OK
8333	SSL-01642	274	18	0.0022	2	394	OK	2	394	OK	3	394	OK	3	394	OK
8334	SSL-01785	400	18	0.0040	1	395	OK	2	394	OK	2	394	OK	2	394	OK
8336	SSL-02268	344	18	0.0051	1	396	OK	2	395	OK	2	395	OK	3	394	OK
8339	SSL-01781	116	18	0.0496	39	397	OK	38	397	OK	40	395	OK	41	394	OK
8341	SSL-01780	261	18	0.0040	1	395	OK	1	395	OK	1	395	OK	1	395	OK
8342	SSL-01779	44	18	0.0050	3	397	OK	4	395	OK	4	395	OK	4	395	OK
8344	SSL-01778	362	18	0.0050	4	396	OK	4	396	OK	4	396	OK	4	396	OK
8345	NoMatch	227	12	0.0170	212	445	OK	245	411	OK	256	401	OK	261	396	OK
8348	NoMatch	294	12	0.0045	12	397	OK	13	396	OK	13	396	OK	14	396	OK
8349	NoMatch	240	12	0.0201	38	404	OK	43	398	OK	45	397	OK	46	396	OK
8351	NoMatch	240	12	0.0007	19	398	OK	20	397	OK	21	396	OK	21	396	OK
8352	NoMatch	128	12	0.0293	47	399	OK	47	399	OK	49	397	OK	50	396	OK
8354	NoMatch	108	10	0.0812	13	404	OK	20	397	OK	21	397	OK	22	396	OK
8356	NoMatch	332	10	0.0113	2	396	OK	1	397	OK	1	397	OK	2	397	OK
8359	NoMatch	329	10	0.0165	1	397	OK	2	397	OK	2	397	OK	2	397	OK
8361	NoMatch	66	10	0.0294	13	399	OK	14	398	OK	15	397	OK	15	397	OK
8362	NoMatch	141	10	0.0055	841	624	OK	951	514	OK	1078	387	IH, Backwater	1068	397	IH, Backwater
8364	NoMatch	157	10	0.0229	216	397	OK	204	409	OK	212	401	OK	216	397	OK
8365	NoMatch	56	8	0.3034	185	428	OK	202	412	OK	210	403	OK	214	399	OK
8367	NoMatch	142	10	0.0069	0	399	OK	0	399	OK	0	399	OK	0	399	OK
8368	NoMatch	194	10	0.0053	6	399	OK	6	399	OK	6	399	OK	6	399	OK
8370	NoMatch	280	10	0.0029	17	403	OK	18	402	OK	20	400	OK	22	399	OK
8372	NoMatch	217	10	0.0089	6	404	OK	9	401	OK	9	401	OK	10	400	OK
8374	NoMatch	273	10	0.0047	0	401	OK	0	401	OK	0	401	OK	0	401	OK
8375	NoMatch	263	10	0.0186	4	412	OK	4	412	OK	7	410	OK	14	402	IH, Backwater

Conduit ID	GIS ID	Length (ft)	Diameter (in)	Slope	Existing Condition			2025 Condition			2035 Condition			Buildout Condition		
					Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category	Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category	Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category	Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category
8404	SSL-01672	26	12	0.0100	8	405	OK	9	404	OK	10	403	OK	11	402	OK
8405	SSL-01670	36	12	0.0256	2	403	OK	2	403	OK	3	403	OK	3	403	OK
8406	SSL-01805	400	18	0.0283	5	403	OK	5	403	OK	5	403	OK	6	403	OK
8408	SSL-01804	303	18	0.0000	3	406	OK	4	405	OK	4	405	OK	4	404	OK
8410	SSL-01803	308	18	0.0000	15	407	OK	16	406	OK	17	405	OK	17	405	OK
8412	SSL-01802	179	15	0.0279	5	406	OK	6	406	OK	6	405	OK	6	405	OK
8418	NoMatch	68	10	0.0256	6	404	OK	4	406	OK	5	405	OK	5	405	OK
8420	NoMatch	210	10	0.0920	48	415	OK	49	414	OK	54	409	OK	57	406	OK
8470	NoMatch	412	8	0.0557	6	407	OK	7	406	OK	7	406	OK	7	406	OK
8471	SSL-01864	64	8	0.0041	236	520	OK	285	472	OK	330	427	OK	351	406	OK
8473	SSL-01863	496	8	0.0040	12	405	OK	10	407	OK	11	406	OK	11	406	OK
8474	NoMatch	153	8	0.0000	9	409	OK	11	408	OK	12	407	OK	12	406	OK
8477	NoMatch	85	8	0.1298	2	407	OK	2	407	OK	2	407	OK	2	406	OK
8480	NoMatch	205	8	0.0732	120	423	OK	129	415	OK	134	409	OK	136	407	OK
8482	NoMatch	65	8	0.0462	3	408	OK	3	408	OK	4	408	OK	4	408	OK
8484	NoMatch	84	8	0.0000	1	408	OK	2	408	OK	2	408	OK	2	408	OK
8487	NoMatch	300	8	0.0833	11	407	OK	9	408	OK	10	408	OK	10	408	OK
8489	NoMatch	400	8	0.0000	108	421	OK	115	414	OK	119	410	OK	121	408	OK
8492	NoMatch	195	8	0.1282	1	408	OK	1	408	OK	1	408	OK	1	408	OK
8493	NoMatch	400	8	0.0000	289	443	OK	313	419	OK	323	409	OK	324	408	OK
8494	NoMatch	228	8	0.0219	1	408	OK	1	408	OK	1	408	OK	1	408	OK
8495	NoMatch	66	8	0.0758	13	410	OK	13	409	OK	14	409	OK	14	408	OK
8496	SSL-02076	271	8	0.0069	67	409	OK	64	413	OK	67	410	OK	68	409	OK
8499	SSL-02075	124	8	0.0365	3	409	OK	4	409	OK	4	409	OK	4	409	OK
8500	SSL-02077	268	8	0.0037	8	412	OK	9	411	OK	10	410	OK	10	409	OK
8502	SSL-02078	303	8	0.0334	3	411	OK	4	410	OK	4	410	OK	4	409	OK
8505	SSL-01926	58	8	0.0125	3	410	OK	3	410	OK	3	410	OK	3	410	OK
8508	SSL-01927	278	8	0.0045	3	409	OK	2	410	OK	2	410	OK	2	410	OK
8510	SSL-01928	178	8	0.0091	1	411	OK	1	410	OK	1	410	OK	1	410	OK
8511	SSL-02079	138	8	0.0147	2	411	OK	2	411	OK	2	410	OK	2	410	OK
8512	SSL-01925	124	8	0.0592	4	411	OK	4	411	OK	5	411	OK	5	411	OK
8514	SSL-01360	126	8	0.0047	17	409	OK	15	412	OK	15	411	OK	16	411	OK
8517	SSL-01361	136	8	0.0047	213	439	OK	227	425	OK	236	416	OK	240	411	OK
8520	SSL-01357	123	8	0.0034	2	412	OK	2	412	OK	2	412	OK	2	412	OK
8521	SSL-01348	166	8	0.0095	4	414	OK	5	413	OK	6	412	OK	6	412	OK
8523	SSL-01349	135	8	0.0064	0	412	OK	0	412	OK	0	412	OK	0	412	OK
8525	SSL-01351	163	8	0.0065	2	413	OK	2	412	OK	3	412	OK	3	412	OK
8526	SSL-01609	190	10	0.0069	5	413	OK	5	413	OK	5	413	OK	6	413	OK
8527	SSL-01597	256	8	0.0747	107	427	OK	113	420	OK	118	415	OK	120	413	OK
8530	SSL-01126	140	8	0.0320	5	414	OK	6	413	OK	7	413	OK	7	413	OK
8532	SSL-01188	43	8	0.0954	1	414	OK	1	414	OK	2	414	OK	2	414	OK
8535	SSL-01189	54	8	0.0922	22	412	OK	19	415	OK	19	414	OK	20	414	OK
8537	SSL-01059	382	8	0.0042	58	417	OK	57	418	OK	60	415	OK	61	414	OK
8540	SSL-01595	262	8	0.0026	45	420	OK	46	418	OK	49	416	OK	50	415	OK
8542	SSL-01075	231	8	0.0101	12	419	OK	15	416	OK	16	415	OK	16	415	OK
8544	SSL-01199	163	8	0.0921	4	418	OK	6	416	OK	7	416	OK	7	415	OK
8547	SSL-01071	169	8	0.0068	1	416	OK	1	415	OK	1	415	OK	1	415	OK
8549	SSL-01072	264	8	0.0140	4	415	OK	3	416	OK	3	416	OK	3	415	OK
8551	SSL-01073	278	8	0.0160	1	416	OK	1	416	OK	1	416	OK	1	416	OK
8552	SSL-01128	134	8	0.0038	8	418	OK	7	418	OK	8	417	OK	8	417	OK
8555	SSL-01130	348	8	0.0238	16	414	OK	11	418	OK	12	417	OK	12	417	OK
8557	SSL-01193	124	8	0.0914	4	418	OK	4	418	OK	4	417	OK	5	417	OK
8558	SSL-01197	124	8	0.0773	10	419	OK	11	418	OK	11	418	OK	12	417	OK
8559	SSL-01127	206	8	0.0019	3	418	OK	3	418	OK	3	417	OK	3	417	OK

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8560	SSL-01131	135	8	0.0216	0	418	OK	0	418	OK	0	418	OK	0	418	OK
8561	SSL-01101	37	10	0.0067	2	419	OK	3	418	OK	3	418	OK	3	418	OK
8562	NoMatch	27	8	0.0132	2	418	OK	2	418	OK	2	418	OK	2	418	OK
8596	SSL-02073	129	8	0.0329	0	418	OK	0	418	OK	0	418	OK	0	418	OK
8602	SSL-00533	302	8	0.0131	6	418	OK	5	419	OK	5	419	OK	5	418	OK
8604	SSL-00534	290	8	0.0040	1	419	OK	1	419	OK	1	419	OK	1	419	OK
8605	SSL-08449	326	18	0.0013	1	419	OK	1	419	OK	1	419	OK	1	419	OK
8608	SSL-08448	183	18	0.0020	3	419	OK	2	419	OK	2	419	OK	2	419	OK
8610	SSL-01857	408	18	0.0000	3	421	OK	4	420	OK	4	420	OK	4	419	OK
8611	SSL-01103	120	18	0.0038	29	429	OK	33	424	OK	31	427	OK	38	419	IH, Backwater
8613	SSL-01102	38	18	0.0042	43	434	OK	53	423	OK	55	421	OK	57	420	OK
8615	SSL-01105	256	18	0.0014	59	423	OK	58	424	OK	61	422	OK	62	420	OK
8617	SSL-01104	50	18	0.0058	6	423	OK	7	422	OK	8	421	OK	8	421	OK
8777	SSL-02465	362	36	0.0006	91	446	OK	109	428	OK	114	423	OK	116	421	OK
8780	SSL-02466	159	36	0.0061	2	421	OK	3	421	OK	3	421	OK	3	421	OK
8782	SSL-02479	174	36	0.0010	2	422	OK	2	422	OK	2	421	OK	2	421	OK
8785	SSL-02480	187	36	0.0010	7	426	OK	10	423	OK	11	422	OK	11	422	OK
8787	SSL-02481	120	36	0.0018	12	424	OK	12	423	OK	13	422	OK	13	422	OK
8789	SSL-02482	116	36	0.0018	18	429	OK	23	424	OK	24	423	OK	24	422	OK
8791	SSL-02483	233	36	0.0014	4	423	OK	4	423	OK	4	423	OK	4	423	OK
8793	SSL-02484	236	36	0.0020	3	423	OK	4	423	OK	4	423	OK	4	423	OK
8795	SSL-02485	277	36	0.0020	11	427	OK	12	425	OK	13	424	OK	14	423	OK
8797	SSL-02486	63	36	0.0154	9	426	OK	10	425	OK	11	424	OK	11	424	OK
8799	SSL-02487	134	36	0.0037	3	426	OK	5	425	OK	5	424	OK	6	424	OK
8802	SSL-02473	449	36	0.0007	1	425	OK	2	424	OK	2	424	OK	2	424	OK
8805	SSL-02474	500	36	0.0008	22	430	OK	26	426	OK	27	425	OK	27	424	OK
8807	SSL-02475	410	36	0.0009	1	426	OK	2	425	OK	2	425	OK	3	424	OK
8809	SSL-02476	425	36	0.0012	1	425	OK	1	425	OK	2	425	OK	2	425	OK
8811	SSL-02477	364	36	0.0013	0	425	OK	0	425	OK	0	425	OK	0	425	OK
8813	SSL-02478	147	36	0.0010	10	424	OK	8	426	OK	8	426	OK	9	426	OK
8814	SSL-02470	500	36	0.0003	0	426	OK	0	426	OK	0	426	OK	0	426	OK
8816	SSL-02471	452	36	0.0007	1	426	OK	1	426	OK	2	426	OK	2	426	OK
8817	SSL-02472	29	10	0.1117	1	427	OK	1	427	OK	1	427	OK	1	427	OK
8818	SSL-02469	325	36	0.0024	0	427	OK	0	427	OK	0	427	OK	0	427	OK
8821	SSL-02461	93	12	0.0022	19	431	OK	21	429	OK	22	428	OK	23	427	OK
8823	SSL-02467	132	36	0.0017	4	429	OK	5	428	OK	5	428	OK	6	428	OK
8825	SSL-02468	213	36	0.0024	5	429	OK	6	428	OK	6	428	OK	6	428	OK
8826	SSL-01920	79	30	0.0010	2	428	OK	2	428	OK	2	428	OK	2	428	OK
8829	SSL-02457	215	30	0.0015	11	428	OK	9	429	OK	10	429	OK	10	428	OK
8831	SSL-02458	270	30	0.0013	2	429	OK	2	429	OK	2	429	OK	2	429	OK
8833	SSL-02447	412	30	0.0012	7	431	OK	8	430	OK	9	429	OK	10	429	OK
8835	SSL-02449	100	24	0.0011	18	423	OK	12	430	OK	12	429	OK	13	429	OK
8837	SSL-02453	500	24	0.0016	13	430	OK	13	430	OK	13	429	OK	14	429	OK
8839	SSL-02454	87	24	0.0021	0	430	OK	0	430	OK	0	430	OK	0	430	OK
8841	SSL-02455	266	24	0.0011	29	433	OK	30	432	OK	31	430	OK	32	430	OK
8843	SSL-02456	500	24	0.0003	11	429	OK	9	431	OK	10	430	OK	10	430	OK
8845	SSL-02451	150	24	0.0021	12	435	OK	14	433	OK	16	432	OK	16	431	OK
8846	SSL-02459	59	30	0.0024	3	431	OK	3	432	OK	3	431	OK	3	431	OK
8848	SSL-02450	377	30	0.0006	11	430	OK	9	432	OK	9	432	OK	9	432	OK
8850	SSL-02460	377	30	0.0003	9	453	IH, Backwater	36	426	LH, Backwater	31	431	LH, Backwater	31	432	LH, Backwater
8852	SSL-02462	377	30	0.0001	2	433	OK	2	432	OK	3	432	OK	3	432	OK
8855	SSL-02463	355	36	0.0013	246	468	OK	266	449	OK	276	438	OK	282	432	OK
8857	SSL-02464	349	36	0.0033	3	433	OK	3	433	OK	3	433	OK	3	433	OK
8858	SSL-02491	500	36	0.0010	195	524	OK	233	486	OK	269	450	OK	285	434	OK

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28899	SSL-02398	220	10	0.0045	6	348	OK	6	347	OK	31	323	IH, Backwater	41	312	IH, Backwater
29953	NoMatch	83	30	0.0006	31	315	OK	29	317	OK	32	314	OK	34	312	OK
29958	SSL-00441	412	30	0.0007	13	314	OK	14	313	OK	15	313	OK	15	312	OK
29960	NoMatch	200	30	0.0024	10	314	OK	10	313	OK	11	313	OK	11	312	OK
30833	SSL-02130	355	8	0.0286	29	316	OK	31	315	OK	32	313	OK	32	313	OK
37629	SSL-02397	116	10	0.0086	21	316	OK	20	316	OK	22	314	OK	23	313	OK
37789	SSL-02399	85	10	0.0118	17	326	OK	26	317	OK	28	315	OK	30	313	OK
37920	SSL-02395	220	10	0.0045	422	381	OK	449	354	OK	442	361	OK	489	315	OK
39880	SSL-00836	115	24	0.0010	3	315	OK	2	315	OK	2	315	OK	2	315	OK
40161	SSL-00838	502	24	0.0008	27	317	OK	26	318	OK	27	316	OK	28	316	OK
40249	SSL-00839	329	24	0.0009	28	315	OK	25	318	OK	26	317	OK	26	316	OK
40262	SSL-00840	470	24	0.0008	20	324	OK	26	318	OK	27	317	OK	28	316	OK
41532	SSL-00483	76	8	0.0889	576	547	OK	667	456	OK	756	366	OK	806	317	IH, Backwater
41535	SSL-00484	82	8	0.0663	20	323	OK	23	320	OK	25	318	OK	26	317	OK
41538	SSL-00482	349	8	0.0352	26	346	OK	39	333	OK	50	321	OK	55	317	OK
98211	SSL-01543	123	8	0.0051	13	445	OK	11	448	OK	20	439	IH, Backwater	24	434	IH, Backwater
98212	SSL-02158	262	8	0.0069	2	438	OK	5	435	OK	5	435	OK	5	435	OK
98213	SSL-01514	107	8	0.0047	2	435	OK	2	435	OK	3	435	OK	3	435	OK
98214	SSL-01942	264	8	0.0007	2	436	OK	2	436	OK	2	435	OK	3	435	OK
98215	SSL-01706	168	8	0.0501	6	435	OK	5	436	OK	6	436	OK	6	436	OK
98216	SSL-01541	263	8	0.0110	835	655	OK	952	538	OK	1020	470	OK	1054	436	OK
98217	SSL-00855	278	8	0.0482	4	437	OK	5	437	OK	5	437	OK	5	437	OK
98218	SSL-00735	252	8	0.0184	3	440	OK	4	439	OK	5	438	OK	5	438	OK
98219	SSL-00750	111	8	0.0332	45	444	OK	47	442	OK	49	440	OK	50	439	OK
98220	SSL-00732	194	8	0.0144	6	439	OK	5	440	OK	5	440	OK	6	440	OK
98221	SSL-00740	239	8	0.0049	4	440	OK	5	440	OK	5	440	OK	5	440	OK
98222	SSL-00727	265	8	0.0400	98	459	OK	106	451	OK	114	443	OK	116	441	OK
98223	SSL-00749	142	8	0.0215	9	442	OK	9	441	OK	10	441	OK	10	441	OK
98224	SSL-00747	147	8	0.0073	5	442	OK	6	442	OK	6	441	OK	6	441	OK
98225	SSL-01589	181	8	0.0040	29	446	OK	31	444	OK	32	443	OK	33	442	OK
98226	SSL-01000	225	8	0.0365	2	443	OK	3	442	OK	3	442	OK	3	442	OK
98227	SSL-01002	154	8	0.0220	68	453	OK	74	447	OK	77	444	OK	79	443	OK
98228	SSL-01003	125	8	0.0458	216	443	OK	204	455	OK	212	447	OK	216	443	OK
98229	SSL-01005	171	8	0.0123	13	836	OK	405	444	OK	405	443	OK	405	443	OK
98230	SSL-01007	168	8	0.0058	6	444	OK	6	444	OK	6	444	OK	7	444	OK
98231	SSL-00573	34	8	0.0050	80	477	OK	91	466	OK	105	452	OK	112	445	OK
98232	SSL-00207	63	8	0.0114	82	461	OK	87	456	OK	95	448	OK	98	445	OK
98233	SSL-02199	291	8	0.0154	9	447	OK	10	446	OK	10	446	OK	11	445	OK
98234	SSL-01992	30	8	0.3228	234	662	OK	436	461	OK	441	455	OK	449	447	IH, Backwater
98235	SSL-00195	190	8	0.0038	4	447	OK	4	447	OK	4	447	OK	4	447	OK
98237	SSL-01445	135	8	0.0039	19	447	OK	18	448	OK	19	447	OK	20	447	OK
98238	SSL-01446	42	8	0.0050	2	450	OK	3	449	OK	3	449	OK	3	448	OK
98239	SSL-01447	86	8	0.0356	4	449	OK	4	449	OK	4	449	OK	4	449	OK
98241	NoMatch	108	8	0.0195	8	451	OK	9	450	OK	9	450	OK	9	450	OK
98242	SSL-00194	281	8	0.0132	7	451	OK	8	451	OK	8	450	OK	8	450	OK
98243	SSL-00147	70	8	0.0142	16	453	OK	17	452	OK	18	451	OK	18	451	OK
98244	SSL-00148	8	8	0.0258	9	452	OK	10	452	OK	10	451	OK	11	451	OK
98245	SSL-00193	293	8	0.0040	2	452	OK	2	452	OK	2	451	OK	2	451	OK
98246	NoMatch	57	8	0.0041	48	458	OK	52	455	OK	54	453	OK	55	452	OK
98247	NoMatch	140	8	0.0065	1	452	OK	1	452	OK	1	452	OK	2	452	OK
98248	SSL-00152	105	8	0.0742	6	457	OK	7	455	OK	8	454	OK	8	454	OK
98249	SSL-00151	100	8	0.0040	29	455	OK	28	457	OK	29	456	OK	29	455	OK
98250	SSL-00153	335	8	0.0039	0	456	OK	0	456	OK	0	456	OK	0	456	OK
98251	SSL-00154	86	8	0.0069	67	476	OK	75	468	OK	82	460	OK	87	456	OK

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					Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category	Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category	Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category	Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category
98252	NoMatch	36	8	0.0055	83	453	OK	75	461	OK	78	458	OK	80	457	OK
98253	SSL-00263	97	8	0.0041	46	457	OK	42	460	OK	45	458	OK	46	457	OK
98254	SSL-00899	411	8	0.0044	17	460	OK	18	460	OK	19	459	OK	19	458	OK
98255	SSL-00183	528	8	0.0040	1	461	OK	1	460	OK	1	460	OK	1	460	OK
98256	SSL-00179	267	8	0.0393	45	466	OK	48	464	OK	50	461	OK	51	460	OK
98257	SSL-00184	301	8	0.0083	2	461	OK	3	461	OK	3	461	OK	3	461	OK
98258	SSL-00185	125	8	0.0220	3	462	OK	4	461	OK	4	461	OK	4	461	OK
98259	SSL-00186	219	8	0.0040	2	462	OK	2	462	OK	2	462	OK	2	462	OK
98260	SSL-00187	224	8	0.0060	1	463	OK	1	463	OK	2	463	OK	2	463	OK
98261	SSL-00188	211	8	0.0176	820	670	OK	932	558	OK	996	494	OK	1027	463	OK
98262	SSL-01081	494	8	0.0050	4	465	OK	4	465	OK	5	465	OK	5	464	OK
98263	SSL-00180	70	8	0.0041	23	467	OK	24	466	OK	25	465	OK	26	465	OK
98264	SSL-00167	82	8	0.0039	19	467	OK	21	466	OK	21	465	OK	22	465	OK
98265	NoMatch	177	8	0.0065	12	467	OK	12	466	OK	13	466	OK	13	465	OK
98266	NoMatch	96	8	0.0188	14	468	OK	14	468	OK	15	467	OK	15	467	OK
98267	SSL-00370	87	8	0.0100	1	468	OK	1	468	OK	1	468	OK	1	468	OK
98268	SSL-00371	134	8	0.0100	2	469	OK	3	468	OK	3	468	OK	3	468	OK
98269	SSL-00372	299	8	0.0100	8	471	OK	10	469	OK	11	468	OK	11	468	OK
98270	SSL-00373	449	8	0.0100	125	485	OK	133	477	OK	139	471	OK	141	468	OK
98271	SSL-00374	444	8	0.0086	3	468	OK	2	469	OK	2	469	OK	2	469	OK
98272	SSL-00969	308	8	0.0032	211	503	OK	229	484	OK	238	475	OK	243	470	OK
98273	SSL-00375	67	8	0.0039	16	468	OK	14	471	OK	14	470	OK	15	470	OK
98274	SSL-01082	41	8	0.0083	8	478	OK	12	474	OK	14	471	OK	15	470	OK
98275	SSL-00166	421	8	0.0038	258	510	OK	280	488	OK	291	476	OK	297	470	OK
98276	SSL-01947	158	8	0.0051	19	473	OK	20	472	OK	21	471	OK	21	471	OK
98277	SSL-00262	70	8	0.0191	815	678	OK	927	566	OK	990	503	OK	1021	472	OK
98278	SSL-00265	220	8	0.0102	237	500	OK	258	479	OK	266	472	OK	266	472	OK
98279	SSL-01223	234	8	0.0104	4,696	3265	OK	6783	1179	OK	7245	716	OK	7488	473	OK
98280	SSL-02106	171	8	0.0155	2	473	OK	2	473	OK	3	473	OK	3	473	OK
98281	SSL-01226	218	8	0.0098	232	614	OK	342	504	OK	362	485	OK	370	476	OK
98282	SSL-01954	236	8	0.0127	1	476	OK	1	476	OK	1	476	OK	1	476	OK
98283	SSL-01225	292	8	0.0126	18	476	OK	16	477	OK	17	476	OK	17	476	OK
98284	SSL-01224	161	8	0.0088	181	478	OK	164	495	OK	163	497	OK	183	476	OK
98285	SSL-01953	255	8	0.0225	5	477	OK	5	477	OK	5	477	OK	5	477	OK
98287	SSL-00251	341	8	0.0044	3	477	OK	3	477	OK	3	477	OK	3	477	OK
98288	SSL-00682	240	8	0.0093	2,477	0	LH	202	0	IH	441	0	IH	214	478	IH, Backwater
98289	SSL-00683	139	8	0.0866	39	488	OK	42	485	OK	46	481	OK	49	479	OK
98290	SSL-00685	115	8	0.0273	2	479	OK	2	479	OK	2	479	OK	2	479	OK
98291	SSL-00688	148	8	0.0217	10	482	OK	12	480	OK	12	480	OK	13	480	OK
98292	SSL-00691	220	8	0.0159	19	484	OK	21	481	OK	22	480	OK	23	480	OK
98293	SSL-00694	120	8	0.0100	27	481	OK	25	483	OK	26	482	OK	27	481	OK
98294	SSL-00702	135	8	0.0633	1	481	OK	1	481	OK	1	481	OK	1	481	OK
98295	SSL-00705	272	8	0.0199	0	483	OK	0	483	OK	0	483	OK	0	483	OK
98296	SSL-00706	98	8	0.0196	10	484	OK	8	486	OK	9	485	OK	9	485	OK
98297	SSL-00709	156	8	0.0309	62	503	OK	68	497	OK	76	489	OK	79	485	OK
98298	SSL-00856	97	8	0.0034	2	489	OK	3	487	OK	3	487	OK	4	487	OK
98299	SSL-00858	164	8	0.0043	2	645	OK	160	487	OK	160	487	OK	160	487	OK
98300	SSL-00861	117	8	0.0051	2	488	OK	2	488	OK	2	488	OK	2	488	OK
98301	SSL-00862	119	8	0.0028	2	491	OK	2	491	OK	2	491	OK	3	491	OK
98302	SSL-00863	168	8	0.0038	0	496	OK	0	496	OK	0	496	OK	5	491	OK
98303	SSL-00864	157	8	0.0040	16	492	OK	15	493	OK	15	493	OK	16	492	OK
98304	SSL-00865	176	8	0.0043	3	494	OK	3	493	OK	3	493	OK	3	493	OK
98305	SSL-00867	121	8	0.0036	10	494	OK	9	495	OK	9	495	OK	9	495	OK
98306	SSL-00868	97	8	0.0062	0	495	OK	0	495	OK	0	495	OK	0	495	OK

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98307	SSL-00869	88	8	0.0037	26	498	OK	27	497	OK	29	496	OK	29	496	OK
98308	SSL-00870	278	8	0.0026	7	500	OK	10	497	OK	11	496	OK	11	496	OK
98309	SSL-00873	116	8	0.1443	5	497	OK	5	497	OK	5	496	OK	5	496	OK
98310	SSL-00876	54	8	0.0864	5	497	OK	5	497	OK	5	496	OK	5	496	OK
98311	SSL-00879	132	8	0.0508	57	514	OK	63	508	OK	70	501	OK	73	498	OK
98312	SSL-00904	64	8	0.0072	22	509	OK	24	507	OK	29	502	OK	33	498	OK
98313	SSL-01218	131	8	0.0053	250	714	OK	447	517	IH, Backwater	461	503	IH, Backwater	466	499	IH, Backwater
98314	SSL-01219	123	8	0.0066	2	500	OK	2	500	OK	2	500	OK	2	500	OK
98315	SSL-01603	209	8	0.0037	4,921	0	OK	200	667	OK	207	659	OK	367	500	OK
98316	SSL-01631	292	8	0.0032	2	501	OK	2	501	OK	2	501	OK	2	501	OK
98317	SSL-01632	224	8	0.0091	121	520	OK	131	509	OK	136	504	OK	139	501	OK
98318	SSL-01630	25	8	0.0668	2	503	OK	3	502	OK	3	502	OK	3	502	OK
98319	SSL-00857	73	8	0.0147	2	508	OK	2	508	OK	2	508	OK	2	507	OK
98320	SSL-01148	181	8	0.0123	4	508	OK	4	508	OK	4	508	OK	4	508	OK
98321	SSL-00908	85	8	0.0060	4	509	OK	4	509	OK	4	509	OK	5	509	OK
98322	SSL-01149	66	8	0.0443	28	483	OK	2	509	OK	2	509	OK	2	509	OK
98323	SSL-01150	76	8	0.0041	3	510	OK	4	510	OK	4	509	OK	4	509	OK
98324	SSL-01335	216	8	0.0063	9	510	OK	10	510	OK	10	510	OK	10	509	OK
98325	SSL-02357	50	8	0.0046	1	509	OK	1	509	OK	2	509	OK	2	509	OK
98326	SSL-01421	143	8	0.0107	11	513	OK	12	511	OK	13	510	OK	14	509	OK
98327	SSL-01422	188	8	0.0034	2	515	OK	2	515	OK	2	515	OK	7	509	OK
98328	SSL-00025	123	8	0.0051	4	510	OK	4	510	OK	4	510	OK	4	509	OK
98329	SSL-01204	135	8	0.0391	0	510	OK	0	510	OK	0	510	OK	0	510	OK
98330	SSL-01210	139	8	0.0696	5	514	OK	5	514	OK	6	513	OK	6	513	OK
98331	SSL-01458	32	8	0.3913	3	514	OK	3	514	OK	3	514	OK	3	513	OK
98332	SSL-01459	188	8	0.0665	201	527	OK	201	526	OK	210	518	OK	214	514	OK
98333	SSL-01460	82	8	0.0145	2	514	OK	2	514	OK	2	514	OK	2	514	OK
98334	SSL-01495	149	8	0.0220	0	515	OK	0	515	OK	0	515	OK	0	515	OK
98336	SSL-02084	66	8	0.0464	2	516	OK	2	516	OK	2	516	OK	2	516	OK
98337	SSL-02088	85	8	0.0061	100	508	OK	87	521	OK	90	518	OK	91	516	OK
98338	SSL-02091	99	8	0.0063	23	519	OK	25	518	OK	25	517	OK	26	517	OK
98339	SSL-02136	236	8	0.0127	4	518	OK	4	518	OK	4	518	OK	5	518	OK
98340	SSL-02139	65	8	0.0077	29	523	OK	31	521	OK	32	520	OK	33	519	OK
98341	SSL-00061	222	8	0.0037	18	529	OK	26	521	OK	27	520	OK	28	519	OK
98342	SSL-01205	155	8	0.0041	17	525	OK	19	523	OK	22	521	OK	23	519	OK
98343	SSL-01295	98	8	0.0063	10	523	OK	11	521	OK	12	520	OK	13	520	OK
98344	SSL-01300	74	8	0.0039	2	519	OK	2	520	OK	2	520	OK	2	520	OK
98345	SSL-01301	87	8	0.0039	19	524	OK	18	524	OK	20	522	OK	22	521	OK
98346	SSL-01302	96	8	0.0039	1	521	OK	1	521	OK	1	521	OK	1	521	OK
98347	SSL-01303	154	8	0.0323	467	731	OK	542	657	OK	632	566	OK	677	521	OK
98348	SSL-01304	93	8	0.0040	4	522	OK	5	522	OK	5	522	OK	5	522	OK
98349	SSL-01305	93	8	0.0040	89	557	OK	101	545	OK	116	529	OK	124	522	OK
98350	SSL-01307	141	8	0.0094	1	523	OK	1	523	OK	1	523	OK	1	523	OK
98351	SSL-01366	208	8	0.0045	298	1192	OK	976	514	IH, Backwater	974	516	IH, Backwater	967	523	IH, Backwater
98352	SSL-01367	216	8	0.0017	40	527	IH, Backwater	36	530	IH, Backwater	46	520	IH, Backwater	43	523	IH, Backwater
98353	SSL-01368	174	8	0.0040	0	523	OK	0	523	OK	0	523	OK	0	523	OK
98354	SSL-01369	177	8	0.0038	8	525	OK	9	524	OK	9	524	OK	9	524	OK
98355	SSL-01371	215	8	0.0133	20	527	OK	22	525	OK	23	524	OK	23	524	OK
98356	SSL-01373	133	8	0.0040	14	527	OK	15	526	OK	16	526	OK	16	525	OK
98357	SSL-01374	165	8	0.0040	18	524	OK	15	527	OK	16	526	OK	17	525	OK
98358	SSL-01209	97	8	0.0524	4	528	OK	6	526	OK	7	526	OK	7	526	OK
98359	SSL-00485	56	8	0.1347	10	527	OK	10	527	OK	11	526	OK	11	526	OK
98360	SSL-01068	92	8	0.0080	0	526	OK	0	526	OK	0	526	OK	0	526	OK
98361	SSL-01067	66	8	0.0117	1	527	OK	1	527	OK	1	527	OK	1	527	OK

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98362	SSL-00198	267	8	0.0544	28	530	OK	30	529	OK	31	528	OK	31	527	OK
98363	SSL-00199	146	8	0.0416	14	530	OK	14	529	OK	15	529	OK	15	528	OK
98365	SSL-00202	490	8	0.0423	10	527	OK	7	530	OK	8	529	OK	8	529	OK
98366	SSL-01590	125	8	0.0419	13	529	OK	11	532	OK	12	531	OK	13	530	OK
98367	SSL-00173	107	8	0.0217	383	536	OK	365	553	OK	380	538	OK	388	531	OK
98368	SSL-00205	139	8	0.0043	0	532	OK	0	532	OK	0	532	OK	0	532	OK
98370	SSL-00206	445	8	0.0132	43	695	OK	203	535	OK	205	533	OK	206	532	OK
98371	SSL-01720	213	8	0.0064	8	533	OK	8	533	OK	9	533	OK	9	532	OK
98372	SSL-01529	161	8	0.0330	12	534	OK	13	533	OK	13	533	OK	14	532	OK
98373	SSL-01542	119	8	0.0237	2	533	OK	2	533	OK	2	533	OK	2	533	OK
98374	SSL-01526	146	8	0.0075	23	539	OK	25	537	OK	28	534	OK	29	533	OK
98375	SSL-01538	129	8	0.0062	17	537	OK	20	534	OK	21	533	OK	21	533	OK
98376	SSL-01539	257	8	0.0177	6	534	OK	6	533	OK	7	533	OK	7	533	OK
98377	SSL-01512	62	8	0.1349	5	534	OK	6	534	OK	6	533	OK	6	533	OK
98378	SSL-01534	167	8	0.0175	40	539	OK	42	538	OK	43	536	OK	44	535	OK
98379	SSL-01525	98	8	0.0044	857	581	OK	883	555	LH, Backwater	883	555	LH, Backwater	903	535	LH, Backwater
98380	SSL-01474	289	8	0.0503	7	537	OK	8	536	OK	9	536	OK	9	535	OK
98381	SSL-01879	304	8	0.0105	7	535	OK	6	536	OK	6	536	OK	7	535	OK
98382	SSL-01880	113	8	0.0126	9	537	OK	10	536	OK	10	536	OK	11	536	OK
98383	SSL-01528	62	8	0.0531	1	536	OK	1	536	OK	1	536	OK	1	536	OK
98385	SSL-00108	329	8	0.0366	3	541	OK	7	537	OK	8	537	OK	8	536	OK
98386	SSL-01940	203	8	0.0040	4	537	OK	4	537	OK	4	537	OK	4	537	OK
98387	SSL-00841	225	8	0.0049	4	537	OK	4	537	OK	4	537	OK	4	537	OK
98389	SSL-01839	267	8	0.0045	16	541	OK	19	538	OK	20	537	OK	20	537	OK
98390	SSL-01843	382	8	0.0040	1	538	OK	2	538	OK	2	537	OK	2	537	OK
98391	SSL-01841	274	8	0.0040	2	538	OK	2	538	OK	3	538	OK	3	538	OK
98392	SSL-00843	101	8	0.0034	4	539	OK	5	538	OK	6	538	OK	6	538	OK
98393	SSL-01875	352	8	0.0107	2	550	OK	4	548	OK	4	548	OK	13	538	OK
98394	SSL-01862	248	8	0.0040	7	540	OK	7	540	OK	7	540	OK	7	540	OK
98395	SSL-01796	375	8	0.0040	1	540	OK	1	540	OK	1	540	OK	1	540	OK
98396	SSL-00216	351	8	0.0064	2	541	OK	2	540	OK	2	540	OK	2	540	OK
98397	SSL-00182	284	8	0.0285	1	541	OK	1	541	OK	2	540	OK	2	540	OK
98398	SSL-01793	416	8	0.0037	3	540	OK	3	541	OK	3	541	OK	3	540	OK
98399	SSL-01792	352	8	0.0041	77	545	OK	76	546	OK	79	543	OK	80	542	OK
98401	SSL-00842	294	8	0.0052	1,296	0	LH	5	543	OK	5	542	OK	5	542	OK
98402	SSL-01281	456	8	0.0198	2	543	OK	2	543	OK	2	543	OK	2	543	OK
98403	SSL-01271	105	8	0.0499	2	544	OK	2	543	OK	2	543	OK	2	543	OK
98404	SSL-01278	155	8	0.0147	14	546	OK	15	545	OK	16	544	OK	16	544	OK
98405	SSL-02053	164	8	0.0933	0	545	OK	0	545	OK	0	545	OK	0	545	OK
98406	SSL-01370	129	8	0.0040	9	543	OK	6	546	OK	7	546	OK	7	545	OK
98407	SSL-01276	356	8	0.0384	45	544	OK	41	548	OK	42	547	OK	43	546	OK
98408	SSL-02170	188	8	0.0534	115	571	OK	130	555	OK	136	550	OK	139	547	OK
98409	SSL-01279	395	8	0.0527	8	548	OK	8	548	OK	8	548	OK	8	547	OK
98410	SSL-01274	361	8	0.0060	7	625	OK	84	549	OK	84	548	OK	84	548	OK
98411	SSL-01119	264	8	0.0040	6	548	OK	4	550	OK	5	549	OK	5	549	OK
98412	SSL-02052	259	8	0.0069	120	575	OK	137	559	OK	143	553	OK	146	549	OK
98413	SSL-02037	252	8	0.0660	2	550	OK	2	550	OK	2	550	OK	2	550	OK
98414	SSL-02038	114	8	0.0622	4,243	3138	OK	6249	1132	OK	6637	744	OK	6831	550	OK
98415	SSL-02062	274	8	0.0552	196	642	OK	234	604	OK	270	567	OK	287	551	OK
98416	SSL-01412	193	8	0.0146	6	553	OK	7	552	OK	7	552	OK	8	551	OK
98417	SSL-01306	90	8	0.0039	4	552	OK	4	552	OK	4	552	OK	4	552	OK
98418	SSL-02031	359	8	0.0069	82	557	OK	82	557	OK	86	554	OK	88	552	OK
98419	SSL-00065	110	8	0.0229	108	557	OK	106	559	OK	110	554	OK	112	552	OK
98420	SSL-02167	232	8	0.0038	3	554	OK	4	553	OK	4	553	OK	4	553	OK

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98421	SSL-02048	380	8	0.0231	1	553	OK	1	553	OK	1	553	OK	1	553	OK
98422	SSL-02169	202	8	0.0100	20	559	OK	23	555	OK	25	554	OK	25	553	OK
98423	SSL-01617	176	8	0.0177	3	554	OK	3	554	OK	3	554	OK	3	554	OK
98424	SSL-01337	276	8	0.0199	1	554	OK	1	554	OK	1	554	OK	1	554	OK
98425	SSL-02165	283	8	0.0096	10	556	OK	11	555	OK	11	555	OK	12	554	OK
98426	SSL-01339	212	8	0.0265	29	553	OK	26	556	OK	27	555	OK	27	555	OK
98427	SSL-01407	125	8	0.0623	34	557	OK	33	557	OK	35	556	OK	35	555	OK
98428	SSL-02041	111	8	0.0042	2	557	OK	3	556	OK	3	556	OK	3	556	OK
98429	SSL-02054	80	8	0.0107	1	557	OK	2	556	OK	2	556	OK	2	556	OK
98430	SSL-02060	279	8	0.0622	1	557	OK	1	557	OK	1	556	OK	1	556	OK
98431	SSL-02055	352	8	0.0061	2	559	OK	3	558	OK	3	558	OK	3	558	OK
98432	SSL-00831	358	8	0.0208	2	559	OK	2	559	OK	2	559	OK	2	559	OK
98433	SSL-01480	58	8	0.0828	6	564	OK	6	563	OK	8	562	OK	9	561	OK
98434	SSL-00917	393	8	0.0253	1	562	OK	1	561	OK	1	561	OK	1	561	OK
98435	SSL-01399	430	8	0.0434	14	564	OK	16	562	OK	17	562	OK	17	561	OK
98436	SSL-02164	244	8	0.0045	5	563	OK	6	563	OK	6	562	OK	6	562	OK
98437	SSL-01208	382	8	0.0153	0	563	OK	0	563	OK	0	563	OK	0	563	OK
98438	SSL-02140	143	8	0.0080	23	567	OK	25	565	OK	26	564	OK	27	564	OK
98439	SSL-01308	199	8	0.0226	37	558	OK	29	566	OK	30	565	OK	30	564	OK
98440	SSL-01375	183	8	0.0013	43	567	OK	43	567	OK	45	566	OK	46	565	OK
98441	SSL-02162	220	8	0.0460	1,096	962	OK	1408	650	OK	1484	574	OK	1493	565	OK
98442	SSL-02090	177	8	0.0288	9	566	OK	8	566	OK	9	566	OK	9	566	OK
98443	SSL-02087	81	8	0.0351	81	584	OK	94	572	OK	98	568	OK	100	566	OK
98444	SSL-01372	210	8	0.0040	3	567	OK	3	567	OK	4	566	OK	4	566	OK
98445	SSL-02161	251	8	0.0037	45	577	OK	50	572	OK	54	568	OK	55	566	OK
98446	SSL-01415	208	8	0.0061	4	565	OK	2	567	OK	2	567	OK	2	567	OK
98447	SSL-02163	185	8	0.0368	8	568	OK	9	568	OK	9	567	OK	9	567	OK
98448	SSL-01403	259	8	0.0058	3	567	OK	2	567	OK	2	567	OK	2	567	OK
98449	SSL-01411	246	8	0.0209	1	568	OK	1	568	OK	1	568	OK	1	568	OK
98450	SSL-01417	273	8	0.0383	12	576	OK	18	570	OK	19	569	OK	20	568	OK
98451	SSL-00176	392	8	0.0200	874	827	OK	1021	680	OK	1093	609	OK	1133	569	OK
98452	SSL-01932	106	8	0.0064	729	429	OK	547	612	OK	578	580	OK	589	570	OK
98453	SSL-00174	27	8	0.0373	11	572	OK	12	571	OK	12	570	OK	13	570	OK
98454	SSL-00175	262	8	0.0173	12	570	OK	10	571	OK	10	571	OK	11	571	OK
98455	SSL-00426	247	8	0.0028	680	5419	DH, Backwater	3288	2811	DH, Backwater	4706	1393	HS, Backwater	5527	572	DH, Backwater
98456	SSL-00422	94	8	0.0534	17	575	OK	17	575	OK	19	573	OK	20	572	OK
98457	SSL-00421	106	8	0.0175	3	574	OK	3	574	OK	3	574	OK	3	574	OK
98458	SSL-02203	313	8	0.0040	7	581	OK	10	577	OK	13	575	OK	14	574	OK
98459	SSL-00351	105	8	0.0040	0	576	OK	0	576	OK	0	576	OK	0	576	OK
98460	SSL-00411	129	8	0.0028	2	577	OK	2	577	OK	2	577	OK	2	577	OK
98461	SSL-00414	249	8	0.0040	2	578	OK	3	577	OK	3	577	OK	3	577	OK
98462	SSL-00415	187	8	0.0043	2	578	OK	2	577	OK	2	577	OK	2	577	OK
98463	SSL-00425	80	8	0.0036	23	606	OK	36	593	OK	47	582	OK	52	577	OK
98464	SSL-01604	178	8	0.0038	7	579	OK	7	578	OK	7	578	OK	8	578	OK
98465	SSL-01424	173	8	0.0034	183	590	OK	183	590	OK	190	583	OK	194	579	OK
98466	SSL-01425	143	8	0.0045	16	585	OK	21	581	OK	22	580	OK	22	579	OK
98467	SSL-01426	169	8	0.0042	428	648	OK	467	609	OK	486	590	OK	496	580	OK
98468	SSL-00353	365	8	0.0035	26	584	OK	28	583	OK	29	581	OK	29	581	OK
98469	SSL-00998	100	8	0.0039	218	630	FM	260	588	FM	256	591	FM	266	582	FM
98470	SSL-00999	264	8	0.0038	233	632	FM	247	617	FM	270	594	FM	282	583	FM
98471	SSL-01001	131	8	0.0228	11	588	OK	12	587	OK	14	585	OK	14	585	OK
98472	SSL-01004	228	8	0.0368	95	602	OK	102	595	OK	110	588	OK	112	585	OK
98473	SSL-00352	109	8	0.0062	133	587	OK	126	594	OK	132	588	OK	134	585	OK
98474	SSL-00358	115	8	0.0035	43	590	OK	44	590	OK	45	588	OK	46	587	OK

Conduit ID	GIS ID	Length (ft)	Diameter (in)	Slope	Existing Condition			2025 Condition			2035 Condition			Buildout Condition		
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98475	SSL-00575	147	8	0.0050	1	587	OK	1	587	OK	1	587	OK	1	587	OK
98476	SSL-00577	149	8	0.0458	7	588	OK	8	588	OK	8	587	OK	8	587	OK
98477	SSL-00590	115	8	0.0381	0	588	OK	0	588	OK	0	588	OK	0	588	OK
98478	SSL-00591	293	8	0.0011	58	614	OK	65	607	OK	76	596	OK	81	590	OK
98479	SSL-00593	140	8	0.0279	4	592	OK	4	592	OK	4	592	OK	4	592	OK
98480	SSL-00596	115	8	0.0116	2	593	OK	2	592	OK	2	592	OK	2	592	OK
98481	SSL-00718	160	8	0.0059	6	594	OK	7	593	OK	8	593	OK	8	592	OK
98482	SSL-01291	443	8	0.0042	750	742	OK	831	661	OK	875	616	OK	898	593	OK
98483	SSL-00125	210	8	0.0150	4	595	OK	5	594	OK	5	594	OK	5	593	OK
98485	SSL-00031	210	8	0.0062	71	610	OK	82	599	OK	85	596	OK	87	594	OK
98486	SSL-01026	343	8	0.0041	10	597	OK	11	596	OK	12	595	OK	12	595	OK
98487	SSL-01123	245	8	0.0283	3	598	OK	5	597	OK	5	596	OK	5	596	OK
98488	SSL-02101	445	8	0.0040	2	597	OK	2	597	OK	2	597	OK	2	597	OK
98489	SSL-01121	103	8	0.0153	4	599	OK	4	598	OK	4	598	OK	5	598	OK
98490	SSL-01122	195	8	0.0039	65	600	OK	63	602	OK	66	600	OK	67	598	OK
98491	SSL-01125	217	8	0.0086	14	597	OK	11	600	OK	12	600	OK	12	599	OK
98492	SSL-01916	386	8	0.0050	13	595	OK	8	600	OK	8	600	OK	9	600	OK
98493	SSL-02097	454	8	0.0040	2	601	OK	2	601	OK	2	601	OK	2	600	OK
98494	SSL-01124	201	8	0.0047	1	601	OK	1	601	OK	1	601	OK	1	601	OK
98495	SSL-01917	317	8	0.0050	114	615	OK	121	608	OK	126	603	OK	128	601	OK
98496	SSL-00490	437	8	0.0083	163	636	OK	184	615	OK	179	620	OK	198	601	OK
98497	SSL-01284	66	8	0.0126	3	602	OK	3	602	OK	3	601	OK	3	601	OK
98498	SSL-01178	139	8	0.0154	5	603	OK	5	603	OK	5	603	OK	5	603	OK
98499	SSL-01042	50	8	0.1808	6	604	OK	6	603	OK	6	603	OK	6	603	OK
98500	SSL-01918	72	8	0.0050	9	604	OK	9	604	OK	10	603	OK	10	603	OK
98501	SSL-01786	149	8	0.0106	21	606	OK	22	605	OK	23	604	OK	24	603	OK
98502	SSL-01787	165	8	0.0099	16	614	OK	24	606	OK	25	605	OK	26	605	OK
98503	SSL-02096	405	8	0.0040	1	606	OK	2	605	OK	2	605	OK	2	605	OK
98504	SSL-00488	66	8	0.1166	8	603	OK	6	606	OK	6	605	OK	6	605	OK
98505	SSL-01340	7	8	0.0190	6	606	OK	6	606	OK	6	606	OK	6	605	OK
98506	SSL-01333	165	8	0.0040	21	610	OK	24	607	OK	25	606	OK	26	606	OK
98507	SSL-00028	396	8	0.0357	2	606	OK	2	606	OK	2	606	OK	2	606	OK
98508	SSL-01243	299	8	0.0098	233	642	OK	252	623	OK	262	613	OK	268	607	OK
98509	SSL-01545	66	8	0.0241	297	644	OK	322	620	OK	333	609	OK	334	608	OK
98510	SSL-01544	69	8	0.0120	1	609	OK	1	609	OK	1	609	OK	1	609	OK
98511	SSL-01282	276	8	0.0565	8	609	OK	8	610	OK	8	609	OK	8	609	OK
98512	SSL-01287	254	8	0.0039	13	611	OK	12	612	OK	13	611	OK	14	610	OK
98513	SSL-01283	265	8	0.0199	2	612	OK	4	611	OK	4	611	OK	4	611	OK
98514	SSL-01288	219	8	0.0025	750	767	OK	845	672	OK	849	668	OK	905	612	OK
98515	SSL-00486	292	8	0.0267	2	613	OK	3	613	OK	3	612	OK	3	612	OK
98519	SSL-01266	76	8	0.0039	0	617	OK	0	617	OK	0	617	OK	3	614	OK
98520	SSL-01754	42	8	0.0000	0	614	OK	0	614	OK	0	614	OK	0	614	OK
98522	SSL-02166	195	8	0.0045	9	620	OK	13	615	OK	14	615	OK	14	615	OK
98524	SSL-00099	228	8	0.0175	1	618	OK	2	618	OK	2	617	OK	2	617	OK
98525	SSL-00100	108	8	0.0090	14	613	OK	8	619	OK	9	618	OK	9	618	OK
98526	SSL-00101	143	8	0.0409	1	619	OK	2	618	OK	2	618	OK	2	618	OK
98527	SSL-00085	92	8	0.0411	8	618	OK	7	620	OK	8	619	OK	8	618	OK
98529	SSL-00794	305	8	0.0632	5	619	OK	4	620	OK	4	620	OK	4	620	OK
98531	SSL-00560	93	8	0.0605	41	591	OK	10	622	OK	11	622	OK	11	621	OK
98532	SSL-00995	192	8	0.0043	5	624	OK	6	622	OK	7	622	OK	7	622	OK
98534	SSL-01251	161	8	0.0733	0	622	OK	0	622	OK	0	622	OK	0	622	OK
98536	SSL-01261	137	8	0.0492	12	624	OK	13	623	OK	13	623	OK	13	623	OK
98537	SSL-01262	98	8	0.0060	13	625	OK	14	624	OK	15	623	OK	15	623	OK
98538	SSL-00792	335	8	0.0223	18	628	OK	21	625	OK	22	624	OK	23	623	OK

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98539	SSL-01263	181	8	0.0040	12	1016	OK	404	625	OK	404	624	OK	404	624	OK
98540	SSL-01280	81	8	0.0123	2	624	OK	2	624	OK	2	624	OK	2	624	OK
98541	SSL-00975	112	8	0.0062	0	625	OK	0	625	OK	0	625	OK	0	625	OK
98542	SSL-00527	53	8	0.1325	139	648	OK	148	640	OK	159	628	OK	162	625	OK
98543	SSL-00529	273	8	0.0279	151	750	OK	252	649	OK	268	633	OK	275	626	OK
98544	SSL-00754	367	8	0.0065	20	631	OK	22	629	OK	22	628	OK	23	628	OK
98545	SSL-00970	236	8	0.0245	2	629	OK	2	629	OK	2	629	OK	2	629	OK
98546	SSL-00978	114	8	0.0228	3	630	OK	3	630	OK	4	630	OK	4	629	OK
98547	SSL-00983	125	8	0.0136	5	631	OK	6	631	OK	6	631	OK	6	631	OK
98548	SSL-00828	123	8	0.0059	18	633	OK	19	632	OK	19	631	OK	20	631	OK
98549	SSL-00805	165	8	0.0929	154	724	OK	199	680	OK	232	647	OK	247	631	OK
98550	SSL-00825	142	8	0.0039	7	636	OK	11	632	OK	12	632	OK	12	631	OK
98551	SSL-00790	41	8	0.2573	248	660	OK	264	644	OK	274	634	OK	276	632	OK
98552	SSL-00793	96	8	0.0079	8	633	OK	8	633	OK	8	633	OK	9	632	OK
98553	SSL-00788	148	8	0.0156	4,813	4749	OK	7880	1682	OK	8566	996	OK	8930	633	OK
98554	SSL-00787	77	8	0.0384	10	634	OK	11	634	OK	11	633	OK	11	633	OK
98555	SSL-02404	233	8	0.0176	132	666	OK	155	644	OK	161	637	OK	165	634	OK
98556	SSL-02312	286	8	0.0165	3	635	OK	3	635	OK	3	635	OK	3	635	OK
98557	SSL-01865	484	8	0.0100	22	639	OK	24	637	OK	25	636	OK	25	636	OK
98558	SSL-01876	461	8	0.0040	13	650	OK	23	640	OK	25	637	OK	27	636	OK
98559	SSL-00791	309	8	0.0262	723	429	OK	487	665	OK	511	641	OK	516	637	OK
98560	SSL-01254	248	8	0.0246	1	639	OK	1	639	OK	1	639	OK	1	639	OK
98561	SSL-01133	142	8	0.0036	110	669	OK	131	647	OK	137	642	OK	140	639	OK
98562	SSL-01275	141	8	0.0227	5	640	OK	5	640	OK	5	640	OK	5	640	OK
98563	SSL-00568	199	8	0.0236	50	613	OK	20	643	OK	22	641	OK	23	640	OK
98564	SSL-01260	262	8	0.0039	38	648	OK	39	647	OK	43	643	OK	45	641	OK
98565	SSL-00795	202	8	0.0446	160	677	OK	181	656	OK	176	661	OK	194	643	OK
98566	SSL-00569	160	8	0.0038	14	651	OK	20	644	OK	21	643	OK	22	643	OK
98567	SSL-00168	219	8	0.0038	1	645	OK	1	645	OK	1	645	OK	1	645	OK
98568	SSL-00119	458	8	0.0037	4	643	OK	2	645	OK	2	645	OK	2	645	OK
98569	SSL-00404	62	8	0.0637	2	645	OK	2	645	OK	2	645	OK	2	645	OK
98570	SSL-00405	115	8	0.0782	45	618	OK	15	648	OK	16	647	OK	17	646	OK
98572	SSL-00649	181	8	0.0039	4	647	OK	3	647	OK	3	647	OK	3	647	OK
98573	SSL-00979	173	8	0.0185	1,244	1105	OK	1575	773	OK	1678	670	OK	1700	648	OK
98574	SSL-00971	349	8	0.0215	2	648	OK	1	649	OK	1	649	OK	1	649	OK
98575	SSL-00756	274	8	0.0210	111	656	OK	111	656	OK	115	651	OK	118	649	OK
98576	SSL-00757	86	8	0.0057	7	650	OK	8	649	OK	8	649	OK	8	649	OK
98577	SSL-01503	97	8	0.0198	6	650	OK	6	649	OK	6	649	OK	6	649	OK
98578	SSL-00789	156	8	0.0934	4	650	OK	4	649	OK	4	649	OK	4	649	OK
98579	SSL-01509	119	8	0.0337	5	649	OK	4	650	OK	4	650	OK	4	650	OK
98580	SSL-01175	125	8	0.1228	2	651	OK	2	651	OK	2	650	OK	3	650	OK
98582	SSL-00118	125	8	0.0040	15	662	OK	22	654	OK	23	653	OK	24	652	OK
98583	SSL-00121	188	8	0.0048	60	1056	OK	455	661	IH, Backwater	463	653	IH, Backwater	463	653	IH, Backwater
98584	SSL-00006	253	8	0.0234	11	656	OK	12	656	OK	13	654	OK	14	654	OK
98585	SSL-00120	208	8	0.0036	138	685	OK	156	667	OK	164	659	OK	168	655	OK
98586	SSL-00067	115	8	0.0049	4	657	OK	4	656	OK	5	656	OK	5	656	OK
98587	SSL-01298	321	8	0.0040	5	657	OK	5	657	OK	6	657	OK	6	656	OK
98588	SSL-00063	144	8	0.0326	12	659	OK	12	659	OK	13	658	OK	14	657	OK
98589	SSL-01299	213	8	0.0040	1	657	OK	1	657	OK	1	657	OK	1	657	OK
98590	SSL-01297	122	8	0.0040	2	658	OK	3	658	OK	3	658	OK	3	658	OK
98591	SSL-02207	289	8	0.0037	84	664	OK	84	664	OK	88	661	OK	90	659	OK
98592	SSL-00679	170	8	0.0584	1	660	OK	1	660	OK	2	660	OK	2	660	OK
98593	SSL-00696	263	8	0.0060	44	698	OK	63	678	OK	76	666	OK	81	660	OK
98594	SSL-00697	99	8	0.0070	7	663	OK	9	661	OK	9	661	OK	10	660	OK

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98595	SSL-00746	169	8	0.0125	3	661	OK	3	661	OK	3	661	OK	3	661	OK
98596	SSL-00695	101	8	0.0058	4	661	OK	4	661	OK	4	661	OK	4	661	OK
98597	SSL-01899	45	8	0.0058	1	664	OK	2	664	OK	2	664	OK	2	664	OK
98598	SSL-01905	347	8	0.0020	768	776	OK	850	695	HH, Backwater	866	679	HH, Backwater	880	664	HH, Backwater
98599	SSL-01091	136	8	0.0464	3	665	OK	4	664	OK	4	664	OK	4	664	OK
98600	SSL-01910	315	8	0.0040	4	668	OK	7	665	OK	7	665	OK	7	664	OK
98601	SSL-01900	388	8	0.0040	1,099	1062	OK	1411	750	OK	1487	674	OK	1496	665	OK
98604	SSL-00845	473	8	0.0056	3	668	OK	4	666	OK	4	666	OK	4	666	OK
98605	SSL-01922	272	8	0.0073	4	667	OK	4	667	OK	5	666	OK	5	666	OK
98607	SSL-01290	35	8	0.0043	0	667	OK	0	667	OK	0	667	OK	0	667	OK
98608	SSL-01136	118	8	0.0036	12	664	OK	9	667	OK	9	667	OK	10	667	OK
98609	SSL-01138	182	8	0.0035	863	714	OK	890	687	IH, Backwater	890	687	IH, Backwater	910	667	IH, Backwater
98610	SSL-01140	124	8	0.0049	140	701	OK	164	677	OK	171	670	OK	174	667	OK
98611	SSL-01142	159	8	0.0056	11	668	OK	11	668	OK	12	667	OK	12	667	OK
98612	SSL-00012	111	8	0.2040	6	668	OK	6	668	OK	6	668	OK	7	667	OK
98613	SSL-00013	49	8	0.0786	3	668	OK	3	668	OK	3	668	OK	3	668	OK
98614	SSL-00014	143	8	0.0050	104	660	OK	92	673	OK	95	670	OK	96	668	OK
98615	SSL-00015	99	8	0.0157	4	670	OK	5	669	OK	5	669	OK	5	668	OK
98616	SSL-00016	120	8	0.0907	6	670	OK	7	670	OK	8	669	OK	8	669	OK
98617	SSL-00076	86	8	0.0039	15	674	OK	17	672	OK	19	671	OK	19	670	OK
98618	SSL-00077	84	8	0.0082	17	674	OK	19	672	OK	20	671	OK	21	671	OK
98619	SSL-00080	113	8	0.1733	164	842	OK	324	682	OK	331	675	OK	335	671	OK
98620	SSL-00082	153	8	0.0247	2	672	OK	2	672	OK	3	672	OK	3	672	OK
98621	SSL-00089	110	8	0.0610	57	679	OK	61	676	OK	64	673	OK	65	672	OK
98622	SSL-00090	83	8	0.0007	0	673	OK	0	673	OK	0	673	OK	0	673	OK
98623	SSL-00095	223	8	0.0070	11	686	OK	20	677	OK	22	675	OK	23	674	OK
98624	SSL-00098	235	8	0.0043	4	673	OK	3	674	OK	3	674	OK	3	674	OK
98625	SSL-01176	103	8	0.0995	27	670	OK	21	675	OK	22	674	OK	22	674	OK
98626	SSL-01177	73	8	0.1045	14	676	OK	15	675	OK	15	675	OK	16	675	OK
98628	SSL-01076	232	8	0.0281	228	712	OK	247	693	OK	257	682	OK	262	677	OK
98629	SSL-01087	112	8	0.0500	2	678	OK	2	678	OK	2	678	OK	3	678	OK
98630	SSL-01089	190	8	0.0242	11	679	OK	11	679	OK	12	678	OK	12	678	OK
98631	SSL-00523	106	8	0.0168	3	679	OK	3	679	OK	3	679	OK	3	679	OK
98632	SSL-01151	96	8	0.0510	2	679	OK	3	679	OK	3	679	OK	3	679	OK
98633	SSL-00236	203	8	0.0035	4	681	OK	5	680	OK	6	679	OK	6	679	OK
98634	SSL-00877	118	8	0.0136	2	681	OK	2	681	OK	2	681	OK	2	681	OK
98635	SSL-00874	76	8	0.1549	36	683	OK	36	683	OK	37	682	OK	38	681	OK
98636	SSL-00875	87	8	0.0102	2	681	OK	2	681	OK	2	681	OK	2	681	OK
98637	SSL-01153	91	8	0.0149	3	682	OK	4	681	OK	4	681	OK	4	681	OK
98638	SSL-00909	85	8	0.0438	33	687	OK	33	686	OK	36	683	OK	38	682	OK
98639	SSL-00911	55	8	0.0145	36	693	OK	44	685	OK	45	683	OK	46	682	OK
98640	SSL-01615	188	8	0.0431	4	683	OK	4	683	OK	4	683	OK	4	683	OK
98641	SSL-00064	200	8	0.0433	7	684	OK	7	683	OK	8	683	OK	8	683	OK
98642	SSL-00912	192	8	0.0060	2	683	OK	3	683	OK	3	683	OK	3	683	OK
98643	SSL-01206	157	8	0.0558	34	683	OK	30	687	OK	31	686	OK	32	685	OK
98644	NoMatch	287	8	0.0217	51	698	OK	60	689	OK	62	687	OK	64	685	OK
98645	SSL-01410	17	8	0.0105	4	688	OK	5	688	OK	5	688	OK	5	688	OK
98646	SSL-00238	181	8	0.0300	21	692	OK	24	690	OK	25	689	OK	25	688	OK
98647	SSL-00270	261	8	0.0046	5	690	OK	6	689	OK	6	689	OK	6	689	OK
98648	SSL-00360	122	8	0.0135	764	780	OK	802	742	OK	836	708	OK	853	691	OK
98649	SSL-00271	225	8	0.0114	36	698	OK	40	695	OK	42	692	OK	43	691	OK
98650	SSL-00571	63	8	0.0369	17	695	OK	19	693	OK	20	692	OK	20	692	OK
98651	SSL-00362	211	8	0.0051	1,399	1145	OK	1817	727	OK	1842	703	OK	1852	692	OK
98652	SSL-00581	203	8	0.0597	14	695	OK	15	693	OK	16	692	OK	16	692	OK

Conduit ID	GIS ID	Length (ft)	Diameter (in)	Slope	Existing Condition			2025 Condition			2035 Condition			Buildout Condition		
					Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category	Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category	Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category	Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category
98653	SSL-00572	140	8	0.0100	123	707	OK	131	700	OK	136	695	OK	138	692	OK
98654	SSL-00365	185	8	0.0998	12	694	OK	12	693	OK	13	693	OK	13	693	OK
98655	SSL-00366	95	8	0.0326	119	708	OK	126	701	OK	131	696	OK	133	694	OK
98656	SSL-00369	187	8	0.0020	4	696	OK	4	696	OK	5	695	OK	5	695	OK
98657	SSL-00447	119	8	0.0040	2	696	OK	2	696	OK	2	696	OK	2	696	OK
98658	SSL-00608	126	8	0.0704	7	697	OK	7	696	OK	7	696	OK	8	696	OK
98659	SSL-00609	245	8	0.0064	7	697	OK	7	697	OK	7	697	OK	7	696	OK
98660	SSL-00610	242	8	0.0528	17	703	OK	19	701	OK	21	698	OK	22	697	OK
98661	SSL-00611	160	8	0.0321	2	698	OK	3	698	OK	3	698	OK	3	698	OK
98662	SSL-00612	331	8	0.0463	13	701	OK	14	700	OK	15	700	OK	15	699	OK
98663	SSL-01051	531	8	0.0050	11	701	OK	12	700	OK	12	700	OK	13	700	OK
98664	SSL-01016	128	8	0.0043	9	701	OK	9	701	OK	9	700	OK	10	700	OK
98665	SSL-01017	291	8	0.0044	8	700	OK	7	701	OK	7	700	OK	8	700	OK
98666	SSL-01018	239	8	0.0040	448	778	OK	491	735	OK	514	713	OK	526	700	OK
98667	SSL-01019	143	8	0.0356	2	701	OK	2	701	OK	2	701	OK	2	701	OK
98668	SSL-01020	248	8	0.0904	24	704	OK	25	702	OK	26	701	OK	27	701	OK
98669	SSL-01021	297	8	0.0426	39	708	OK	39	707	OK	43	703	OK	45	701	OK
98670	SSL-01022	146	8	0.0264	3	703	OK	3	703	OK	4	702	OK	4	702	OK
98671	SSL-01023	163	8	0.0151	82	713	OK	87	707	OK	91	704	OK	92	702	OK
98672	SSL-00784	26	8	0.0110	6	702	OK	5	704	OK	5	704	OK	5	704	OK
98674	SSL-00966	171	8	0.0554	42	713	OK	43	713	OK	47	708	OK	49	706	OK
98675	SSL-02198	156	8	0.0598	20	713	OK	25	708	OK	26	707	OK	27	706	OK
98676	SSL-00445	149	8	0.0306	8	710	OK	9	710	OK	9	710	OK	9	709	OK
98677	SSL-00785	72	8	0.0042	11	711	OK	12	710	OK	12	710	OK	13	710	OK
98678	SSL-00872	126	8	0.0031	14	708	OK	11	711	OK	12	710	OK	12	710	OK
98679	SSL-00057	120	8	0.1168	3	711	OK	3	711	OK	3	711	OK	3	711	OK
98680	SSL-00058	138	8	0.0243	0	712	OK	0	712	OK	0	712	OK	0	712	OK
98681	SSL-00905	108	8	0.0165	48	721	OK	49	720	OK	54	715	OK	57	712	OK
98682	SSL-00906	134	8	0.0051	35	718	OK	35	718	OK	38	714	OK	40	713	OK
98683	SSL-00907	168	8	0.0050	2	715	OK	2	715	OK	2	715	OK	2	715	OK
98684	SSL-01147	38	8	0.0068	3	715	OK	4	715	OK	4	715	OK	4	715	OK
98685	SSL-01612	267	8	0.0076	75	747	OK	86	736	OK	99	723	OK	106	716	OK
98686	SSL-01613	312	8	0.0038	12	718	OK	13	717	OK	13	717	OK	14	716	OK
98687	SSL-01241	237	8	0.0052	1	717	OK	2	717	OK	2	716	OK	2	716	OK
98688	SSL-01242	456	8	0.0046	5	717	OK	5	717	OK	6	717	OK	6	716	OK
98689	SSL-01392	125	8	0.0029	2	717	OK	2	717	OK	2	717	OK	2	717	OK
98690	SSL-01393	171	8	0.0121	31	721	OK	30	722	OK	34	718	OK	35	717	OK
98691	SSL-01394	296	8	0.0474	3	721	OK	4	719	OK	4	719	OK	4	719	OK
98692	SSL-01401	102	8	0.0137	22	799	OK	99	722	OK	100	721	OK	100	720	OK
98693	SSL-01402	65	8	0.0422	3	725	OK	3	725	OK	4	725	OK	4	725	OK
98694	SSL-01404	169	8	0.0410	22	729	OK	23	729	OK	25	726	OK	26	725	OK
98695	SSL-01405	198	8	0.0079	0	726	OK	0	726	OK	0	726	OK	0	726	OK
98696	SSL-01406	135	8	0.0323	52	743	OK	64	731	OK	67	728	OK	68	726	OK
98697	SSL-01408	214	8	0.0735	53	735	OK	55	733	OK	58	730	OK	59	729	OK
98698	SSL-01413	156	8	0.0225	2	730	OK	2	730	OK	2	730	OK	2	730	OK
98699	SSL-01416	61	8	0.0333	5	732	OK	6	731	OK	7	731	OK	7	731	OK
98700	SSL-01611	120	8	0.0788	0	731	OK	0	731	OK	0	731	OK	0	731	OK
98701	SSL-01395	211	8	0.0162	3	732	OK	3	732	OK	3	732	OK	3	732	OK
98702	SSL-01397	67	8	0.0045	460	815	OK	506	768	OK	530	744	OK	543	732	OK
98703	SSL-01398	135	8	0.1195	3	733	OK	3	733	OK	4	732	OK	4	732	OK
98704	SSL-01409	109	8	0.0069	3	735	OK	3	735	OK	4	735	OK	4	734	OK
98705	SSL-01414	131	8	0.0437	6	736	OK	4	737	OK	4	737	OK	5	737	OK
98706	SSL-01400	47	8	0.2235	2	737	OK	1	737	OK	1	737	OK	1	737	OK
98707	SSL-00019	184	8	0.0040	4	736	OK	3	737	OK	3	737	OK	3	737	OK

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98708	SSL-00055	300	8	0.0268	10	737	OK	7	741	OK	7	740	OK	7	740	OK
98709	SSL-00056	112	8	0.0530	4,706	3547	OK	6796	1457	OK	7264	989	OK	7512	740	OK
98710	SSL-00673	169	8	0.0089	2	742	OK	2	742	OK	2	741	OK	2	741	OK
98711	SSL-01811	366	8	0.0040	10	750	OK	16	744	OK	18	742	OK	19	741	OK
98712	SSL-01812	292	8	0.0038	2	741	OK	1	742	OK	1	742	OK	1	742	OK
98713	SSL-01816	375	8	0.0040	2	741	OK	1	742	OK	1	742	OK	1	742	OK
98714	SSL-01817	286	8	0.0058	4	745	OK	5	744	OK	5	743	OK	5	743	OK
98715	SSL-01822	321	8	0.0039	0	744	OK	0	744	OK	0	744	OK	0	744	OK
98716	SSL-01823	315	8	0.0040	85	761	OK	90	756	OK	98	748	OK	101	744	OK
98717	SSL-01830	170	8	0.0400	3	744	OK	2	745	OK	2	744	OK	2	744	OK
98718	SSL-01831	444	8	0.0153	1	746	OK	1	746	OK	2	746	OK	2	746	OK
98719	SSL-01832	191	8	0.0029	0	746	OK	0	746	OK	0	746	OK	0	746	OK
98720	SSL-00822	164	8	0.0040	0	747	OK	0	747	OK	0	747	OK	0	747	OK
98721	SSL-00834	99	8	0.0713	11	748	OK	10	749	OK	11	749	OK	11	748	OK
98722	SSL-01012	167	8	0.0668	28	755	OK	33	751	OK	34	749	OK	35	748	OK
98723	SSL-01888	367	8	0.0040	0	749	OK	0	749	OK	0	749	OK	0	749	OK
98724	SSL-01663	50	8	0.0085	0	749	OK	0	749	OK	0	749	OK	0	749	OK
98725	SSL-01894	24	8	0.0752	28	769	OK	38	759	OK	45	752	OK	48	749	OK
98726	SSL-01950	379	8	0.0059	2	751	OK	4	749	OK	4	749	OK	5	749	OK
98727	SSL-01956	301	8	0.0040	0	749	OK	0	749	OK	0	749	OK	0	749	OK
98728	SSL-01958	285	8	0.0040	0	750	OK	0	750	OK	0	750	OK	0	750	OK
98729	SSL-01960	141	8	0.0040	55	735	OK	37	752	OK	39	751	OK	40	750	OK
98730	SSL-01961	260	8	0.0040	0	751	OK	0	751	OK	0	751	OK	0	751	OK
98731	SSL-01965	501	8	0.0040	8	752	OK	9	751	OK	9	751	OK	9	751	OK
98732	SSL-01889	260	8	0.0141	3	754	OK	6	752	OK	6	752	OK	7	751	OK
98733	SSL-01891	124	8	0.0437	456	1166	OK	841	780	IH, Backwater	857	764	IH, Backwater	870	752	IH, Backwater
98734	SSL-01967	12	8	0.0016	9	754	OK	11	753	OK	11	752	OK	12	752	OK
98735	SSL-01885	171	8	0.0023	0	752	OK	0	752	OK	0	752	OK	0	752	OK
98736	SSL-01892	105	8	0.0010	10	754	OK	11	753	OK	12	753	OK	12	753	OK
98737	SSL-00117	276	8	0.0030	140	747	OK	127	759	OK	131	755	OK	134	753	OK
98738	SSL-00116	152	8	0.0043	0	753	OK	0	753	OK	0	753	OK	0	753	OK
98739	SSL-00008	21	8	0.0387	0	754	OK	0	754	OK	0	754	OK	0	754	OK
98740	SSL-00114	36	8	0.0039	4	755	OK	3	755	OK	4	755	OK	4	754	OK
98741	SSL-00115	282	8	0.0045	0	755	OK	0	755	OK	0	755	OK	0	755	OK
98742	SSL-01657	172	8	0.0058	8	758	OK	8	757	OK	9	757	OK	9	757	OK
98743	SSL-01887	370	8	0.0064	1,765	1012	OK	1756	1021	OK	1739	1038	OK	2019	758	OK
98744	SSL-00992	320	8	0.0039	4	759	OK	4	759	OK	4	759	OK	4	759	OK
98745	SSL-00987	101	8	0.0058	251	797	OK	271	777	OK	283	766	OK	288	760	OK
98746	SSL-00071	73	8	0.0139	80	763	OK	78	765	OK	81	762	OK	83	760	OK
98747	SSL-01129	127	8	0.0063	3	760	OK	2	760	OK	2	760	OK	2	760	OK
98748	SSL-01135	140	8	0.0246	214	767	OK	206	775	OK	215	766	OK	219	761	OK
98749	SSL-01245	126	8	0.0052	4	761	OK	3	762	OK	3	762	OK	3	762	OK
98750	SSL-01253	149	8	0.0113	7	767	OK	11	763	OK	11	762	OK	12	762	OK
98751	SSL-01247	110	8	0.0785	10	922	OK	169	764	OK	169	763	OK	170	763	OK
98752	SSL-01255	86	8	0.0774	30	764	OK	26	768	OK	29	765	OK	30	764	OK
98753	SSL-01256	126	8	0.0605	1	764	OK	1	764	OK	1	764	OK	1	764	OK
98754	SSL-01257	128	8	0.0373	0	764	OK	0	764	OK	0	764	OK	0	764	OK
98755	SSL-01258	112	8	0.1088	2	767	OK	3	765	OK	3	765	OK	4	765	OK
98756	SSL-01259	108	8	0.0606	1,778	900	OK	1764	914	OK	1749	929	OK	1910	768	IH, Backwater
98757	SSL-01273	239	8	0.0106	6	772	OK	10	769	OK	10	769	OK	10	769	OK
98758	SSL-01475	158	8	0.0100	23	773	OK	25	771	OK	26	770	OK	26	769	OK
98759	SSL-02197	249	8	0.0073	20	769	OK	18	771	OK	19	770	OK	20	770	OK
98760	SSL-01248	151	8	0.0329	24	773	OK	24	772	OK	25	771	OK	26	771	OK
98761	SSL-01249	140	8	0.0544	9	773	OK	9	773	OK	10	772	OK	10	772	OK

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98762	SSL-01264	182	8	0.0162	48	774	OK	46	775	OK	48	773	OK	49	772	OK
98763	SSL-01265	158	8	0.0114	5	773	OK	5	773	OK	6	773	OK	6	773	OK
98764	SSL-01267	110	8	0.0180	2	773	OK	3	773	OK	3	773	OK	3	773	OK
98765	SSL-01268	132	8	0.0303	5	774	OK	4	776	OK	4	776	OK	4	775	OK
98766	SSL-01269	147	8	0.1077	1,390	1228	OK	1807	811	OK	1830	787	OK	1840	777	OK
98767	SSL-01270	140	8	0.1055	242	918	OK	353	808	OK	372	788	OK	381	779	OK
98768	SSL-01767	67	8	0.0585	9	780	OK	10	780	OK	10	779	OK	10	779	OK
98769	SSL-01766	312	8	0.0065	22	783	OK	23	782	OK	24	781	OK	25	781	OK
98770	SSL-01638	246	8	0.0047	1	783	OK	2	782	OK	3	782	OK	3	782	OK
98771	SSL-01343	209	8	0.0305	2	782	OK	2	782	OK	2	782	OK	2	782	OK
98772	SSL-01344	370	8	0.0040	3	783	OK	3	782	OK	4	782	OK	4	782	OK
98773	SSL-01345	158	8	0.0040	7	787	OK	11	783	OK	11	783	OK	11	783	OK
98774	SSL-01382	28	8	0.0120	20	783	OK	19	785	OK	20	784	OK	20	784	OK
98775	SSL-01383	134	8	0.0063	3	784	OK	3	784	OK	3	784	OK	3	784	OK
98776	SSL-01385	231	8	0.0375	36	793	OK	39	789	OK	41	788	OK	42	787	OK
98777	SSL-01386	215	8	0.0443	2	788	OK	3	788	OK	3	788	OK	3	788	OK
98778	SSL-01387	227	8	0.0239	145	826	OK	170	802	OK	165	806	OK	182	790	OK
98779	SSL-01389	206	8	0.0433	5	791	OK	5	790	OK	6	790	OK	6	790	OK
98780	SSL-01390	257	8	0.0042	3	791	OK	4	790	OK	4	790	OK	4	790	OK
98781	SSL-01546	101	8	0.0262	43	798	OK	48	794	OK	50	792	OK	51	791	OK
98782	SSL-00001	361	8	0.0040	13	797	OK	14	796	OK	16	794	OK	16	794	OK
98783	SSL-00002	155	8	0.0296	0	794	OK	0	794	OK	0	794	OK	0	794	OK
98784	SSL-00093	239	8	0.0067	415	907	OK	510	812	OK	512	810	OK	528	794	IH, Backwater
98785	SSL-01117	363	8	0.0039	5	798	OK	6	797	OK	7	796	OK	7	796	OK
98788	SSL-01141	200	8	0.0044	1	797	OK	2	797	OK	2	797	OK	2	796	OK
98789	SSL-00088	197	8	0.0077	5	797	OK	6	797	OK	6	797	OK	6	797	OK
98790	SSL-01132	300	8	0.0045	1	798	OK	1	798	OK	1	797	OK	1	797	OK
98791	SSL-00103	186	8	0.0269	1	798	OK	1	799	OK	1	799	OK	1	799	OK
98792	SSL-00084	185	8	0.0271	7	800	OK	7	799	OK	7	799	OK	8	799	OK
98793	SSL-00096	217	8	0.0435	729	663	OK	550	842	OK	582	810	OK	593	800	OK
98794	SSL-00092	216	8	0.0188	11	801	OK	12	801	OK	13	800	OK	13	800	OK
98795	SSL-01252	245	8	0.0951	2	802	OK	2	802	OK	2	802	OK	2	802	OK
98796	SSL-01246	187	8	0.1111	4	802	OK	5	802	OK	5	802	OK	5	802	OK
98797	SSL-00091	117	8	0.0057	50	812	OK	53	810	OK	58	805	OK	61	802	OK
98798	SSL-00086	115	8	0.0277	3	802	OK	2	803	OK	2	802	OK	3	802	OK
98799	SSL-00087	173	8	0.0450	10	804	OK	10	803	OK	11	803	OK	11	802	OK
98800	SSL-00075	198	8	0.0040	1	803	OK	1	803	OK	2	803	OK	2	803	OK
98801	SSL-00078	173	8	0.0671	0	803	OK	0	803	OK	0	803	OK	0	803	OK
98802	SSL-00074	283	8	0.0735	0	804	OK	0	804	OK	0	804	OK	0	804	OK
98803	SSL-00072	187	8	0.0461	280	836	OK	297	819	OK	308	807	OK	311	805	OK
98804	SSL-00073	300	8	0.0471	185	807	OK	168	824	OK	167	826	OK	187	805	OK
98805	SSL-02196	68	8	0.1401	182	1010	OK	373	819	OK	384	808	OK	387	805	OK
98806	SSL-01292	264	8	0.0040	4	806	OK	4	805	OK	4	805	OK	4	805	OK
98807	SSL-01293	83	8	0.0134	3	806	OK	3	806	OK	3	805	OK	3	805	OK
98808	SSL-01829	225	8	0.0040	270	837	OK	287	820	OK	298	809	OK	300	807	OK
98809	SSL-01655	183	8	0.0038	195	941	OK	302	833	OK	320	816	OK	328	807	OK
98810	SSL-01833	243	8	0.0030	271	839	OK	288	822	OK	299	811	OK	302	809	OK
98811	SSL-00780	87	8	0.0092	7	811	OK	8	810	OK	9	810	OK	9	810	OK
98812	SSL-00781	132	8	0.0040	34	805	OK	26	812	OK	27	811	OK	28	811	OK
98813	SSL-00783	108	8	0.0039	3	814	OK	5	813	OK	5	812	OK	5	812	OK
98814	SSL-01835	386	8	0.0122	2	813	OK	2	813	OK	2	813	OK	2	813	OK
98815	SSL-01897	162	8	0.0314	4	814	OK	4	814	OK	4	814	OK	5	814	OK
98816	SSL-01788	146	8	0.0041	78	833	OK	91	820	OK	94	816	OK	96	814	OK
98817	SSL-01789	179	8	0.0040	56	819	OK	55	819	OK	58	816	OK	59	815	OK

Conduit ID	GIS ID	Length (ft)	Diameter (in)	Slope	Existing Condition			2025 Condition			2035 Condition			Buildout Condition		
					Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category	Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category	Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category	Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category
98818	SSL-01896	69	8	0.0059	5	818	OK	6	817	OK	6	816	OK	7	816	OK
98819	SSL-01025	76	8	0.0029	87	822	OK	88	822	OK	91	819	OK	93	817	OK
98820	SSL-01111	200	8	0.0065	0	817	OK	0	817	OK	0	817	OK	0	817	OK
98821	SSL-00778	226	8	0.0153	27	825	OK	28	824	OK	29	823	OK	30	822	OK
98822	SSL-01775	247	8	0.0033	2	823	OK	2	823	OK	2	823	OK	2	823	OK
98823	SSL-01654	398	8	0.0048	11	824	OK	9	826	OK	9	826	OK	9	825	OK
98824	SSL-01384	90	8	0.0022	109	841	OK	117	833	OK	122	828	OK	124	826	OK
98825	SSL-01391	64	8	0.1194	36	825	OK	32	829	OK	34	827	OK	34	827	OK
98826	SSL-01656	397	8	0.0150	3	826	OK	2	827	OK	2	827	OK	2	827	OK
98827	SSL-01548	97	8	0.0038	5	829	OK	5	828	OK	6	828	OK	6	828	OK
98828	SSL-01774	206	8	0.0243	12	831	OK	15	829	OK	15	829	OK	16	828	OK
98829	SSL-02071	233	8	0.0678	31	827	OK	28	830	OK	29	829	OK	30	828	OK
98830	SSL-02070	63	8	0.0156	1	829	OK	1	829	OK	1	829	OK	1	829	OK
98831	SSL-02137	28	8	0.0080	38	832	OK	36	834	OK	38	832	OK	39	831	OK
98832	SSL-00920	470	8	0.0244	1,383	1280	OK	1799	864	OK	1822	841	OK	1831	832	OK
98833	SSL-02057	27	8	0.0040	3	832	OK	3	832	OK	3	832	OK	3	832	OK
98834	SSL-02061	286	8	0.0034	11	836	OK	12	835	OK	14	833	OK	14	833	OK
98835	SSL-02168	27	8	0.0049	16	835	OK	18	834	OK	18	833	OK	19	833	OK
98836	SSL-00933	159	8	0.0052	834	1210	OK	1131	913	DH, Backwater	1192	852	DH, Backwater	1209	834	DH, Backwater
98837	SSL-00939	208	8	0.0142	23	840	OK	26	836	OK	27	835	OK	28	835	OK
98838	SSL-00930	90	8	0.0060	12	837	OK	13	837	OK	14	836	OK	14	836	OK
98839	SSL-00931	235	8	0.0204	7	838	OK	9	836	OK	9	836	OK	9	836	OK
98840	SSL-00934	179	8	0.0050	4	838	OK	4	838	OK	4	838	OK	4	838	OK
98841	SSL-00105	168	8	0.0009	3	838	OK	3	838	OK	3	838	OK	3	838	OK
98842	SSL-00620	480	8	0.0211	145	2078	OK	1345	877	OK	1371	852	OK	1383	840	OK
98843	SSL-01066	121	8	0.0098	7	840	OK	5	842	OK	5	841	OK	5	841	OK
98844	SSL-01064	190	8	0.0092	3	842	OK	3	841	OK	3	841	OK	3	841	OK
98845	SSL-01065	174	8	0.0105	3	842	OK	3	842	OK	4	842	OK	4	842	OK
98846	SSL-01054	164	8	0.0158	6	844	OK	6	844	OK	6	843	OK	6	843	OK
98847	SSL-00047	100	8	0.0020	4	844	OK	4	844	OK	4	844	OK	4	843	OK
98848	SSL-00626	163	8	0.0177	13	847	OK	14	846	OK	14	846	OK	15	845	OK
98849	SSL-00627	171	8	0.0304	1	847	OK	1	847	OK	1	847	OK	1	847	OK
98850	SSL-00629	289	8	0.0297	1	849	OK	2	848	OK	2	848	OK	2	848	OK
98851	SSL-00634	303	8	0.0073	1	849	OK	1	849	OK	1	849	OK	2	849	OK
98852	SSL-00203	202	8	0.0280	0	851	OK	0	851	OK	0	851	OK	0	851	OK
98853	SSL-01676	399	8	0.0039	33	857	OK	35	855	OK	36	854	OK	37	853	OK
98854	SSL-02209	192	8	0.0348	19	860	OK	21	857	OK	23	855	OK	25	854	OK
98855	SSL-01056	260	8	0.0149	3	860	OK	4	858	OK	5	857	OK	5	857	OK
98856	SSL-00647	261	8	0.0380	13	862	OK	16	858	OK	17	858	OK	18	857	OK
98857	SSL-01062	509	8	0.0145	7	858	OK	7	858	OK	7	858	OK	7	857	OK
98858	SSL-00762	212	8	0.0040	2	859	OK	2	859	OK	2	859	OK	2	859	OK
98859	SSL-00624	176	8	0.0173	125	887	OK	142	870	OK	149	864	OK	152	860	OK
98860	SSL-00625	168	8	0.0082	87	874	OK	94	866	OK	98	863	OK	100	861	OK
98861	SSL-00764	181	8	0.0237	5	863	OK	5	862	OK	5	862	OK	6	862	OK
98862	SSL-00922	203	8	0.0115	33	869	OK	36	867	OK	37	865	OK	38	864	OK
98863	SSL-00925	88	8	0.0601	70	866	OK	67	869	OK	69	866	OK	71	865	OK
98864	SSL-00048	116	8	0.0004	14	867	OK	13	868	OK	15	866	OK	15	866	OK
98865	SSL-01277	261	8	0.0038	232	1080	OK	424	888	OK	444	869	OK	446	867	OK
98866	SSL-00196	338	8	0.0040	40	876	OK	42	874	OK	47	869	OK	50	867	OK
98867	SSL-00211	388	8	0.0181	1	867	OK	1	867	OK	1	867	OK	1	867	OK
98868	SSL-02056	140	8	0.0033	23	870	OK	24	869	OK	25	868	OK	25	868	OK
98869	SSL-02063	205	8	0.0040	92	882	OK	100	874	OK	104	871	OK	106	869	OK
98870	SSL-01506	193	8	0.0024	1	871	OK	1	871	OK	1	871	OK	1	871	OK
98871	SSL-01508	74	8	0.0066	4	871	OK	4	871	OK	4	871	OK	4	871	OK

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98872	SSL-01505	56	8	0.0186	6	873	OK	6	872	OK	7	872	OK	7	872	OK
98873	SSL-01504	89	8	0.0217	28	951	OK	105	874	OK	106	873	OK	107	872	OK
98874	SSL-01496	134	8	0.0182	2	875	OK	2	875	OK	2	875	OK	2	875	OK
98875	SSL-00060	254	8	0.0276	26	954	OK	103	877	OK	104	876	OK	104	875	OK
98876	SSL-01207	168	8	0.1052	29	875	OK	26	878	OK	27	877	OK	27	876	OK
98877	SSL-01336	132	8	0.0082	3	878	OK	4	877	OK	4	877	OK	4	877	OK
98878	SSL-00062	199	8	0.0326	245	907	OK	267	885	OK	275	877	OK	275	877	OK
98879	SSL-01338	84	8	0.0198	152	887	OK	152	887	OK	158	881	OK	161	878	OK
98881	SSL-00066	110	8	0.0136	107	878	OK	100	885	OK	104	881	OK	106	879	OK
98882	SSL-01659	48	8	0.0050	4	881	OK	4	880	OK	4	880	OK	4	880	OK
98883	SSL-01895	231	8	0.0054	437	1049	OK	501	985	OK	573	912	OK	605	880	OK
98884	SSL-00536	234	8	0.0015	18	882	OK	17	882	OK	18	881	OK	18	881	OK
98885	SSL-00532	371	8	0.0041	0	881	OK	0	881	OK	0	881	OK	0	881	OK
98886	SSL-00531	328	8	0.0041	2	882	OK	2	882	OK	2	882	OK	2	882	OK
98887	SSL-00254	165	8	0.0081	60	880	OK	54	886	OK	57	884	OK	58	882	OK
98895	SSL-00068	145	8	0.0048	2	885	OK	2	884	OK	2	884	OK	2	884	OK
98896	SSL-00052	232	8	0.0129	5	885	OK	5	885	OK	5	885	OK	5	885	OK
98898	SSL-00918	374	8	0.0041	2	886	OK	2	886	OK	3	886	OK	3	886	OK
98899	SSL-00124	236	8	0.0038	25	889	OK	26	888	OK	27	887	OK	28	886	OK
98900	SSL-00123	143	8	0.0050	13	888	OK	14	887	OK	14	887	OK	14	886	OK
98901	SSL-00122	220	8	0.0041	0	888	OK	0	888	OK	0	888	OK	0	888	OK
98902	SSL-02192	145	8	0.0290	2	889	OK	2	889	OK	2	889	OK	2	889	OK
98903	SSL-02191	113	8	0.0292	1,115	1293	OK	1429	979	OK	1508	900	OK	1519	889	OK
98904	SSL-00986	209	8	0.0040	77	907	OK	88	896	OK	91	892	OK	93	890	OK
98905	SSL-02200	77	8	0.0370	326	693	OK	121	897	OK	126	893	OK	128	891	OK
98906	SSL-00714	181	8	0.0221	62	916	OK	70	908	OK	82	896	OK	87	891	OK
98907	SSL-00446	113	8	0.0040	27	891	OK	24	893	OK	26	892	OK	26	891	OK
98908	SSL-00444	132	8	0.0039	6	894	OK	7	894	OK	7	893	OK	7	893	OK
98909	SSL-00806	193	8	0.0208	6	900	OK	10	896	OK	11	895	OK	12	894	OK
98910	SSL-00937	220	8	0.0036	139	899	OK	132	907	OK	126	912	OK	142	896	OK
98911	SSL-00802	127	8	0.0221	5	900	OK	6	899	OK	7	899	OK	7	899	OK
98912	SSL-01605	300	8	0.0047	78	915	OK	89	904	OK	93	901	OK	94	899	OK
98913	SSL-00310	291	8	0.0040	10	903	OK	12	901	OK	13	900	OK	14	899	OK
98914	SSL-00315	164	8	0.0032	43	870	OK	13	900	OK	13	900	OK	14	899	OK
98915	SSL-00413	115	8	0.0052	1	900	OK	2	900	OK	2	900	OK	2	900	OK
98916	SSL-00813	222	8	0.0594	2	900	OK	2	900	OK	2	900	OK	2	900	OK
98917	SSL-00635	275	8	0.0270	8	901	OK	9	901	OK	9	900	OK	10	900	OK
98918	SSL-00720	167	8	0.0058	34	911	OK	41	904	OK	43	902	OK	44	901	OK
98919	SSL-00462	103	8	0.0256	4	903	OK	4	902	OK	5	902	OK	5	902	OK
98920	SSL-00463	199	8	0.0497	24	900	OK	21	904	OK	22	903	OK	22	902	OK
98921	SSL-00458	144	8	0.0037	726	743	OK	527	942	OK	558	911	OK	567	902	OK
98922	SSL-00580	149	8	0.0134	8	905	OK	8	904	OK	9	904	OK	9	904	OK
98923	SSL-00595	152	8	0.0131	8	909	OK	11	906	OK	11	905	OK	11	905	OK
98924	SSL-00576	92	8	0.0069	2	907	OK	3	906	OK	3	906	OK	4	906	OK
98925	SSL-00455	142	8	0.0529	4	908	OK	5	907	OK	5	907	OK	5	907	OK
98926	SSL-00592	145	8	0.0045	1,113	1313	OK	1427	999	OK	1506	920	OK	1517	909	OK
98927	SSL-00465	319	8	0.0031	234	1048	OK	344	938	OK	363	918	OK	372	909	OK
98928	SSL-00588	141	8	0.0169	2	910	OK	2	910	OK	2	910	OK	2	910	OK
98929	SSL-00640	90	8	0.0444	2	910	OK	2	910	OK	2	910	OK	2	910	OK
98930	SSL-01166	111	8	0.1022	149	915	OK	143	922	OK	149	916	OK	152	912	OK
98931	SSL-00320	214	8	0.0034	3	917	OK	5	915	OK	5	914	OK	6	914	OK
98932	SSL-00689	336	8	0.0061	3	916	OK	2	917	OK	2	917	OK	2	917	OK
98933	SSL-00686	151	8	0.0246	356	1321	OK	740	937	OK	750	926	OK	760	917	OK
98934	SSL-00963	145	8	0.0437	2	918	OK	2	919	OK	2	919	OK	2	919	OK

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98935	SSL-00859	115	8	0.0042	769	923	OK	707	985	OK	771	921	OK	773	919	OK
98936	SSL-00687	136	8	0.0536	4	920	OK	4	920	OK	4	920	OK	4	920	OK
98937	SSL-00751	138	8	0.0240	65	929	OK	68	926	OK	71	923	OK	73	921	OK
98938	SSL-01473	89	8	0.0171	11	921	OK	10	923	OK	10	922	OK	11	922	OK
98939	SSL-01164	177	8	0.0703	7	923	OK	8	923	OK	8	922	OK	8	922	OK
98940	SSL-00737	237	8	0.0330	0	923	OK	0	923	OK	0	923	OK	0	923	OK
98941	SSL-00690	65	8	0.0414	33	926	OK	29	929	OK	32	926	OK	34	924	OK
98942	SSL-00628	148	8	0.0313	2	925	OK	1	925	OK	1	925	OK	2	925	OK
98944	SSL-00389	262	8	0.0006	22	1109	OK	204	927	OK	205	926	OK	205	926	OK
98945	SSL-00584	135	8	0.0056	65	1002	OK	81	985	OK	112	955	OK	138	929	OK
98947	SSL-00586	158	8	0.0134	0	929	OK	0	929	OK	0	929	OK	0	929	OK
98948	SSL-00398	325	8	0.0050	1	930	OK	2	929	OK	2	929	OK	2	929	OK
98949	SSL-00399	92	8	0.0022	15	933	OK	16	932	OK	17	931	OK	17	931	OK
98950	SSL-00642	79	8	0.0875	2	932	OK	2	932	OK	2	932	OK	3	932	OK
98951	SSL-00698	133	8	0.0047	67	940	OK	71	936	OK	74	933	OK	75	932	OK
98952	SSL-00701	196	8	0.0061	46	939	OK	49	936	OK	51	934	OK	53	933	OK
98953	SSL-00703	62	8	0.0059	2	933	OK	2	933	OK	2	933	OK	2	933	OK
98954	SSL-00113	152	8	0.0052	4	935	OK	5	935	OK	5	935	OK	5	935	OK
98955	SSL-00901	123	8	0.0686	21	938	OK	22	937	OK	23	936	OK	23	935	OK
98956	SSL-01183	228	8	0.0477	297	968	OK	315	950	OK	327	938	OK	330	935	OK
98957	SSL-01220	236	8	0.0041	33	943	OK	34	941	OK	36	940	OK	36	939	OK
98958	SSL-01181	171	8	0.0036	5	941	OK	5	940	OK	6	940	OK	6	940	OK
98959	SSL-00902	125	8	0.0558	853	985	OK	879	960	DH, Backwater	880	959	DH, Backwater	898	940	DH, Backwater
98960	SSL-00880	332	8	0.0128	107	949	OK	108	948	OK	113	943	OK	115	941	OK
98961	SSL-01185	128	8	0.0185	34	939	OK	30	943	OK	31	942	OK	32	941	OK
98962	SSL-01184	299	8	0.0207	0	942	OK	0	942	OK	0	942	OK	0	942	OK
98964	SSL-01824	38	8	0.0039	16	947	OK	19	944	OK	20	943	OK	20	943	OK
98965	SSL-01827	411	8	0.0022	5	943	OK	5	943	OK	5	943	OK	6	943	OK
98966	SSL-01828	104	8	0.0019	7	946	OK	8	945	OK	8	945	OK	8	945	OK
98967	SSL-01933	15	8	0.0053	44	1137	OK	232	949	OK	234	947	OK	235	946	OK
98968	SSL-01941	204	8	0.0040	4	946	OK	3	947	OK	3	947	OK	4	946	OK
98969	SSL-01943	230	8	0.0040	0	947	OK	0	947	OK	0	947	OK	0	947	OK
98970	SSL-02160	20	8	0.0035	139	1029	OK	178	990	OK	207	961	OK	221	947	OK
98971	SSL-00959	31	8	0.0039	71	934	OK	55	951	OK	57	949	OK	58	948	OK
98973	SSL-00976	81	8	0.0283	1	948	OK	1	948	OK	2	948	OK	2	948	OK
98974	SSL-01030	387	8	0.0039	1	952	OK	1	952	OK	1	952	OK	2	952	OK
98975	SSL-01583	450	8	0.0043	6	953	OK	6	952	OK	6	952	OK	6	952	OK
98976	SSL-01029	500	8	0.0042	2,492	2307	OK	3302	1497	OK	3573	1226	OK	3845	954	OK
98977	SSL-01028	287	8	0.0032	48	955	OK	45	958	OK	47	956	OK	48	955	OK
98978	SSL-01041	276	8	0.0376	4	956	OK	4	956	OK	4	956	OK	4	956	OK
98979	SSL-01044	150	8	0.0104	25	961	OK	28	958	OK	29	957	OK	30	956	OK
98980	SSL-01045	98	8	0.0104	2	959	OK	2	959	OK	2	959	OK	2	959	OK
98981	SSL-01469	43	8	0.0212	163	1061	OK	210	1014	OK	246	978	OK	263	962	OK
98982	SSL-01470	195	8	0.0516	3	964	OK	3	964	OK	3	963	OK	4	963	OK
98983	NoMatch	33	8	0.0093	0	964	OK	0	964	OK	0	964	OK	0	964	OK
98985	SSL-01499	70	8	0.0040	2	965	OK	1	965	OK	1	965	OK	1	965	OK
98986	SSL-01500	45	8	0.0053	3	964	OK	1	965	OK	1	965	OK	1	965	OK
98987	SSL-01467	73	8	0.0054	6	967	OK	6	966	OK	6	966	OK	6	966	OK
98988	SSL-00900	81	8	0.0059	1	967	OK	1	966	OK	1	966	OK	2	966	OK
98989	SSL-00913	166	8	0.0023	4	967	OK	4	967	OK	4	967	OK	4	967	OK
98990	SSL-00914	377	8	0.0040	79	952	OK	60	971	OK	62	969	OK	63	967	OK
98991	SSL-00915	379	8	0.0040	1	970	OK	3	969	OK	3	969	OK	4	968	IH, Backwater
98993	SSL-00416	101	8	0.0029	1	972	OK	2	971	OK	2	971	OK	2	971	OK
98994	SSL-00364	145	8	0.0087	3	972	OK	3	972	OK	3	972	OK	3	972	OK

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98995	SSL-00800	171	8	0.0356	11	974	OK	12	973	OK	13	972	OK	13	972	OK
98996	SSL-00241	169	8	0.0047	3	977	OK	5	975	OK	5	975	OK	5	975	OK
98997	SSL-00827	225	8	0.0430	2	977	OK	3	976	OK	3	976	OK	3	976	OK
98998	SSL-02201	189	8	0.0140	12	981	OK	15	977	OK	16	977	OK	16	976	OK
98999	SSL-01186	80	8	0.0416	220	988	OK	212	996	OK	222	986	OK	231	977	IH, Backwater
99000	SSL-01182	276	8	0.0400	765	1091	OK	846	1011	OK	862	995	OK	876	980	OK
99001	SSL-00881	138	8	0.0535	245	1120	OK	356	1010	OK	376	990	OK	385	981	OK
99003	SSL-01048	417	8	0.0040	64	1005	OK	76	993	OK	84	985	OK	88	981	OK
99005	SSL-00932	170	8	0.0059	8	991	OK	12	987	OK	15	984	OK	16	983	OK
99006	SSL-02174	32	8	0.0490	2	986	OK	2	986	OK	2	986	OK	2	985	OK
99008	SSL-02173	55	8	0.0172	95	992	OK	95	992	OK	99	988	OK	101	986	OK
99009	SSL-00363	142	8	0.0049	1	987	OK	1	987	OK	1	987	OK	1	987	OK
99010	SSL-00801	110	8	0.0488	1	987	OK	2	987	OK	2	987	OK	2	987	OK
99011	SSL-01728	147	8	0.0060	1	989	OK	1	988	OK	1	988	OK	1	988	OK
99012	SSL-01731	93	8	0.0434	22	993	OK	26	990	OK	27	989	OK	27	988	OK
99013	SSL-01732	262	8	0.0768	53	1010	OK	62	1001	OK	69	994	OK	72	991	OK
99014	SSL-01733	107	8	0.0305	3	993	OK	3	992	OK	3	992	OK	4	992	OK
99015	SSL-01734	130	8	0.0060	6	993	OK	7	993	OK	7	993	OK	7	992	OK
99016	SSL-01680	176	8	0.0052	32	993	OK	30	995	OK	32	994	OK	32	993	OK
99017	SSL-01684	168	8	0.0052	6	999	OK	9	996	OK	10	996	OK	10	995	OK
99018	SSL-01692	59	8	0.0816	7	997	OK	7	996	OK	8	996	OK	8	996	OK
99019	SSL-01696	236	8	0.0327	17	999	OK	18	998	OK	19	997	OK	19	996	OK
99020	SSL-01726	119	8	0.0109	3	1003	OK	7	999	OK	8	999	OK	8	999	OK
99021	SSL-01237	215	8	0.0060	11	1004	OK	13	1002	OK	14	1001	OK	14	1001	OK
99022	SSL-01238	41	8	0.0059	5	1003	OK	4	1004	OK	5	1003	OK	5	1003	OK
99023	SSL-01239	26	8	0.0000	767	1117	OK	848	1035	IH, Backwater	865	1019	IH, Backwater	879	1004	IH, Backwater
99024	SSL-02193	90	8	0.0042	8	1009	OK	10	1006	OK	11	1006	OK	11	1006	OK
99025	SSL-01457	58	8	0.0133	18	1014	OK	23	1008	OK	24	1007	OK	25	1006	OK
99026	SSL-00818	22	8	0.0032	3	1009	OK	4	1008	OK	4	1007	OK	4	1007	OK
99027	SSL-00618	366	8	0.0069	12	1012	OK	13	1010	OK	15	1009	OK	16	1008	OK
99028	SSL-00935	65	8	0.0040	2	1010	OK	2	1010	OK	2	1010	OK	2	1010	OK
99029	SSL-01614	468	8	0.0064	6	1011	OK	5	1012	OK	6	1011	OK	6	1011	OK
99030	SSL-01296	120	8	0.0555	29	1009	OK	25	1013	OK	26	1012	OK	27	1012	OK
99031	SSL-00554	109	8	0.0453	1,376	1458	OK	1791	1043	OK	1813	1022	OK	1822	1013	OK
99032	SSL-00555	111	8	0.0269	3	1015	OK	3	1015	OK	3	1015	OK	3	1015	OK
99033	SSL-02059	100	8	0.0077	4	1019	OK	5	1018	OK	6	1018	OK	6	1017	OK
99034	SSL-01791	348	8	0.0018	0	1021	OK	0	1021	OK	0	1021	OK	0	1021	OK
99036	SSL-01027	464	8	0.0161	18	1023	OK	18	1022	OK	19	1022	OK	20	1021	OK
99038	SSL-01156	69	8	0.0110	384	1072	OK	410	1046	OK	426	1030	OK	435	1022	OK
99039	SSL-01174	99	8	0.0709	2	1022	OK	2	1022	OK	2	1022	OK	2	1022	OK
99040	SSL-01217	249	8	0.0039	432	1191	OK	496	1128	OK	568	1055	OK	600	1024	OK
99041	SSL-01578	303	8	0.0042	745	1022	OK	680	1087	OK	745	1022	OK	742	1025	OK
99042	SSL-00617	327	8	0.0061	0	1026	OK	0	1026	OK	0	1026	OK	0	1026	OK
99043	SSL-01083	230	8	0.0040	24	1106	OK	101	1029	OK	102	1028	OK	102	1027	OK
99044	SSL-01084	237	8	0.0040	303	1138	OK	347	1095	OK	393	1048	OK	414	1028	OK
99045	SSL-01085	105	8	0.0040	5	1029	OK	5	1029	OK	5	1029	OK	6	1029	OK
99046	SSL-01769	475	8	0.0096	2	1032	OK	2	1031	OK	2	1031	OK	2	1031	OK
99047	SSL-01768	26	8	0.0119	2	1033	OK	3	1033	OK	3	1033	OK	3	1033	OK
99048	NoMatch	450	8	0.0040	3	1033	OK	3	1033	OK	3	1033	OK	3	1033	OK
99049	NoMatch	279	8	0.0038	2	1035	OK	2	1035	OK	2	1035	OK	2	1035	OK
99050	SSL-08458	32	8	0.0095	6	1037	OK	6	1037	OK	7	1036	OK	7	1036	OK
99051	SSL-01772	241	8	0.0058	9	1038	OK	10	1037	OK	10	1037	OK	10	1036	OK
99052	SSL-01773	40	8	0.0100	5	1038	OK	5	1038	OK	5	1037	OK	5	1037	OK
99056	SSL-01203	69	8	0.0092	27	1043	OK	30	1040	OK	31	1039	OK	32	1038	OK

Conduit ID	GIS ID	Length (ft)	Diameter (in)	Slope	Existing Condition			2025 Condition			2035 Condition			Buildout Condition		
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99057	SSL-00832	36	8	0.0439	9	1050	OK	18	1040	OK	19	1039	OK	20	1039	OK
99058	SSL-00972	209	8	0.0718	2	1039	OK	2	1039	OK	2	1039	OK	2	1039	OK
99059	SSL-01092	149	8	0.0524	4	1040	OK	5	1040	OK	5	1039	OK	5	1039	OK
99060	SSL-01093	121	8	0.0389	16	1036	OK	10	1043	OK	11	1042	OK	11	1041	OK
99061	SSL-01094	89	8	0.0253	404	1108	OK	432	1080	OK	425	1087	OK	470	1042	OK
99062	SSL-01097	182	8	0.0260	11	1040	OK	8	1043	OK	9	1042	OK	9	1042	OK
99063	SSL-01113	70	8	0.0060	6	1043	OK	6	1044	OK	6	1044	OK	6	1043	OK
99064	SSL-01116	187	8	0.0114	4	1044	OK	5	1044	OK	5	1044	OK	5	1044	OK
99065	SSL-01118	278	8	0.0039	4	1045	OK	4	1045	OK	4	1044	OK	4	1044	OK
99066	SSL-01120	246	8	0.0036	2	1046	OK	2	1046	OK	2	1045	OK	3	1045	OK
99067	SSL-01192	246	8	0.0061	0	1045	OK	0	1045	OK	0	1045	OK	0	1045	OK
99068	SSL-01194	235	8	0.0040	4	1046	OK	4	1046	OK	5	1046	OK	5	1046	OK
99070	SSL-01311	161	8	0.0016	47	1019	OK	17	1049	OK	18	1048	OK	19	1048	OK
99071	SSL-01314	265	8	0.0043	236	1186	OK	346	1076	OK	365	1057	OK	374	1048	OK
99072	SSL-01315	91	8	0.0057	0	1048	OK	0	1048	OK	0	1048	OK	0	1048	OK
99073	SSL-01096	228	8	0.0484	440	1457	OK	823	1074	OK	837	1059	OK	849	1048	OK
99074	SSL-01309	118	8	0.0040	80	1053	OK	79	1053	OK	82	1050	OK	84	1049	OK
99075	SSL-01313	399	8	0.0040	7	1050	OK	7	1050	OK	7	1049	OK	8	1049	OK
99076	SSL-01316	211	8	0.0470	6	1051	OK	7	1050	OK	7	1050	OK	7	1050	OK
99077	SSL-01095	209	8	0.1665	3	1051	OK	4	1051	OK	4	1051	OK	4	1051	OK
99078	SSL-01099	70	8	0.0634	8	1056	OK	11	1052	OK	12	1051	OK	12	1051	OK
99080	SSL-01794	280	8	0.0040	6	1052	OK	6	1052	OK	6	1052	OK	6	1052	OK
99081	SSL-01847	433	8	0.0040	4	1053	OK	4	1053	OK	4	1053	OK	4	1052	OK
99085	SSL-01674	52	8	0.0040	40	1021	OK	7	1053	OK	7	1053	OK	7	1053	OK
99088	SSL-02409	135	10	0.0307	2	1054	OK	2	1054	OK	2	1054	OK	2	1054	OK
99089	SSL-02408	29	10	0.0834	4	1055	OK	4	1055	OK	4	1055	OK	4	1055	OK
99090	SSL-01840	475	8	0.0040	2	1056	OK	2	1056	OK	3	1055	OK	3	1055	OK
99091	SSL-01883	309	8	0.0033	6	1059	OK	8	1056	OK	9	1056	OK	9	1056	OK
99092	SSL-01587	224	8	0.0040	371	1116	OK	395	1092	OK	388	1098	OK	430	1056	OK
99093	SSL-02313	147	8	0.0190	2	1059	OK	2	1059	OK	2	1059	OK	3	1059	OK
99095	SSL-00938	413	8	0.0040	0	1059	OK	0	1059	OK	0	1059	OK	0	1059	OK
99097	SSL-00623	106	8	0.0081	17	1068	OK	18	1067	OK	20	1066	OK	21	1065	OK
99098	SSL-00761	109	8	0.0431	77	1077	OK	83	1072	OK	86	1069	OK	87	1067	OK
99100	SSL-01819	45	8	0.0036	22	1074	OK	22	1074	OK	24	1071	OK	26	1070	OK
99103	SSL-01795	165	8	0.0040	5	1071	OK	4	1071	OK	5	1071	OK	5	1071	OK
99104	SSL-01797	275	8	0.0040	6	1070	OK	5	1071	OK	5	1071	OK	5	1071	OK
99105	SSL-01799	311	8	0.0038	1	1072	OK	1	1072	OK	2	1072	OK	2	1071	OK
99106	SSL-01800	410	8	0.0196	0	1072	OK	0	1072	OK	0	1072	OK	0	1072	OK
99107	SSL-01798	80	8	0.0048	42	1078	OK	43	1077	OK	44	1075	OK	45	1074	OK
99108	SSL-01801	326	8	0.0195	5	1078	OK	7	1077	OK	8	1075	OK	8	1075	OK
99109	SSL-01818	380	8	0.0039	20	1077	OK	21	1076	OK	21	1076	OK	22	1075	OK
99110	SSL-01063	176	8	0.0121	10	1075	OK	9	1076	OK	10	1076	OK	10	1075	OK
99111	SSL-00767	111	8	0.0087	0	1076	OK	0	1076	OK	0	1076	OK	0	1076	OK
99112	SSL-00766	159	8	0.0335	41	1086	OK	47	1079	OK	49	1077	OK	50	1076	OK
99113	SSL-01155	209	8	0.0178	21	1079	OK	22	1078	OK	23	1077	OK	23	1077	OK
99114	SSL-00621	168	8	0.0040	7	1079	OK	7	1079	OK	7	1078	OK	7	1078	OK
99115	SSL-00765	191	8	0.0068	169	2320	OK	1367	1122	OK	1395	1094	OK	1409	1080	OK
99116	SSL-01053	79	8	0.0093	10	1080	OK	8	1082	OK	9	1081	OK	10	1081	OK
99117	SSL-00768	180	8	0.0043	103	1101	OK	116	1088	OK	121	1083	OK	123	1081	OK
99118	SSL-00619	214	8	0.0039	175	2323	OK	1374	1125	OK	1403	1095	OK	1416	1082	OK
99119	SSL-00763	100	8	0.0234	8	1082	OK	6	1084	OK	7	1084	OK	7	1083	OK
99120	SSL-00769	131	8	0.0038	7	1098	OK	10	1095	OK	11	1094	OK	20	1084	OK
99121	SSL-00919	75	8	0.0107	2	1085	OK	2	1085	OK	2	1084	OK	2	1084	OK
99122	SSL-00929	124	8	0.0040	3	1089	OK	4	1087	OK	4	1087	OK	4	1087	OK

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99123	SSL-00489	221	8	0.0199	0	1090	OK	0	1090	OK	0	1090	OK	0	1090	OK
99125	SSL-01039	325	8	0.0040	7	1092	OK	8	1091	OK	8	1091	OK	8	1091	OK
99126	SSL-01047	441	8	0.0201	2	1091	OK	2	1091	OK	2	1091	OK	3	1091	OK
99127	SSL-00217	341	8	0.0301	4	1092	OK	4	1091	OK	5	1091	OK	5	1091	OK
99128	SSL-00221	260	8	0.0032	2	1091	OK	1	1091	OK	1	1091	OK	1	1091	OK
99129	SSL-00253	105	8	0.0100	1	1142	OK	338	805	OK	205	938	OK	50	1093	OK
99130	SSL-00257	147	8	0.0867	135	1096	OK	128	1103	OK	134	1097	OK	137	1094	OK
99131	SSL-00258	123	8	0.0326	14	1094	OK	11	1096	OK	12	1095	OK	12	1095	OK
99132	SSL-00648	179	8	0.0348	9	1096	OK	8	1097	OK	9	1096	OK	9	1096	OK
99133	SSL-00650	197	8	0.0488	151	1102	OK	144	1108	OK	151	1102	OK	154	1099	OK
99134	SSL-01143	397	8	0.0230	2	1101	OK	2	1101	OK	2	1101	OK	2	1101	OK
99135	SSL-01144	233	8	0.0064	240	1130	OK	262	1109	OK	269	1101	OK	269	1101	OK
99136	SSL-01145	286	8	0.0051	1	1105	OK	1	1104	OK	1	1104	OK	1	1104	OK
99137	SSL-01146	270	8	0.0051	22	1108	OK	23	1106	OK	24	1106	OK	24	1105	OK
99138	SSL-01588	380	8	0.0046	26	1111	OK	27	1110	OK	29	1108	OK	29	1108	OK
99139	SSL-01427	52	8	0.0229	161	2348	OK	1360	1149	OK	1387	1122	OK	1400	1109	OK
99140	SSL-01429	87	8	0.0426	3	1111	OK	4	1110	OK	4	1110	OK	4	1110	OK
99141	SSL-01440	160	8	0.0209	4	1111	OK	4	1111	OK	4	1111	OK	4	1111	OK
99142	SSL-01678	147	8	0.0041	6	1113	OK	7	1112	OK	8	1112	OK	8	1111	OK
99143	SSL-01679	249	8	0.0361	0	1112	OK	0	1112	OK	0	1112	OK	0	1112	OK
99144	SSL-01681	349	8	0.0206	23	1120	OK	26	1117	OK	29	1114	OK	30	1113	OK
99145	SSL-01683	125	8	0.0276	4	1114	OK	4	1114	OK	4	1114	OK	4	1114	OK
99146	SSL-01685	182	8	0.0040	2	1114	OK	3	1114	OK	3	1114	OK	3	1114	OK
99147	SSL-02317	269	8	0.0017	5	1115	OK	5	1115	OK	6	1115	OK	6	1115	OK
99148	SSL-00220	203	8	0.0034	3	1114	OK	2	1115	OK	2	1115	OK	2	1115	OK
99149	SSL-00218	168	8	0.0040	31	1120	OK	34	1118	OK	35	1116	OK	36	1115	OK
99151	SSL-00223	328	8	0.0091	11	1119	OK	12	1119	OK	12	1118	OK	13	1118	OK
99152	SSL-00226	242	8	0.0330	13	1116	OK	9	1119	OK	10	1119	OK	10	1118	OK
99153	SSL-00844	241	8	0.0044	11	1124	OK	15	1120	OK	16	1119	OK	16	1119	OK
99154	SSL-00227	222	8	0.0470	15	1121	OK	16	1121	OK	17	1120	OK	17	1119	OK
99155	SSL-00228	44	8	0.0171	4	1121	OK	5	1121	OK	5	1121	OK	5	1121	OK
99156	SSL-00229	313	8	0.0167	5	1122	OK	5	1121	OK	5	1121	OK	5	1121	OK
99157	SSL-00814	232	8	0.0040	13	1129	OK	17	1125	OK	18	1124	OK	18	1124	OK
99158	SSL-00816	69	8	0.0524	19	1125	OK	16	1127	OK	17	1126	OK	17	1126	OK
99159	SSL-01179	177	8	0.0158	2	1128	OK	2	1128	OK	2	1128	OK	2	1128	OK
99160	SSL-00225	326	8	0.0124	10	1130	OK	11	1130	OK	11	1129	OK	12	1129	OK
99161	SSL-00815	40	8	0.0040	4	1130	OK	5	1130	OK	5	1129	OK	5	1129	OK
99162	SSL-01060	400	8	0.0089	2	1130	OK	1	1131	OK	1	1131	OK	1	1131	OK
99163	SSL-01061	312	8	0.0079	0	1132	OK	0	1132	OK	0	1132	OK	0	1132	OK
99164	SSL-01608	267	8	0.0106	0	1133	OK	0	1133	OK	0	1133	OK	0	1133	OK
99165	SSL-02095	163	8	0.0050	1	1133	OK	1	1133	OK	2	1133	OK	2	1133	OK
99166	SSL-02104	333	8	0.0279	7	1135	OK	8	1134	OK	8	1134	OK	8	1134	OK
99167	SSL-02105	330	8	0.0193	0	1138	OK	0	1138	OK	0	1138	OK	0	1138	OK
99168	SSL-02094	400	8	0.0056	4	1139	OK	5	1139	OK	5	1138	OK	5	1138	OK
99169	SSL-01472	68	8	0.0130	4	1138	OK	3	1139	OK	3	1138	OK	3	1138	OK
99170	SSL-01461	41	8	0.3670	26	1143	OK	28	1140	OK	29	1139	OK	30	1138	OK
99171	SSL-01158	82	8	0.1231	100	1182	OK	122	1161	OK	135	1147	OK	141	1141	OK
99172	SSL-00107	43	8	0.0290	63	1144	OK	61	1146	OK	64	1143	OK	65	1142	OK
99173	SSL-02194	111	8	0.0046	2	1144	OK	2	1144	OK	2	1143	OK	2	1143	OK
99174	SSL-00017	212	8	0.0045	1,344	1555	DH, Backwater	1744	1155	IH, Backwater	1751	1149	IH, Backwater	1755	1145	IH, Backwater
99175	SSL-00045	353	8	0.0150	5	1147	OK	6	1146	OK	6	1146	OK	6	1146	OK
99177	SSL-01358	243	8	0.0050	1	1150	OK	1	1150	OK	1	1150	OK	1	1150	OK
99178	SSL-00046	318	8	0.0241	0	1153	OK	0	1153	OK	0	1153	OK	0	1153	OK
99179	SSL-01180	161	8	0.0275	6	1157	OK	6	1156	OK	7	1155	OK	7	1155	OK

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99180	SSL-01359	241	8	0.0542	3	1158	OK	3	1158	OK	3	1157	OK	3	1157	OK
99181	SSL-00021	47	8	0.0307	2	1160	OK	2	1160	OK	2	1159	OK	2	1159	OK
99182	SSL-00023	46	8	0.0345	1	1160	OK	2	1160	OK	2	1159	OK	2	1159	OK
99183	SSL-00024	79	8	0.0257	14	1162	OK	15	1161	OK	16	1160	OK	16	1160	OK
99184	SSL-00033	96	8	0.1208	793	1176	OK	738	1231	OK	800	1170	OK	810	1160	OK
99185	SSL-00034	206	8	0.0850	152	1164	OK	146	1170	OK	152	1164	OK	156	1161	OK
99186	SSL-00035	130	8	0.0055	15	1162	OK	15	1161	OK	16	1161	OK	16	1161	OK
99187	SSL-00036	174	8	0.0216	2	1161	OK	2	1161	OK	2	1161	OK	2	1161	OK
99188	SSL-00037	194	8	0.0056	10	1159	OK	6	1163	OK	7	1162	OK	7	1162	OK
99189	SSL-00038	106	8	0.0846	870	1421	OK	1003	1288	OK	1087	1204	OK	1127	1164	OK
99190	SSL-00039	201	8	0.1078	2	1164	OK	2	1164	OK	2	1164	OK	2	1164	OK
99191	SSL-00040	236	8	0.0067	6	1163	OK	5	1165	OK	5	1164	OK	5	1164	OK
99192	SSL-00041	194	8	0.0940	3	1165	OK	3	1165	OK	3	1165	OK	3	1165	OK
99193	SSL-00042	303	8	0.0054	1,065	1555	OK	1375	1245	OK	1448	1172	OK	1455	1165	OK
99194	SSL-00043	205	8	0.0601	26	1168	OK	27	1167	OK	28	1166	OK	29	1165	OK
99195	SSL-00044	89	8	0.1241	107	1173	OK	107	1173	OK	111	1168	OK	114	1166	OK
99196	SSL-01585	170	8	0.0064	9	1166	OK	8	1167	OK	8	1167	OK	9	1166	OK
99197	SSL-01347	129	8	0.0210	0	1167	OK	0	1167	OK	0	1167	OK	0	1167	OK
99200	SSL-01350	253	8	0.0342	5	1169	OK	6	1169	OK	6	1168	OK	6	1168	OK
99202	SSL-01352	92	8	0.0664	5	1171	OK	5	1170	OK	6	1170	OK	6	1169	OK
99203	SSL-00779	117	8	0.0188	6	1171	OK	6	1170	OK	6	1170	OK	6	1170	OK
99204	SSL-01294	173	8	0.0040	38	1175	OK	40	1173	OK	42	1171	OK	43	1170	OK
99205	SSL-01719	272	8	0.0112	16	1169	OK	13	1172	OK	14	1171	OK	14	1171	OK
99206	SSL-01024	102	8	0.0054	8	1175	OK	11	1172	OK	12	1171	OK	12	1171	OK
99207	SSL-01244	218	8	0.0199	4	1174	OK	5	1174	OK	5	1173	OK	5	1173	OK
99208	SSL-01109	270	8	0.0048	5	1176	OK	5	1176	OK	6	1176	OK	6	1175	OK
99209	SSL-01170	246	8	0.0281	2	1178	OK	2	1178	OK	2	1178	OK	3	1177	OK
99210	SSL-01171	199	8	0.0320	406	1245	OK	434	1217	OK	427	1224	OK	473	1179	OK
99211	SSL-00266	232	8	0.0040	2	1180	OK	1	1180	OK	1	1180	OK	1	1180	OK
99212	SSL-00029	209	8	0.0042	786	1192	OK	729	1249	OK	789	1189	OK	798	1181	OK
99213	SSL-00104	106	8	0.0066	18	1184	OK	20	1182	OK	21	1181	OK	21	1181	OK
99214	SSL-01513	177	8	0.0043	1,478	0	IH	128	1188	OK	132	1183	OK	135	1181	OK
99215	SSL-02123	390	8	0.0101	116	1175	OK	102	1189	OK	106	1185	OK	107	1183	OK
99216	SSL-02125	174	8	0.0539	5	1186	OK	4	1187	OK	4	1187	OK	4	1187	OK
99217	SSL-02120	237	8	0.0040	2	1189	OK	2	1189	OK	2	1189	OK	2	1189	OK
99218	SSL-02117	269	8	0.0163	0	1191	OK	0	1191	OK	0	1191	OK	0	1191	OK
99219	SSL-01886	228	8	0.0039	3	1196	OK	4	1195	OK	4	1195	OK	4	1195	OK
99220	SSL-02119	295	8	0.0040	23	1194	OK	20	1198	OK	21	1197	OK	21	1197	OK
99221	SSL-00267	301	8	0.0160	13	1200	OK	14	1198	OK	15	1197	OK	15	1197	OK
99222	SSL-00268	268	8	0.0041	2	1197	OK	2	1197	OK	2	1197	OK	2	1197	OK
99223	SSL-00296	190	8	0.0040	4	1199	OK	4	1199	OK	4	1199	OK	5	1198	OK
99224	SSL-00294	286	8	0.0176	2	1200	OK	2	1200	OK	2	1200	OK	2	1200	OK
99225	SSL-01662	333	8	0.0053	8	1201	OK	9	1201	OK	9	1200	OK	9	1200	OK
99227	SSL-01701	191	8	0.0674	0	1201	OK	0	1201	OK	0	1201	OK	0	1201	OK
99228	SSL-02113	53	8	0.0075	0	1201	OK	0	1201	OK	0	1201	OK	0	1201	OK
99229	SSL-02114	238	8	0.0057	0	1204	OK	0	1204	OK	0	1204	OK	0	1204	OK
99230	SSL-02115	147	8	0.0059	149	2445	OK	1350	1243	OK	1376	1218	OK	1388	1205	OK
99231	SSL-02116	276	8	0.0804	14	1212	OK	18	1208	OK	19	1207	OK	19	1207	OK
99232	SSL-02118	245	8	0.0266	378	1267	OK	402	1243	OK	395	1250	OK	438	1207	OK
99233	SSL-02121	189	8	0.0039	0	1209	OK	0	1209	OK	0	1209	OK	0	1209	OK
99234	SSL-02122	152	8	0.0039	383	1270	OK	407	1246	OK	400	1253	OK	443	1210	OK
99236	SSL-02126	253	8	0.0098	3	1211	OK	4	1211	OK	4	1211	OK	4	1210	OK
99237	SSL-02128	261	8	0.0040	1	1212	OK	1	1212	OK	1	1212	OK	1	1212	OK
99238	SSL-02129	296	8	0.0054	1	1212	OK	1	1212	OK	2	1212	OK	2	1212	OK

Conduit ID	GIS ID	Length (ft)	Diameter (in)	Slope	Existing Condition			2025 Condition			2035 Condition			Buildout Condition		
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99240	SSL-02131	216	8	0.0203	2	1213	OK	3	1213	OK	3	1213	OK	3	1213	OK
99241	SSL-00181	304	8	0.0040	3	1213	OK	2	1214	OK	3	1214	OK	3	1214	OK
99243	SSL-01914	188	8	0.0004	2	1216	OK	3	1215	OK	3	1215	OK	3	1215	OK
99244	SSL-01049	165	8	0.0424	0	1215	OK	0	1215	OK	0	1215	OK	0	1215	OK
99245	SSL-01388	331	8	0.0165	0	1215	OK	0	1215	OK	0	1215	OK	0	1215	OK
99246	SSL-02006	101	8	0.0045	6	1217	OK	7	1217	OK	7	1216	OK	7	1216	OK
99247	SSL-02020	144	8	0.0051	17	1216	OK	15	1218	OK	16	1217	OK	16	1217	OK
99248	SSL-02026	153	8	0.0053	30	1249	OK	45	1234	OK	56	1223	OK	61	1218	OK
99249	SSL-02008	325	8	0.0062	1,449	1712	OK	1886	1275	OK	1925	1236	OK	1942	1219	OK
99250	SSL-02025	440	8	0.0066	2	1220	OK	1	1221	OK	1	1221	OK	1	1221	OK
99251	SSL-02181	244	8	0.0040	0	1221	OK	0	1221	OK	0	1221	OK	0	1221	OK
99252	SSL-02182	271	8	0.0049	19	1229	OK	23	1226	OK	24	1225	OK	24	1224	OK
99253	SSL-02023	163	8	0.0401	1	1227	OK	2	1227	OK	2	1227	OK	2	1227	OK
99254	SSL-01703	89	8	0.0967	10	1236	OK	11	1234	OK	12	1234	OK	12	1233	OK
99255	SSL-02009	131	8	0.1877	15	1235	OK	16	1235	OK	17	1234	OK	17	1233	OK
99256	SSL-02005	255	8	0.0050	3	1236	OK	5	1235	OK	5	1234	OK	5	1234	OK
99257	SSL-01698	269	8	0.0594	13	1237	OK	14	1236	OK	15	1235	OK	15	1235	OK
99258	SSL-02007	268	8	0.0286	28	1235	OK	26	1237	OK	27	1236	OK	28	1236	OK
99259	SSL-02172	186	8	0.0473	5	1237	OK	5	1237	OK	6	1237	OK	6	1236	OK
99260	SSL-02002	129	8	0.0482	383	1298	OK	408	1273	OK	401	1280	OK	444	1237	OK
99261	SSL-02022	192	8	0.0042	9	1239	OK	9	1238	OK	10	1238	OK	10	1237	OK
99262	SSL-02153	251	8	0.0084	1	1238	OK	1	1238	OK	1	1238	OK	1	1238	OK
99263	SSL-02010	308	8	0.0556	4	1240	OK	4	1239	OK	5	1239	OK	5	1239	OK
99264	SSL-02154	117	8	0.0914	23	1244	OK	25	1241	OK	26	1240	OK	27	1240	OK
99265	SSL-02012	117	8	0.0200	15	1241	OK	14	1242	OK	15	1241	OK	16	1240	OK
99266	SSL-01727	367	8	0.0071	2	1241	OK	2	1241	OK	2	1241	OK	2	1241	OK
99267	SSL-02003	249	8	0.0054	1	1242	OK	1	1241	OK	1	1241	OK	1	1241	OK
99268	SSL-02156	333	8	0.0049	11	1245	OK	13	1243	OK	13	1242	OK	14	1242	OK
99269	SSL-02004	211	8	0.0046	5	1244	OK	5	1244	OK	5	1244	OK	5	1244	OK
99270	SSL-01784	216	8	0.0276	2	1247	OK	3	1245	OK	3	1245	OK	3	1245	OK
99271	SSL-02016	111	8	0.0895	3,060	1860	OK	3379	1541	OK	3457	1463	OK	3675	1245	OK
99273	SSL-02018	161	8	0.0109	8	1254	OK	9	1253	OK	10	1252	OK	10	1251	OK
99274	SSL-01729	128	8	0.0091	239	1280	OK	260	1259	OK	268	1252	OK	268	1251	OK
99275	SSL-02001	283	8	0.0138	3	1254	OK	4	1252	OK	5	1252	OK	5	1252	OK
99276	SSL-02019	131	8	0.0685	2	1253	OK	2	1253	OK	2	1252	OK	2	1252	OK
99277	SSL-01783	204	8	0.0620	2,997	3478	OK	4832	1643	OK	5090	1385	OK	5222	1253	OK
99278	SSL-02021	152	8	0.0742	1	1253	OK	1	1253	OK	1	1253	OK	1	1253	OK
99279	SSL-01515	147	8	0.0754	0	1253	OK	0	1253	OK	0	1253	OK	0	1253	OK
99280	SSL-02017	183	8	0.0742	0	1254	OK	0	1254	OK	0	1254	OK	0	1254	OK
99282	SSL-01705	374	8	0.0424	3	1256	OK	3	1256	OK	3	1256	OK	4	1256	OK
99283	SSL-01697	68	8	0.0697	0	1258	OK	0	1258	OK	0	1258	OK	0	1258	OK
99284	SSL-01521	51	8	0.1789	94	1273	OK	102	1265	OK	106	1261	OK	108	1259	OK
99285	SSL-01522	157	8	0.0151	4	1260	OK	4	1260	OK	5	1260	OK	5	1260	OK
99286	SSL-01524	59	8	0.0252	4	1264	OK	6	1262	OK	7	1262	OK	7	1262	OK
99287	NoMatch	263	8	0.0040	0	1262	OK	0	1262	OK	0	1262	OK	0	1262	OK
99288	NoMatch	29	8	0.0339	8	1267	OK	10	1265	OK	10	1265	OK	11	1264	OK
99289	SSL-01694	87	8	0.0495	5	1267	OK	6	1266	OK	6	1266	OK	6	1266	OK
99290	SSL-01050	188	8	0.1928	0	1266	OK	0	1266	OK	0	1266	OK	0	1266	OK
99291	SSL-01760	132	8	0.0073	7	1267	OK	6	1268	OK	7	1267	OK	7	1267	OK
99292	SSL-02177	54	8	0.0037	8	1270	OK	8	1269	OK	9	1269	OK	9	1269	OK
99293	SSL-02178	76	8	0.0034	9	1270	OK	10	1270	OK	10	1269	OK	10	1269	OK
99294	SSL-02179	117	8	0.0063	140	2511	OK	1340	1310	OK	1365	1286	OK	1376	1274	OK
99295	SSL-02180	87	8	0.0039	2	1276	OK	2	1276	OK	2	1276	OK	2	1276	OK
99296	SSL-02185	31	8	0.0075	1	1276	OK	2	1276	OK	2	1276	OK	2	1276	OK

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99297	SSL-02183	37	8	0.0011	134	1264	OK	114	1285	OK	118	1281	OK	120	1279	OK
99298	SSL-02186	185	8	0.0046	0	1283	OK	0	1283	OK	0	1283	OK	0	1283	OK
99299	SSL-00760	294	8	0.0595	2	1285	OK	3	1285	OK	3	1285	OK	3	1285	OK
99300	SSL-00823	142	8	0.0041	0	1289	OK	0	1289	OK	0	1289	OK	0	1289	OK
99301	SSL-00427	330	8	0.0011	55	1310	OK	65	1300	OK	72	1293	OK	75	1290	OK
99302	SSL-00243	314	8	0.0242	29	1301	OK	37	1294	OK	39	1292	OK	40	1291	OK
99303	SSL-00521	120	8	0.0106	2	1293	OK	2	1293	OK	3	1292	OK	3	1292	OK
99304	SSL-00824	228	8	0.0622	11	1302	OK	12	1300	OK	14	1299	OK	14	1298	OK
99305	SSL-00830	130	8	0.0038	2	1300	OK	4	1299	OK	4	1299	OK	4	1299	OK
99306	SSL-01154	149	8	0.0057	0	1299	OK	0	1299	OK	0	1299	OK	0	1299	OK
99311	SSL-00303	91	8	0.0044	48	1303	OK	49	1303	OK	51	1301	OK	52	1300	OK
99312	SSL-01430	101	8	0.0093	3	1302	OK	5	1301	OK	5	1301	OK	5	1300	OK
99313	SSL-00252	91	8	0.0040	0	1302	OK	0	1302	OK	0	1302	OK	0	1302	OK
99314	SSL-00208	169	8	0.0168	0	1309	OK	0	1309	OK	0	1309	OK	0	1309	OK
99315	SSL-00984	141	8	0.0042	4,717	4157	OK	6824	2050	OK	7305	1569	OK	7565	1309	OK
99316	SSL-00400	351	8	0.0146	1	1310	OK	1	1310	OK	1	1309	OK	1	1309	OK
99317	SSL-00231	196	8	0.0151	1	1312	OK	2	1312	OK	2	1312	OK	2	1312	OK
99318	SSL-00545	9	8	0.1223	1	1314	OK	1	1314	OK	1	1314	OK	1	1314	OK
99319	SSL-00230	139	8	0.0206	2	1315	OK	2	1316	OK	2	1316	OK	2	1316	OK
99321	SSL-00401	215	8	0.0182	0	1319	OK	0	1319	OK	0	1319	OK	0	1319	OK
99322	SSL-00007	246	8	0.0102	3	1320	OK	3	1320	OK	4	1320	OK	4	1320	OK
99323	SSL-00010	159	8	0.0066	14	1322	OK	15	1321	OK	15	1320	OK	16	1320	OK
99324	SSL-00009	241	8	0.0040	0	1321	OK	0	1321	OK	0	1321	OK	0	1321	OK
99326	SSL-00109	25	8	0.0503	2	1321	OK	2	1321	OK	2	1321	OK	2	1321	OK
99327	SSL-00711	131	8	0.0103	2	1322	OK	2	1321	OK	3	1321	OK	3	1321	OK
99329	SSL-00512	118	8	0.1195	3	1323	OK	3	1323	OK	3	1323	OK	3	1323	OK
99330	SSL-00819	76	8	0.0037	218	1334	OK	210	1342	OK	223	1329	OK	227	1325	OK
99332	SSL-00535	302	8	0.0040	107	1339	OK	113	1333	OK	118	1328	OK	120	1326	OK
99333	SSL-00537	58	8	0.0139	4	1326	OK	4	1326	OK	5	1326	OK	5	1326	OK
99335	SSL-00616	7	8	0.0070	1	1326	OK	2	1326	OK	2	1326	OK	2	1326	OK
99336	SSL-00636	67	8	0.0556	7	1330	OK	7	1329	OK	7	1329	OK	7	1329	OK
99337	SSL-00403	311	8	0.0451	13	1334	OK	16	1331	OK	17	1330	OK	18	1330	OK
99338	SSL-00406	227	8	0.0185	2	1330	OK	2	1330	OK	2	1330	OK	2	1330	OK
99339	SSL-01579	225	8	0.0112	22	1334	OK	25	1332	OK	26	1331	OK	26	1331	OK
99340	SSL-00407	172	8	0.0092	0	1332	OK	0	1332	OK	0	1332	OK	0	1332	OK
99341	SSL-01600	240	8	0.0300	35	1340	OK	40	1335	OK	42	1333	OK	43	1332	OK
99342	SSL-00359	154	8	0.0049	2	1333	OK	2	1333	OK	2	1333	OK	3	1332	OK
99347	NoMatch	397	8	0.0038	4	1333	OK	4	1333	OK	4	1333	OK	4	1333	OK
99348	SSL-00285	264	8	0.0041	2	1335	OK	2	1335	OK	2	1335	OK	2	1335	OK
99354	SSL-02187	140	8	0.0030	773	1346	OK	714	1406	OK	774	1346	OK	780	1339	OK
99355	SSL-02188	140	8	0.0434	1	1340	OK	1	1340	OK	1	1340	OK	1	1340	OK
99356	SSL-02189	130	8	0.0057	0	1341	OK	0	1341	OK	0	1341	OK	0	1341	OK
99357	SSL-02190	140	8	0.0184	8	1346	OK	10	1344	OK	10	1344	OK	11	1343	OK
99358	SSL-02171	59	8	0.1947	7	1347	OK	9	1345	OK	9	1345	OK	10	1345	OK
99359	SSL-00829	88	8	0.0057	1	1347	OK	1	1347	OK	1	1346	OK	1	1346	OK
99360	SSL-02184	233	8	0.0049	4	1350	OK	4	1350	OK	4	1349	OK	4	1349	OK
99361	SSL-00032	140	8	0.0038	24	1355	OK	26	1352	OK	27	1351	OK	28	1351	OK
99362	SSL-01972	403	8	0.0287	0	1351	OK	0	1351	OK	0	1351	OK	0	1351	OK
99363	SSL-01353	109	8	0.0792	1	1353	OK	2	1352	OK	2	1352	OK	2	1352	OK
99364	SSL-01354	278	8	0.0170	3	1354	OK	3	1354	OK	3	1354	OK	3	1354	OK
99365	SSL-01355	110	8	0.0283	1	1354	OK	1	1354	OK	1	1354	OK	1	1354	OK
99367	SSL-01362	195	8	0.0059	796	1377	OK	742	1432	OK	803	1371	OK	814	1360	OK
99368	SSL-01364	160	8	0.0444	1	1361	OK	1	1361	OK	1	1361	OK	1	1361	OK
99369	SSL-01365	195	8	0.0589	2	1361	OK	2	1361	OK	2	1361	OK	2	1361	OK

Conduit ID	GIS ID	Length (ft)	Diameter (in)	Slope	Existing Condition			2025 Condition			2035 Condition			Buildout Condition		
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99370	SSL-01453	71	8	0.1413	2	1363	OK	2	1363	OK	3	1363	OK	3	1363	OK
99374	SSL-01929	104	8	0.1068	0	1368	OK	0	1368	OK	0	1368	OK	0	1368	OK
99375	SSL-01930	85	8	0.0792	22	1372	OK	24	1370	OK	25	1369	OK	26	1368	OK
99377	SSL-02013	200	8	0.0062	7	1397	OK	29	1374	IH, Backwater	30	1373	IH, Backwater	33	1370	IH, Backwater
99378	SSL-02014	451	8	0.0344	2	1372	OK	2	1371	OK	3	1371	OK	3	1371	OK
99380	SSL-01471	60	8	0.0254	13	1378	OK	13	1377	OK	14	1377	OK	14	1376	OK
99381	SSL-02155	98	8	0.0350	26	1381	OK	27	1380	OK	28	1379	OK	29	1378	OK
99382	SSL-02157	130	8	0.0415	44	1383	OK	42	1384	OK	44	1382	OK	45	1381	OK
99383	SSL-00018	144	8	0.0028	4	1386	OK	5	1385	OK	5	1385	OK	5	1384	OK
99384	SSL-00020	149	8	0.0115	14	1385	OK	13	1386	OK	13	1386	OK	14	1385	OK
99385	SSL-00022	20	8	0.0187	0	1385	OK	0	1385	OK	0	1385	OK	0	1385	OK
99386	SSL-01322	40	8	0.0156	33	1388	OK	33	1388	OK	35	1387	OK	35	1386	OK
99387	SSL-01323	236	8	0.0189	61	1401	OK	67	1394	OK	72	1390	OK	74	1388	OK
99388	SSL-01487	218	8	0.0068	12	1392	OK	12	1391	OK	13	1390	OK	13	1390	OK
99390	SSL-02024	102	8	0.0028	13	1395	OK	13	1395	OK	14	1394	OK	14	1394	OK
99391	SSL-02205	113	8	0.0701	2	1396	OK	2	1395	OK	2	1395	OK	3	1395	OK
99392	SSL-00742	157	8	0.0043	3	1397	OK	2	1398	OK	2	1397	OK	2	1397	OK
99393	SSL-00053	196	8	0.0663	12	1402	OK	12	1401	OK	13	1400	OK	13	1400	OK
99394	SSL-00848	358	8	0.0058	31	1403	OK	31	1403	OK	32	1402	OK	33	1401	OK
99395	SSL-00641	102	8	0.0243	2	1403	OK	2	1403	OK	2	1403	OK	2	1403	OK
99396	SSL-00637	184	8	0.0924	2	1404	OK	3	1404	OK	3	1403	OK	3	1403	OK
99397	SSL-00680	116	8	0.0105	2	1407	OK	2	1407	OK	3	1407	OK	3	1407	OK
99398	SSL-00396	224	8	0.0041	6	1408	OK	4	1410	OK	4	1410	OK	4	1410	OK
99399	SSL-00391	140	8	0.0070	30	1813	OK	423	1421	OK	425	1419	OK	425	1418	OK
99400	SSL-00574	183	8	0.0101	39	1819	OK	432	1425	OK	434	1424	OK	435	1423	OK
99401	SSL-00583	286	8	0.0222	14	1427	OK	16	1425	OK	17	1424	OK	17	1424	OK
99402	SSL-00585	157	8	0.0119	7	1426	OK	7	1425	OK	7	1425	OK	7	1425	OK
99403	SSL-00962	251	8	0.0072	26	1429	OK	28	1427	OK	30	1426	OK	30	1425	OK
99404	SSL-00964	161	8	0.0040	450	1630	OK	521	1558	OK	609	1471	OK	654	1426	OK
99405	SSL-00587	203	8	0.0100	13	1426	OK	13	1427	OK	13	1426	OK	13	1426	OK
99406	SSL-00860	328	8	0.0043	1	1437	OK	2	1436	OK	2	1436	OK	2	1436	OK
99407	SSL-00054	101	8	0.0040	0	1439	OK	0	1439	OK	0	1439	OK	0	1439	OK
99408	SSL-00699	292	8	0.0483	1	1442	OK	1	1442	OK	1	1442	OK	1	1442	OK
99409	SSL-00681	109	8	0.0099	5	1445	OK	5	1445	OK	5	1445	OK	5	1445	OK
99410	SSL-01536	143	8	0.0277	37	1843	OK	430	1450	OK	432	1448	OK	433	1447	OK
99411	SSL-01586	412	8	0.0549	3	1450	OK	4	1450	OK	4	1450	OK	4	1449	OK
99412	SSL-00704	329	8	0.0183	4	1450	OK	4	1450	OK	5	1450	OK	5	1450	OK
99413	SSL-01616	352	8	0.0457	3	1452	OK	4	1451	OK	4	1451	OK	4	1451	OK
99414	SSL-00707	161	8	0.0130	3	1452	OK	3	1452	OK	3	1451	OK	3	1451	OK
99415	SSL-00708	296	8	0.0090	10	1450	OK	7	1453	OK	7	1453	OK	8	1452	OK
99416	SSL-00866	281	8	0.0281	24	1456	OK	24	1455	OK	25	1454	OK	26	1454	OK
99418	SSL-00852	196	8	0.0040	16	1463	OK	17	1462	OK	17	1462	OK	18	1461	OK
99419	SSL-01532	137	8	0.0126	0	1462	OK	0	1462	OK	0	1462	OK	0	1462	OK
99420	SSL-00871	154	8	0.0641	0	1465	OK	0	1465	OK	0	1465	OK	0	1465	OK
99421	SSL-01363	232	8	0.0097	6	1474	OK	10	1469	OK	12	1468	OK	12	1468	OK
99422	SSL-00878	184	8	0.0972	1	1469	OK	2	1468	OK	2	1468	OK	2	1468	OK
99423	SSL-01152	347	8	0.0350	157	1472	OK	150	1479	OK	157	1473	OK	160	1469	OK
99424	SSL-00903	133	8	0.0243	2	1470	OK	2	1470	OK	2	1470	OK	3	1470	OK
99425	SSL-01162	358	8	0.0318	2	1471	OK	2	1471	OK	2	1471	OK	2	1471	OK
99426	SSL-01221	394	8	0.0044	0	1471	OK	0	1471	OK	0	1471	OK	0	1471	OK
99427	SSL-01222	133	8	0.0072	0	1475	OK	0	1475	OK	0	1475	OK	0	1475	OK
99428	SSL-00059	508	8	0.0123	6	1480	OK	9	1477	OK	9	1477	OK	9	1477	OK
99429	SSL-00910	476	8	0.0050	32	1491	OK	33	1489	OK	35	1488	OK	35	1487	OK
99430	SSL-01334	137	8	0.0037	0	1488	OK	0	1488	OK	0	1488	OK	0	1488	OK

Conduit ID	GIS ID	Length (ft)	Diameter (in)	Slope	Existing Condition			2025 Condition			2035 Condition			Buildout Condition		
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99431	SSL-01423	154	8	0.0078	1	1489	OK	1	1488	OK	1	1488	OK	1	1488	OK
99432	SSL-02074	77	8	0.0340	2	1490	OK	2	1489	OK	2	1489	OK	2	1489	OK
99433	SSL-01533	161	8	0.0046	0	1493	OK	0	1493	OK	0	1493	OK	0	1493	OK
99434	SSL-02080	248	8	0.0212	2	1496	OK	2	1495	OK	2	1495	OK	2	1495	OK
99435	SSL-01523	130	8	0.0495	8	1497	OK	9	1497	OK	9	1497	OK	9	1496	OK
99436	SSL-01530	115	8	0.0372	0	1497	OK	0	1497	OK	0	1497	OK	0	1497	OK
99437	SSL-01531	135	8	0.0342	0	1498	OK	0	1498	OK	0	1498	OK	0	1498	OK
99438	SSL-00821	72	8	0.0039	136	1484	OK	116	1505	OK	120	1500	OK	122	1498	OK
99439	SSL-01009	81	8	0.0378	16	1508	OK	17	1507	OK	18	1507	OK	18	1506	OK
99440	SSL-02040	113	8	0.0672	1,164	1943	OK	1490	1618	OK	1584	1524	OK	1601	1507	OK
99441	SSL-00820	154	8	0.0322	3	1509	OK	4	1509	OK	4	1509	OK	4	1509	OK
99442	SSL-01008	149	8	0.0026	2,990	3732	OK	4824	1898	OK	5081	1641	OK	5213	1509	OK
99443	SSL-00524	190	8	0.0554	1	1511	OK	1	1511	OK	1	1510	OK	1	1510	OK
99444	SSL-01014	152	8	0.0988	11	1512	OK	11	1511	OK	11	1511	OK	12	1510	OK
99445	SSL-01015	64	8	0.0095	0	1513	OK	0	1513	OK	0	1513	OK	0	1513	OK
99446	SSL-01195	105	8	0.0513	0	1515	OK	0	1515	OK	0	1515	OK	0	1515	OK
99447	SSL-01187	55	8	0.0100	0	1517	OK	0	1517	OK	0	1517	OK	0	1517	OK
99448	SSL-01623	47	8	0.0066	12	1517	OK	11	1518	OK	11	1518	OK	12	1517	OK
99449	SSL-01624	61	8	0.2532	2	1519	OK	2	1519	OK	2	1519	OK	2	1518	OK
99450	SSL-01511	94	8	0.1633	6	1523	OK	7	1522	OK	8	1521	OK	8	1521	OK
99451	SSL-01527	44	8	0.0077	154	1528	OK	148	1534	OK	154	1528	OK	158	1525	OK
99452	SSL-01707	210	8	0.0899	1	1528	OK	1	1528	OK	1	1528	OK	1	1528	OK
99453	SSL-01463	286	8	0.0322	1	1528	OK	1	1528	OK	1	1528	OK	1	1528	OK
99454	SSL-01537	109	8	0.0159	11	1530	OK	11	1529	OK	12	1528	OK	12	1528	OK
99455	SSL-01540	159	8	0.0458	0	1529	OK	0	1529	OK	0	1529	OK	0	1529	OK
99457	SSL-01730	87	8	0.0656	3	1531	OK	3	1531	OK	3	1531	OK	3	1531	OK
99458	SSL-01693	111	8	0.0144	0	1537	OK	0	1537	OK	0	1537	OK	0	1537	OK
99459	SSL-00110	106	8	0.0669	19	1561	OK	19	1561	OK	20	1561	OK	20	1560	OK
99460	SSL-00111	150	8	0.0047	2	1561	OK	2	1561	OK	2	1561	OK	2	1561	OK
99461	SSL-00112	80	8	0.0144	1	1562	OK	1	1562	OK	2	1561	OK	2	1561	OK
99462	SSL-01163	121	8	0.0405	5	1564	OK	6	1563	OK	7	1563	OK	7	1562	OK
99463	SSL-01165	295	8	0.0491	0	1566	OK	0	1566	OK	0	1566	OK	0	1566	OK
99464	SSL-01167	265	8	0.0057	0	1571	OK	0	1571	OK	0	1571	OK	0	1571	OK
99465	SSL-01168	123	8	0.0067	0	1573	OK	0	1573	OK	0	1573	OK	0	1573	OK
99466	SSL-01231	58	8	0.0723	0	1575	OK	0	1575	OK	0	1575	OK	0	1575	OK
99467	SSL-01462	155	8	0.0300	14	1585	OK	16	1583	OK	17	1582	OK	18	1581	OK
99468	SSL-01040	133	8	0.1200	2	1581	OK	2	1581	OK	2	1581	OK	2	1581	OK
99469	SSL-01043	147	8	0.0352	2	1581	OK	2	1582	OK	2	1582	OK	2	1582	OK
99470	SSL-01285	196	8	0.0054	10	1590	OK	9	1590	OK	10	1590	OK	10	1590	OK
99471	SSL-01286	127	8	0.0115	262	1597	OK	254	1604	OK	263	1596	OK	267	1592	OK
99472	SSL-01464	115	8	0.0464	24	1597	OK	28	1594	OK	29	1592	OK	30	1592	OK
99473	SSL-01377	249	8	0.0086	1	1596	OK	1	1596	OK	1	1596	OK	1	1596	OK
99474	SSL-01441	94	8	0.0079	1	1596	OK	1	1596	OK	1	1596	OK	1	1596	OK
99475	SSL-01465	212	8	0.0142	2	1597	OK	2	1597	OK	2	1597	OK	2	1597	OK
99476	SSL-00487	119	8	0.0045	26	1600	OK	27	1599	OK	28	1598	OK	29	1597	OK
99477	SSL-00417	227	8	0.0128	8	1599	OK	9	1599	OK	9	1598	OK	10	1598	OK
99478	SSL-01428	263	8	0.0048	1	1606	OK	2	1606	OK	2	1606	OK	2	1606	OK
99479	SSL-00256	246	8	0.0101	2	1611	OK	2	1611	OK	2	1611	OK	2	1611	OK
99480	SSL-00259	279	8	0.0100	9	1625	OK	11	1624	OK	12	1622	OK	12	1622	OK
99481	SSL-00244	305	8	0.0157	15	1628	OK	16	1627	OK	17	1626	OK	17	1626	OK
99482	SSL-02202	216	8	0.0136	28	2022	OK	421	1629	OK	422	1628	OK	423	1627	OK
99483	SSL-00249	142	8	0.0053	6	1630	OK	5	1632	OK	5	1631	OK	5	1631	OK
99484	SSL-00209	346	8	0.0072	0	1633	OK	0	1633	OK	0	1633	OK	0	1633	OK
99485	SSL-00210	451	8	0.0180	67	1648	OK	70	1645	OK	73	1642	OK	75	1640	OK

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99486	SSL-00418	349	8	0.0049	0	1642	OK	0	1642	OK	0	1642	OK	0	1642	OK
99487	SSL-00420	176	8	0.0184	117	2874	OK	1314	1677	OK	1336	1655	OK	1346	1645	OK
99488	SSL-00419	283	8	0.0459	0	1648	OK	0	1648	OK	0	1648	OK	0	1648	OK
99489	SSL-01682	193	8	0.0521	2	1650	OK	2	1650	OK	2	1650	OK	2	1650	OK
99490	SSL-00242	155	8	0.0241	3	1652	OK	3	1652	OK	4	1651	OK	4	1651	OK
99491	SSL-01677	309	8	0.0245	111	2879	OK	1308	1683	OK	1329	1662	OK	1338	1652	OK
99492	SSL-00248	327	8	0.0062	0	1654	OK	0	1654	OK	0	1654	OK	0	1654	OK
99493	SSL-00245	203	8	0.0051	2	1655	OK	2	1655	OK	2	1655	OK	2	1655	OK
99494	SSL-00759	128	8	0.0422	5	1657	OK	5	1656	OK	6	1656	OK	6	1655	OK
99495	SSL-00233	365	8	0.0365	4	1656	OK	4	1656	OK	4	1656	OK	5	1656	OK
99496	SSL-00323	246	8	0.0097	0	1660	OK	0	1660	OK	0	1660	OK	0	1660	OK
99497	SSL-00234	267	8	0.0047	0	1662	OK	0	1662	OK	0	1662	OK	0	1662	OK
99498	SSL-01006	307	8	0.0067	2	1664	OK	2	1664	OK	3	1664	OK	3	1664	OK
99499	SSL-00235	210	8	0.0297	2	1666	OK	2	1666	OK	2	1666	OK	2	1666	OK
99500	SSL-00274	241	8	0.0047	20	1671	OK	21	1670	OK	22	1669	OK	22	1668	OK
99501	SSL-00272	251	8	0.0037	4	1673	OK	5	1672	OK	5	1672	OK	5	1672	OK
99502	SSL-00232	268	8	0.0040	0	1672	OK	0	1672	OK	0	1672	OK	0	1672	OK
99503	SSL-00361	253	8	0.0150	43	1680	OK	44	1678	OK	48	1674	OK	51	1672	OK
99504	SSL-00240	367	8	0.0037	18	1677	OK	20	1675	OK	21	1674	OK	21	1674	OK
99505	SSL-00237	215	8	0.0881	5	1679	OK	5	1678	OK	5	1678	OK	5	1678	OK
99506	SSL-00810	134	8	0.0206	1,248	2102	OK	1425	1924	OK	1577	1773	OK	1666	1683	OK
99507	SSL-00811	315	8	0.0959	66	1692	OK	69	1689	OK	72	1686	OK	74	1684	OK
99508	SSL-00807	132	8	0.0040	10	1686	OK	11	1685	OK	11	1685	OK	12	1684	OK
99509	SSL-00450	149	8	0.0587	0	1684	OK	0	1684	OK	0	1684	OK	0	1684	OK
99510	SSL-00786	180	8	0.0165	0	1685	OK	0	1685	OK	0	1685	OK	0	1685	OK
99511	SSL-00594	205	8	0.0849	0	1689	OK	0	1689	OK	0	1689	OK	0	1689	OK
99512	SSL-00275	256	8	0.0671	0	1695	OK	0	1695	OK	0	1695	OK	0	1695	OK
99513	SSL-00239	152	8	0.0586	652	2059	OK	984	1728	DH, Backwater	999	1712	DH, Backwater	1015	1696	DH, Backwater
99514	SSL-01033	401	8	0.0380	2	1699	OK	2	1699	OK	2	1698	OK	2	1698	OK
99515	SSL-00269	330	8	0.0053	144	1760	OK	194	1710	IH, Backwater	200	1704	IH, Backwater	204	1700	IH, Backwater
99516	SSL-00273	344	8	0.0405	1,242	2123	OK	1418	1946	OK	1569	1796	OK	1659	1706	OK
99517	SSL-00717	295	8	0.0059	1	1707	OK	1	1707	OK	2	1707	OK	2	1707	OK
99518	SSL-00423	269	8	0.0039	5	1713	OK	7	1710	OK	8	1710	OK	8	1710	OK
99519	SSL-00424	212	8	0.0053	41	1725	OK	49	1717	OK	52	1715	OK	53	1714	OK
99520	SSL-00940	219	8	0.0145	2	1718	OK	2	1718	OK	2	1718	OK	2	1718	OK
99521	SSL-00412	133	8	0.0158	352	1469	OK	92	1728	OK	96	1725	OK	98	1723	OK
99522	SSL-00354	295	8	0.0043	861	1955	OK	975	1841	OK	1060	1756	OK	1093	1723	OK
99523	SSL-00355	194	8	0.0040	1	1724	OK	2	1724	OK	2	1724	OK	2	1724	OK
99524	SSL-00321	461	8	0.0180	264	1736	OK	256	1743	OK	265	1735	OK	269	1730	OK
99525	SSL-01034	487	8	0.0344	8	1730	OK	6	1732	OK	7	1732	OK	7	1731	OK
99526	SSL-00716	225	8	0.0524	37	1748	OK	45	1740	OK	47	1738	OK	48	1737	OK
99527	SSL-00928	357	8	0.0546	0	1746	OK	0	1746	OK	0	1746	OK	0	1746	OK
99528	SSL-00456	206	8	0.0122	12	1754	OK	12	1753	OK	13	1752	OK	13	1752	OK
99529	SSL-00461	239	8	0.0312	3	1756	OK	2	1757	OK	2	1756	OK	2	1756	OK
99530	SSL-00669	252	8	0.0042	6	1758	OK	6	1758	OK	7	1758	OK	7	1758	OK
99531	SSL-00670	232	8	0.0040	0	1759	OK	0	1759	OK	0	1759	OK	0	1759	OK
99532	SSL-00667	169	8	0.0038	789	2138	OK	1085	1843	OK	1145	1783	OK	1163	1765	OK
99533	SSL-00459	206	8	0.0370	0	1767	OK	0	1767	OK	0	1767	OK	0	1767	OK
99534	SSL-00314	158	8	0.0041	0	1768	OK	0	1768	OK	0	1768	OK	0	1768	OK
99535	SSL-02206	207	8	0.0040	0	1769	OK	0	1769	OK	0	1769	OK	0	1769	OK
99536	SSL-00318	90	8	0.0038	7	1771	OK	6	1771	OK	7	1771	OK	7	1771	OK
99537	SSL-00331	303	8	0.0640	714	1887	OK	801	1800	OK	813	1788	OK	826	1775	OK
99538	SSL-00741	256	8	0.0138	0	1776	OK	0	1776	OK	0	1776	OK	0	1776	OK
99539	SSL-00739	219	8	0.0500	9	1777	OK	10	1777	OK	10	1776	OK	10	1776	OK

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99540	SSL-02027	153	8	0.0061	5	1789	OK	5	1789	OK	6	1789	OK	6	1789	OK
99541	SSL-02072	95	8	0.0435	106	1802	OK	112	1796	OK	116	1791	OK	119	1789	OK
99543	SSL-02068	217	8	0.0058	41	1794	OK	40	1796	OK	41	1795	OK	42	1794	OK
99544	SSL-02089	101	8	0.0607	0	1802	OK	0	1802	OK	0	1802	OK	0	1802	OK
99545	SSL-02086	139	8	0.0220	382	1855	OK	408	1830	OK	424	1813	OK	432	1805	OK
99546	SSL-02065	103	8	0.0046	6	1807	OK	7	1806	OK	8	1806	OK	8	1805	OK
99548	SSL-02069	148	8	0.0078	0	1806	OK	0	1806	OK	0	1806	OK	0	1806	OK
99549	SSL-02064	122	8	0.0318	5	1813	OK	5	1813	OK	5	1813	OK	5	1813	OK
99550	SSL-02133	136	8	0.0088	0	1816	OK	0	1816	OK	0	1816	OK	0	1816	OK
99552	SSL-02143	180	8	0.0717	0	1819	OK	0	1819	OK	0	1819	OK	0	1819	OK
99553	SSL-02067	62	8	0.0132	45	1837	OK	49	1832	OK	52	1830	OK	53	1829	OK
99554	SSL-02138	160	8	0.0100	0	1832	OK	0	1832	OK	0	1832	OK	0	1832	OK
99555	SSL-02092	141	8	0.0039	0	1837	OK	0	1837	OK	0	1837	OK	0	1837	OK
99556	SSL-02083	151	8	0.0086	0	1844	OK	0	1844	OK	0	1844	OK	0	1844	OK
99557	SSL-02066	341	8	0.0404	0	1845	OK	0	1845	OK	0	1845	OK	0	1845	OK
99558	SSL-02085	105	8	0.0413	8	1851	OK	10	1849	OK	11	1849	OK	11	1849	OK
99559	SSL-02134	191	8	0.0297	0	1849	OK	0	1849	OK	0	1849	OK	0	1849	OK
99561	SSL-02144	218	8	0.0044	39	1853	OK	37	1855	OK	39	1853	OK	40	1852	OK
99562	SSL-02135	82	8	0.0066	1,623	1988	OK	1602	2009	OK	1600	2011	OK	1751	1860	OK
99563	SSL-02145	168	8	0.0051	18	1864	OK	19	1862	OK	20	1861	OK	20	1861	OK
99564	SSL-02142	143	8	0.0451	2	1879	OK	2	1879	OK	2	1879	OK	2	1879	OK
99565	SSL-02132	115	8	0.0147	6	1879	OK	5	1880	OK	6	1880	OK	6	1880	OK
99566	SSL-02141	224	8	0.0063	2,986	4109	OK	4820	2275	OK	5077	2019	OK	5208	1888	OK
99567	SSL-02029	434	8	0.0094	3	1908	OK	2	1908	OK	2	1908	OK	2	1908	OK
99568	SSL-02028	197	8	0.0056	0	1910	OK	0	1910	OK	0	1910	OK	0	1910	OK
99569	SSL-01660	75	8	0.0051	2	1912	OK	4	1911	OK	4	1911	OK	4	1911	OK
99570	SSL-01658	178	8	0.0054	2	1916	OK	2	1916	OK	2	1916	OK	2	1916	OK
99571	SSL-01667	293	8	0.0068	27	1921	OK	26	1922	OK	29	1920	OK	30	1918	OK
99572	SSL-01011	162	8	0.0363	12	1923	OK	14	1921	OK	16	1920	OK	16	1919	OK
99573	SSL-00557	287	8	0.0154	17	1930	OK	21	1926	OK	25	1922	OK	27	1920	OK
99574	SSL-01664	230	8	0.0096	52	1945	OK	62	1935	OK	71	1926	OK	76	1921	OK
99575	SSL-00985	169	8	0.0039	0	1926	OK	0	1926	OK	0	1926	OK	0	1926	OK
99576	SSL-00558	202	8	0.0142	0	1934	OK	0	1934	OK	0	1934	OK	0	1934	OK
99577	SSL-00561	275	8	0.0677	0	1939	OK	0	1939	OK	0	1939	OK	0	1939	OK
99578	SSL-00562	291	8	0.0113	0	1953	OK	0	1953	OK	0	1953	OK	0	1953	OK
99579	SSL-00565	166	8	0.0385	0	1953	OK	0	1953	OK	0	1953	OK	0	1953	OK
99580	SSL-01665	215	8	0.0056	0	1965	OK	0	1965	OK	0	1965	OK	0	1965	OK
99581	SSL-01666	391	8	0.0070	11	2359	OK	402	1967	OK	403	1966	OK	403	1966	OK
99582	SSL-00564	279	8	0.0475	1	1982	OK	1	1982	OK	1	1982	OK	1	1982	OK
99583	SSL-00530	170	8	0.0041	373	2044	OK	399	2019	OK	415	2003	OK	423	1994	OK
99584	SSL-01661	202	8	0.0049	0	1995	OK	0	1995	OK	0	1995	OK	0	1995	OK
99585	SSL-01890	265	8	0.0067	3	1998	OK	3	1998	OK	3	1998	OK	3	1998	OK
99587	SSL-01010	277	8	0.0176	0	2002	OK	0	2002	OK	0	2002	OK	0	2002	OK
99588	SSL-01013	233	8	0.0379	3	2003	OK	3	2003	OK	3	2003	OK	3	2003	OK
99589	SSL-00833	291	8	0.0308	0	2023	OK	0	2023	OK	0	2023	OK	0	2023	OK
99590	SSL-01196	49	8	0.0504	81	3243	OK	1273	2051	OK	1287	2037	OK	1294	2031	OK
99591	SSL-00826	146	8	0.0379	3	2037	OK	3	2037	OK	3	2037	OK	4	2036	OK
99593	SSL-00518	261	8	0.0040	77	3256	OK	4479	0	OK	2211	1123	OK	1297	2037	OK
99594	SSL-00522	292	8	0.0170	0	3653	OK	188	3464	OK	1291	2362	HS, Backwater	1614	2038	HS, Backwater
99595	SSL-00525	104	8	0.0776	1	2048	OK	1	2048	OK	1	2048	OK	1	2048	OK
99596	SSL-00526	164	8	0.0426	88	3275	OK	1280	2083	OK	1295	2068	OK	1302	2061	OK
99597	SSL-00973	189	8	0.0318	34	2457	OK	426	2064	OK	428	2062	OK	429	2061	OK
99598	SSL-00974	211	8	0.0378	0	2061	OK	0	2061	OK	0	2061	OK	0	2061	OK
99599	SSL-00981	174	8	0.0562	0	2062	OK	0	2062	OK	0	2062	OK	0	2062	OK

Conduit ID	GIS ID	Length (ft)	Diameter (in)	Slope	Existing Condition			2025 Condition			2035 Condition			Buildout Condition		
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99600	SSL-00982	174	8	0.1116	2	2069	OK	2	2069	OK	3	2069	OK	3	2069	OK
99601	SSL-01198	161	8	0.0718	0	3650	OK	268	3383	OK	1335	2316	HS, Backwater	1567	2084	HS, Backwater
99602	SSL-01134	113	8	0.0042	0	2088	OK	0	2088	OK	0	2088	OK	0	2088	OK
99603	SSL-01070	258	8	0.0050	14	2105	OK	17	2103	OK	19	2101	OK	11	2109	OK
99606	SSL-01074	283	8	0.0078	766	2121	OK	704	2183	OK	768	2119	OK	769	2118	OK
99608	SSL-01079	312	8	0.0576	7	2511	OK	398	2119	OK	398	2119	OK	399	2119	OK
99609	SSL-01088	125	8	0.0624	23	2125	OK	26	2122	OK	27	2121	OK	28	2120	OK
99610	SSL-01100	290	8	0.0323	0	2120	OK	0	2120	OK	0	2120	OK	0	2120	OK
99611	SSL-01098	177	8	0.0783	0	2135	OK	0	2135	OK	0	2135	OK	0	2135	OK
99612	SSL-01090	355	8	0.0040	57	2172	OK	63	2165	OK	66	2163	OK	67	2162	OK
99613	SSL-00993	251	8	0.0380	0	2173	OK	0	2173	OK	0	2173	OK	0	2173	OK
99614	SSL-01115	169	8	0.0040	14	2193	OK	15	2192	OK	15	2191	OK	16	2191	OK
99615	SSL-01114	316	8	0.0138	0	3766	OK	215	3551	OK	1580	2186	HH, Backwater	1558	2208	HH, Backwater
99616	SSL-00994	252	8	0.0045	0	2211	OK	0	2211	OK	0	2211	OK	0	2211	OK
99617	SSL-00069	340	8	0.0123	19	2225	OK	21	2222	OK	24	2220	OK	25	2219	OK
99618	SSL-01057	270	8	0.0219	3	2228	OK	3	2228	OK	3	2228	OK	3	2228	OK
99620	SSL-01058	267	8	0.0086	0	2228	OK	0	2228	OK	0	2228	OK	0	2228	OK
99623	SSL-01317	189	8	0.0941	0	2231	OK	0	2231	OK	0	2231	OK	0	2231	OK
99624	SSL-01137	135	8	0.0043	0	2234	OK	0	2234	OK	0	2234	OK	0	2234	OK
99625	SSL-01069	481	8	0.0101	0	2236	OK	0	2236	OK	0	2236	OK	0	2236	OK
99626	SSL-01139	159	8	0.0040	0	2237	OK	0	2237	OK	0	2237	OK	0	2237	OK
99627	SSL-00990	286	8	0.0183	0	2241	OK	0	2241	OK	0	2241	OK	0	2241	OK
99628	SSL-00991	299	8	0.0034	68	2245	OK	66	2247	OK	68	2244	OK	70	2243	OK
99629	SSL-00094	151	8	0.0065	28	2247	OK	30	2245	OK	31	2244	OK	32	2243	OK
99630	SSL-00989	503	8	0.0036	0	2246	OK	0	2246	OK	0	2246	OK	0	2246	OK
99631	SSL-00083	159	8	0.0284	0	2246	OK	0	2246	OK	0	2246	OK	0	2246	OK
99632	SSL-01582	279	8	0.0076	0	2263	OK	0	2263	OK	0	2263	OK	0	2263	OK
99634	SSL-01634	126	8	0.0287	98	2273	OK	97	2274	OK	101	2270	OK	103	2267	OK
99635	SSL-01945	240	8	0.0243	0	2269	OK	0	2269	OK	0	2269	OK	0	2269	OK
99636	SSL-01946	108	8	0.0092	124	2300	OK	138	2286	OK	143	2280	OK	146	2277	OK
99637	SSL-01948	160	8	0.0051	0	2278	OK	0	2278	OK	0	2278	OK	0	2278	OK
99638	SSL-01949	259	8	0.0040	21	2288	OK	22	2286	OK	23	2285	OK	24	2285	OK
99639	SSL-01951	231	8	0.0040	0	2289	OK	0	2289	OK	0	2289	OK	0	2289	OK
99640	SSL-01952	166	8	0.0047	761	2296	OK	697	2360	OK	762	2296	OK	762	2296	OK
99641	SSL-01955	447	8	0.0041	1	2297	OK	1	2297	OK	1	2297	OK	1	2297	OK
99642	SSL-01957	78	8	0.0044	12	2314	OK	7	2318	OK	8	2317	OK	9	2317	OK
99643	SSL-01959	490	8	0.0098	1	2343	OK	1	2343	OK	2	2343	OK	2	2343	OK
99644	SSL-01962	330	8	0.0039	1,242	2769	OK	1418	2592	OK	1569	2442	OK	1659	2352	OK
99645	SSL-01963	166	8	0.0040	40	2364	OK	37	2367	OK	44	2360	OK	47	2357	OK
99646	SSL-01964	136	8	0.0147	0	2361	OK	0	2361	OK	0	2361	OK	0	2361	OK
99647	SSL-01966	208	8	0.0040	12	2404	OK	14	2402	OK	15	2401	OK	16	2400	OK
99648	SSL-01970	308	8	0.0040	0	2402	OK	0	2402	OK	0	2402	OK	0	2402	OK
99649	SSL-02108	465	8	0.0204	151	2750	OK	226	2674	OK	370	2530	OK	495	2406	OK
99650	SSL-02109	176	8	0.0076	4	2412	OK	5	2412	OK	5	2412	OK	5	2412	OK
99651	SSL-00026	139	8	0.0367	0	2422	OK	0	2422	OK	0	2422	OK	0	2422	OK
99652	SSL-00027	289	8	0.0050	1	2429	OK	1	2429	OK	2	2429	OK	2	2429	OK
99653	SSL-00030	178	8	0.0379	35	2441	OK	37	2438	OK	39	2437	OK	40	2436	OK
99654	SSL-02175	81	8	0.0048	96	2458	OK	102	2451	OK	106	2448	OK	108	2446	OK
99655	SSL-02176	70	8	0.0057	0	2465	OK	0	2465	OK	0	2465	OK	0	2465	OK
99656	SSL-00261	155	8	0.0036	58	2499	OK	69	2488	OK	79	2478	OK	83	2473	OK
99657	SSL-00264	256	8	0.0041	144	2818	OK	219	2743	OK	362	2599	OK	486	2475	OK
99658	SSL-00295	126	8	0.0040	0	2491	OK	0	2491	OK	0	2491	OK	0	2491	OK
99662	SSL-01110	347	8	0.0046	4,343	5123	OK	6369	3098	OK	6775	2692	OK	6976	2491	OK
99663	SSL-01169	267	8	0.0036	56	2527	OK	67	2516	OK	77	2506	OK	81	2502	OK

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99664	SSL-01172	149	8	0.0078	0	2528	OK	0	2528	OK	0	2528	OK	0	2528	OK
99665	SSL-01598	420	8	0.0344	0	2535	OK	0	2535	OK	0	2535	OK	0	2535	OK
99666	SSL-01599	362	8	0.0040	0	2570	OK	0	2570	OK	0	2570	OK	0	2570	OK
99667	SSL-01240	354	8	0.0361	15	2583	OK	15	2582	OK	16	2581	OK	17	2581	OK
99668	SSL-01318	233	8	0.0050	2,482	1574	OK	4307	14505	OK	5856	12956	OK	16228	2583	OK
99669	SSL-01319	228	8	0.0260	0	2589	OK	0	2589	OK	0	2589	OK	0	2589	OK
99670	SSL-01321	165	8	0.0065	0	2594	OK	0	2594	OK	0	2594	OK	0	2594	OK
99671	SSL-01326	265	8	0.0040	0	2596	OK	0	2596	OK	0	2596	OK	0	2596	OK
99672	SSL-01327	322	8	0.0049	0	2599	OK	0	2599	OK	0	2599	OK	0	2599	OK
99673	SSL-01329	151	8	0.0126	2,476	1585	OK	4294	14545	OK	5842	12997	OK	16215	2624	OK
99674	SSL-01330	68	8	0.0190	0	2664	OK	0	2664	OK	0	2664	OK	0	2664	OK
99675	SSL-01289	216	8	0.0045	156	3036	OK	232	2960	OK	377	2816	OK	501	2691	OK
99676	SSL-01437	123	8	0.0045	4,669	5414	OK	6734	3348	OK	7158	2925	OK	7368	2715	OK
99677	SSL-01341	130	8	0.0139	0	2716	OK	0	2716	OK	0	2716	OK	0	2716	OK
99678	SSL-01436	234	8	0.0031	24	2723	OK	25	2723	OK	27	2720	OK	28	2719	OK
99679	SSL-01378	164	8	0.0053	0	2736	OK	0	2736	OK	0	2736	OK	0	2736	OK
99681	SSL-01379	277	8	0.0046	0	2742	OK	0	2742	OK	0	2742	OK	0	2742	OK
99682	SSL-01556	406	8	0.0040	0	2745	OK	0	2745	OK	0	2745	OK	0	2745	OK
99685	SSL-01376	198	8	0.0141	0	2747	OK	0	2747	OK	0	2747	OK	0	2747	OK
99686	SSL-01108	222	8	0.0058	0	2751	OK	0	2751	OK	0	2751	OK	0	2751	OK
99688	SSL-01112	147	8	0.0027	0	2751	OK	0	2751	OK	0	2751	OK	0	2751	OK
99689	SSL-02127	152	8	0.0180	0	2754	OK	0	2754	OK	0	2754	OK	0	2754	OK
99690	SSL-01554	410	8	0.0040	0	2763	OK	0	2763	OK	0	2763	OK	0	2763	OK
99691	SSL-01380	414	8	0.0045	0	2766	OK	0	2766	OK	0	2766	OK	0	2766	OK
99692	SSL-01381	206	8	0.0121	0	2771	OK	0	2771	OK	0	2771	OK	0	2771	OK
99693	SSL-01331	296	8	0.0041	2	2773	OK	2	2773	OK	2	2773	OK	2	2773	OK
99694	SSL-01324	302	8	0.0047	1	2774	OK	1	2774	OK	1	2774	OK	1	2774	OK
99695	SSL-01328	288	8	0.0066	159	3121	OK	235	3045	OK	380	2901	OK	504	2776	OK
99696	SSL-01325	142	8	0.0212	4,809	5833	OK	7074	3568	OK	7586	3056	OK	7862	2780	OK
99697	SSL-01332	225	8	0.0051	0	2792	OK	0	2792	OK	0	2792	OK	0	2792	OK
99698	SSL-01342	109	8	0.0172	2	2797	OK	2	2797	OK	2	2797	OK	2	2797	OK
99699	SSL-01346	369	8	0.0043	41	2805	OK	43	2803	OK	46	2799	OK	48	2797	OK
99700	SSL-02110	140	8	0.0118	0	2801	OK	0	2801	OK	0	2801	OK	0	2801	OK
99701	SSL-01547	251	8	0.0041	263	1093	FM	159	2811	FM	165	2805	FM	168	2802	FM
99702	SSL-00777	299	8	0.0040	0	2804	OK	0	2804	OK	0	2804	OK	0	2804	OK
99703	SSL-00776	148	8	0.0054	1,873	3015	OK	2058	2830	OK	2053	2834	OK	2068	2819	IH, Backwater
99704	SSL-00782	176	8	0.0039	0	2821	OK	0	2821	OK	0	2821	OK	0	2821	OK
99705	SSL-00005	67	8	0.0321	0	2825	OK	0	2825	OK	0	2825	OK	0	2825	OK
99706	SSL-01553	202	8	0.0039	761	2836	OK	697	2900	OK	761	2836	OK	761	2836	OK
99707	SSL-01557	22	8	0.0050	6	2844	OK	6	2843	OK	6	2843	OK	11	2839	OK
99708	SSL-01046	91	8	0.0040	4,723	5748	OK	6842	3629	OK	7325	3146	OK	7591	2881	OK
99709	SSL-00003	144	8	0.0036	0	2899	OK	0	2899	OK	0	2899	OK	0	2899	OK
99710	SSL-00004	63	8	0.0037	0	2922	OK	0	2922	OK	0	2922	OK	0	2922	OK
99718	SSL-01909	285	8	0.0069	0	2945	OK	0	2945	OK	0	2945	OK	0	2945	OK
99719	SSL-01911	201	8	0.0348	1,253	3364	OK	1430	3188	OK	1583	3035	OK	1671	2946	OK
99720	SSL-01913	355	8	0.0160	0	2958	OK	0	2958	OK	0	2958	OK	0	2958	OK
99721	SSL-01443	194	8	0.0433	1,246	3379	OK	1424	3201	OK	1575	3050	OK	1665	2960	OK
99722	SSL-00808	113	8	0.0443	3	2982	OK	3	2982	OK	3	2981	OK	4	2981	OK
99723	SSL-00668	160	8	0.0036	0	2985	OK	0	2985	OK	0	2985	OK	0	2985	OK
99724	SSL-00812	191	8	0.0261	0	2985	OK	0	2985	OK	0	2985	OK	0	2985	OK
99725	SSL-00454	308	8	0.0350	0	4524	OK	35	4489	OK	1013	3511	HS, Backwater	1504	3019	HS, Backwater
99726	SSL-00723	145	8	0.0062	0	3025	OK	0	3025	OK	0	3025	OK	0	3025	OK
99727	SSL-00663	135	8	0.0616	2	3027	OK	2	3027	OK	2	3027	OK	2	3027	OK
99728	SSL-00457	188	8	0.0037	0	3035	OK	0	3035	OK	0	3035	OK	0	3035	OK

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99729	SSL-00163	70	8	0.0011	3,069	3664	OK	3393	3340	OK	3471	3262	OK	3692	3041	OK
99730	SSL-00646	44	8	0.0216	0	3046	OK	0	3046	OK	0	3046	OK	0	3046	OK
99731	SSL-00162	80	8	0.0054	0	3049	OK	0	3049	OK	0	3049	OK	0	3049	OK
99732	SSL-00161	296	8	0.0052	0	3065	OK	0	3065	OK	0	3065	OK	0	3065	OK
99733	SSL-00158	129	8	0.0042	216	3102	OK	204	3114	OK	212	3106	OK	216	3102	OK
99734	SSL-00159	77	8	0.0073	0	3115	OK	0	3115	OK	0	3115	OK	0	3115	OK
99735	SSL-00160	140	8	0.0046	0	3126	OK	0	3126	OK	0	3126	OK	0	3126	OK
99736	SSL-00164	251	8	0.0053	9	3158	OK	8	3159	OK	9	3158	OK	10	3158	OK
99737	SSL-00165	255	8	0.0054	80	3176	OK	80	3176	OK	83	3173	OK	85	3172	OK
99738	SSL-00796	138	8	0.1237	32	3202	OK	41	3192	OK	50	3184	OK	53	3180	OK
99739	SSL-00797	175	8	0.0295	0	3193	OK	0	3193	OK	0	3193	OK	0	3193	OK
99740	SSL-00798	210	8	0.0978	0	3211	OK	0	3211	OK	0	3211	OK	0	3211	OK
99741	SSL-01444	38	8	0.0644	1,370	3658	OK	1784	3243	OK	1805	3223	OK	1813	3214	OK
99742	SSL-00799	63	8	0.0469	21	3228	OK	23	3227	OK	24	3226	OK	24	3226	OK
99745	SSL-00559	195	8	0.0315	4,826	6440	OK	7243	4023	OK	7676	3591	OK	7997	3269	OK
99746	SSL-00563	172	8	0.0616	7	3287	OK	9	3285	OK	15	3279	OK	20	3274	OK
99747	SSL-00556	193	8	0.0135	4,244	2524	OK	8845	17582	OK	11888	14539	OK	23091	3337	OK
99748	SSL-00566	210	8	0.0578	63	3344	OK	57	3349	OK	60	3347	OK	61	3346	OK
99749	SSL-00567	110	8	0.0106	2,463	1752	OK	4267	15283	OK	5816	13734	OK	16195	3355	OK
99751	SSL-00977	254	8	0.0138	1,247	3865	OK	1578	3534	OK	1682	3430	OK	1704	3408	OK
99752	SSL-01477	172	8	0.0087	0	3476	OK	0	3476	OK	0	3476	OK	0	3476	OK
99753	SSL-00514	106	8	0.0345	0	3476	OK	0	3476	OK	0	3476	OK	0	3476	OK
99754	SSL-00516	164	8	0.0221	0	3500	OK	0	3500	OK	0	3500	OK	0	3500	OK
99755	SSL-00980	78	8	0.0415	1	3536	OK	1	3535	OK	1	3535	OK	1	3535	OK
99756	SSL-00520	261	8	0.0041	0	3537	OK	0	3537	OK	0	3537	OK	0	3537	OK
99757	SSL-00515	285	8	0.0336	0	3538	OK	0	3538	OK	0	3538	OK	0	3538	OK
99758	SSL-00528	118	8	0.0106	4,240	2447	OK	8809	17304	OK	11854	14258	OK	22550	3562	OK
99759	SSL-00513	122	8	0.0522	0	3564	OK	0	3564	OK	0	3564	OK	0	3564	OK
99760	SSL-00519	120	8	0.0105	0	3633	OK	0	3633	OK	0	3633	OK	0	3633	OK
99761	SSL-00817	101	8	0.0241	0	3640	OK	0	3640	OK	0	3640	OK	0	3640	OK
99762	SSL-00517	122	8	0.0123	2	3653	OK	2	3653	OK	2	3653	OK	2	3653	OK
99787	SSL-00921	194	8	0.0294	0	3671	OK	0	3671	OK	0	3671	OK	0	3671	OK
99788	SSL-00923	100	8	0.0054	4,269	2375	OK	8801	17143	OK	11859	14086	OK	22272	3672	OK
99789	SSL-00926	98	8	0.0050	0	3676	OK	0	3676	OK	0	3676	OK	0	3676	OK
99790	SSL-00049	121	8	0.0064	0	3690	OK	0	3690	OK	0	3690	OK	0	3690	OK
99792	SSL-00622	35	8	0.0502	0	3691	OK	0	3691	OK	0	3691	OK	0	3691	OK
99793	SSL-00631	215	8	0.0072	4,252	2429	OK	8804	17283	OK	11857	14229	OK	22390	3696	OK
99794	SSL-00632	141	8	0.0062	0	3705	OK	0	3705	OK	0	3705	OK	0	3705	OK
99795	SSL-00924	140	8	0.0351	3,001	5957	OK	4835	4122	OK	5093	3864	OK	5226	3731	OK
99796	SSL-00633	217	8	0.0023	0	3770	OK	0	3770	OK	0	3770	OK	0	3770	OK
99797	SSL-00927	77	8	0.0153	4,256	6399	OK	6285	4370	OK	6671	3984	OK	6862	3793	OK
99798	SSL-01944	136	8	0.0050	4,260	2434	OK	8799	17340	OK	11857	14281	OK	22323	3815	OK
99799	SSL-00050	121	8	0.0063	0	3848	OK	0	3848	OK	0	3848	OK	0	3848	OK
99801	SSL-00051	186	8	0.0569	0	3867	OK	0	3867	OK	0	3867	OK	0	3867	OK
99802	SSL-01035	168	8	0.0529	0	3892	OK	0	3892	OK	0	3892	OK	0	3892	OK
99803	SSL-00311	199	8	0.0036	0	3897	OK	0	3897	OK	0	3897	OK	0	3897	OK
99804	SSL-00312	271	8	0.0041	0	3900	OK	0	3900	OK	0	3900	OK	0	3900	OK
99805	SSL-00313	273	8	0.0041	0	3919	OK	0	3919	OK	0	3919	OK	0	3919	OK
99806	SSL-00319	75	8	0.0050	0	3928	OK	0	3928	OK	0	3928	OK	0	3928	OK
99807	SSL-00342	287	8	0.0286	0	3930	OK	0	3930	OK	0	3930	OK	0	3930	OK
99808	SSL-00733	31	8	0.0245	0	3932	OK	0	3932	OK	0	3932	OK	0	3932	OK
99809	SSL-00734	116	8	0.0047	0	3932	OK	0	3932	OK	0	3932	OK	0	3932	OK
99810	SSL-00736	107	8	0.0087	0	3932	OK	0	3932	OK	0	3932	OK	0	3932	OK
99811	SSL-00738	169	8	0.0716	0	3932	OK	0	3932	OK	0	3932	OK	0	3932	OK

Conduit ID	GIS ID	Length (ft)	Diameter (in)	Slope	Existing Condition			2025 Condition			2035 Condition			Buildout Condition		
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99812	SSL-00752	175	8	0.0314	0	3942	OK	0	3942	OK	0	3942	OK	0	3942	OK
99813	SSL-00753	258	8	0.0043	0	3945	OK	0	3945	OK	0	3945	OK	0	3945	OK
99814	SSL-00846	129	8	0.0041	4,822	7996	OK	8145	4673	OK	8591	4227	OK	8840	3978	OK
99815	SSL-00936	60	8	0.0256	7	3995	OK	8	3994	OK	9	3993	OK	9	3992	OK
99816	SSL-00847	85	8	0.1969	0	3998	OK	0	3998	OK	0	3998	OK	0	3998	OK
99817	SSL-00853	147	8	0.0042	0	4001	OK	0	4001	OK	0	4001	OK	0	4001	OK
99818	SSL-00854	231	8	0.0127	0	4007	OK	0	4007	OK	0	4007	OK	0	4007	OK
99819	SSL-01036	306	8	0.0153	0	4011	OK	0	4011	OK	0	4011	OK	0	4011	OK
99820	SSL-00748	151	8	0.0332	0	4017	OK	0	4017	OK	0	4017	OK	0	4017	OK
99821	SSL-00851	144	8	0.0442	0	4017	OK	0	4017	OK	0	4017	OK	0	4017	OK
99822	SSL-00743	264	8	0.0164	0	4044	OK	0	4044	OK	0	4044	OK	0	4044	OK
99823	SSL-00850	195	8	0.0283	0	4058	OK	0	4058	OK	0	4058	OK	0	4058	OK
99824	SSL-00329	212	8	0.0148	0	4069	OK	0	4069	OK	0	4069	OK	0	4069	OK
99825	SSL-00745	142	8	0.0045	7,607	1287	OK	12304	17382	OK	15451	14235	OK	25606	4080	OK
99826	SSL-00849	168	8	0.0380	0	4098	OK	0	4098	OK	0	4098	OK	0	4098	OK
99827	NoMatch	125	8	0.0144	125	5345	OK	1323	4147	OK	1346	4124	OK	1357	4114	OK
99828	SSL-00744	116	8	0.0049	127	5358	OK	1325	4160	OK	1348	4137	OK	1359	4127	OK
99829	SSL-01602	295	8	0.0006	0	4145	OK	0	4145	OK	0	4145	OK	0	4145	OK
99830	SSL-00390	257	8	0.0040	0	4151	OK	0	4151	OK	0	4151	OK	0	4151	OK
99831	SSL-00395	135	8	0.0050	2,471	1920	OK	4288	16080	OK	5838	14530	OK	16214	4154	OK
99832	SSL-00725	130	8	0.0038	2,475	1921	OK	4292	16096	OK	5841	14547	OK	16215	4173	OK
99833	SSL-00392	130	8	0.0056	0	6722	OK	1475	5247	OK	2004	4718	OK	2455	4267	OK
99834	SSL-00393	93	8	0.0041	0	4296	OK	0	4296	OK	0	4296	OK	0	4296	OK
99835	SSL-00729	149	8	0.0375	0	4304	OK	0	4304	OK	0	4304	OK	0	4304	OK
99836	SSL-00639	104	8	0.0625	7,596	1371	OK	12294	17636	OK	15442	14487	OK	25609	4321	OK
99837	SSL-00630	145	8	0.0077	79	4370	OK	97	4352	OK	109	4340	OK	115	4334	OK
99838	SSL-00643	166	8	0.0468	0	4399	OK	0	4399	OK	0	4399	OK	0	4399	OK
99839	SSL-00730	110	8	0.0630	0	4402	OK	0	4402	OK	0	4402	OK	0	4402	OK
99840	SSL-00578	177	8	0.0122	0	4410	OK	0	4410	OK	0	4410	OK	0	4410	OK
99841	SSL-00582	106	8	0.0173	0	4426	OK	0	4426	OK	0	4426	OK	0	4426	OK
99842	SSL-00638	137	8	0.0864	0	4442	OK	0	4442	OK	0	4442	OK	0	4442	OK
99843	SSL-00644	142	8	0.0214	0	4474	OK	0	4474	OK	0	4474	OK	0	4474	OK
99844	SSL-00645	96	8	0.0125	0	4477	OK	0	4477	OK	0	4477	OK	0	4477	OK
99845	SSL-00589	413	8	0.0158	0	4481	OK	0	4481	OK	0	4481	OK	0	4481	OK
99846	SSL-00965	294	8	0.0040	0	4490	OK	0	4490	OK	0	4490	OK	0	4490	OK
99847	SSL-01606	170	8	0.0127	0	4498	OK	0	4498	OK	0	4498	OK	0	4498	OK
99848	SSL-01489	127	8	0.0047	0	4516	OK	0	4516	OK	0	4516	OK	0	4516	OK
99849	SSL-01488	78	8	0.0064	0	4529	OK	0	4529	OK	0	4529	OK	0	4529	OK
99850	SSL-01490	41	8	0.0119	4,824	7914	OK	7534	5204	OK	7899	4839	OK	8191	4547	OK
99851	SSL-01491	49	8	0.0004	0	4637	OK	0	4637	OK	0	4637	OK	0	4637	OK
99852	SSL-01492	93	8	0.0074	0	4715	OK	0	4715	OK	0	4715	OK	0	4715	OK
99853	SSL-01493	240	8	0.0176	0	4721	OK	0	4721	OK	0	4721	OK	0	4721	OK
99854	SSL-01494	275	8	0.0047	0	4764	OK	0	4764	OK	0	4764	OK	0	4764	OK
99855	SSL-00410	99	8	0.0040	0	4787	OK	0	4787	OK	0	4787	OK	0	4787	OK
99856	SSL-01501	61	8	0.0064	0	4798	OK	0	4798	OK	0	4798	OK	0	4798	OK
99857	SSL-01502	133	8	0.0041	0	4826	OK	0	4826	OK	0	4826	OK	0	4826	OK
99858	SSL-01507	66	8	0.0059	1	7281	OK	1475	5807	OK	2004	5278	OK	2456	4827	OK
99859	SSL-00219	37	8	0.0041	2	4845	OK	2	4845	OK	2	4845	OK	2	4844	OK
99861	SSL-00177	362	8	0.0033	7,625	1512	OK	12323	18175	OK	15470	15028	OK	25617	4881	OK
99864	SSL-01200	257	8	0.0039	33	5278	OK	426	4885	OK	427	4883	OK	428	4882	OK
99865	SSL-01078	315	8	0.0343	0	4883	OK	0	4883	OK	0	4883	OK	0	4883	OK
99866	SSL-01190	222	8	0.0630	0	4901	OK	0	4901	OK	0	4901	OK	0	4901	OK
99868	SSL-01201	136	8	0.0054	4,076	5845	OK	4527	5394	OK	4670	5250	OK	4985	4936	OK
99869	SSL-01202	158	8	0.0035	0	7394	OK	1475	5918	OK	2004	5389	OK	2455	4938	OK

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99870	SSL-01077	230	8	0.0335	0	5005	OK	0	5005	OK	0	5005	OK	0	5005	OK
99871	SSL-00070	48	8	0.0114	3,941	5886	OK	4379	5448	OK	4511	5316	OK	4805	5023	OK
99872	SSL-01418	297	8	0.0046	3	7513	OK	1475	6041	OK	2004	5512	OK	2455	5061	OK
99873	SSL-02030	141	8	0.1053	3,945	5953	OK	4383	5515	OK	4515	5382	OK	4810	5087	OK
99874	SSL-02034	204	8	0.0102	3,968	5965	OK	4405	5528	OK	4539	5394	OK	4837	5096	OK
99875	SSL-02033	142	8	0.1001	6,802	2144	OK	11460	18400	OK	14567	15293	OK	24743	5117	OK
99877	SSL-02039	148	8	0.0439	0	5127	OK	0	5127	OK	0	5127	OK	0	5127	OK
99878	SSL-02032	120	8	0.0406	3,971	6007	OK	4410	5569	OK	4544	5434	OK	4843	5135	OK
99879	SSL-02045	125	8	0.0040	3,951	6027	OK	4390	5589	OK	4523	5455	OK	4819	5159	OK
99880	SSL-02046	139	8	0.0107	3,072	5853	OK	3396	5529	OK	3475	5450	OK	3696	5229	OK
99881	SSL-01771	93	8	0.0068	4,336	7902	OK	6362	5876	OK	6767	5471	OK	6969	5269	OK
99882	SSL-01777	306	8	0.0090	6,819	2182	OK	11476	18568	OK	14585	15460	OK	24746	5298	OK
99883	SSL-01310	24	8	0.0089	4,799	10348	FM	7826	7321	FM	8878	6269	FM	9806	5341	FM
99884	SSL-01312	215	8	0.0607	0	5376	OK	0	5376	OK	0	5376	OK	0	5376	OK
99885	SSL-08408	69	8	0.0114	939	5705	OK	1073	5572	IH, Backwater	1153	5491	IH, Backwater	1205	5439	IH, Backwater
99886	SSL-01419	294	8	0.0061	0	5473	OK	0	5473	OK	0	5473	OK	0	5473	OK
99887	SSL-01580	288	8	0.0048	4,767	10455	FM	7773	7449	FM	8818	6404	FM	9740	5481	FM
99888	SSL-01420	53	8	0.0099	0	5554	OK	0	5554	OK	0	5554	OK	0	5554	OK
99890	SSL-00284	429	8	0.0040	4,830	8670	OK	7128	6372	OK	7581	5920	OK	7894	5607	OK
99891	SSL-00289	496	8	0.0043	4,836	8624	OK	7030	6430	OK	7504	5957	OK	7803	5658	OK
99892	SSL-00290	75	8	0.0047	6,759	2369	OK	11417	19052	OK	14522	15946	OK	24720	5749	OK
99894	SSL-01971	205	8	0.0040	0	5797	OK	0	5797	OK	0	5797	OK	0	5797	OK
99896	SSL-01691	130	8	0.0101	0	5801	OK	0	5801	OK	0	5801	OK	0	5801	OK
99897	SSL-01721	271	8	0.0040	759	5852	OK	746	5864	OK	773	5837	OK	807	5804	OK
99901	SSL-01704	42	8	0.3379	0	5945	OK	0	5945	OK	0	5945	OK	0	5945	OK
99902	SSL-01708	102	8	0.0958	6,747	2451	OK	11410	19292	OK	14511	16191	OK	24725	5977	OK
99903	SSL-01709	105	8	0.0588	0	6012	OK	0	6012	OK	0	6012	OK	0	6012	OK
99904	SSL-01710	80	8	0.0533	6,282	2836	OK	10975	19460	OK	14059	16377	OK	24397	6039	OK
99905	SSL-01711	109	8	0.0385	6,297	2822	OK	10984	0	OK	14067	16370	OK	24356	6080	OK
99906	SSL-01712	68	8	0.0514	0	6101	OK	0	6101	OK	0	6101	OK	0	6101	OK
99907	SSL-01713	206	8	0.0097	0	6159	OK	0	6159	OK	0	6159	OK	0	6159	OK
99908	SSL-01714	156	8	0.0632	0	6247	OK	0	6247	OK	0	6247	OK	0	6247	OK
99909	SSL-01715	110	8	0.0176	2,505	2369	OK	4340	18267	OK	5895	16712	OK	16272	6334	OK
99910	SSL-01716	113	8	0.0040	0	6480	OK	0	6480	OK	0	6480	OK	0	6480	OK
99911	SSL-01717	133	8	0.0099	0	6486	OK	0	6486	OK	0	6486	OK	0	6486	OK
99912	SSL-01983	22	8	0.1783	389	11663	DH, Backwater	3301	8751	DH, Backwater	4706	7346	HS, Backwater	5539	6513	DH, Backwater
99914	SSL-01718	222	8	0.0118	0	6544	FM	0	6544	FM	0	6544	FM	0	6544	FM
99915	SSL-01722	62	8	0.0040	0	6568	OK	0	6568	OK	0	6568	OK	0	6568	OK
99916	SSL-01723	170	8	0.0196	32	7325	OK	425	6933	OK	427	6931	OK	427	6930	OK
99917	SSL-01724	421	8	0.0373	4,078	7945	OK	4529	7494	OK	4673	7350	OK	4988	7035	OK
99918	SSL-01725	173	8	0.0401	451	7262	OK	523	7190	OK	611	7102	OK	656	7057	OK
99919	SSL-01753	60	8	0.0040	0	7147	OK	0	7147	OK	0	7147	OK	0	7147	OK
99920	SSL-01755	62	8	0.0079	2,470	2601	OK	4288	19233	OK	5837	17683	OK	16215	7305	OK
99921	SSL-01756	90	8	0.0077	4,339	10181	OK	6365	8156	OK	6771	7750	OK	6972	7549	OK
99922	SSL-01757	192	8	0.0260	0	7768	OK	0	7768	OK	0	7768	OK	0	7768	OK
99923	SSL-01758	96	8	0.0551	4,344	10409	OK	6370	8383	OK	6775	7978	OK	6977	7776	OK
99924	SSL-01759	125	8	0.0393	4,080	4037	OK	8871	22826	OK	11798	19899	OK	23920	7777	OK
99925	SSL-01761	57	8	0.0037	31	7902	OK	32	7901	OK	35	7898	OK	37	7896	OK
99926	SSL-01762	228	8	0.0173	4,082	8897	OK	4533	8446	OK	4678	8301	OK	4994	7985	OK
99927	SSL-01763	297	8	0.0040	0	8030	OK	0	8030	OK	0	8030	OK	0	8030	OK
99928	SSL-01764	180	8	0.0142	2,484	2781	OK	4309	20111	OK	5858	18562	OK	16230	8189	OK
99929	SSL-01765	215	8	0.0374	4,754	9891	OK	6158	8487	OK	6352	8293	OK	6164	8482	IH, Backwater
99930	SSL-02159	31	8	0.0148	108	10396	OK	1307	9197	OK	1327	9176	OK	1337	9166	OK
99932	SSL-01866	165	8	0.0030	4,099	4204	OK	8669	23752	OK	11695	20726	OK	23252	9169	OK

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99933	SSL-01867	238	8	0.0111	7,659	27542	OK	12358	22843	OK	15507	19694	OK	25650	9551	OK
99934	SSL-01868	312	8	0.0108	0	9685	OK	0	9685	OK	0	9685	OK	0	9685	OK
99935	SSL-01869	589	8	0.0040	239	15298	OK	3301	12236	DH, Backwater	4722	10815	DH, Backwater	5542	9996	DH, Backwater
99937	SSL-01873	351	8	0.0151	0	10010	OK	0	10010	OK	0	10010	OK	0	10010	OK
99938	SSL-01874	349	8	0.0060	5,003	13284	OK	7254	11033	OK	7867	10419	OK	8275	10012	OK
99939	SSL-01877	240	8	0.0047	4,236	12946	OK	6244	10938	OK	6629	10553	OK	6820	10362	OK
99940	SSL-01878	384	8	0.0040	7,067	13660	OK	8999	11728	OK	9581	11146	OK	10125	10602	OK
99941	SSL-01882	478	8	0.0040	0	11840	OK	0	11840	OK	0	11840	OK	0	11840	OK
99942	SSL-01973	464	8	0.0093	0	11933	OK	0	11933	OK	0	11933	OK	0	11933	OK
99943	SSL-01974	342	8	0.0166	5	2821	OK	9	13102	OK	72	13039	OK	288	12823	OK
99944	SSL-01858	491	8	0.0040	4,080	13888	OK	4531	13438	OK	4675	13293	OK	4991	12978	OK
99945	SSL-01859	68	8	0.0040	2,119	13165	OK	2040	13244	OK	2094	13191	OK	2057	13227	OK
99947	SSL-01975	8	8	0.0312	13	14139	OK	32	14120	DH, Backwater	601	13551	DH, Backwater	572	13580	DH, Backwater
99948	SSL-01860	71	8	0.0105	2,494	15493	OK	3302	14685	OK	3571	14416	OK	3843	14144	OK
99949	SSL-02343	49	8	0.0190	2,527	4444	OK	4414	27919	OK	5947	26386	OK	17001	15332	OK
99957	SSL-02405	64	10	0.0081	2,491	17395	OK	3303	16583	OK	3577	16309	OK	3850	16035	OK
99959	SSL-02406	77	10	0.0077	66	16162	OK	77	16150	OK	86	16142	OK	90	16138	OK
99961	SSL-02407	66	10	0.0232	4,292	19002	OK	6298	16995	OK	6691	16602	OK	6888	16406	OK
99963	SSL-02410	57	10	0.0086	0	3864	OK	0	17921	OK	23	17897	OK	122	17799	OK
99969	SSL-02438	243	8	0.1263	6,314	6561	OK	10999	31977	OK	14080	28895	OK	24324	18652	OK
99971	SSL-02436	377	8	0.0101	31	4582	OK	60	21337	OK	239	21159	OK	658	20739	OK
99973	SSL-02437	110	8	0.0110	14	4600	OK	22	21379	OK	130	21271	OK	450	20951	OK
99975	SSL-02439	74	8	0.0073	6	26886	OK	1474	25419	OK	2005	24888	OK	2454	24439	OK
99987	SSL-02493	255	8	0.0037	5,001	32147	OK	7907	29241	OK	8086	29062	OK	8289	28860	OK
99989	SSL-02508	23	8	0.0126	0	29242	OK	0	29242	OK	0	29242	OK	0	29242	OK
99991	SSL-02495	319	8	0.0040	9,911	36744	OK	12689	33965	OK	13573	33081	OK	14483	32171	OK
99993	SSL-02494	110	8	0.0023	4,418	9682	OK	8924	46134	OK	11987	43071	OK	22380	32678	OK
99995	SSL-02502	78	8	0.0060	1	39412	OK	1	39412	OK	1	39412	OK	1	39412	OK
99997	SSL-02499	177	8	0.0064	2,509	9515	OK	4344	51427	OK	5900	49871	OK	16277	39494	OK
99999	SSL-02500	149	8	0.0042	7,071	46657	OK	9002	44726	OK	9584	44145	OK	10129	43600	OK
100001	SSL-02501	16	8	0.0244	5,778	0	OK	12331	1542	OK	16877	0	OK	32804	0	OK
100005	SSL-02506	75	10	0.0067	9,685	0	OK	12423	0	OK	13259	0	DS	14131	0	DS
100007	SSL-02507	24	10	0.0242	9,680	0	DS	12419	0	DS	13255	0	DS	14127	0	DS
100024	SSL-08348	103	8	0.0051	4,799	0	FM	7828	0	FM	8881	0	FM	9809	0	FM
100025	SSL-08347	334	8	0.0060	4,767	0	FM	7776	0	FM	8822	0	FM	9744	0	FM
100028	SSL-08346	340	8	0.0053	9,586	0	DS	12334	0	DS	13166	0	DS	14032	0	DS
100029	SSL-08345	372	10	0.0045	4,567	217	OK	8731	9953	OK	11572	7112	OK	23144	0	OK
100051	SSL-08352	122	8	0.0104	2,491	105	OK	4321	7720	OK	5874	6167	OK	16250	0	OK
100052	SSL-08355	160	8	0.0875	6,719	0	OK	11384	9867	OK	14481	6770	OK	24718	0	OK
100053	SSL-08356	116	8	0.0168	3,004	0	OK	4839	0	OK	5098	0	OK	5230	0	OK
100054	SSL-08357	79	8	0.0027	40	2990	OK	3335	0	OK	4606	0	OK	5588	0	DS
100055	SSL-08358	110	8	0.0041	4,668	517	OK	6734	0	OK	7158	0	OK	7367	0	OK
100056	SSL-08359	89	8	0.0041	2,120	1520	OK	4526	0	HS	5958	0	IS	5750	0	HS
100057	SSL-08360	140	8	0.0040	9,735	2477	OK	12445	0	OK	13266	0	OK	14135	0	OK
100058	SSL-08361	161	8	0.0040	3,004	415	OK	4839	0	OK	5098	0	OK	5230	0	OK
100059	SSL-08363	335	8	0.0040	4,599	0	OK	5127	0	OK	5324	0	OK	5718	0	OK
100060	SSL-08362	275	8	0.0040	78	4200	OK	3330	948	OK	4742	0	DH, Backwater	5575	0	DH, Backwater
100061	SSL-08364	170	8	0.0040	4,608	0	OK	5140	0	OK	5338	0	OK	5734	0	OK
100062	SSL-08365	170	8	0.0034	1,636	629	OK	3274	0	DS	3342	0	DS	3374	0	DS
100063	SSL-08353	153	8	0.0041	1,723	759	OK	3381	0	DS	3465	0	DS	3505	0	DS
100064	SSL-08368	222	8	0.0331	1,738	857	OK	3400	0	OK	3489	0	OK	3530	0	OK
100065	SSL-08366	135	8	0.0033	956	0	OK	1094	0	HS	1172	0	HS	1213	0	HS
100066	SSL-08367	155	8	0.0040	1,642	951	OK	3281	0	DS	3349	0	DS	3381	0	DS
800000	SSL-01702	86	8	0.0531	41	332	OK	40	332	OK	42	331	OK	43	330	OK

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800010	SSL-00150	57	8	-0.0089	6	331	OK	6	330	OK	7	330	OK	7	330	OK
800054	SSL-02042	118	10	0.0343	10	332	OK	11	331	OK	11	331	OK	12	330	OK
800056	NoMatch	129	8	0.0706	10	332	OK	11	331	OK	11	331	OK	12	330	OK
800084	NoMatch	128	8	0.0038	3	331	OK	4	331	OK	4	331	OK	4	330	OK
800086	SSL-00888	407	18	0.0010	216	330	OK	204	342	OK	212	335	OK	216	330	OK
800115	NoMatch	500	8	0.0009	3	332	OK	4	331	OK	4	331	OK	4	331	OK
800116	SSL-00674	106	12	0.0013	12	332	OK	13	332	OK	14	331	OK	14	331	OK
800117	SSL-01236	110	12	0.0056	9	334	OK	10	332	OK	12	331	OK	12	331	OK
800119	SSL-01808	343	12	0.0076	46	362	OK	44	363	OK	68	340	IH, Backwater	77	331	IH, Backwater
800122	SSL-01893	125	10	0.0010	216	331	OK	204	343	OK	212	335	OK	216	331	OK
800124	SSL-02492	309	24	0.0000	216	331	OK	204	343	OK	212	335	OK	216	331	OK
800135	NoMatch	276	8	0.0214	122	398	OK	154	365	OK	178	342	OK	189	331	OK
800136	NoMatch	207	8	0.0042	10	333	OK	10	333	OK	11	332	OK	12	331	OK
800137	NoMatch	273	8	0.0176	190	328	OK	164	354	OK	171	347	OK	186	331	IH, Backwater
800138	NoMatch	78	8	0.0066	1	331	OK	1	331	OK	1	331	OK	1	331	OK
800139	NoMatch	161	8	0.0060	21	333	OK	22	332	OK	23	332	OK	23	331	OK
800146	SSL-01439	154	10	0.0019	4	333	OK	5	332	OK	5	332	OK	5	331	OK
800147	SSL-01438	152	10	0.0019	14	333	OK	15	332	OK	16	332	OK	16	331	OK
800188	SSL-01454	35	8	0.0011	3	332	OK	3	332	OK	3	331	OK	3	331	OK
800189	SSL-01456	161	8	0.0034	9	334	OK	11	332	OK	12	332	OK	12	331	OK
800190	SSL-01455	142	8	0.0031	21	334	OK	22	333	OK	23	332	OK	23	332	OK
800230	NoMatch	119	8	0.0061	3	334	OK	4	333	OK	4	332	OK	5	332	OK
800252	SSL-01751	82	10	0.0017	2	332	OK	2	332	OK	2	332	OK	2	332	OK
800253	SSL-00192	286	8	0.0026	418	491	OK	478	432	OK	547	362	OK	577	332	OK
800269	SSL-00547	196	12	0.0032	8	336	OK	8	335	OK	9	334	OK	11	332	OK
800280	SSL-01742	90	10	0.0365	1,110	735	OK	1424	421	OK	1502	343	OK	1513	332	OK
800281	SSL-01743	38	10	0.0640	10	334	OK	10	333	OK	11	333	OK	11	332	OK
800282	SSL-01744	33	10	0.2800	1	342	OK	1	342	OK	7	337	OK	11	332	IH, Backwater
800283	SSL-01746	151	10	0.0042	5	332	OK	4	333	OK	4	333	OK	5	332	OK
800284	SSL-01747	53	10	0.4885	10	332	OK	9	334	OK	9	333	OK	9	333	OK
800285	SSL-01748	150	10	0.0351	6	336	OK	9	333	OK	9	333	OK	9	333	OK
800286	SSL-01749	136	10	0.0434	10	335	OK	11	335	OK	11	334	OK	12	334	OK
800287	SSL-01750	101	10	0.0035	17	337	OK	18	335	OK	19	334	OK	19	334	OK
800288	SSL-01752	83	10	0.0040	9	333	OK	8	334	OK	8	334	OK	8	334	OK
800294	SSL-01739	103	10	0.0048	8	338	OK	10	336	OK	11	335	OK	11	334	OK
800295	SSL-01740	168	10	0.0040	3	336	OK	4	335	OK	4	334	OK	4	334	OK
800297	SSL-01741	82	10	0.0356	34	349	OK	55	328	IH, Backwater	51	332	IH, Backwater	48	335	IH, Backwater
800299	NoMatch	13	21	0.2936	2	335	OK	2	335	OK	2	335	OK	2	335	OK
800306	NoMatch	128	8	0.0250	5	338	OK	7	335	OK	8	335	OK	8	335	OK
800308	SSL-02051	291	10	0.0013	7	336	OK	8	336	OK	8	335	OK	8	335	OK
800325	SSL-01782	178	18	0.0060	4	337	OK	6	336	OK	6	336	OK	6	335	OK
800334	SSL-01688	152	10	0.0018	23	346	OK	32	338	OK	33	336	OK	34	335	OK
800386	NoMatch	204	8	0.0039	4	336	OK	5	336	OK	5	336	OK	5	336	OK
800396	SSL-01919	290	10	0.0015	6	336	OK	6	337	OK	6	336	OK	7	336	OK
800397	NoMatch	110	8	0.0583	2	336	OK	2	336	OK	2	336	OK	2	336	OK
800398	NoMatch	23	8	0.0792	5	337	OK	5	337	OK	6	336	OK	6	336	OK
800416	SSL-01442	145	18	0.1176	1	336	OK	1	336	OK	1	336	OK	1	336	OK
800417	SSL-00429	133	10	0.0118	10	338	OK	11	337	OK	12	336	OK	12	336	OK
800447	SSL-01497	123	10	0.0025	9	337	OK	10	337	OK	10	336	OK	10	336	OK
800448	SSL-01498	52	10	0.0027	3	337	OK	4	337	OK	4	336	OK	5	336	OK
800449	SSL-02044	96	10	0.0065	0	336	OK	0	336	OK	0	336	OK	0	336	OK
800450	NoMatch	61	10	0.0078	5	337	OK	5	337	OK	6	337	OK	6	336	OK
800452	SSL-02049	240	10	0.0179	5	336	OK	4	337	OK	5	337	OK	5	337	OK
800453	SSL-02043	142	10	0.0086	1	337	OK	1	337	OK	1	337	OK	1	337	OK

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800565	SSL-00143	270	27	0.0009	11	334	OK	7	337	OK	7	337	OK	8	337	OK
802247	SSL-02248	48	8	0.0073	6	338	OK	6	337	OK	6	337	OK	6	337	OK
802248	SSL-02247	267	8	0.0034	18	328	OK	9	338	OK	9	337	OK	10	337	OK
802249	SSL-02250	257	8	0.0169	202	363	OK	216	350	OK	224	342	OK	229	337	OK
802254	SSL-02249	304	8	0.0540	0	337	OK	0	337	OK	0	337	OK	0	337	OK
802259	SSL-02230	257	8	0.0011	6	338	OK	6	338	OK	7	337	OK	7	337	OK
802260	SSL-02229	155	8	0.0063	3	340	OK	6	338	OK	6	337	OK	6	337	OK
802268	SSL-02270	45	12	0.0051	9	338	OK	10	338	OK	10	337	OK	10	337	OK
802269	SSL-02271	45	12	0.0096	9	338	OK	9	338	OK	10	338	OK	10	337	OK
802270	SSL-02272	45	12	0.0051	5	338	OK	5	338	OK	5	338	OK	6	337	OK
802271	SSL-02273	45	12	0.0024	2	337	OK	1	338	OK	2	337	OK	2	337	OK
802278	SSL-02292	131	8	0.0053	3	338	OK	3	338	OK	3	338	OK	3	337	OK
802279	SSL-02293	200	8	0.0038	6	339	OK	7	339	OK	7	338	OK	8	337	OK
802280	SSL-02290	165	8	0.0474	5	339	OK	5	338	OK	6	338	OK	6	338	OK
802281	SSL-02291	116	8	0.0602	3	340	OK	5	338	OK	5	338	OK	5	338	OK
802292	SSL-02265	65	8	0.0071	3	338	OK	3	338	OK	3	338	OK	3	338	OK
802300	SSL-02262	90	8	0.0042	1	338	OK	1	338	OK	1	338	OK	1	338	OK
802301	SSL-02263	273	8	0.0040	4	338	OK	4	339	OK	5	338	OK	5	338	OK
802302	SSL-02264	91	8	0.0062	4	340	OK	5	338	OK	5	338	OK	5	338	OK
802312	SSL-02227	129	8	0.0040	18	731	OK	410	339	OK	410	339	OK	411	338	OK
802313	SSL-02228	222	8	0.0040	216	338	OK	204	350	OK	212	342	OK	216	338	OK
802315	SSL-02237	36	8	0.3392	4	339	OK	4	339	OK	4	338	OK	4	338	OK
802316	SSL-02238	87	8	0.0436	3	339	OK	4	339	OK	4	339	OK	4	338	OK
802356	SSL-02240	55	8	0.0047	2	341	OK	2	341	OK	4	339	OK	5	338	OK
802357	SSL-02241	84	8	0.0092	2	339	OK	3	339	OK	3	339	OK	3	339	OK
802358	SSL-02243	96	8	0.0058	4	340	OK	4	339	OK	5	339	OK	5	339	OK
802359	SSL-02242	367	8	0.0036	30	340	OK	30	341	OK	31	339	OK	31	339	OK
802364	SSL-02251	81	10	0.0058	2	339	OK	2	339	OK	2	339	OK	2	339	OK
802365	SSL-02252	195	10	0.0043	11	341	OK	12	341	OK	13	340	OK	13	339	OK
802366	SSL-02253	47	10	0.0074	4	340	OK	4	340	OK	4	339	OK	4	339	OK
802367	SSL-02254	43	10	0.0109	116	403	OK	146	372	OK	168	350	OK	179	339	OK
802368	SSL-02255	49	10	0.0580	2	341	OK	3	340	OK	3	340	OK	4	339	OK
802369	SSL-02259	252	8	0.0423	3	340	OK	3	340	OK	3	340	OK	3	339	OK
802370	SSL-02256	102	10	0.0654	3	340	OK	3	340	OK	4	340	OK	4	340	OK
802371	SSL-02258	174	10	0.0514	3	340	OK	3	340	OK	3	340	OK	3	340	OK
802372	NoMatch	107	10	0.0019	8	342	OK	9	341	OK	10	340	OK	10	340	OK
802394	SSL-02294	94	8	0.1007	4	340	OK	3	340	OK	3	340	OK	4	340	OK
802395	SSL-02295	157	8	0.0554	18	342	OK	19	341	OK	20	340	OK	20	340	OK
802396	SSL-02296	102	8	0.0312	1	340	OK	1	340	OK	1	340	OK	1	340	OK
802397	SSL-02297	75	8	0.0797	3	340	OK	3	340	OK	3	340	OK	3	340	OK
802398	SSL-02298	63	8	0.0543	4	340	OK	4	340	OK	4	340	OK	4	340	OK
802399	SSL-02299	86	8	0.0277	34	343	OK	36	342	OK	37	341	OK	38	340	OK
802400	SSL-02300	40	8	0.0030	4	340	OK	3	340	OK	3	340	OK	4	340	OK
802401	SSL-02301	77	8	0.0408	5	340	OK	4	341	OK	4	340	OK	4	340	OK
802402	SSL-02302	89	8	0.0470	30	338	OK	27	342	OK	28	341	OK	28	340	OK
802403	SSL-02322	74	8	0.0251	2	340	OK	2	340	OK	2	340	OK	3	340	OK
802404	SSL-02321	149	8	0.0973	3	341	OK	3	341	OK	3	340	OK	3	340	OK
802433	SSL-01931	37	8	0.0159	19	344	OK	22	341	OK	23	341	OK	23	340	OK
802436	SSL-02210	132	8	0.0490	2	341	OK	2	340	OK	3	340	OK	3	340	OK
802438	SSL-02011	217	8	0.0090	4	341	OK	4	341	OK	5	340	OK	5	340	OK
802439	SSL-02275	133	8	0.0045	24	348	OK	27	345	OK	30	342	OK	32	340	OK
802440	SSL-02279	133	8	0.0363	2	341	OK	2	341	OK	2	341	OK	2	340	OK
802441	SSL-02276	195	8	0.0185	3	341	OK	3	341	OK	3	341	OK	3	341	OK
802442	SSL-02282	62	8	0.0058	1	341	OK	2	341	OK	2	341	OK	2	341	OK

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802443	SSL-02283	104	8	0.0054	12	341	OK	11	341	OK	12	341	OK	12	341	OK
802444	SSL-02277	317	8	0.0295	2	342	OK	2	342	OK	2	342	OK	3	341	OK
802445	SSL-02278	134	8	0.0142	2	341	OK	2	341	OK	2	341	OK	2	341	OK
802446	SSL-02280	303	8	0.0152	2	342	OK	2	341	OK	2	341	OK	2	341	OK
802447	SSL-02281	59	8	0.0075	1	342	OK	2	342	OK	2	341	OK	2	341	OK
802448	SSL-02289	391	8	0.0050	4	342	OK	4	342	OK	4	342	OK	4	341	OK
802449	SSL-02288	58	8	0.0046	0	343	OK	0	343	OK	0	343	OK	1	342	IH, Backwater
802450	SSL-02287	229	8	0.0162	1	342	OK	1	342	OK	1	342	OK	1	342	OK
802451	SSL-02286	295	8	0.0223	16	347	OK	18	345	OK	20	343	OK	22	342	OK
802452	SSL-02285	120	8	0.0059	6	341	OK	4	342	OK	4	342	OK	5	342	OK
802453	SSL-02284	209	8	0.0047	1	342	OK	1	342	OK	1	342	OK	1	342	OK
803638	SSL-08413	140	8	0.0086	6	343	OK	6	342	OK	6	342	OK	7	342	OK
803889	SSL-08349	6	30	0.0000	1	342	OK	2	342	OK	2	342	OK	2	342	OK
803894	SSL-02488	61	36	0.0026	7	343	OK	8	343	OK	8	342	OK	8	342	OK
803896	SSL-02448	350	36	0.0048	9	342	OK	7	344	OK	8	343	OK	8	342	OK
811535	SSL-02112	35	8	0.0049	2	343	OK	2	343	OK	2	342	OK	3	342	OK
811537	SSL-02308	30	8	0.0020	2	342	OK	2	343	OK	2	343	OK	2	343	OK
811547	SSL-01848	284	8	0.0040	43	348	OK	46	346	OK	48	344	OK	49	343	OK
811554	SSL-02310	100	8	0.0450	0	343	OK	0	343	OK	0	343	OK	0	343	OK
811555	SSL-02309	182	8	0.0185	2	343	OK	2	343	OK	2	343	OK	2	343	OK
811558	SSL-02325	250	8	0.0165	2	344	OK	2	344	OK	2	343	OK	2	343	OK
811559	SSL-02326	67	8	0.0149	1	344	OK	2	344	OK	2	344	OK	2	344	OK
811562	SSL-02320	108	8	0.0507	1	344	OK	1	344	OK	1	344	OK	1	344	OK
811563	SSL-02319	232	8	0.0030	2	348	OK	2	348	OK	5	345	OK	6	344	OK
811565	SSL-02307	127	8	0.0059	5	345	OK	5	345	OK	5	344	OK	5	344	OK
811568	SSL-02358	105	8	0.0059	1	345	OK	1	345	OK	2	345	OK	2	345	OK
811569	SSL-02356	54	8	0.0091	4	347	OK	6	346	OK	6	345	OK	7	345	OK
811574	SSL-02361	39	8	0.0135	0	345	OK	0	345	OK	0	345	OK	0	345	OK
811575	SSL-02360	109	8	0.0027	1	345	OK	1	345	OK	1	345	OK	2	345	OK
811576	SSL-02359	375	8	0.0047	0	345	OK	0	345	OK	0	345	OK	0	345	OK
811577	SSL-02362	60	8	0.0010	8	346	OK	8	346	OK	9	345	OK	9	345	OK
811590	SSL-02333	70	8	0.0053	45	339	OK	37	347	OK	39	346	OK	39	345	OK
811591	SSL-02341	15	8	0.0082	12	352	OK	18	346	OK	19	346	OK	20	345	OK
811592	SSL-02332	165	8	0.0077	28	355	OK	36	347	OK	37	346	OK	38	345	OK
811593	SSL-02330	84	8	0.0036	728	478	OK	802	404	OK	841	366	OK	861	345	OK
811594	SSL-02331	128	8	0.0060	9	347	OK	9	346	OK	9	346	OK	10	345	OK
811595	SSL-02337	181	8	0.0051	34	351	OK	37	348	OK	39	346	OK	40	346	OK
811596	SSL-02336	90	8	0.0717	7	348	OK	8	347	OK	9	346	OK	10	346	OK
811597	SSL-02335	181	8	0.0276	22	349	OK	23	348	OK	24	347	OK	25	346	OK
811598	SSL-02334	146	8	0.0128	5	349	OK	7	347	OK	8	347	OK	8	346	OK
811600	SSL-02339	82	8	0.0474	1	347	OK	2	347	OK	2	346	OK	2	346	OK
811601	SSL-02338	161	8	0.0059	23	347	OK	21	348	OK	22	347	OK	23	347	OK
811602	SSL-00409	26	8	0.0038	29	351	OK	31	349	OK	32	348	OK	33	347	OK
811603	SSL-00408	166	8	0.0173	6	346	OK	4	347	OK	5	347	OK	5	347	OK
811606	SSL-02347	165	8	0.0099	5	348	OK	6	348	OK	6	347	OK	6	347	OK
811607	SSL-00222	352	8	0.0233	21	353	OK	24	349	OK	25	348	OK	26	348	OK
811609	SSL-02244	41	10	0.0032	3	348	OK	4	348	OK	4	348	OK	4	348	OK
811611	SSL-02316	269	8	0.0015	2	349	OK	2	349	OK	2	349	OK	2	349	OK
811616	SSL-02318	199	8	0.0014	12	351	OK	13	350	OK	13	349	OK	14	349	OK
811617	SSL-02315	56	8	0.0110	32	353	OK	34	351	OK	35	350	OK	36	349	OK
811618	NoMatch	211	8	0.0260	152	416	OK	177	391	OK	204	364	IH, Backwater	217	351	IH, Backwater
811619	SSL-00201	315	8	0.0040	1	351	OK	1	351	OK	1	351	OK	1	351	OK
811630	SSL-02311	152	8	0.0001	4	355	OK	7	352	OK	8	352	OK	8	351	OK
811632	SSL-01431	79	10	0.0025	10	357	OK	13	354	OK	15	353	OK	16	352	OK

Conduit ID	GIS ID	Length (ft)	Diameter (in)	Slope	Existing Condition			2025 Condition			2035 Condition			Buildout Condition		
					Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category	Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category	Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category	Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category
811636	SSL-01038	234	8	0.0040	53	543	OK	241	355	OK	243	353	OK	244	352	OK
811643	SSL-02351	330	8	0.0036	9	351	OK	7	353	OK	8	352	OK	8	352	OK
811644	SSL-02350	310	8	0.0041	2	353	OK	2	353	OK	2	352	OK	2	352	OK
811645	SSL-02353	285	8	0.0469	23	359	OK	27	355	OK	28	354	OK	29	353	OK
811646	SSL-02354	287	8	0.0264	11	352	OK	9	354	OK	9	353	OK	9	353	OK
811647	SSL-02352	258	8	0.0100	2	354	OK	2	354	OK	2	353	OK	2	353	OK
811648	SSL-02355	98	8	0.0408	4,706	3159	OK	6796	1069	OK	7264	601	OK	7511	353	OK
812436	SSL-02396	86	10	0.0116	13	354	OK	12	355	OK	13	354	OK	13	354	OK
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812445	SSL-02393	43	8	0.0058	5	357	OK	6	356	OK	6	356	OK	6	356	OK
812460	SSL-02380	148	8	0.0042	0	356	OK	0	356	OK	0	356	OK	0	356	OK
812461	SSL-02379	50	8	0.0048	2	358	OK	2	357	OK	2	357	OK	2	357	OK
812463	SSL-02367	131	8	0.0038	2	358	OK	2	358	OK	2	358	OK	3	357	OK
812464	SSL-02368	59	8	0.0071	123	383	OK	140	366	OK	146	360	OK	149	357	OK
812467	SSL-02382	85	8	0.0118	25	361	OK	27	360	OK	28	359	OK	29	358	OK
812468	SSL-02381	156	8	0.0364	1	358	OK	1	358	OK	1	358	OK	1	358	OK
812473	SSL-02391	48	8	0.2977	16	358	OK	14	359	OK	15	359	OK	15	358	OK
812477	SSL-02366	321	8	0.0040	19	363	OK	22	360	OK	23	359	OK	24	359	OK
812483	SSL-02389	150	8	0.0500	0	359	OK	0	359	OK	0	359	OK	0	359	OK
812484	SSL-02387	205	8	0.0040	14	368	OK	20	362	OK	22	360	OK	23	359	OK
812485	SSL-02390	97	8	0.0748	9	360	OK	9	360	OK	10	359	OK	10	359	OK
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812507	SSL-02363	142	8	0.0062	2	361	OK	2	361	OK	3	361	OK	3	361	OK
812508	SSL-02365	130	8	0.0082	3	362	OK	3	362	OK	3	361	OK	3	361	OK
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814124	SSL-08369	33	30	0.0867	3	363	OK	2	364	OK	2	364	OK	2	364	OK
814131	SSL-08370	31	30	0.0016	3	364	OK	3	364	OK	3	364	OK	3	364	OK
814132	SSL-08373	15	30	0.0013	4	364	OK	4	364	OK	4	364	OK	4	364	OK
814133	SSL-08371	147	30	0.0016	8	366	OK	9	366	OK	9	365	OK	9	365	OK
814134	SSL-08374	48	30	0.0017	2	365	OK	2	365	OK	2	365	OK	3	365	OK
814135	SSL-08375	15	30	0.0213	12	366	OK	12	366	OK	13	366	OK	13	365	OK
815896	SSL-01844	297	8	0.0160	0	366	OK	0	366	OK	0	366	OK	0	366	OK
819865	SSL-02327	168	8	0.0023	15	373	OK	17	372	OK	18	371	OK	18	370	OK
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819893	SSL-02432	197	8	0.0027	8	373	OK	9	372	OK	10	371	OK	11	371	OK
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819902	SSL-02402	275	10	0.0123	5	372	OK	6	372	OK	6	372	OK	6	372	OK
819916	SSL-02420	340	12	0.0228	4	373	OK	4	372	OK	5	372	OK	5	372	OK

Conduit ID	GIS ID	Length (ft)	Diameter (in)	Slope	Existing Condition			2025 Condition			2035 Condition			Buildout Condition		
					Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category	Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category	Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category	Maximum Flow (gpm)	Remaining Capacity (gpm)	HGL Category
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819926	SSL-02428	324	8	0.0162	2	373	OK	2	373	OK	3	373	OK	3	373	OK
819927	SSL-02430	26	8	0.0000	96	423	OK	121	398	OK	138	381	OK	146	373	OK
819928	SSL-08342	350	8	0.0110	154	394	OK	165	383	OK	172	377	OK	176	373	OK
40006A	SSL-00835	223	24	0.0010	2	315	OK	2	315	OK	2	315	OK	2	315	OK
40297A	SSL-01565	240	24	0.0019	41	330	OK	52	320	OK	54	317	OK	55	316	OK
41208A	SSL-01633	470	8	0.0081	22	319	OK	23	318	OK	24	317	OK	25	316	OK
41208B	SSL-02446	32	8	0.0049	12	324	OK	18	318	OK	19	317	OK	19	317	OK
819914A	SSL-02421	261	12	0.0625	13	376	OK	15	374	OK	16	373	OK	17	372	OK
819914B	SSL-02422	239	12	0.0348	139	432	OK	162	408	OK	187	384	OK	198	372	OK
98523A	SSL-02195	135	8	0.1767	31	626	OK	39	619	OK	41	617	OK	42	616	OK
98523B	SSL-08451	65	8	0.2533	16	619	OK	18	617	OK	18	617	OK	19	616	OK
98602A	SSL-01901	90	8	0.0042	62	672	OK	65	669	OK	67	667	OK	69	666	OK
99242A	SSL-01912	340	8	0.0165	24	1219	OK	27	1216	OK	28	1215	OK	28	1215	OK
99366A	SSL-01356	147	8	0.1138	428	1523	OK	491	1460	OK	564	1388	OK	595	1356	OK
99366B	SSL-02208	144	8	0.0690	0	1357	OK	0	1357	OK	0	1357	OK	0	1357	OK
99379A	SSL-02015	144	8	0.1046	848	1502	OK	924	1426	IH, Backwater	983	1368	IH, Backwater	976	1374	HH, Backwater
99889A	SSL-01999	240	8	0.0058	15	5600	OK	14	5601	OK	15	5599	OK	16	5598	OK
99893A	SSL-01639	286	8	0.0038	0	5765	OK	0	5765	OK	0	5765	OK	0	5765	OK
99893B	SSL-02433	206	8	0.0048	1	8924	OK	1865	7060	OK	2550	6375	OK	3143	5781	OK
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SF1	NoMatch	14	10	0.1131	2,507	11309	OK	4341	9475	OK	5897	183034	OK	16274	172656	OK
SF10	NoMatch	236	10	0.0031	17,687	202360	OK	25470	194577	OK	27098	192950	OK	32138	187910	OK
SF2	NoMatch	34	10	0.0030	146	277449	OK	157	277438	OK	162	277432	OK	165	277429	OK
SF3	NoMatch	34	10	0.0030	20,054	347335	FM	27701	339687	FM	41104	326284	FM	60536	306852	FM
SF4	NoMatch	59	10	0.0031	0	367389	FM	0	367389	FM	0	367389	FM	0	367389	FM
SF5	NoMatch	69	10	0.0045	2,508	31427	OK	4342	29592	OK	5898	458147	OK	16276	447770	OK
SF6	NoMatch	268	10	0.0031	22,468	790699	OK	30668	782499	OK	45122	768046	OK	65100	748068	OK
SF7	NoMatch	123	10	0.0032	10,409	802758	OK	12873	800295	OK	16906	796261	OK	24638	788529	OK
SF8	NoMatch	391	10	0.0031	109	2583927	OK	115	2583920	OK	119	2583916	OK	122	2583914	OK
SF9	NoMatch	126	10	0.0031	23	18801372	OK	24	18801372	OK	25	18801370	OK	26	18801370	OK

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TUALGIS

City of Tualatin
Sewer System Master Plan

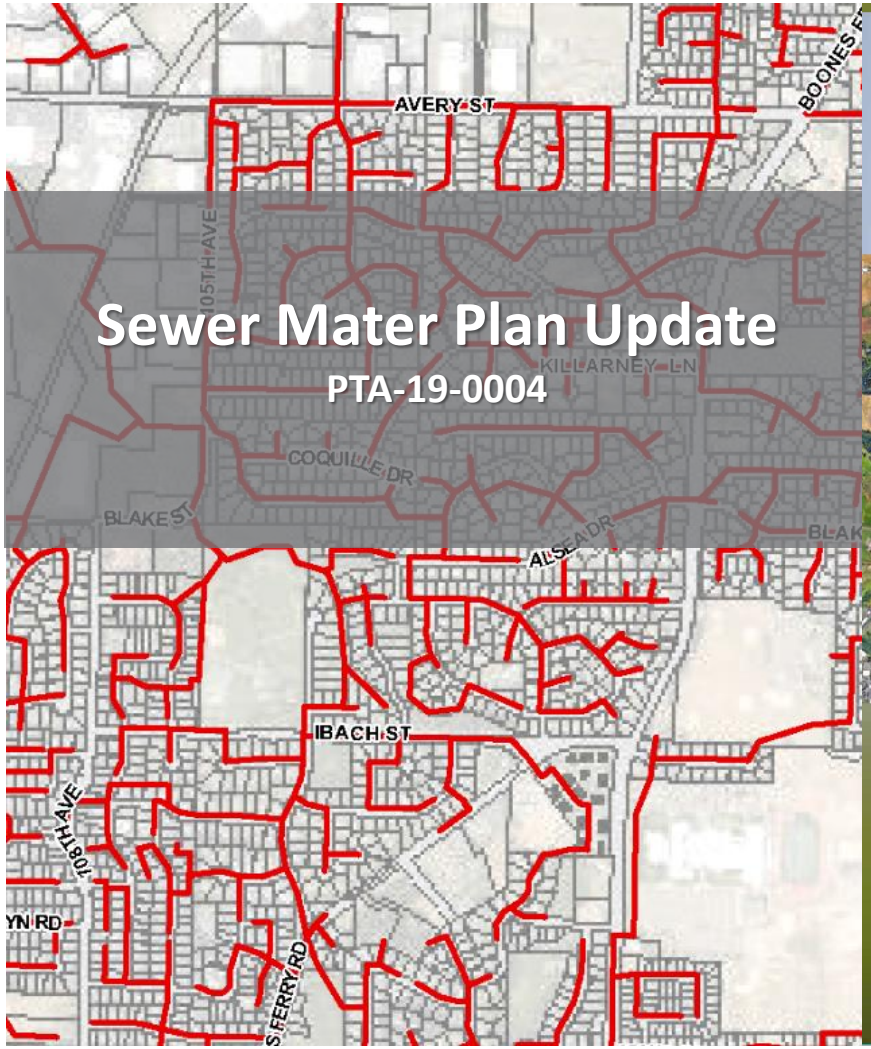
Map 13-1

- Conceptual Lift Station
- Lift Station
- Gravity Pipe
- Force Main
- Conceptual Gravity Pipe
- Conceptual Force Main
- Planning Area Boundary

RF 1:26,500

This map is derived from various digital database sources. While an attempt has been made to provide an accurate map, the City of Tualatin assumes no responsibility or liability for any errors or omissions in the information. This map is provided "as is". -TualGIS

Data Resource CenterMetro



Sewer Mater Plan Update

PTA-19-0004

Sewer Master Plan Update
PTA-19-0004

TUALATIN PLANNING COMMISSION
October 17, 2019

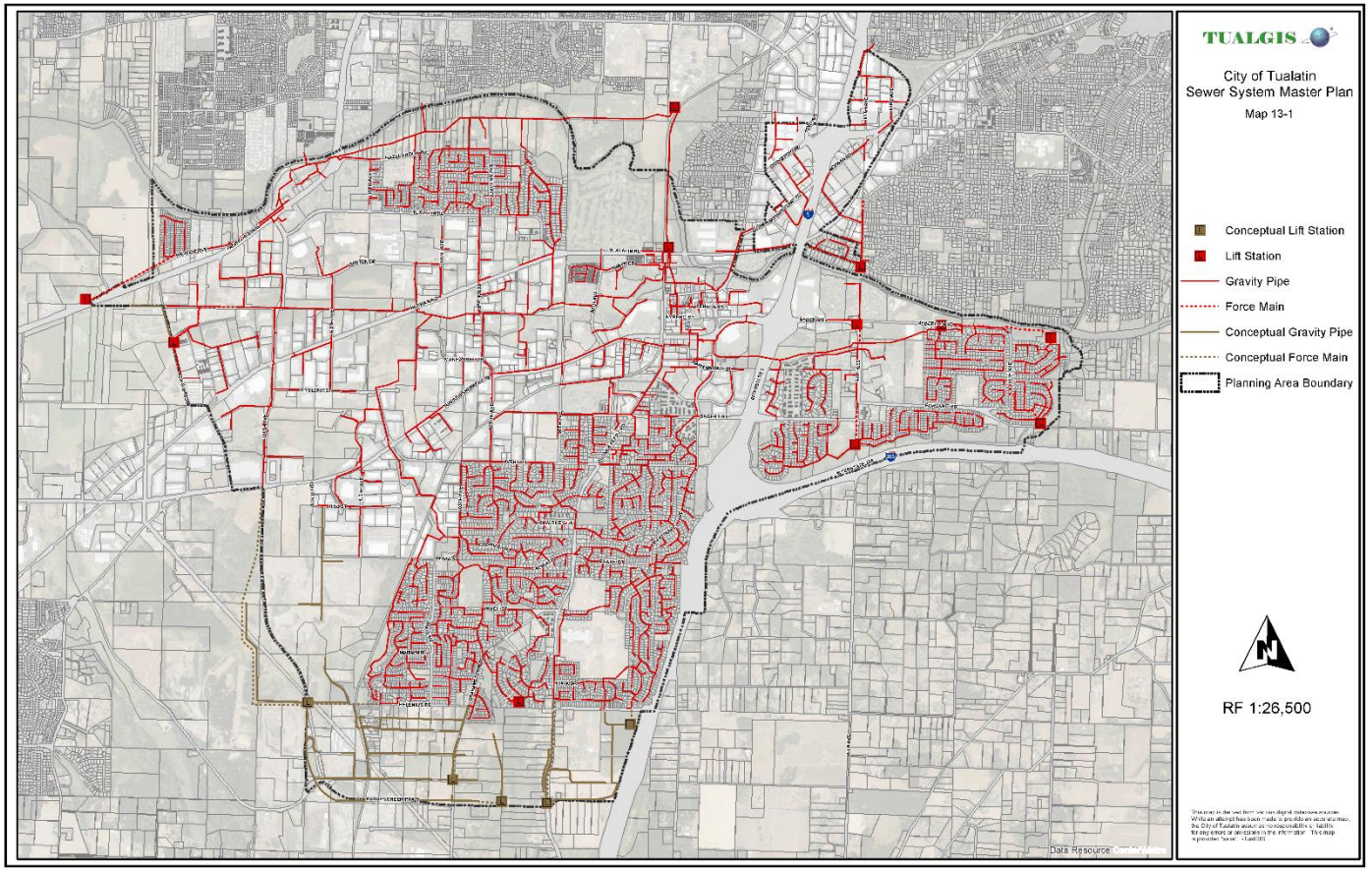
Tonight's Presentation

1. Objective
2. Existing Sewer Plan: Map 13-1
3. Proposed Plan Text Changes
4. Applicable Criteria
5. Conclusion

Objective

- Update the Tualatin Community Plan (Chapter 13) to be consistent with the Tualatin Sewer Master Plan, updated in 2019.

Existing Sewer Plan: Map 13-1



Sewer Master Plan Update
PTA-19-0004

TUALATIN PLANNING COMMISSION
October 17, 2019

Proposed Plan Text Changes

- Update Community Plan Chapter 13 to reflect the 2019 Sewer Master Plan updated, including an updated project list.
- Update outdated code references to previous version of Sewer Master Plan,
- Update outdated technical information.

Applicable Criteria

- Statewide Planning Goals
- Oregon Administrative Rules
- Metro Urban Growth Management Functional Plan
- TDC 33.070, Plan Amendments

Conclusion

- The findings demonstrate that the proposal meets the applicable criteria.
- Staff recommends the Tualatin Planning Commission forward a recommendation of approval of the proposed amendments (PTA-19-0004) to the City Council.
- Questions?

Item Attachment Documents:

1. Tualatin 2040 Project Update

CITY OF TUALATIN
Staff Report

TO:	Tualatin Planning Commissioners
FROM:	Steve Koper, AICP, Planning Manager
DATE:	October 17, 2019

SUBJECT:
Tualatin 2040 Project Update

RECOMMENDATION:
None. This item is informational-only in nature.

EXECUTIVE SUMMARY:
The Tualatin 2040 project, which is engaging the community to identify areas of the Development Code that should be updated to accommodate the next 20 years of growth while maintaining livability and community identity, is nearing conclusion. At its November 21, 2019 meeting, the Tualatin Planning Commission will be asked to consider making a recommendation to the City Council on whether to accept the Housing Needs Analysis and Economic Opportunities Analysis generated as part of the Tualatin 2040 project, and a recommendation on prioritization of potential policy changes to the Development Code identified by stakeholders and the community during the project. The purpose of this item is to provide an update on the work to date of the Tualatin 2040 project and to help inform this subsequent consideration.

Included as attachments are the Draft Housing Strategy and the Draft Economic Development Strategy. The full Draft Housing Needs Analysis and Draft Economic Opportunities Analysis can be found at: https://www.tualatin2040.com/project-library.

ATTACHMENTS:

- Draft Housing Strategy

-Draft Economic Development Strategy

ECONorthwest
ECONOMICS • FINANCE • PLANNING

DATE: September 16, 2019
TO: Tualatin Housing Needs Analysis Project Advisory Committees
CC: Karen Perl Fox, Steve Koper, and Jonathan Taylor
FROM: Beth Goodman and Sadie DiNatale, ECONorthwest
SUBJECT: DRAFT: TUALATIN HOUSING STRATEGY

The City of Tualatin contracted ECONorthwest to develop a Housing Needs Analysis and a Housing Strategy for Tualatin. The Housing Needs Analysis will determine whether the City of Tualatin has enough land to accommodate 20-years of population and housing growth. It will characterize housing affordability problems and identify gaps in housing affordability in Tualatin. The Housing Needs Analysis (HNA) will provide the basis for an update to the City's Comprehensive Plan Housing Element, as well as for development of an action plan to implement the housing policies (i.e. the Housing Strategy).

The HNA uses a planning period of 2020-2040. Tualatin is planning for minimum growth of 1,014 new dwelling units within the Tualatin city limits and the Basalt Creek area over the 2020-2040 planning period. Tualatin's vacant unconstrained buildable land has capacity for development of 1,915 new dwelling units at full build-out, not including redevelopment capacity. Build-out of Tualatin's vacant land could occur within the 2020-2040 period or it could take longer. While the HNA works with the forecast of growth of 1,014 new dwelling units through 2040, the City may consider potential residential growth beyond this forecast in its housing policies, including buildout of all vacant land and redevelopment resulting in additional housing

The results of the HNA show that Tualatin has a deficit of land designated for housing in the Medium High Density Residential and High Density / High-Rise Residential comprehensive plan designations. The City will need to develop policies to meet this deficit, through policies such as redevelopment or re-zoning land to meet these housing needs.

A key objective of the HNA and accompanying 2020 housing strategy is to identify options for changes to the City's comprehensive plan and land use regulations needed to address housing and residential land needs. This memorandum presents a Housing Strategy for Tualatin, based on the results of the HNA, and discussions with the Community Advisory Committee (CAC) and Technical Advisory Committee (TAC). The housing strategy presents a comprehensive package of interrelated policy changes that the CAC recommends the City address.

This housing strategy recognizes that the City does not build housing. The strategy focuses on land use tools to ensure there is adequate land planned and zoned to meet the variety of housing needs and opportunities for a variety of housing types, whether they be priced at market rate or subsidized. This strategy strives to provide opportunities for lower-cost market rate housing, to the extent possible, to achieve more housing affordability without complete reliance on subsidies, and to include subsidized housing as an important tool to meet the need at the lower end of the income spectrum (low, very low and extremely low) in the mix of strategies.

The housing strategy addresses the needs of households with middle, low, very low, or extremely low income. The following describes these households, based on information from the Tualatin Housing Needs Analysis.

- **Very low-income and extremely low-income households** are those who have an income of 50% or less of Washington County Median Family Income (MFI)[1] which is an annual household income of about $41,000 or less for a family of four. About 31% of Tualatin's households fit into this category. They can afford a monthly housing cost of $1,018 or less.[2] Development of housing affordable to households at this income level is generally accomplished through development of income-restricted housing.
- **Low-income households** are those who have income of 50% to 80% of Washington County's MFI or income between $41,000 to $65,000 for a family of four. About 15% of Tualatin's households fit into this category. They can afford a monthly housing cost of $1,018 to $1,625. Households with income below 60% of MFI typically qualify for some types of income-restricted housing. The private housing market often struggles to develop housing affordable to households in this group, especially for the lower income households in the group.
- **Middle-income households** are those who have income of 80% to 120% of Washington County's MFI or income between $65,000 to $98,000 for a family of four. About 15% of Tualatin's households fit into this category. They can afford a monthly housing cost of $1,625 to $2,400. The private housing market may develop housing affordable to households in this group.

Through the technical analysis of the HNA and input from the CAC and TAC, the City identified six strategic priorities to meet housing needs identified in the HNA. Strategic priorities are described in greater detail in the section below. Appendix A presents the full text of Tualatin's existing Comprehensive Plan policies for housing. Appendix B presents the information provided to the CAC in the memorandum Housing Policy Tools to Address Needs (dated May 16, 2019).

Tualatin's Housing Strategy

Tualatin's housing strategy is organized around six broad strategic priorities: (1) ensure an adequate supply of land that is available and serviceable; (2) encourage development of a wider variety of housing types; (3) identify strategies to support affordable housing; (4) evaluate funding tools to support residential development; (5) identify redevelopment opportunities; and (6) ensure there are connections between planning for housing and other planning (such as transportation planning, water and wastewater planning, or economic development planning). The broad goal of the Tualatin housing strategy is to help the City manage the land within the

[1] Median Family Income is determined by the U.S. Department of Housing and Urban Development. In 2018, Washington County's MFI was $81,400.

[2] This assumes that households pay less than 30% of their gross income on housing costs, including rent or mortgage, utilities, home insurance, and property taxes.

Tualatin planning area to meet current and future housing needs while maintaining the character and quality of life in Tualatin and protecting public interests such as housing affordability, health, safety, and municipal revenues.

The Tualatin CAC convened seven times between March 2019 and September 2019. The CAC discussed housing at the meetings in March, May, August, and September. The Tualatin TAC met four times between April 2019 and September 2019 and discussed housing at all four meetings (while some meetings included discussions of other topics, as well). The CAC and TAC provided input, through discussions at meetings and opportunities for input on written documents, into the development of the Housing Strategy.

The recommendations from the CAC in this strategy consider key findings from the HNA, such as the following examples. The City has a long-term deficit of residential land. The housing market is not building enough housing that is affordable to households with annual incomes less than $35,000 based on U.S. Census American Community Survey data. The housing market in Tualatin also has a deficit of housing affordable to households earning more than $150,000.[3] The composition of Tualatin's population is becoming older and more diverse. This document presents a comprehensive strategy that provides a variety of opportunities to meet the housing needs of Tualatin's residents at all income levels.

Many of the actions described in the Tualatin Housing Strategy will require legislative amendments to the City's comprehensive plan and/or development code. These actions will be subject to standard notification and hearing procedures. After the housing needs analysis is completed, the Planning Commission and City Council will prioritize the actions suggested in this memorandum, along with other actions suggested for Tualatin 2040. Implementation of high priority actions will begin in 2020, based on City Council direction.

[3] This analysis is based on Exhibit 79 in the Tualatin Housing Needs Analysis.

Summary of Actions

The table below summarizes the Strategies, Actions, and Recommendations made by the CAC.

Note: The priority will be added based on discussions with the CAC.

Strategy, Action, and Recommendations	Priority
Strategy 1: Ensure an adequate supply of land that is available and serviceable.	
Action 1.1. Evaluate opportunities to increase development densities within Tualatin's existing zones. ▪ **Recommendation 1.1a:** Evaluate increasing densities in the Residential High and Residential High Density / High Rise to allow buildings that are five to eight stories tall. ▪ **Recommendation 1.1b:** Conduct an audit of the City's development code to identify barriers to residential development and identify alternatives for lowering or eliminating the barriers. ▪ **Recommendation 1.1c:** Evaluate off-street parking requirements for multifamily housing to identify opportunities for reduction in parking requirements, especially for housing developed for groups who have fewer cars. ▪ **Recommendation 1.1d:** Adopt a PUD ordinance to allow flexibility in both development standards and housing types.	
Action 1.2. Evaluate opportunities to re-zone land to provide additional opportunities for multifamily housing development. ▪ **Recommendation 1.2a:** Identify opportunities to re-zone industrial or commercial land for mixed-use that includes employment and residential uses. ▪ **Recommendation 1.2b:** Evaluate opportunities to re-zone Residential Low Density and Residential Medium Low Density land for higher density housing. ▪ **Recommendation 1.2c:** Evaluate merging High Density zone and the High Density / High Rise zone into one zone and evaluate increasing the maximum density and maximum height limit allowed.	
Action 1.3. Plan for infrastructure development to support residential development. ▪ **Recommendation 1.3a:** Identify opportunities to increase coordination between transportation planning and residential growth to manage congestion from growth. ▪ **Recommendation 1.3b:** Identify opportunities to increase transit service.	
Action 1.4. Plan for long-term development in Tualatin through 2040 and beyond. ▪ **Recommendation 1.4a:** Actively work with Metro staff on upcoming Regional Growth Management reports. ▪ **Recommendation 1.4b:** Develop and implement a system to monitor the supply of residential land every two years. ▪ **Recommendation 1.4c:** Reevaluate Tualatin's housing needs and land sufficiency on a schedule tied to the Metro Growth Management cycle. ▪ **Recommendation 1.4d:** When needed in the future, work with Metro on potential expansion of the Metro UGB to include the Stafford area.	

Strategy, Action, and Recommendations	Priority
Strategy 2: Encourage development of a wider variety of housing types.	
Action 2.1. Allow and encourage development of duplexes, cottage housing, townhomes, row houses, and tri- and quad-plexes in lower density residential zones. ▪ **Recommendation 2.1a:** Allow duplexes, triplexes, quadplexes, cottage clusters, and townhouses in the Residential Low Density zone. ▪ **Recommendation 2.1b:** Allow cottage cluster housing in the Medium-Low Density and Medium-High Density zones, at densities appropriate for the zones. ▪ **Recommendation 2.1c:** Allow up to two accessory dwelling units per single-family detached lot, with one accessory dwelling attached to the existing unit and one free-standing from the existing unit.	
Action 2.2. Identify opportunities to increase development of commercial and residential mixed-use development. ▪ **Recommendation 2.2a:** Identify opportunities for more mixed-use development.	
Action 2.3. Identify opportunities to allow and support development of additional housing types. ▪ **Recommendation 2.3a:** Evaluate allowing and supporting development of other housing types in Tualatin.	
Strategy 3: Support development and preservation of housing that is affordable for all households.	
Action 3.1. Leverage funding from the Metro Bond by developing policies to support development of housing affordable to households earning less than 60% of Median Family Income in Washington County ($48,900 for a household size of four people). ▪ **Recommendation 3.1a:** Develop policies to support development of housing affordable to households with incomes below 60% of MFI as part of the City's program to leverage funds from the Metro Bond.	
Action 3.2 Develop policies to support development of housing affordable to people who live and work in Tualatin. ▪ **Recommendation 3.2a:** Emphasize growth of jobs that pay at or above average wages, as part of the City's economic development strategy. ▪ **Recommendation 3.2b:** Identify opportunities to partner with or support employers who are interested in developing an Employer Assisted Housing program.	
Action 3.3. Develop policies to prevent and address homelessness. ▪ **Recommendation 3.3a:** Develop policies to prevent and address homelessness.	
Action 3.4. Develop policies to prevent or mitigate residential displacement resulting from redevelopment and increases in housing costs in Tualatin. ▪ **Recommendation 3.4a:** Develop policies to prevent displacement of existing residents. ▪ **Recommendation 3.4b:** Develop policies to prevent loss of existing affordable housing.	
Action 3.5. Partner with organizations to establish a land bank or land trust. ▪ **Recommendation 3.5a:** Determine whether to participate in a land bank or land trust, such as the Proud Ground Community Land Trust.	
Action 3.6. Evaluate creative system development charge financing opportunities. ▪ **Recommendation 3.6a:** Evaluate options for potential changes to SDCs and TDTs to support development of affordable housing.	
Action 3.7. Evaluate establishment of a tax exemption program to support development of affordable housing. ▪ **Recommendation 3.7a:** Evaluate tax exemption options to support development of affordable housing or mixed-use housing.	
Action 3.8. Ensure that Tualatin has sufficient staff capacity to implement the housing program priorities set by the City Council. ▪ **Recommendation 3.8a:** Determine whether the City will need to add staff to implement the policies in the Housing Strategy.	

Strategy, Action, and Recommendations	Priority
Strategy 4: Identify funding tools to support residential development.	
Action 4.1. Evaluate opportunities to use and leverage funds from the Metro Housing Bond to support development of affordable housing. ▪ **Recommendation 4.1a:** Evaluate opportunities to leverage funding from the Metro Bond to support development of affordable housing.	
Action 4.2. Evaluate establishing an Urban Renewal district. ▪ **Recommendation 4.2a:** Continue the evaluation of establishing a new urban renewal district and consider including urban renewal projects that support development of multifamily housing affordable for households earning less than 60% of MFI.	
Action 4.3. Establish a construction excise tax. ▪ **Recommendation 4.3a:** Evaluate implementation of a CET, starting with an analysis of the financial capacity of a CET.	
Strategy 5: Identify redevelopment opportunities.	
Action 5.1. Identify districts within Tualatin with opportunities for redevelopment for housing and employment uses. ▪ **Recommendation 5.1a:** Identify opportunities for redevelopment of mixed-use districts and initiate an area planning process to guide redevelopment.	
Action 5.2. Support redevelopment of underutilized commercial buildings for housing. ▪ **Recommendation 5.2a:** Identify underutilized commercial areas that are ripe for redevelopment and work with landowners and developers to support redevelopment.	
Strategy 6: Ensure there are connections between planning for housing and other community planning.	
Action 6.1. Ensure that updates to the Transportation System Plan are coordinated with planning for residential growth. ▪ **Recommendation 6.1a:** Evaluate opportunities to decrease dependence on automotive transportation in areas planned for housing. ▪ **Recommendation 6.1b:** Evaluate opportunities to expand transit and improve transportation connectivity in Tualatin particularly from the future Southwest Corridor station in Bridgeport to the Tualatin's Town Center. ▪ **Recommendation 6.1c:** Evaluate opportunities for planning transit-oriented development. ▪ **Recommendation 6.1d:** Develop a bicycle and pedestrian plan for Tualatin to increase connectivity within Tualatin.	
Action 6.2. Coordinate planning for economic development planning with housing planning. ▪ **Recommendation 6.2a:** Ensure the City includes housing planning for housing that is affordable to people who work at businesses in Tualatin.	
Action 6.3. Develop a design and planning framework for "ten-minute neighborhoods" that include a mixture of uses. ▪ **Recommendation 6.3a:** Develop a framework for mixed-use neighborhoods that includes the elements that residents need for day-to-day life.	
Action 6.4. Support sustainable development practices. ▪ **Recommendation 6.4a:** Evaluate sustainable building practices, including certifications, to determine whether the City should offer incentives for certification or require certification of new buildings as sustainable.	

Strategy 1: Ensure an adequate supply of land that is available and serviceable

This strategy is about ensuring an adequate land supply—not only a twenty-year supply (as Goal 10 requires) but also a pipeline of serviced land that is available for immediate development. The following recommended strategies and actions are intended to ensure an adequate supply of residential land through a combination of changes to the Tualatin Development Code, re-zoning land, and long-term regional planning for housing. Efficient use of Tualatin's residential land is key to ensuring that Tualatin has adequate opportunities to grow from 2020 to 2040, and beyond.

Issue Statement

Tualatin's vacant unconstrained residential land can accommodate about 1,900 new dwelling units, including land within the city limits and Basalt Creek. Development of all of Tualatin's vacant unconstrained land may occur over a period longer than the 20-year planning period of this project. The forecast for housing growth over the 2020 to 2040 period is 1,041 new dwelling units.

The results of the HNA show that Tualatin has a **surplus** of capacity for new housing in the Low Density Residential, Medium Low Density Residential, and High Density Residential plan designations but a **deficit** in the Medium High Density Residential and High Density / High-Rise Residential plan designations. Tualatin has a deficit of 107 dwelling units (about 7 gross acres of land) in the Medium High Density Residential designation and a deficit of 101 dwelling units (about 4 gross acres of land) in the High Density / High-Rise Residential designation.

Tualatin has enough land within its planning area to accommodate the forecast for new housing. The existing zoning, however, leads to deficits of land in the Medium High Density Residential and High Density / High-Rise Residential plan designations. Oregon's Statewide Planning System requires cities that do not have enough land within their UGB (or in selected plan designations) to evaluate and implement policies to increase land use efficiently, expand the UGB, or both.

Tualatin is part of the Metro UGB and cannot expand its planning area on its own. Tualatin can, however, increase land use efficiency within its planning area through increasing allowable development densities, re-zoning land, or planning for redevelopment to meet the needs in the Medium High Density Residential and High Density / High-Rise Residential plan designations. In addition, Tualatin can monitor growth to ensure that the city continues to have sufficient land for residential growth, and work with Metro and other regional partners on future expansions of the Metro UGB to accommodate additional residential development in Tualatin.

Tualatin not only needs land that is vacant, the land must also have urban services that support residential development, such as municipal water service, sewer and wastewater service, storm water management systems, and transportation connections with adequate capacity to accommodate growth.

Goal

Ensure that sufficient land is designated and has urban services to support development so that the supply is adequate for all needed housing types at the needed densities. Consider the development-ready residential land supply as part of ongoing functional planning efforts to provide necessary urban services in support of residential development.

Recommended Actions

Action 1.1. Evaluate opportunities to increase development densities within Tualatin's existing zones.

This approach seeks to increase housing capacity by increasing allowable density in residential zones. In short, it gives developers the option of building to higher densities. Higher densities increase residential landholding capacity. Higher densities, where appropriate, provide more housing, a greater variety of housing options, and a more efficient use of scarce land resources. Higher densities also reduce sprawl development, add tax revenue that benefits the City as more units can be built, and make the provision of services more cost effective.

This action will look at increasing allowed densities in the comprehensive plan and decreasing minimum lot size standards and/or allowable densities in all residential zones.

Tualatin could modify the density ranges outlined in the Tualatin Development Code. These are currently:

- Residential Low (RL): 1 -6.4 dwelling units per acre
- Residential Medium-Low Density (RML): 6-10 dwelling units per acre
- Residential Medium-High Density (RMH): 11-15 dwelling units per acre
- Residential High Density (RH): 16-25 dwelling units per acre
- Residential High Density / High Rise (RH/HR): 26-30 dwelling units per acre

With respect to zoning, Tualatin presently has the following zoning standards:
P is permitted, C is conditional, and N is not permitted
Minimum Lot size is in square feet and maximum density is in dwelling units per acre (du/ac)

Zone	Single-Family Detached	Manufact-ured Home on a Lot	Accces-ory Dwelling Unit	Manufact-ured Home Park	Duplex	Town-house	Multi-family
Residential Low (RL)							
Allowed uses	P	P	P	N	C	C	C
Minimum Lot Size	6,500 average	6,500 average	-		6,000	6,000	6,000
Maximum Density	6.4 du/ac	6.4 du/ac	Accessory to lot with single		6.4 du/ac	6.4 du/ac	6.4 du/ac

Zone	Single-Family Detached	Manufact-ured Home on a Lot	Accces-ory Dwelling Unit	Manufact-ured Home Park	Duplex	Town-house	Multi-family
			family dwelling				
Residential Medium-Low Density (RML)							
Allowed uses	C	N	P	P	P	P	P
Minimum Lot Size	4,500				4,356*	1,400	4,356*
Maximum Density	10 du/ac			12 du/ac	10 du/ac	10 du/ac	10 du/ac
Residential Medium-High Density (RMH)							
Allowed uses	N	N	N	N	P	P	P
Minimum Lot Size					2,904*	1,400	2,904*
Maximum Density					15 du/ac	15 du/ac	15 du/ac
Residential High Density (RH)							
Allowed uses	N	N	N	N	P	P	P
Minimum Lot Size					1,742*	1,400	1,742*
Maximum Density					25 du/ac	25 du/ac	25 du/ac
Residential High Density / High Rise (RH/HR)							
Allowed uses	N	N	N	N	P	P	P
Minimum Lot Size					1,452	1,452	1,452*
Maximum Density					30 du/ac	30 du/ac	30 du/ac
Mixed Use Commercial Overlay Zone (MUCOD)							
Allowed uses	N	N	N	N	P	P	P
Minimum Lot Size					None	None	None
Maximum Density					50 du/ac	50 du/ac	50 du/ac
Central Tualatin Overlay Zone (RH/HR)							
Allowed uses	N	N	N	N	P	P	P
Minimum Lot Size (Core Area)					5,000	5,000	5,000
Minimum Lot Size (Non-core Area)					25,000	25,000	25,000
Maximum Density					25 du/ac	25 du/ac	25 du/ac

*Note: The lot sizes for duplex and multifamily units are based on development on more than one acre. Development on less than one acre has a different standard for minimum lot size.

Changes to lot size standards are legislative changes to the comprehensive plan and/or zoning code. As such, this process should be initiated with the Planning Commission and include opportunities for public input.

Recommendation 1.1a: Tualatin should evaluate increasing densities in the Residential High and Residential High Density / High Rise to allow buildings that are five to eight stories tall (or higher). The City could increase densities to 60 to 100 dwelling units per acre. Alternatively, the City could allow the zoning standards to dictate the number of new dwelling units, based on standards such as building height limitations, parking requirements per unit, lot coverage ratios, setback requirements, and other zoning standards.

Recommendation 1.1b: Tualatin should conduct an audit of the City's development code to identify barriers to residential development and identify alternatives for lowering or eliminating the barriers. For example, the code audit could include evaluating dimensional standards (e.g., lot size, setbacks, and lot coverage ratio) in all zones to understand the potential impact of development of vacant land, especially smaller or irregularly shaped lots to identify barriers to infill development.

Recommendation 1.1c: Tualatin should evaluate off-street parking requirements for multifamily housing to identify opportunities for reduction in parking requirements, especially for housing developed for groups who have fewer cars such as seniors or low-income affordable housing, close proximity to transit stop, and/or additional provision of bicycle parking. The City could consider changes that allow for alternative ways to meet parking requirements or reduce (or eliminate) parking requirements:

- Requiring off-street parking but not necessarily requiring parking garages;
- Allowing some on-street parking within a set distance of the development to account for some off-street parking requirements;
- Requiring less off-street parking when close (such as within ¼ mile) of a transit stop; or
- Requiring additional provision of bicycle parking to reduce parking requirements for the building

Recommendation 1.1d: Adopt a PUD ordinance to allow flexibility in both development standards and housing types, subject to a maximum density, in exchange for provision of protected open space, through a land use application process that would require a hearing about the proposed development with the Planning Commission.

Action 1.2. Evaluate opportunities to re-zone land to provide additional opportunities for multifamily housing development.[4]

This action seeks to address the deficit of land in the Medium High Density Residential designation (about 7 gross acres of land) and in the High Density / High-Rise Residential designation(about 4 gross acres of land). The action also seeks to provide additional opportunities for development of multifamily housing to provide more opportunities for people who work at businesses in Tualatin to also live in Tualatin.

> Recommendation 1.2a: Identify opportunities to re-zone industrial or commercial land for mixed-use that includes employment and residential uses. The City should exclude industrial sanctuary land (i.e., land in the Southwest Tualatin Concept Plan area) from this evaluation, as this land has been identified as regionally significant industrial areas.
>
> Recommendation 1.2b: Evaluate opportunities to re-zone Residential Low Density and Residential Medium Low Density land for higher density housing.
>
> Recommendation 1.2c: Evaluate merging High Density zone and the High Density / High Rise zone into one zone and evaluate increasing the maximum density and maximum height limit allowed in the revised zone, consistent with Action 1.1.

Action 1.3. Plan for infrastructure development to support residential development.

The City already coordinates land use planning with the Capital Improvement Plan to ensure that infrastructure is available to support residential development, especially in newly urbanizing areas and areas identified as high priority for development. Some types of infrastructure development, especially transportation and transit infrastructure, have lagged behind growth in Tualatin and in the broader region, resulting in automotive congestion and insufficient transit service, as discussed in Strategy 6.

> Recommendation 1.3a: Identify opportunities to increase coordination between transportation planning and residential growth to manage and reduce congestion resulting from new growth.
>
> Recommendation 1.3b: Identify opportunities to increase transit service between Tualatin and other cities within the Portland region (such as the on-going planning for the Southwest Corridor) and transit within Tualatin.

[4] An alternative to this strategy suggested by a committee member was revising the City's zoning system to the following categories of land use: Suburban Residential (replaces the RL and RML zones) with a maximum of 10 dwelling unit per acre and maximum building height of 45 feet; Urban Residential (replaces the RMH and RH zones) with a minimum density of 15 dwelling units per acre and maximum building height of 65 feet; and Urban II (includes the RH/HR zone) with a minimum density of 30 dwelling units per acre and maximum building height of 100 feet.

Action 1.4. Plan for long-term development in Tualatin through 2040 and beyond.

The Housing Needs Analysis plans for the 2020 to 2040 period. It is based on Metro's current forecasts for household growth in Tualatin. The Economic Opportunities Analysis shows that employment will continue to grow in Tualatin at a substantially faster pace over the next 20-years than households.

Tualatin has capacity for residential development beyond the forecast for growth over the next 20 years and may be planning for additional capacity for residential growth (through policies to increase multifamily building height and density standards (Action 1.1), through increased mixed-use development (Action 1.2), and through redevelopment (Action 5.1). Even so, if Tualatin wants to provide more opportunities for development of housing to allow people to live and work in Tualatin, the City will need to identify additional opportunities for residential development, beyond the Tualatin planning area.

A key part of this planning is working with Metro on regional planning for housing and employment in and around Tualatin. The City would be well-served by having information to share with Metro about new development, the City's planning efforts to provide opportunities for people to work and live in Tualatin, and economic development plans.

> Recommendation 1.4a: Actively work with Metro staff on upcoming Regional Growth Management reports to ensure that Tualatin's population and employment forecasts are planned for similar growth rates and to coordinate Tualatin's planning with regional plans.
>
> Recommendation 1.4b: Develop and implement a system to monitor the supply of residential land every two years. This includes monitoring residential development (through permits) as well as land consumption (e.g. development on vacant, or redevelopable lands). The reports resulting from growth monitoring can be used for working with Metro to better understand Tualatin's opportunities for growth.
>
> Recommendation 1.4c: Reevaluate Tualatin's housing needs and land sufficiency on a regular basis tied to the Metro Growth Management cycle (i.e., every six years), as part of the City's coordination with Metro. This recommendation is consistent with new requirements in ORS 197.296 (2)(a)(B)(ii), which was updated through House Bill 2003 to require Metro cities to update their housing needs analysis every six years.
>
> Recommendation 1.4d: As Tualatin continues to grow and eventually cannot accommodate residential growth within the City, work with Metro on potential expansion of the Metro UGB to include the Stafford area.

Strategy 2: Encourage development of a wider variety of housing types

This strategy focuses on actions that are intended to ensure new residential structures developed in Tualatin are diverse and include for example: "missing middle, "workforce housing," "low to moderate income senior" housing and other housing products to achieve housing affordability for households and to meet Tualatin's 20-year housing needs.

Issue Statement

Continued increases in housing costs may increase demand for denser housing (e.g., multifamily housing, single-family attached housing, and compact single-family detached housing). To the extent that denser housing types are more affordable than larger housing types (i.e., single-family detached units on larger lots, such as 2,500 square foot dwelling units on lots larger than 5,000 square feet), continued increases in housing costs will increase demand for denser housing.

Tualatin's housing mix in the 2013-2017 period[5] was 53% single-family detached, 6% single-family attached, and 41% multifamily. Of the multifamily housing, about 5% are low-density multifamily housing types such as duplexes, tri-plexes, and quad-plexes. The HNA assumes that the housing mix of *new* dwelling units in Tualatin will be about 40% single-family detached, 15% single-family attached, and 45% multifamily.

To achieve this mix, Tualatin will need to implement policies that allow a wider variety of middle-density housing types (e.g. cottage cluster, townhouses, duplexes, tri-plexes, and quad-plexes), as well as higher-density housing types (e.g., apartment buildings taller than four stories and mixed-use buildings).

In addition, Tualatin will allow for development of housing that is affordable to workers in Tualatin,[6] and located in proximity to employment opportunities to attract needed labor force for its industrial and commercial zones and mixed-use overlay zones. These types of housing include (but are not limited to): live-work units, "skinny" single-family detached housing, townhouses, cottage housing, duplexes and triplexes, and less costly types of multifamily housing.

Goal

Allow and encourage the development of a broader diversity of housing types, including middle-density housing types and higher-density housing types.

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[5] Based on 2013-2017 ACS 5-year estimates for Tualatin.

[6] The average wage in Tualatin was $57,300 in 2017. Housing that is affordable to a worker with that wage would have a housing cost of no more than $1,430 per month. Some workers make less than the average wage and would require housing affordable to lower incomes, as described in Strategy 3.

A single-worker with a job paying the average wage could afford a dwelling with a sales price of no more than $230,000. Given that the average sales price in Tualatin in early 2019 was $480,000, housing affordable at the average wage in Tualatin is likely to be rental housing. If the household has two full time workers with jobs paying the average wage, the household may be able to afford to purchase a dwelling in Tualatin.

Recommended Actions

Action 2.1. Allow and encourage development of duplexes, cottage housing, townhomes, row houses, and tri- and quad-plexes in lower density residential zones.

Allowing these housing types can increase overall density of residential development and may encourage a higher percentage of multifamily housing types. In addition, the City may want to evaluate allowing two accessory dwelling units, one attached to the primary unit and one detached from the primary unit. Allowing two accessory dwelling units is another way to increase housing opportunities.

This approach would be implemented through the local zoning or development code and would list these housing types as outright allowable uses in appropriate residential zones. These housing types may provide additional affordability and allow more residential units than would be achieved by detached homes alone.

The City has already partially implemented this strategy. The City already allows one accessory dwelling unit for existing single-family units. Tualatin allows duplexes, townhouses, and multifamily housing as a conditional use in the Residential Low Density zone. Tualatin allows duplexes, townhouses, and multifamily housing as a permitted use in the Medium-Low Density and Medium-High Density zones.

This strategy would move Tualatin towards compliance with the potential requirements of House Bill 2001, which passed during the 2019 Legislative session. The bill requires cities within the Metro UGB to allow "middle" housing types in low-density residential zones. The bill defines middle housing types as:

(A) Duplexes;

(B) Triplexes;

(C) Quadplexes;

(D) Cottage clusters; and

(E) Townhouses.

To comply with House Bill 2001, Tualatin will need to:

- Allow cottage cluster as a housing type in the Residential Low Density zone. Tualatin may want to allow cottage cluster housing in the Medium-Low Density and Medium-High Density zones. Tualatin will also need to include development standards in the Tualatin Development Code.
- Allow duplexes, townhouses, and multifamily housing as a permitted use in the Residential Low Density zone.

  Recommendations 2.1a: Allow duplexes, triplexes, quadplexes, cottage clusters, and townhouses in the Residential Low Density zone. Tualatin may want to allow cottage cluster housing in the Medium-Low Density and Medium-High Density zones. Tualatin

will also need to revise the development code to include development standards for these housing types. As part of implementation of House Bill 2001, DLCD will be developing a model code for cities to accommodate these housing types. Given that the model code may not be available before December 2020 and the deadline for adoption of policies to meet the requirement of House Bill 2001 is June 30, 2022, Tualatin should begin the process to identify changes necessary to implement House Bill 2001 before the model code is available.

Recommendations 2.1b: Allow cottage cluster housing in the Medium-Low Density and Medium-High Density zones, at densities appropriate for the zones.

Recommendations 2.1c: Allow up to two accessory dwelling units per single-family detached lot, with one accessory dwelling attached to the existing unit and one free-standing from the existing unit.

Action 2.2. Identify opportunities to increase development of commercial and residential mixed-use development.

One way to provide additional opportunities for housing development, especially multifamily housing development, is through planning for mixed-use development. Tualatin defines Mixed Use Development as "A tract of land or building or structure with two or more different uses such as, but not limited to residential, office, retail, manufacturing, public or entertainment, in a compact urban form."

The Economic Opportunities Analysis shows that Tualatin has a small amount of vacant unconstrained commercial land (11 acres). Strategy 5 (redevelopment) recommends identifying opportunities for redevelopment, especially for mixed-use development. The Economic Opportunities Analysis and Housing Needs Analysis both document the fact that most people who work in Tualatin live elsewhere and that there are relatively few opportunities for housing for people who want to live and work in Tualatin.

One way to increase opportunities for this type of housing is to increase the overall amount of housing affordable to people who work at jobs in Tualatin, much of which will be multifamily housing and should be located near to employment centers in Tualatin. Increasing opportunities for mixed-use development can address both of these issues.

Recommendation 2.2a: Identify opportunities for more mixed-use development, either through rezoning land to a mixed-use zone and/or through redevelopment (consistent with Action 5.1).

Action 2.3. Identify opportunities to allow and support development of additional housing types.

Some housing types have traditionally not been present in Tualatin, either because they are not allowed, or the market is not developing them. Some innovative housing types may include: single-room occupancy (more than four unrelated living in the same dwelling with shared kitchen and bathrooms); reuse of cargo containers for housing; tiny homes (dwelling units between 100 and 500 square feet); and other innovative housing types.

In addition, growth of seniors is increasing demand for single-level single-family detached units to allow seniors to remain in Tualatin as they age. While this type of unit is allowed in Tualatin, little of this housing has been developed over recent years.

Tualatin's land base does not provide opportunity for development of higher amenity housing on larger lots. This type of housing generally appeals to households with higher incomes. When Tualatin is evaluating opportunities for UGB expansion, there may be opportunities for development of this type of housing in areas where developing higher density housing is challenging or undesirable, such as on hillsides.

> Recommendation 2.3a: Evaluate allowing and supporting development of other housing types in Tualatin, such as single-room occupancy (more than four unrelated living in the same dwelling with shared kitchen and bathrooms); reuse of cargo containers for housing; tiny homes (dwelling units between 100 and 500 square feet); and higher amenity housing on larger lots.

Strategy 3: Support development and preservation of housing that is affordable for all households

The following recommended strategy and actions are intended to use a deliberate set of mandates and incentives to support the development of new affordable housing and preserve existing affordable housing.

Issue Statement

Availability of housing that is affordable to households at all income levels is a key issue in Tualatin. For the purposes of this strategy, affordable housing is defined as: 1) housing for very low-income and extremely low-income households at 50% or below of Median Family Income[7] ($41,000 in 2018), 2) housing for low-income households with income between 50% and 80% of MFI ($41,000 to $65,000 in 2018), and 3) housing for middle-income households with income between 80% and 120% MFI ($65,000 to $98,000 in 2018).

The City's policy options for providing opportunities to build housing, especially affordable housing (both market-rate and government subsidized affordable housing) are limited. The most substantial ways the City can encourage development of housing is through ensuring that

[7] Based on U.S. Department of Housing and Urban Development Median Family Income of $81,400 for Washington County in 2018.

enough land is zoned for residential development, assembling and purchasing land for affordable housing development, eliminating barriers to residential development where possible, and providing infrastructure in a cost-effective way.

Based on the actions identified below and the priorities set by decision makers, the City should develop a comprehensive housing strategy that includes and supports development of long-term (30-60 years) affordable housing by any of the following: government-subsidized non-profit developed, private developed and/or developed in partnership between any of the following: public, non-profit and/or private developers. The Tualatin Housing Program will be a program that uses a variety of tools, such as those described in this memorandum, to lower barriers to and encourage affordable housing development.

Goal

The goal of this strategy is to promote more lower-cost housing, with a focus on low- and middle-income housing, creating mixed income neighborhoods. This focus is to ensure that there is housing that is affordable to workers at businesses in Tualatin.

Recommended Actions

Action 3.1. Leverage funding from the Metro Bond by developing policies to support development of housing affordable to households earning less than 60% of Median Family Income in Washington County ($48,900 for a household size of four people).

Evaluate opportunities to support and leverage the funding from the Metro bond (discussed in Strategy 4) for development of low-income housing, which would be affordable to households earning less than 80% of Median Family Income (MFI) in Washington County ($65,000 for a household size of four people). **The City may choose to emphasize development of housing affordable to households earning less than 60% of MFI ($48,900 for a household of four), who may be eligible for income-restricted housing, which is commonly known as low-income housing.** Some examples of support include:

- Reducing or waiving systems development charges (SDCs) and Transportation Development Tax (TDT) fees (see Action 3.6).
- Evaluating adoption of a tax exemption program (see Action 3.7).
- Providing density bonuses for development of housing affordable to households with income below 60% MFI.
- Participating in a land bank for housing affordable to households with income below 60% MFI (see Action 3.5).
- Evaluating adoption of an inclusionary zoning program to require market-rate development to include some housing affordable to households with income below 80% MFI.
- Developing an expedited review process for development of affordable housing projects that target housing affordability at 60% of MFI.

- Partnering with Washington County Housing Services and Oregon Housing and Community Services (OHCS) to identify resources for developing additional housing affordable for household with income of 60% of MFI or below.

  Recommendation 3.1a: Develop policies to support development of housing affordable to households with income below 60% of MFI as part of the City's program to leverage funds from the Metro Bond.

Action 3.2 Develop policies to support development of housing affordable to people who live and work in Tualatin.

Workforce housing is housing that is affordable to households earning between 60% and 120% of MFI ($48,900 to $98,000 for a household of four in Washington County). An important part of this action is coordinating with economic development planning. In 2017, the average wage for jobs in Tualatin was $57,300.

Action 3.1 includes housing policies for households earning 60% to 120% of MFI. Some additional ways that the City may support development of housing affordable to households with income between 60% and 120% of MFI are:

- Coordinating economic development planning with planning for residential development to emphasize growth of jobs that pay at or above Tualatin's average wage ($57,300 in 2017).
- Supporting and potentially partnering with employers who are interested in developing an Employer Assisted Housing program to provide grants or loans to support rehabilitation or new housing development.
- Partnering with Washington County Housing Services and Oregon Housing and Community Services (OHCS) to identify resources for developing additional housing affordable for household with income between 80% to 120% of MFI.
- Participating in a land bank for housing affordable to households with income of 80% to 120% of MFI (see Action 3.5).

  Recommendation 3.2a: Emphasize growth of jobs that pay at or above average wages, as part of the City's economic development strategy.

  Recommendation 3.2b: Identify opportunities to partner with or support employers who are interested in developing an Employer Assisted Housing program.

Action 3.3. Develop policies to prevent and address homelessness.

Households earning less than 30% of MFI ($24,000 or less for a family of four) are at risk of becoming homeless. They can afford monthly rent of $600 or less. About 16% of households in Tualatin currently fit into this income category. Tualatin has a deficit of about 1,400 units affordable to households with income of $25,000 or less.

Tualatin can use approaches similar to those in Action 3.1 to support development of housing affordable to these households, including using funds from the Metro Bond. Tualatin can also take the following actions to prevent and address homelessness:

- Develop a strategic plan to address homelessness and strengthen partnerships between the city and service providers who assist people experiencing homelessness
- Partner with service providers to expand rapid re-housing and permanent supportive housing programs.
- Partner with service providers to support the creation of overnight shelter that provides safe sleep options for people who are unsheltered and work with service providers to explore alternatives to congregate shelters.

There are many other actions that Tualatin can take to prevent and address homelessness, such as expansion of transportation options, increasing outreach to the homeless population, partnering with service providers of mental health services, supporting a crisis intervention team, and other services.

Recommendation 3.3a: Develop policies to prevent and address homelessness.

Action 3.4. Develop policies to prevent or mitigate residential displacement resulting from redevelopment and increases in housing costs in Tualatin.

Redevelopment and development of new housing can increase housing costs and displace existing residents. Housing that is currently affordable to households such as those earning 60% of MFI or less (less than $48,900 for a household of four) and 60% to 120% of MFI ($48,900 to $98,000 for a household of four) can become unaffordable as a result of redevelopment and overall increases in housing costs in Tualatin, making it harder for existing residents of Tualatin and people working at businesses in Tualatin to afford to live in Tualatin.

- Identify funding to allocate to housing programs that prevent and alleviate the risk of displacement, such as the funding sources identified in Strategy 4, to fund programs such as the ones below.
- Evaluate the feasibility of developing a Housing Preservation and Development program to assist with capital repairs, façade improvements, or weatherization. Tualatin may consider criteria for funding such as the property must be regulated affordable or at risk of converting to market-rate. Tualatin could consider offering funds to low-cost, market-rate properties in need of major structural repairs (in return for the property owner maintaining existing rent levels).
- Partner with organizations to support programs that preserve market-rate housing and affordable housing. These partnerships can include programs such as provision of grants or low-interest loans to support rehabilitation of existing, older single-family detached homes in poor condition, and/or extending existing Low Income Housing Tax Credit projects for an additional term or converting to long-term affordable housing
- Limit condominium conversions. Develop and evaluate requirements for multifamily building owners who want to convert the apartment units to condominiums. Limitations may restrict the conditions under which conversion is allowed, (e.g. based on vacancy rates or tenant consent). Limitations could require that tenants be offered a right of first refusal to purchase their unit, should the owner want to convert their property to a condominium.
- Work with agencies who offer Fair Housing education and enforcement. Provide education for landlords and tenants of rights and responsibilities under Fair Housing law and provide resources for enforcement actions where Fair Housing law has been violated. Tualatin could provide resources/information about the Housing Choice Voucher Program to reduce the extent to which landlords discriminate against Voucher recipients in Tualatin.

  Recommendation 3.4a: Develop policies to prevent displacement of existing residents.

  Recommendation 3.4b: Develop policies to prevent loss of existing affordable housing.

Action 3.5. Partner with organizations to establish a land bank or land trust.

A land bank supports housing affordability by reducing or eliminating land or acquisition costs from a developer's total development budget. Land banks take several forms, but many are administered by a non-profit or government entity with a mission of managing a portfolio of properties to support a public or community purpose over many years or decades. The land banking process involves key procedural steps including (1) strategic land and property acquisition, (2) restoration of the property (e.g. clear blight, clear title), and (3) resale to a buyer.

A land trust is similar to land banking in that they participate in strategic land and property acquisition and restoration of the property (e.g. clear blight, clear title). Though instead of ultimately selling the property (land and buildings), the land trust holds the land in perpetuity and sells or leases the buildings. A land trust is typically a private or non-profit organization that leases or sells the buildings (e.g. dwelling units) sited on the land but owns and manages the land permanently. A land trust can support housing affordability by leasing the dwelling units on their land to income-qualified renters. If the land trust prefers to pursue homeownership objectives, they can enact a deed covenant prior to selling the dwelling units to safeguard lasting affordability for homeowners.

The City's role in a land bank or land trust may include:

- Identifying opportunities to assist with assembly of land into a single tax lot or multiple adjacent tax lots in certain cases (i.e. mixed-use development with more than one developer involved) to support development of affordable housing.
- Identifying surplus publicly-owned properties that could be used for affordable housing and partner with developers of affordable housing (consistent with Actions 3.1 or 3.2).

  Recommendation 3.5a: Determine whether to participate in a land bank or land trust, such as the Proud Ground Community Land Trust, and determine its role in the land banking process.

Action 3.6. Evaluate creative system development charge financing opportunities.

Opportunities to change the way that the City charges system development charge (SDC) and Transportation Development Tax (TDT) include: (1) reduce or waive system development charges for residential development that meet Tualatin's housing needs or goals (such as development of housing affordable to households earning less than 60% of MFI ($48,900 for a household of four)); (2) implement an SDC financing credit program to incentivize needed housing types; (3) develop a sliding-scale of SDC based on the size of the units, charging lower SDC for smaller units; (4) implement sole source system development charge program; (5) vest SDC rates on submission of the complete land use review application to determine the SDC early in the development process; and (6) collect SDC at completion of construction (prior to issuance of a certificate of occupancy) rather than at issuance of the building permit.

> Recommendation 3.6a: Review options for potential changes to SDC and TDT to determine if one or more of the options above is appropriate for Tualatin and implement changes SDC and TDT, as appropriate.

Action 3.7. Evaluate establishment of a tax exemption program to support development of affordable housing.

Tax exemption programs typically provide exemptions from property taxes for 10 years and some for up to 20 years. Tax exemption programs include the following:

Program	Vertical Housing Development Zones (VHDZs)	Multiple-Unit Housing (a.k.a. MUPTE)	Low Income Rental Housing / Nonprofit Corporation Low Income Housing	Tax exemption for newly rehabilitated or constructed multiunit rental housing
Eligible Projects / Properties	Must include at least one "equalized floor" of residential; at least 50% of the street-facing ground floor area must be committed to non-residential use. Can be new construction or rehabilitation. City can add other criteria.	Housing subject to a housing assistance contract with a public agency; OR housing that meets City-established criteria for design elements benefitting the general public and number of units. May be new construction, addition of units, or conversion of an existing building to residential use.	New rental housing exclusively for low-income households (at or below 60% MFI); rental housing for low income persons (at or below 60% MFI) that is owned, being purchased, and/or operated by a nonprofit; or land held for affordable housing development.	Newly rehabilitated or constructed multiunit rental housing. Rental units affordable to households with an annual income at or below 120% of MFI.
Eligible Areas	Within designated areas. City may designate any area it chooses.[8]	Within designated areas. City may designate core areas. Alternatively, the city can designate the entire City and limit the program to affordable housing.	Anywhere in the city	Anywhere in the city
Duration of Tax Exemption / Abatement	Exemption is for 10 years (this is set in statute, not by the City).	Exemption is for up to 10 years, except that for low-income housing, exemption can be extended for as long as the housing is subject to the public assistance contract.	For the low income rental housing program, exemption lasts 20 years.	City must establish a schedule that provides longer exemptions for projects with more qualifying units, with a maximum of 10 years.
Best suited for	Encouraging mixed use development in locations where ground floor commercial uses are essential to the vision and mixed use is not economically feasible yet.	Encouraging multifamily housing in strategic locations or supporting development of housing affordable households with income of 80% of MFI or lower.	Reducing operating costs for regulated affordable housing affordable at 60% MFI or below.	Incentivizing market rate / moderate-income multifamily housing development city-wide.

Recommendation 3.7a: Review tax exemption options to support development of affordable housing or mixed-use housing to determine if one or more of the options above is appropriate for Tualatin and implement the tax exemption program(s) identified as appropriate for Tualatin.

[8] The prior statutes governing the VHDZ program specified certain types of areas where VHDZs could be designated. The current version of the statute leaves this decision entirely up to the City. However, logically, the zoning would need to allow both residential and non-residential uses in order to allow development that could be eligible for VHDZ tax abatement.

Action 3.8. Ensure that Tualatin has sufficient staff capacity to implement the housing program priorities set by the City Council.

The Housing Strategy presented in this memorandum and especially the actions presented in Strategy 3 and Strategy 4 will take substantial staff time to evaluate and implement. The City may need additional staffing to implement the Housing Strategy.

> Recommendation 3.8a: As the City Council sets priorities for implementation of the Housing Strategy, the Council should work with the City Manager and Community Development Director to determine whether the City will need to add staff to implement the policies in the Housing Strategy.

Strategy 4: Identify funding tools to support residential development

The following recommended strategy and actions are intended to consider a range of funding tools that Tualatin may implement and use to support residential development.

Issue Statement

Funding for affordable housing and the infrastructure that serves residential land is becoming increasingly difficult. Cities have adopted a broad range of tools to support affordable housing. The nature of those tools is dependent on local factors: tax base, council support, competing priorities, etc.

Funding affordable housing programs from existing revenue sources may be challenging. Supplemental tools will be necessary if the city wants to support residential development.

Goal

Explore creative and sound ways to support development of affordable housing and infrastructure development.

Recommended Actions

Action 4.1. Evaluate opportunities to use and leverage funds from the Metro Housing Bond to support development of affordable housing.

Evaluate opportunities to use and leverage funds from the Metro housing bond to support development of affordable housing. The Metro housing bond is for $652.8 million, the majority of it will support development of at least 3,900 new affordable units. Most of the new units will be affordable to households with income of 60% MFI ($48,600 for a family of four) or less. Funds from the bond measure can be used for: building new affordable units, housing purchase and rehabilitating existing housing, buying land for new affordable housing, and producing affordable homeownership units.

Washington County has been allocated $118.9 million from the bond. The County's draft Local Implementation Strategy allocates Tualatin $17.5 million for new construction of about 175 units of housing affordable for individuals and families. In addition, the County anticipates $30.6 million in additional funds for Tualatin to support this housing development from sources such

as: Low Income Housing Tax Credits (LIHTC), private resources such as loans from private banks, property tax exemptions, Washington County HOME Partnership Investment Program funds, Washing County Housing Production Opportunity Fund, and resources from partner jurisdictions (such as fee waivers or exemptions, donated or discounted land, grants, or other resources).

The programs discussed in Strategy 3 (especially in Actions 3.1, 3.4, and 3.7) are ways that the City can support and leverage funding from the Metro Bond. In addition, Actions 4.2 (Urban Renewal) and 4.3 (CET) can also leverage funding from the Metro Bond.

> Recommendation 4.1a: Evaluate opportunities to leverage funding from the Metro Bond to support development of affordable housing.

Action 4.2. Evaluate establishing an Urban Renewal district.

As the City evaluates establishing a new urban renewal district (which is an on-going process within the City currently), evaluate opportunities to support development of affordable housing programs (Strategy 3) funded through urban renewal. The City should also evaluate development of infrastructure (Strategy 1) and redevelopment opportunities (Strategy 5) to support residential development.

Tax increment finance revenues (TIFs) are generated by the increase in total assessed value in an urban renewal district from the time the district is first established. As property values increase in the district, the increase in total property taxes (i.e., City, County, school portions) is used to pay off the bonds. When the bonds are paid off, the entire valuation is returned to the general property tax rolls. TIFs defer property tax accumulation by the City and County until the urban renewal district expires or pays off the bonds. Over the long term (most districts are established for a period of twenty or more years), the district could produce significant revenues for capital projects. Urban renewal funds can be invested in the form of low-interest loans and/or grants for a variety of capital investments:

- Redevelopment projects, such as mixed-use or infill housing developments
- Economic development strategies, such as capital improvement loans for small or startup businesses that can be linked to family-wage jobs
- Streetscape improvements, including new lighting, trees, and sidewalks
- Land assembly for public as well as private reuse
- Transportation enhancements, including intersection improvements
- Historic preservation projects
- Parks and open spaces

As the City continues its on-going evaluation of establishing a new urban renewal district, the City should consider including urban renewal projects that support development of multifamily housing affordable for households earning less than 60% of MFI ($48,600 for a household of four). Cities primarily use urban renewal funds to support the development of

affordable housing by purchasing land and accepting development proposals on that land. Cities typically require some percentage of housing to be affordable, or they make the inclusion of affordable housing a criterion for the evaluation of development proposals.

In addition, cities use urban renewal funds to directly invest in infrastructure projects that benefit housing development.

> Recommendation 4.2a: As the City continues its on-going evaluation of establishing a new urban renewal district, the City should consider including urban renewal projects that support development of multifamily housing affordable for households earning less than 60% of MFI.

Action 4.3. Establish a construction excise tax.

The construction excise tax (CET) is a tax assessed on construction permits issued by local cities and counties. The tax is assessed as a percent of the value of the improvements for which a permit is sought, unless the project is exempted from the tax. In 2016, the Oregon Legislature passed Senate Bill 1533, which permits cities to adopt a construction excise tax (CET) on the value of new construction projects to raise funds for affordable housing projects. CETs may be residential only, commercial only, or residential and commercial. If the City were to adopt a CET, the tax would be up to 1% of the permit value on residential construction and an uncapped rate on commercial and industrial construction.

The allowed uses for CET funding are defined by the state statute. The City may retain 4% of funds to cover administrative costs. The funds remaining must be allocated as follows, if the City uses a residential CET:

- 50% must be used for developer incentives (e.g., fee and SDC waivers, tax abatements, etc.).
- 35% may be used flexibly for affordable housing programs, as defined by the jurisdiction.
- 15% flows to Oregon Housing and Community Services for homeowner programs.

If the City implements a CET on commercial or industrial uses, 50% of the funds must be used for allowed developer incentives, while the remaining 50% is unrestricted. The rate may exceed 1% if levied on commercial or industrial uses.

> Recommendation 4.3a: Evaluate implementation of a CET, starting with an analysis of the financial capacity of a CET based on historical construction rates and the amount of the CET. The fiscal potential will provide a foundation that (1) helps determine whether a CET would generate enough revenue to make an impact, and (2) helps focus discussion on how the city could generate the best return on investment of CET funds.

Strategy 5: Identify redevelopment opportunities

This strategy focuses on actions that are intended to identify redevelopment opportunities in areas where housing would be appropriate.

Issue Statement

Tualatin has a deficit of land for housing, a deficit of 103 dwelling units in the Medium High Density Residential designation and a deficit of 101 dwelling units in the High Density / High-Rise Residential designation. Some (or perhaps all) of this deficit could be accommodated through redevelopment of existing areas within Tualatin, where there are opportunities to increase the intensity of land uses. Redevelopment may also provide opportunities for development of mixed-use areas that are more walkable, have amenities that households frequently access (e.g., schools, medical facilities, parks, retail, restaurants, and other services), and have access to transit, consistent with the actions in Strategy 6.

Redevelopment may require actions from other strategies, such as: increasing allowable densities, up-zoning, density bonuses for affordable housing, land assembly, reduced parking requirements, tax abatement programs to support housing development, and funding support such as an Urban Renewal District.

As the City plans for redevelopment, it should be sensitive to the potential for displacement of existing residents. Action 3.4 includes measures to mitigate displacement resulting for redevelopment.

Goal

Redevelop selected areas of Tualatin to create vibrant mixed-use districts that include new housing opportunities.

Recommended Actions

Action 5.1. Identify districts within Tualatin with opportunities for redevelopment for housing and employment uses.

A key finding of the Housing Needs Analysis is that Tualatin has limited land for development of multifamily housing and projects deficits of land to accommodate new housing in the Medium High Density and High Density / High Rise plan designations. The Economic Opportunities analysis finds that Tualatin has limited land for commercial development and projects a substantial deficit of land to accommodate new housing.

The City should identify three to four areas within Tualatin for redevelopment into mixed-use areas, with a mixture of higher-density housing and employment uses such as retail, office, and commercial services. For example, some areas that may be appropriate for redevelopment include: the Commons, areas near key transit stops, and the area West of 6th Street/East of 90th Street/North of Sagert Street. In selecting areas ripe for redevelopment, the City should consider whether economic conditions support redevelopment and landowner attitudes to redevelopment, and also set criteria based on transportation and transit connections and proximity to existing employment centers.

The City should engage the community in developing a vision for redeveloping the selected areas. The planning to implement this vision could be developed through redevelopment plans that show how the property will be redeveloped into a vibrant area with a mixture of uses, connections with Tualatin's automotive and pedestrian/bicycle transportation networks, and a variety of housing types. The redevelopment plans should include working with land owners to ensure they are supportive of the plans, as well as involving stakeholder and citizen input into the vision for the district and development of the redevelopment plans.

The City should consider opportunities to support redevelopment, such as Urban Renewal (Action 4.2) to address infrastructure deficiencies or to support development of affordable housing, funding from the Metro Bond (Action 4.1) for affordable housing development, land banking (Action 3.5), opportunities to reduce SDCs (Action 3.6), and property tax exemptions (Action 3.7) to support housing development.

> Recommendation 5.1a: Initiate a process to identify opportunities for redevelopment of mixed-use districts and initiate an area planning process to guide redevelopment.

Action 5.2. Support redevelopment of underutilized commercial buildings for housing.

Tualatin has several underutilized commercial buildings, such as stores that have closed, that may be appropriate for redevelopment. The City should work with landowners to evaluate opportunities for redeveloping vacant buildings for new housing.

The City should consider opportunities to support redevelopment of underutilized commercial buildings, such as Urban Renewal to address infrastructure deficiencies or support development of affordable housing, such as the Metro Bond (Action 4.1) or property tax abatements (Action 3.7).

> Recommendation 5.2a: Identify underutilized commercial areas that are ripe for redevelopment and work with landowners and developers to support redevelopment.

Strategy 6: Ensure there are connections between planning for housing and other community planning

This strategy focuses on actions that are intended to ensure coordination between planning for housing and other community planning, such as transportation planning or neighborhood planning.

Issue Statement

Discussions of residential development led to discussions of the design of neighborhoods and connectivity in Tualatin and a desire for more deliberate planning of new residential development to integrate multiple modes of transportation, access to parks and schools, and retail and services in or near neighborhoods. Given that large parts of Tualatin are already built out, this type of planning will need to consider long-term redevelopment opportunities to retrofit the existing built environment into neighborhoods with these characteristics.

This type of planning should occur with attention paid to equity issues, ensuring that neighborhoods with these characteristics are developed in a way that does not displace existing households and provides opportunity for housing for all residents of Tualatin, regardless of income, age, or race/ethnicity. This implies development of neighborhoods with a mixture of incomes, homeowners and renters, and a mixture of housing types (i.e., both single-family detached housing and attached or multifamily housing).

Goal

Ensure that Tualatin develops as a walkable and complete community with amenities that are easily accessible to people who live in Tualatin.

Recommended Actions

Action 6.1. Ensure that updates to the Transportation System Plan are coordinated with planning for residential growth

The next update to the Transportation System Plan (TSP) should coordinate planning for housing, as well as employment growth, with transportation planning, providing for opportunities for more intensive multifamily development where there is sufficient capacity for automotive and transit capacity. The redevelopment areas (Action 5.1) should be planned for in areas where there is higher capacity for automotive and transit, as well as being connected by pedestrian and bicycle trails.

The update to the TSP ensures there are additional opportunities to decrease dependence on automotive transportation, such as increased focus on development in walkable and bikeable areas and increases in transit service (amount and frequency of transit, as well as increased destinations for transit). The TSP update should also identify opportunities to address capacity issues on Tualatin's roads to ease congestion and make traveling by car within Tualatin and to areas outside of Tualatin easier.

> Recommendation 6.1a: Evaluate opportunities to decrease dependence on automotive transportation in areas planned for housing, such as increased focus on development in

walkable and bikeable areas and increases in transit service (amount and frequency of transit, as well as increased destinations for transit).

Recommendation 6.1b: Evaluate opportunities to expand transit and improve transportation connectivity in Tualatin particularly from the future Southwest Corridor station in Bridgeport to the Tualatin's Town Center and vital services, and out to the neighborhoods.

Recommendation 6.1c: Evaluate opportunities for planning transit-oriented development, as transit becomes more available in Tualatin, consistent with redevelopment planning.

Recommendation 6.1d: Develop a bicycle and pedestrian plan for Tualatin to increase connectivity within Tualatin.

Action 6.2. Coordinate planning for economic development with housing planning.

Tualatin has a jobs and housing imbalance, with more jobs than residents in Tualatin. The other strategies in this memorandum are intended to support development of housing that is affordable to people who work at businesses in Tualatin (the average wage was $57,300 in 2017), such as Action 3.2. The City should evaluate opportunities to support development of housing that is affordable to workers at businesses in Tualatin to ensure that people who work in Tualatin have the opportunity to live in Tualatin. As part of this evaluation, the City should identify opportunities for residential development closer to jobs in Tualatin, to make it easier for people to walk, bicycle, or use transit to get to work. These opportunities are parts of the strategies throughout this memorandum.

Recommendation 6.2a: Ensure the City includes housing planning for housing that is affordable to people who work at businesses in Tualatin.

Action 6.3. Develop a design and planning framework for "ten-minute neighborhoods" that include a mixture of uses.

The City should develop a framework for development of mixed-use neighborhoods that results in neighborhoods where residents have easy, convenient access to many of the places and services they use daily without relying heavily on a car. The framework would include the following elements: walkable neighborhoods, with access to transit, with nearby parks (i.e., within one-quarter mile), with neighborhood retail and restaurants, and near schools. The neighborhood would have higher concentrations of people and would be complete with sidewalks, bike lanes and bus routes that support a variety of transportation options. The design of the neighborhood should integrate design standards that promote public safety. In larger cities, these are referred to as "20 minute neighborhoods" but given Tualatin's smaller size, the scale might be more like "10 minute neighborhoods."

Recommendation 6.3a: Develop a framework for mixed-use neighborhoods that include the elements that residents need for day-to-day life.

Action 6.4. Support sustainable development practices.

Sustainable development practices are environmentally responsible and resource-efficient building practices that range from building design, building construction, and building operations and maintenance. Examples of sustainable building practices include certification programs such as Leadership in Energy and Environmental Design (LEED) or National Green Building Standard.

The City could support sustainable development practices by offering incentives for certified buildings or the City could require that new buildings adhere to specified sustainable building practices.

The trade-off with some types of sustainable building practices is that they can increase development costs (especially over the short run) and may make it more difficult to develop housing affordable for middle and lower income households. Over the long run, some sustainable building practices pay for themselves with decreased operational costs (such as energy efficient features that reduce heating and cooling costs).

Recommendation 6.4a: Evaluate sustainable building practices, including certifications, to determine whether the City should offer incentives for certification or require certification of new buildings as sustainable.

Appendix A: Tualatin's Existing Comprehensive Plan Policies

Section 4.050 General Growth Objectives.

> Note to CAC: The following section includes objectives related to housing and that are not directly related to housing.

The following are general objectives used as a guide to formulate the Plan. The objectives are positive statements to de-scribe the Plan's intent to:

(1) Provide a plan that will accommodate a population range of 22,000 to 29,000 people.

(2) Cooperate with the Metropolitan Service District to reach regional consensus on population growth projections within the Tualatin area.

(3) Conform to Metropolitan Service District (Metro) procedures for initiating amendments to the Metro Urban Growth Boundary.

(4) Provide a plan that will create an environment for the orderly and efficient transition from rural to urban land uses.

(5) Convert agricultural land only if needed for urban uses.

(6) Arrange the various land uses so as to minimize land use conflicts and maximize the use of public facilities as growth occurs.

(7) Prepare a balanced plan meeting, as closely as possible, the specific objectives and assumptions of each individual plan element.

(8) Define the urban growth boundary.

(9) Prepare a plan providing a variety of living and working environments.

(10) Encourage the highest quality physical design for future development.

(11) Coordinate development plans with regional, state, and federal agencies to as-sure consistency with statutes, rules, and standards concerning air, noise, water quality, and solid waste. Cooperate with the U.S. Fish and Wildlife Service to minimize adverse impacts to the Tualatin River National Wildlife Refuge from development in adjacent areas of Tualatin.

(12) Adopt measures protecting life and property from natural hazards such as flooding, high groundwater, weak foundation soils and steep slopes.

(13) Develop regulations to control sedimentation of creeks and streams caused by erosion during development of property.

(14) Develop a separate growth program that controls the rate of community growth and is acceptable to the Land Conservation and Development Commission.

(15) Arrange the various land uses in a manner that is energy efficient.

(16) Encourage energy conservation by arranging land uses in a manner compatible with public transportation objectives.

(17) Maintain for as long a period as possible a physical separation of non-urban land around the City so as to maintain its physical and emotional identity within urban areas of the region.

(18) Fully develop the industrial area located in Washington County west of the City only when adequate transportation facilities are available and the area has been annexed to the City and served with water and sewer services.

(19) Cooperate with Washington County to study the methods available for providing transportation, water and sewer service to the industrial area west of the City, designating this area as a special study area.

(20) Initiate annexation of property within the Urban Growth Boundary planned for residential development only when petitioned to do so by owners of the affected property, including cases involving unincorporated "islands" of property surrounded by land annexed previously.

(21) Territories to be annexed shall be in the Metro Urban Growth Boundary.

(22) Address Metro's Urban Growth Management Functional Plan, Title 13, Nature in Neighborhoods, through the conservation, protection and restoration of fish and wildlife habitat, including Metro's Regionally Significant Fish and Wildlife Habitat, through the Tualatin Basin Natural Resource Coordinating Committee and the Tualatin Basin Program.

(a) Support and implement the elements of the Tualatin Basin Program to:

(i) Develop and adopt local policies and regulations to implement the provisions of the Tualatin Basin Program.

(ii) Adopt low impact development (LID) provisions to reduce environmental impacts of new development and remove barriers to their utilization.

(iii) Coordinate with Clean Water Services (CWS) to implement their Healthy Streams Action Plan and other programs such as their Stormwater Management Plan and Design and Construction Standards.

(iv) Coordinate with CWS, Metro and others to develop and support the funding, voluntary and educational components of the Tualatin Basin Program.

(v) Coordinate with CWS, Metro and others to develop and support the monitoring and adaptive management components of the Tualatin Basin Program.

(b) Continue active participation in the Tualatin Basin Natural Resources Coordinating Committee and the Steering Committee to support and implement the Tualatin Basin Program.

(c) Coordinate with CWS and Metro to update Metro's Regionally Significant Fish and Wildlife Habitat Inventory Map. Changes to the Inventory Map will be on-going as on-site inventories are conducted as part of private and public construction projects.

(d) Support and implement provisions allowing public access to planned public facilities.

Section 5.030 General Objectives.

The following are general objectives used to guide the development of the residential housing element of the Plan. They describe the Plan's intent to:

(1) Provide for the housing needs of existing and future City residents.

(2) Provide housing opportunities for residents with varied income levels and tastes that are esthetically and functionally compatible with the existing community housing stock.

(3) Cooperate with the Housing Authority of Washington County and the Housing Division of Clackamas County to identify sites, projects and developers to provide the City's fair share of assisted housing units for low and moderate income households, and participate in the region's Housing Opportunity Plan.

(4) Locate higher density development where it is convenient to the City's commercial core, near schools, adjacent to arterial and collector streets and, as much as possible, in areas with existing multi-family housing and provide residential opportunities in selected commercial areas through the Mixed Use Commercial Overlay District.

(5) Provide areas that are suitable for manufactured dwelling parks and areas that are suitable for subdivisions that will accommodate manufactured homes.

(6) Provide areas that will accommodate small-lot subdivisions.

(7) Develop specific and enforceable design standards for multi-family developments, town-houses, manufactured homes, manufactured dwelling parks and small-lot subdivisions.

(8) Encourage owner occupancy of multi-family developments and other housing units within the City.

(9) Encourage subdividers and other residential developers to consider the need for solar access on residential construction sites.

(10) Provide for the raising of agricultural animals and agricultural structures in areas that are presently used for this purpose and that are not buildable due to their location in the 100-year flood plain.

(11) Require that all residential development adjacent to Expressways be buffered from the noise of such Expressways through the use of soundproofing devices such as walls, berms or distance. Density transfer to accommodate the-se techniques is acceptable.

(12) Encourage the development of attached housing in accordance with the RML Planning District in the area of the Norwood Express-way/Boones Ferry Road intersection.

(13) Provide truck routes for industrial traffic that provide for efficient movement of goods while protecting the quality of residential areas.

(14) Protect residential, commercial, and sensitive industrial uses from the adverse environmental impacts of adjacent industrial use.

(15) Protect adjacent land uses from noise impacts by adopting industrial noise standards.

(16) Protect the Tonquin Scablands from ad-verse impacts of adjacent development. This includes the main Scabland area in the vicinity of the Burlington Northern Railroad tracks which is preserved through the use of the Wet-lands Protection District and the Greenway and Riverbank Protection District. This also includes other elements of the Scabland formations found farther to the east. These latter areas will be preserved on a case-by-case basis as development occurs through preservation in their natural state, allowing residential density transfer through the small lot subdivision, common wall housing, and condominium condition-al use processes.

(17) Protect wooded areas identified on the Natural Features Map found in the Technical Memorandum by requiring their preservation in a natural state, by integrating the major trees in-to the design of the parking lots, buildings, or landscaping areas of multi-family complexes and non-residential uses, or in low density areas through the small lot, common wall, or condominium conditional use. If it is necessary to remove a portion or all of the trees, the replacement landscape features shall be subject to approval through the Architectural Review process, except for conventional single family subdivisions.

Appendix B: Housing Policy Tools to Address Needs

This appendix presents the information provided to the CAC in the memorandum Housing Policy Tools to Address Needs (dated May 16, 2019).

The City of Tualatin contracted ECONorthwest to develop a Housing Needs Analysis and a Housing Strategy for Tualatin. The Housing Needs Analysis will determine whether the City of Tualatin has enough land to accommodate 20-years of population and housing growth. It will characterize housing affordability problems and identify gaps in housing affordability in Tualatin. The Housing Needs Analysis will provide the basis for an update to the City's Comprehensive Plan Housing Element, as well as development of an action plan to implement the housing policies (i.e. the Housing Strategy).

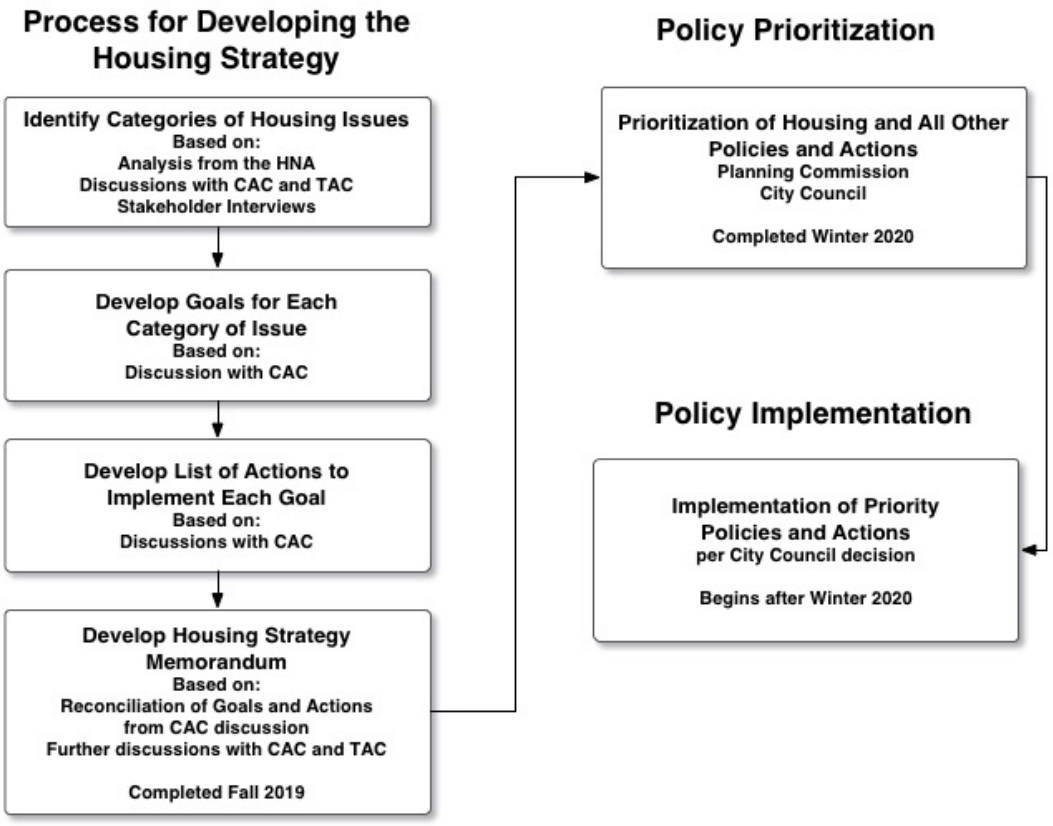
This memorandum provides a range of housing policy options for the City of Tualatin to consider as it addresses its housing needs. These policy options are commonly used by cities in Oregon and other states. Policy options are categorized as follows:

- Land Use Regulations
- Increase Housing Types
- Financial Assistance to Homeowners and Renters
- Lower Development or Operational Costs
- Funding Sources to Support Residential Development

The intention of this memorandum is to provide a toolbox of potential policies and actions that the City can use to address strategic issues. Exhibit 1 illustrates the process for developing the housing strategy and incorporating the strategy into the broader Tualatin 2040 process. Through this project, the CAC and TAC will provide feedback and recommendations that will be used to develop the Tualatin Housing Strategy. The May 23 CAC meeting will begin this process with the following steps: (1) identify categories of housing issues, (2) develop goal(s) to address each category of issue, and (3) developing a list of actions to implement each goal. At a subsequent CAC meeting, we will discuss one or more drafts of the Housing Strategy memorandum, which will document the housing issues, goals, and actions.

After the conclusion of this project, the Housing Strategy will be combined with other policies and actions and will be prioritized by the Tualatin Planning Commission and City Council. The policies and actions will be implemented per the Tualatin City Council's direction once prioritization is completed.

Exhibit 1. Process for developing and implementing the housing strategy



Options for Housing Policy Tools

This memorandum provides the City with information about potential policies that could be implemented in Tualatin to address the City's housing needs. Implementing some of the strategies in this memorandum may be beyond Tualatin's current staff or financial resources.

For many of the policy tools described below, we give an approximate scale of impact. **The purpose of the scale of impact is to provide some context for whether the policy tool generally results in a little or a lot of change in the housing market.** The scale of impact depends on conditions in the City, such as other the City's other existing (or newly implemented) housing policies, the land supply, and housing market conditions. We define the scale of impact as follows:

- A **small** impact may not directly result in development of new housing or it may result in development of a small amount of new housing, such as 1% to 3% of the needed housing (which is 10 to 30 dwelling units for Tualatin). In terms of housing affordability, a small impact may not improve housing affordability in and of itself. A policy with a small impact may be necessary but not sufficient to increase housing affordability.
- A **moderate** impact is likely to directly result in development of new housing, such as 3% to 5% of needed housing (which is 30 to 50 dwelling units for Tualatin). In terms of

housing affordability, a moderate impact may not improve housing affordability in and of itself. A policy with a moderate impact may be necessary but not sufficient to increase housing affordability.

- A **large** impact is likely to directly result in development of new housing, , such as 5% to 10% (or more) of needed housing (which is 50 to 100 dwelling units for Tualatin). In terms of housing affordability, a **large** impact may improve housing affordability in and of itself. A policy with a large impact may still need to work with other policies to increase housing affordability.

Land Use Regulations

The following policies focus on ways in which the City can modify its current land use regulations in order to increase housing affordability and available housing stock. Policies are broken into two categories: those that affect regulatory changes, and those which increase the land available for housing.

Strategy Name	Description	Scale of Impact
Regulatory Changes		
Administrative and Procedural Reforms	Regulatory delay can be a major cost-inducing factor in development. Oregon has specific requirements for review of development applications. However, complicated projects frequently require additional analysis such as traffic impact studies, etc. A key consideration in these types of reforms is how to streamline the review process and still achieve the intended objectives of local development policies.	**Scale of Impact - Small**. The level of impact on production of housing and housing affordability will be small and will depend on the changes made to the city's procedures. Streamlining procedures may be necessary but not sufficient to increase housing production on its own.
Expedited / Fast-tracked Building Permit	Expedite building permits for pre-approved development types or building characteristics (e.g. green buildings). City of Bend offers expedited review and permitting for affordable housing. Any residential or mixed-use development that receives local, state or federal affordable housing funding is eligible to receive a written decision by the Planning Department within two weeks of the date of submittal. For projects that require more complex planning review, a decision will be written or the first public hearing will be held within six weeks of the date of submittal.	**Scale of Impact - Small**. Expedited permit processing will benefit a limited number of projects. It may be necessary but not sufficient to increase housing production on its own.
Streamline Zoning Code and other Ordinances	Complexity of zoning, subdivision, and other ordinances can make development more difficult, time consuming, and costly. Streamlining development regulations can result in increased development. As part of the streamlining process, cities may evaluate potential barriers to affordable workforce housing and multifamily housing. Potential barriers may include: height limitations, complexity of planned unit development regulations, parking requirements, and other zoning standards. Many of the remaining tools in this section focus on changes to the zoning code.	**Scale of Impact - Small to moderate**. The level of impact on production of housing and housing affordability will depend on the changes made to the zoning code and other ordinances.

Strategy Name	Description	Scale of Impact
Allow Small Residential Lots	Small residential lots are generally less than 5,000 sq. ft and sometimes closer to 2,000 sq ft. . This policy allows individual small lots within a subdivision. Small lots can be allowed outright in the minimum lot size and dimensions of a zone, or they could be implemented through the subdivision or planned unit development ordinances. This policy is intended to increase density and lower housing costs. Small-lots limit sprawl, contribute to a more efficient use of land, and promote densities that can support transit. Small lots also provide expanded housing ownership opportunities to broader income ranges and provide additional variety to available housing types. Cities across Oregon allow small residential lots, including many cities in the Metro area.	**Scale of Impact – Small to moderate**. Cities have adopted minimum lot sizes as small as 2,000 sq. ft. However, it is uncommon to see entire subdivisions of lots this small. Small lots typically get mixed in with other lot sizes. This tool generally increases density and amount of single-family detached and townhouse housing in a given area, decreasing housing costs as a result of decreasing amount of land on the lot.
Mandate Maximum Lot Sizes	This policy places an upper bound on lot size and a lower bound on density in single-family zones. For example, a residential zone with a 6,000 sq. ft. minimum lot size might have an 8,000 sq. ft. maximum lot size yielding an effective net density range between 5.4 and 7.3 dwelling units per net acre. This approach ensures minimum densities in residential zones by limiting lot size. It places bounds on building at less than maximum allowable density. Maximum lot sizes can promote appropriate urban densities, efficiently use limited land resources, and reduce sprawl development. This tool is used by some cities but is used less frequently than mandating minimum lot sizes.	**Scale of Impact—Small to moderate**. Mandating maximum lot size may be most appropriate in areas where the market is building at substantially lower densities than are allowed or in cities that do not have minimum densities. This tool generally increases density and amount of single-family detached and townhouse housing in a given area, decreasing housing costs as a result of decreasing amount of land on the lot.

Strategy Name	Description	Scale of Impact
Mandate Minimum Residential Densities	This policy is typically applied in single-family residential zones and places a lower bound on density. Minimum residential densities in single-family zones are typically implemented through maximum lot sizes. In multifamily zones, they are usually expressed as a minimum number of dwelling units per net acre. Such standards are typically implemented through zoning code provisions in applicable residential zones. This policy increases land-holding capacity. Minimum densities promote developments consistent with local comprehensive plans and growth assumptions. They reduce sprawl development, eliminate underbuilding in residential areas, and make provision of services more cost effective. Mandating minimum density is generally most effective in medium and high density zones where single-family detached housing is allowed. The minimum density ensures that low-density single-family housing is not built where higher-density multifamily housing could be built.	**Scale of Impact—Small to moderate**. Increasing minimum densities and ensuring clear urban conversion plans may have a small to moderate impact depending on the observed amount of underbuild and the minimum density standard. For cities that allow single-family detached housing in high density zones, this policy can result in a moderate or larger impact.
Increase Allowable Residential Densities	This approach seeks to increase holding capacity by increasing allowable density in residential zones. It gives developers the option of building to higher densities. This approach would be implemented through the local zoning or development code. This strategy is most commonly applied to multifamily residential zones. For cities with maximum densities, consider removing maximum allowable densities. This change may be most relevant. Higher densities increase residential landholding capacity. Higher densities, where appropriate, provide more housing, a greater variety of housing options, and a more efficient use of scarce land resources. Higher densities also reduce sprawl development and make the provision of services more cost effective.	**Scale of Impact—Small to moderate**. This tool can be most effective in increasing densities where very low density is currently allowed or in areas where a city wants to encourage higher density development. This tool generally increases density and amount of single-family detached and townhouse housing in a given area, decreasing housing costs as a result of decreasing amount of land on the lot.

Strategy Name	Description	Scale of Impact
Allow Clustered Residential Development	Clustering allows developers to increase density on portions of a site, while preserving other areas of the site. Clustering is a tool most commonly used to preserve natural areas or avoid natural hazards during development. It uses characteristics of the site as a primary consideration in determining building footprints, access, etc. Clustering is typically processed during the site review phase of development review.	**Scale of Impact—Moderate.** Clustering can increase density, however, if other areas of the site that could otherwise be developed are not developed, the scale of impact can be reduced.
Reduced Parking Requirements	Jurisdictions can reduce or eliminate minimum off-street parking requirements, as well as provide flexibility in meeting parking requirements. Reducing parking requirements positively impact development of any type of housing, from single-family detached to multifamily housing. Reduced parking requirements are most frequently used in conjunction of development of subsidized affordable housing, but cities like Portland have reduced or eliminated parking requirements for market-based multifamily housing in specific circumstances. City of Bend offers parking reductions for affordable housing and transit proximity. Parking for affordable housing units is 1 space per unit regardless of size, compared to 1 space per studio or 1 bedroom unit, 1.5 spaces per 2-bedroom unit, and 2 spaces per 3- or more bedroom unit for market-rate multifamily development or 2 spaces per market rate detached dwelling unit. Affordable housing units must meet the same eligibility criteria as for other City of Bend affordable housing incentives City of Portland offers parking exceptions for affordable housing and sites adjacent to transit. The City of Portland allows housing developments that meet the inclusionary zoning requirements to reduce parking requirements to zero if located near frequent transit service, and to exclude the affordable housing units from parking requirements for developments located further from frequent transit service. The City also allows market rate housing developments located near frequent transit service to provide little or no parking, depending on the number of units in the development.	**Scale of Impact—Small to moderate**. The City could require the developer to prove the need and public benefit or reducing parking requirements to increase housing affordability. Reducing parking requirements can have a moderate to large impact on housing affordability if little or no parking is required.

Strategy Name	Description	Scale of Impact
Reduce Street Width Standards	This policy is intended to reduce land used for streets and slow down traffic. Street standards are typically described in development and/or subdivision ordinances. Reduced street width standards are most commonly applied on local streets in residential zones. This strategy could be applied to alleys, when required, to ensure that alleys are relatively narrow to reduce development and maintenance costs. Narrower streets make more land available to housing and economic-based development. Narrower streets can also reduce long-term street maintenance costs.	**Scale of Impact—Small**. This policy is most effective in cities that require relatively wide streets.
Preserving Existing Housing Supply	Housing preservation ordinances typically condition the demolition or replacement of certain housing types on the replacement of such housing elsewhere, fees in lieu of replacement, or payment for relocation expenses of existing tenants. Preservation of existing housing may focus on preservation of smaller, more affordable housing. Approaches include: • Housing preservation ordinances • Housing replacement ordinances • Manufactured home preservation • Single-room-occupancy ordinances • Regulating demolitions	**Scale of Impact—Small to moderate**. Preserving small existing housing can make a difference in the availability of affordable housing in a city but it is limited by the existing stock housing, especially smaller, more affordable housing. Cities with older housing stock are more likely to benefit from this policy.

Strategy Name	Description	Scale of Impact
Inclusionary Zoning	Inclusionary zoning policies tie development approval to, or provide regulatory incentives for, the provision of low- and moderate-income housing as part of a proposed development. Mandatory inclusionary zoning requires developers to provide a certain percentage of low-income housing. Incentive-based inclusionary zoning provides density or other types of incentives. The price of low-income housing passed on to purchasers of market-rate housing. Inclusionary zoning impedes the "filtering" process where residents purchase new housing, freeing existing housing for lower-income residents. Oregon's inclusionary zoning laws apply to structures with 20 or more multifamily units, with inclusion of units that are affordable at 80% of the median family income of the city. The City of Portland has implemented an inclusionary zoning program. While Portland's inclusionary zoning program is resulting in production of affordable multifamily units, there is considerable discussion and disagreement about the impact of number of multifamily units being built and potential changes in the location of units.	**Scale of Impact—Small to moderate**. Inclusionary zoning has recently been made legal in Oregon. The scale of impact would depend on the inclusionary zoning policies adopted by the city.

Increasing Land Available for Housing		
Re-designate or rezone land for housing	The types of land rezoned for housing are vacant or partially vacant low-density residential and employment land rezoned to multifamily or mixed use. In rezoning land, it is important to choose land in a compatible location, such as land that can be a buffer between an established neighborhood and other denser uses or land adjacent to existing commercial uses. When rezoning employment land, it is best to select land with limited employment capacity (i.e., smaller parcels) in areas where multifamily housing would be compatible (i.e., along transit corridors or in employment centers that would benefit from new housing). This policy change increases opportunity for comparatively affordable multifamily housing and provides opportunities for mixing residential and other compatible uses. Cities across Oregon frequently re-zone and re-designate land to address deficits of land for new housing.	**Scale of Impact - Small to large.** Scale of impact depends on the amount and location of land rezoned and the densities allowed on the rezoned land.
Encourage multifamily residential development in commercial zones	This tool seeks to encourage denser multifamily housing as part of mixed-use projects in commercial zones. Such policies lower or eliminate barriers to residential development in commercial or mixed-use zones. They include: eliminating requirements for non-residential uses in commercial zones (e.g., requirements for ground floor retail) or requiring minimum residential densities. This policy can increase opportunities for multifamily development on commercial or mixed-use zones or increase the density of that development. Cities across Oregon frequently encourage multifamily housing development in commercial zones, either as stand-along residential buildings or as mixed-use buildings.	**Scale of Impact – Small to moderate.** Many cities already encourage multifamily housing in commercial zones. Further encouraging multifamily housing in commercial zones would likely have a small impact, as multifamily housing is allowed in many of the commercial areas where it would be desirable. Unless it is publicly subsidized, mixed-use development generally results in relatively costly housing because ground floor commercial development is relatively expensive.

Transfer or Purchase of Development Rights	This policy is intended to move development from sensitive areas to more appropriate areas. Development rights are transferred to "receiving zones" and can be traded and can increase overall densities. This policy is usually implemented through a subsection of the zoning code and identifies both sending zones (zones where decreased densities are desirable) and receiving zones (zones where increased densities are allowed). Transfer of development rights is done less frequently in Oregon, as cities generally zone land for higher density housing where they would like it to occur. This policy is frequently used by cities outside of Oregon.	**Scale of Impact - Small to moderate**. Actual impact will depend on the extent to which the policy is used. TDRs may have little impact on overall densities since overall density is not changed; rather it is moved around. TDRs can be used to encourage higher densities in selected areas.
Provide Density Bonuses to Developers	The local government allows developers to build housing at densities higher than are usually allowed by the underlying zoning. Density bonuses are commonly used as a tool to encourage greater housing density in desired areas, provided certain requirements are met. This strategy is generally implemented through provisions of the local zoning code and is allowed in appropriate residential zones. Bonus densities can also be used to encourage development of low-income or workforce affordable housing. An affordable housing bonus would allow for more housing units to be built than allowed by zoning if the proposed project provides a certain number of affordable units. City of Bend offers affordable housing density and height bonuses. Qualifying affordable housing projects are eligible for a 10-foot building height bonus for multifamily housing when affordable housing units are gained and for a density bonus. The density increase is based on the percentage of affordable housing units within the proposed development: if 10% of the units are affordable, the maximum density is 110% of the standard maximum density. The maximum density bonus is 50% above the base density. Qualifying projects must be affordable to households at or below 60% of the AMI for rental housing and at or below 80% of the AMI for ownership housing, and require development agreements and restrictions to ensure continued affordability. Ashland has four different density bonuses, one of which is for development of affordable housing at higher densities and another for energy-efficient housing. Affordable housing projects meeting eligibility requirements (including rental housing affordable to households at or below 60% of AMI or ownership housing affordable to households at or below 80% of AMI for a minimum of 30 years) receive a density bonus	**Scale of Impact – Small to moderate**. Cities provide density bonuses on a case-by-case basis, which results in a small and sometimes moderate impact in many cities. Density bonuses can have a greater impact on housing affordability when the bonus increases the number of affordable units developed.

	of two units for each affordable housing unit provided, up to a maximum of a 35% increase in density. Kirkland Washington offers density bonuses for duplex, triplex, and cottage homes. Cottage homes (limited to 1,500 square feet of floor area) and two- and three-unit homes (up to 1,000 square feet of floor area average per unit) are allowed at double the density of detached dwelling units in the underlying zone.	

Increase Housing Types

The following policies focus on ways in which the City can increase the types of housing available in order to increase housing affordability. Policies focus on increasing housing density or the number of residents within existing City lots.

Strategy Name	Description	Scale of Impact
Allow Duplexes, Cottage housing, Townhomes, Row Houses, and Tri- and Quad-Plexes in low density zones	Allowing these housing types can increase overall density of residential development and may encourage a higher percentage of multifamily housing types. This approach would be implemented through the local zoning or development code and would list these housing types as outright allowable uses in appropriate residential zones. These housing types provide additional affordable housing options and allow more residential units than would be achieved by detached homes alone. House Bill 2001 may require cities to allow some of these housing types in single-family zones.	**Scale of Impact – Small to moderate**. Allowing these types of housing in more zoning districts may provide relatively few number of new, relatively affordable, housing opportunities.
Allow Cottage housing, Tri- and Quad-Plexes Townhomes, Row Houses, Stacked Townhouses, Cottage Courts, Duplex/Townhouse Courts, & Garden Apartments in	Allowing these housing types can increase overall density of residential development and may encourage a higher percentage of multifamily housing types. This approach would be implemented through the local zoning or development code and would list these housing types as outright allowable uses in appropriate residential zones. These housing types provide additional affordable housing options and allow more residential units than would be achieved by detached homes alone.	**Scale of Impact – Small to Large**. Allowing these types of housing in more zoning districts may provide up to a large number of new, relatively affordable, housing opportunities. The scale of impact will depend, in part, on the amount of vacant or redevelopable land in medium density zones, as well as the types

Strategy Name	Description	Scale of Impact
medium density zones		of housing newly allowed in the medium density zone.
Allow Stacked Townhouses, Garden Apartments and larger-scale Apartments in high density zones	Allowing these housing types can increase overall density of residential development and may encourage a higher percentage of multifamily housing types. This approach would be implemented through the local zoning or development code and would list these housing types as outright allowable uses in appropriate residential zones. These housing types provide additional affordable housing options and allow more residential units than would be achieved by detached homes alone.	**Scale of Impact – Small to Large**. Allowing these types of housing in more zoning districts may provide up to a large number of new, relatively affordable, housing opportunities. The scale of impact will depend, in part, on the amount of vacant or redevelopable land in high density zones, as well as the types of housing newly allowed in the high density zone.
Allow Live-Work housing or Mixed-use housing in commercial zones	Allowing these housing types can increase overall density of residential development and may encourage a higher percentage of multifamily housing types. This approach would be implemented through the local zoning or development code and would list these housing types as outright allowable uses in appropriate residential zones. These housing types provide additional affordable housing options and allow more residential units than would be achieved by detached homes alone.	**Scale of Impact – Small to Large**. Allowing these types of housing in more zoning districts may provide up to a large number of new, relatively affordable, housing opportunities.
Remove barriers to Development of Accessory Dwelling Units (ADUs) in single-family zones	As of July 1, 2018, ORS 197.312 requires cities to allow at least one ADU for each detached single-family dwelling in areas zoned for detached single-family dwellings. Jurisdictions can make development of ADUs more likely by limiting restrictive standards and procedures, such as reducing systems development charges for ADUs, reducing or eliminating parking requirements, or allowing ADUs regardless of where the primary dwelling is owner-occupied.	**Scale of Impact - Small**. Oregon law recently changed to require cities to allow ADUs.

Strategy Name	Description	Scale of Impact
Allow small or "tiny" homes	"Tiny" homes are typically dwellings that are 500 square feet or smaller. Some tiny houses are as small as 100 to 150 square feet. They include stand-alone units or very small multifamily units. Tiny homes can be sited in a variety of ways: locating them in RV parks (they are similar in many respects to Park Model RVs), tiny home subdivisions, or allowing them as accessory dwelling units. Smaller homes allow for smaller lots, increasing land use efficiency. They provide opportunities for affordable housing, especially for homeowners. Portland and Eugene allow tiny homes as temporary shelter for people experiencing homelessness.	**Scale of Impact - Small:** Scale of impact depends on regulation of tiny homes, where they are allowed, and market demand for tiny homes.

Lower Development or Operational Costs

The following policies focus on ways in which the City and other entities involved in development can provide financial assistance to lower development or operational costs in a city in order to increase housing affordability and available housing stock.

Strategy Name	Description	Scale of Impact
Programs or policies to lower the cost of development		
Parcel assembly	Parcel assembly involves the city's ability to purchase lands for the purpose of land aggregation or site assembly. It can directly address the issues related to limited multifamily lands being available in appropriate locations (e.g., near arterials and commercial services). Typical goals of parcel assembly programs are: (1) to provide sites for rental apartments in appropriate locations close to services and (2) to reduce the cost of developing multifamily rental units Parcel assembly can lower the cost of multifamily development because the City is able to purchase land in strategic locations over time. Parcel assembly is often associated with development of affordable housing (affordable to households with income below 60% of MFI), where the City partners with nonprofit affordable housing developers. Parcel assembly can be critically important role for cities to kick start quality affordable housing and work force housing projects that can be positive catalysts too for market rate development.	**Scale of Impact - Small to large.** Parcel assembly is most likely to have an effect on a localized area, providing a few opportunities for new multifamily housing development over time**.**

Strategy Name	Description	Scale of Impact
Land Banking	Land banks support housing development by reducing or eliminating land cost from development, with the goal of increasing the affordability of housing. They can take several forms. Many are administered by a non-profit or non-governmental entity with a mission of managing a portfolio of properties to support affordable housing development over many years or decades. Ideally, a land bank is set up to manage financial and administrative resources, including strategic property disposal, for the explicit purpose of supporting affordable housing development. Cities can partner with non-profits or sometimes manage their own land banks. Cities may also donate, sell, or lease publicly-owned land for the development of affordable housing even without a formal 'land bank' organization. Land banks are purposed for short-term ownership of lands. Lands acquired are often vacant, blighted, or environmentally-contaminated. Land banks may also acquire lands with title defects or of which derelict structures sit. Lands are eventually transferred to a new owner for reuse and redevelopment.	**Scale of Impact - Small to large.** A land bank will have the biggest impact on production of low- and moderate-income affordable housing. Considering how difficult it is to build this type of affordable housing and the level of need for affordable housing, a land trust could increase nonprofits' capacity to build affordable housing.
Land Trusts	A land trust is typically a nonprofit organization that owns land and sells or leases the housing on the land to income-qualified buyers. Because the land is not included in the housing price for tenants / buyers, land trusts can achieve below-market pricing. Land trusts are most commonly used as a method for supporting affordable home ownership goals. Land trusts are purposed for long-term stewardship of lands and buildings. Lands / buildings acquired may have need for remediation or redevelopment. Lands / buildings may have also been acquired to preserve affordability, prevent deferred maintenance, or protect against foreclosure Proud Ground (Portland Metro Area) was founded in 1999 and has grown into one of the largest community land trusts in the country. The organization focuses on affordable homeownership and controls ground leases associated with 270 homes in Multnomah, Washington, Clackamas, and Clark County.	**Scale of Impact - Small to large.** A land trust will have the biggest impact on production of low- and moderate-income affordable housing. Considering how difficult it is to build this type of affordable housing and the level of need for affordable housing, a land trust could increase nonprofits' capacity to build affordable housing.

Strategy Name	Description	Scale of Impact
Public Land Disposition	The public sector sometimes controls land that has been acquired with resources that enable it to dispose of that land for private and/or nonprofit redevelopment. Land acquired with funding sources such as tax increment, EB-5, or through federal resources such as CDBG or HUD Section 108 can be sold or leased at below market rates for various projects to help achieve redevelopment objectives. This increases development feasibility by reducing development costs and gives the public sector leverage to achieve its goals via a development agreement process with the developer. Funding can come from Tax Increment, CDBG/HUD 108, or EB-5. Cities across Oregon use publicly land to support affordable and market-rate of housing development. In some cases, municipalities put surplus public land into land banks or land trusts. Tri-Met is evaluating re-use of construction staging sites for future affordable housing and/or transit-orient development sites. Cottage Grove is working with the school district to discuss and plan for use of surplus school district land for future housing development.	**Scale of Impact – Small to moderate.** Depends on whether the City has surplus land that would be appropriate for future housing development.

Strategy Name	Description	Scale of Impact
Reduced / Waived Building Permit fee, Planning fees, or SDCs	Programs that reduce various development fees as an incentive to induce qualifying types of development or building features. There are a number of avenues to seek reduced or waived fees. For example, stormwater improvements can be made through the Commercial Stormwater Fee Reduction. There are commonly used tools, often implemented in conjunction with development agreements or other development negotiation processes. City of Portland offers SDC exemptions for affordable housing. Portland's SDC Exemption Program exempts developers of qualifying affordable housing projects from paying SDCs levied by the City of Portland for transportation, water, parks and environmental services. Eligible rental projects must serve households earning at or below 60% of the AMI for a 60-year period. Portland also offers SDC waivers for development of ADUs. City of McMinnville offers SDC exemptions and reduced permit fees for affordable housing. Building and planning permit fees for new or remodel housing construction projects are reduced by 50% for eligible projects and SDCs for transportation, wastewater and parks are exempted at 100%. Reductions/exemptions are prorated for mixed use or mixed-income developments. The property must be utilized for housing for low-income persons for at least 10 years or the SDCs must be paid to the city.	**Scale of Impact - Small**.
SDC Financing Credits	May help to offset the an SDC charge, which is a one-time fee that is issued when there is new development or a change in use. SDC financing enables developers to stretch their SDC payment over time, thereby reducing upfront costs. Alternately, credits allow developers to make necessary improvements to the site in lieu of paying SDCs. Note that the City can control its own SDCs, but often small cities manage them on behalf of other jurisdictions including the County and special districts. SDCs are granted when the project makes lasting improvements, such as improving roads, reducing number of trips, create or improve parks or recreational centers, and permanently removing water services.	**Scale of Impact – Small to moderate.** The City may consider changes in SDCs to allow financing but the City would want to ensure that the impact should be spread-out and non-negatively impact one entity.

Strategy Name	Description	Scale of Impact
Sole Source SDCs	Retains SDCs paid by developers within a limited geographic area that directly benefits from new development, rather than being available for use city-wide. This enables SDC-eligible improvements within the area that generates those funds to keep them for these improvements. Improvements within smaller areas can enhance the catalytic and redevelopment value of the area. This tool can also be blended with other resources such as LIDs and Urban Renewal (Tax Increment Financing). Funding can come from an SDC fund or general fund. In some cases, there may be no financial impact. The housing can come in the form of student, low-income, or workforce housing.	**Scale of Impact – Small to moderate.** Depends on how the tool is implemented and whether it is used with other tools, such as LIDs or Urban Renewal.
Fees or Other Dedicated Revenue	Directs user fees into an enterprise fund that provides dedicated revenue to fund specific projects. Examples of those types of funds can include parking revenue funds, stormwater/sewer funds, street funds, etc. The City could also use this program to raise private sector funds for a district parking garage wherein the City could facilitate a program allowing developers to pay fees-in-lieu or "parking credits" that developers would purchase from the City for access "entitlement" into the shared supply. The shared supply could meet initial parking need when the development comes online while also maintaining the flexibility to adjust to parking need over time as elasticity in the demand patterns develop in the district and influences like alternative modes are accounted for. Funding can come from residents, businesses, and developers. Also, these fees or revenues allow for new revenue streams into the City.	

Strategy Name	Description	Scale of Impact
Reimbursement District	A Reimbursement District is a cost sharing mechanism, typically Initiated by a developer. The purpose is to provide a reimbursement method to the developer of an infrastructure improvement, through fees paid by property owners at the time the property benefits from the improvement. A developer applies to create a Reimbursement District by demonstrating benefit to properties beyond their own. In addition, the size of the improvement must be measurably greater than would otherwise be ordinarily required for the improvement Eligible Reimbursement District projects typically include (but are not limited to) construction or connections of a sewer, water, storm water or street improvements. Applications typically include: a fee sufficient to cover the cost of administrative review, a description of the project, properties that would be impacted, and a detailed methodology and calculation of how the estimated costs would be reimbursed by payments from benefitted properties over a specified timeframe. A report from the City Engineer is generated in review of the submitted application. After a public hearing process, the council will approve, reject or modify the proposal. The approval of a Reimbursement District results in a resolution and distribution of notice among benefitted properties before construction can begin. Benefitted properties must pay the Reimbursement Fee when they make a physical connection to the improvement (or in the case of a sewer project, when the benefitted property creates an impervious surface that drains into the public sewer) within the Reimbursement District Area. Reimbursement fees are collected by the City and are distributed to the developer for the duration of the Reimbursement District, which are typically 10-15 years. Paid by benefitted properties at the time the property benefits from the improvement, typically at connection to the sewer, water or storm drain system.	**Scale of Impact – Small to moderate**.
Linkage Fees	Linkage fees are charges on new development, usually commercial and / or industrial development only, that can be used to fund affordable housing. To implement them, a city must undertake a nexus study that identifies a legal connection between new jobs housed in the developments, the wages those jobs will pay, and the availability of housing affordable to those employees. • Can be used for acquisition and rehabilitation of existing affordable units. • Can be used for new construction.	**Scale of Impact – Small to moderate**.

Strategy Name	Description	Scale of Impact
Tax abatement programs that decrease operational costs by decreasing property taxes		
Vertical Housing Tax Abatement (Locally Enabled and Managed)	The 2017 Legislature passed legislation moving the administration of Vertical Housing Program from Oregon Housing and Community Services (OHCS) to the local City and County beginning Oct 6th, 2017. OHCS no longer administers this program. The legislation subsidizes "mixed-use" projects to encourage dense development or redevelopment by providing a partial property tax exemption on increased property value for qualified developments. The exemption varies in accordance with the number of residential floors on a mixed-use project with a maximum property tax exemption of 80 percent over 10 years. An additional property tax exemption on the land may be given if some or all of the residential housing is for low-income persons (80 percent of area is median income or below).	**Scale of Impact – Small to moderate**. The design of the tax abatement program will impact whether and how many developers use the tax abatement, which will affect the scale of the impact.

Multiple-Unit Limited Tax Exemption Program (Locally Enabled and Managed)	Through the multifamily tax exemption, a jurisdiction can incent diverse housing options in urban centers lacking in housing choices or workforce housing units. Through a competitive process, multi-unit projects can receive a property tax exemption for up to ten-years on structural improvements to the property. Though the state enables the program, each City has an opportunity to shape the program to achieve its goals by controlling the geography of where the exemption is available, application process and fees, program requirements, criteria (return on investment, sustainability, inclusion of community space, percentage affordable or workforce housing, etc.), and program cap. The City can select projects on a case-by-case basis through a competitive process. The passing of HB 2377 - Multiunit Rental Housing Tax Exemption allows cities and counties to create a property tax exemption for newly rehabilitated or newly constructed multi-unit rental housing within their boundaries depending on the number of units made available to low-income households, for up to 10 consecutive years. The bill was crafted to strengthen the connection to affordability by requiring cities and counties to establish a schedule in which the number of years an exemption is provided increases directly with the percentage of units rented to households with an annual income at or below 120 percent of MFI, and at monthly rates that are affordable to such households. While not specifically referenced in the measure, ORS 308.701 defines “Multi-unit rental housing” as: “(a) residential property consisting of four or more dwelling units” and; “does not include assisted living facilities.” All new multifamily units that are built or renovated that offer rent below 120% of AMI are potentially eligible for this tax exemption. In a city with an AMI of $55,000 (common outside of Portland), that's rent of $1,650 per month or less. The tax exemption is for all taxing districts which is administered by the City. Due to this, smaller jurisdictions may have more trouble managing this program. Local taxing jurisdictions that agree to participate–cities, school districts, counties, etc. The City of Eugene offers a ten-year Multi-Unit Property Tax Exemption (MUPTE) for projects in its eastern downtown core. Eugene’s criteria for granting MUPTE include: Project must provide 5 or more units of housing (not including student housing), development must meet minimum density standards, development must comply with minimum green building requirements, a portion of construction and other contracting requirements must	**Scale of Impact – Small to moderate**. The design of the tax abatement program will impact whether and how many developers use the tax abatement, which will affect the scale of the impact.

Strategy Name	Description	Scale of Impact
	be through local business, the development must provide 30% of the units affordable at 100% of AMI or pay a fee of 10% of the value of the tax abatement toward supporting moderate income housing development, demonstrate that the project would not be financially feasible without the exemption by providing 10-year pro forma with and without MUPTE and comply with other criteria. The City of Salem's Multi-Unit Housing Tax Incentive Program (MUHTIP) was adopted in 2012 to spur the construction of "transit supportive"9 multi-unit housing in the city's downtown core. In order to qualify for the exemption, projects must consist of at least two dwelling units, be located in the city's "core area," and include at least one public benefit.	
Nonprofit Corporation Low Income Housing Tax Exemption and Low-Income Rental Housing Tax Exemption	Note: These are two separate tax exemptions available under statute (ORS 307.515 to 307.523 / ORS 307.540 to 307.548). They are grouped together for their similarities (but differences are noted). Land and improvement tax exemption used to reduce operating costs for regulated affordable housing affordable at 60% AMI or below. Requires the City to adopt standards and guidelines for applications and enforcement mechanisms. The low-income rental housing program exemption lasts 20 years. The nonprofit corporation low-income housing program must be applied for every year but can continue as long as the property meets the criteria. Rents must reflect the full value of the property tax abatement and City can add additional criteria. There is no requirement that construction must be complete prior to application. Programs both work well in tandem with other incentives, such as land banking.	**Scale of Impact – Small to moderate**. The exemption reduces operating costs, meaning it is a tool more useful to property owners of affordable housing projects. Developers, who do not own and operate their own projects, may be less inclined to use the program.

[9] City of Salem, "Multi Unit Housing Tax Incentive Program," https://www.cityofsalem.net/Pages/multi-unit-housing-tax-incentive-program.aspx.

Funding Sources to Support Residential Development

The following policies focus on ways to pay for the costs of implementing the affordable housing programs and infrastructure development.

Strategy Name	Description	Scale of Impact
Urban Renewal / Tax Increment Finance (TIF)	Tax increment finance revenues are generated by the increase in total assessed value in an urban renewal district from the time the district is first established. As property values increase in the district, the increase in total property taxes (i.e., City, County, school portions) is used to pay off the bonds. When the bonds are paid off, the entire valuation is returned to the general property tax rolls. TIFs defer property tax accumulation by the City and County until the urban renewal district expires or pays off bonds. Over the long term (most districts are established for a period of 20 or more years), the district could produce significant revenues for capital projects. Urban renewal funds can be invested in the form of low-interest loans and/or grants for a variety of capital investments: • Redevelopment projects, such as mixed-use or infill housing developments • Economic development strategies, such as capital improvement loans for small or startup businesses which can be linked to family-wage jobs • Streetscape improvements, including new lighting, trees, and sidewalks • Land assembly for public as well as private re-use • Transportation enhancements, including intersection improvements • Historic preservation projects • Parks and open spaces Urban renewal is a commonly used tool to support housing development in cities across Oregon.	**Scale of Impact – Moderate to Large**. Urban Renewal funding is a flexible tool that allows cities to develop essential infrastructure or provides funding for programs that lower the costs of housing development (such as SDC reductions or low interest loan programs). Portland used Urban Renewal to catalyze redevelopment across the City, including the Pearl District and South Waterfront.

Construction Excise Tax (CET)	Funds land use planning throughout the region by taxing construction permits. CET is a tax assessed on construction permits issued by local cities and counties. The tax is assessed as a percent of the value of the improvements for which a permit is sought, unless the project is exempted from the tax. In 2016, the Oregon Legislature passed Senate Bill 1533 which permits cities to adopt a construction excise tax (CET) on the value of new construction projects to raise funds for affordable housing projects. CETs may be residential only, commercial only, or residential and commercial. If the City were to adopt a CET, the tax would be up to 1% of the permit value on residential construction and an uncapped rate on commercial and industrial construction. The allowed uses for CET funding are defined by the state statute. The City may retain 4% of funds to cover administrative costs. The funds remaining must be allocated as follows, if the City uses a residential CET: • 50% must be used for developer incentives (e.g. fee and SDC waivers, tax abatements, etc.) • 35% may be used flexibly for affordable housing programs, as defined by the jurisdiction. • 15% flows to Oregon Housing and Community Services for homeowner programs. If the City implements a CET on commercial or industrial uses, 50% of the funds must be used for allowed developer incentives and the remaining 50% are unrestricted. The rate may exceed 1% if levied on commercial or industrial uses. The City of Portland's CET went into effect in 2016. It levies a 1% CET on residential, commercial, and industrial development valued at $100,000 or more, with all revenues going toward affordable housing. The revenues pay for production of housing at or below 60% AMI, developer incentives for inclusionary zoning, along with state homeownership programs. City of Bend adopted a CET of 0.3% on residential, commercial, and industrial development in 2006, with revenues dedicated to loans to fund developments by profit and nonprofit affordable housing developers. The fee has raised $11 million as of 2016, allowing the City to lend money to fund 615 units. The fund has leveraged $63 million in state and federal funding and $14 million in equity. The City of Milwaukie adopted a CET on commercial, residential, and industrial development in November of 2017. The City exempted deed-restricted affordable	**Scale of Impact – Depends on the amount of funding available**.

	housing, ADUs, and improvements less than $100,000 from paying the CET. The adopting ordinance allocates funds as required by state statutes, specifying that flexible funds from the commercial improvements will be used 50% toward housing available to those making up to 120% of MFI, and 50% for economic development programs in areas with sub-area plans (such as Downtown and Riverfront, and the City's urban renewal areas).	
General Fund and General Obligation (GO) Bonds	Allows funding for a project that is not dependent on revenue from the project to back the bond. City can use general fund monies on hand or can issue bonds backed by the full faith and credit of the city to pay for desired public improvements. Property taxes are increased to pay back the GO bonds. City of Portland passed $258 million bond for affordable housing in 2016. The goal of the bond is to build or preserve up to 1,300 units in the next five to seven years. The city issued a request for information to solicit interest in acquiring properties or land under the affordable housing bond. The city is looking for opportunities to acquire existing properties of 20 or more units, or vacant land that is appropriately zoned for 20+ housing units, and is looking for both traditional and nontraditional development opportunities.	**Scale of Impact – Moderate to large**. GO Bonds can be used to develop essential infrastructure or provides funding for programs that lower the costs of housing development (such as SDC reductions or low interest loan programs).
Local Improvement District (LID)	Enables a group of property owners to share the cost of a project or infrastructural improvement. A special assessment district where property owners are assessed a fee to pay for capital improvements, such as streetscape enhancements, underground utilities, or shared open space. For residential property, the estimated assessment cannot exceed the pre-improvement value of the property based on assessor records. An ordinance must be passed through a public hearing process which must be supported by a majority of affected property owners. Part of this process includes an estimation of the improvement costs and the portion of those costs in which property owners will be responsible to pay for. The public hearing process allows for LIDs to be challenged by property owners. The City collects the funds and regardless if the actual cost is greater than the estimated cost (on which the assessment was based), the City may make a deficit assessment for the additional cost, which would be prorated among all benefitted properties. Another public hearing would be held, in the event that an additional assessment were placed property owners (due to underestimation).	**Scale of Impact – Depends on the amount of funding available and Bonding capacity**.

General Fund Grants or Loans	A city can use general fund or tax increment dollars to directly invest in a specific affordable housing projects. These grants or loans can serve as gap funding to improve development feasibility. There are several options for using general fund grants or loans, including the potential for bonds to generate upfront revenue that is repaid over time, as recently approved in the City of Portland. Another option is to use general fund dollars to contribute to other programs that are successfully operating, such as non-profit land trusts or even other government agencies that have the administrative capacity to maintain compliance requirements over time, using intergovernmental agreements.	**Scale of Impact – Depends on the amount of funding available**.
Transient Lodging Tax (TLT)	Generates revenue by primarily taxing tourists and guests using temporary lodging services. Taxes for temporary lodging at hotels, motels, campgrounds, and other temporary lodgings. Oregon has a statewide TLT and cities and counties can also charge a local TLT subject to certain limitations. The statutes specify that 70% must be used for tourism promotion or tourism related facilities and 30% is unrestricted in use, and there cannot be a reduction of the total percent of room tax. The state tax is specified at 1.8%; local government tax rates vary as local governments set the rate for their jurisdiction by ordinance. Cities and counties may impose taxes on transient lodging. Alternatively, some cities have an agreement for the county to impose the tax and cities share in a percent of the revenue.	**Scale of Impact – Small.** The amount of funding from TLT is likely to be relatively small, given that only 30% of TLT funds have unrestricted use.
CDBG	The Community Development Block Grants program is a flexible program that provides annual grants on a formula basis to both local governments and States. Grants are awarded on a 1, 2, or 3-year period. It is required that at least 70% of the CDGB funds are used for activities that benefit low- and moderate- income. Additionally, each activity must address any threats to health or welfare in the community (for which other funding is unavailable). These funds can be used for acquisition and rehabilitation of existing affordable units, as well as new construction that prioritizes community development efforts.	**Scale of Impact – Depends on the amount of funding available**.

ECONorthwest
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DATE: September 17, 2019
TO: Tualatin Project Advisory Committees
CC: Karen Perl Fox, Steve Koper, and Jonathan Taylor
FROM: Beth Goodman and Sadie DiNatale, ECONorthwest
SUBJECT: DRAFT: TUALATIN ECONOMIC DEVELOPMENT STRATEGY

The City of Tualatin contracted ECONorthwest to develop an Economic Opportunities Analysis and an Economic Development Strategy for Tualatin. The Economic Opportunities Analysis will determine whether the City of Tualatin has enough land to accommodate 20-years of commercial and industrial job growth. The Economic Opportunities Analysis (EOA) will provide the basis for an update to the City's Comprehensive Plan Economic Element, as well as development of an action plan to implement the economic development policies (i.e., the Economic Development Strategy).

The EOA uses a planning period of 2020-2040. Tualatin is planning for growth of about 12,800 new jobs within the Tualatin planning area over the 20-year planning period. The preliminary results of the EOA show that Tualatin has a deficit of land designated for employment in the Commercial and Industrial comprehensive plan designations.

A key objective of the EOA and accompanying economic development strategy is to identify options for changes to the City's comprehensive plan and land use regulations needed to address commercial and industrial land needs. This memorandum presents an Economic Development Strategy for Tualatin, based on the results of the EOA, and discussions with the Community Advisory Committee (CAC) and Technical Advisory Committee (TAC). The economic development presents a comprehensive package of interrelated policy changes that the CAC recommends the City address.

This economic development strategy focuses on land use tools to ensure there is adequate land planned and zoned to provide opportunities for employment growth on sites with a variety of characteristics (e.g., site sizes, locations, visibility, and other characteristics).

Through the technical analysis of the EOA and input from the CAC and TAC, the City identified four strategic priorities to address issues identified in the EOA. The strategic priorities are: (1) ensuring an adequate supply of land that is available and serviceable; (2) identifying redevelopment opportunities; (3) supporting business retention, growth, and attraction; and (4) ensuring there are connections between planning for economic development and other community planning. Strategic priorities are described in greater detail in the section below.

Appendix A presents the full text of Tualatin's existing Comprehensive Plan policies for commercial and industrial development. Appendix B presents the information about economic development tools commonly used in other cities in Oregon.

Tualatin's Economic Development Strategy

Tualatin's economic development strategy is organized around four broad strategic priorities: (1) ensure an adequate supply of land that is available and serviceable; (2) identify redevelopment opportunities; (3) support business retention, growth, and attraction; and (4) ensure there are connections between planning for economic development and other planning (such as transportation planning, water and wastewater planning, and economic development planning). The broad goal of the Tualatin economic development strategy is to help the City manage the land within the Tualatin planning area to support and manage economic growth while maintaining the character and quality of life in Tualatin and protecting public interests such as health, safety, and municipal revenues.

The Tualatin CAC convened seven times between March 2019 and September 2019. The CAC discussed economic development at the meetings in June, August, and September. The Tualatin TAC met four times between April 2019 and September 2019 and discussed economic development at the June, August, and September meetings (while some meetings included discussions of other topics, as well). The CAC and TAC provided input, through discussions at meetings and opportunities for input on written documents, into development of the Economic Development Strategy.

The recommendations from the CAC in this strategy consider key findings from the EOA, such as the following examples. The City has a long-term deficit of commercial and industrial land for growth over the 2020 to 2040 period. This document presents a comprehensive strategy that provides a variety of policies to support business retention, growth, and attraction in Tualatin.

Many of the actions described in the Tualatin Economic Development Strategy will require legislative amendments to the City's comprehensive plan and/or development code. These actions will be subject to standard notification and hearing procedures. After the economic opportunities analysis is completed, the Planning Commission and City Council will prioritize the actions suggested in this memorandum, along with other actions suggested for Tualatin in 2040. Implementation of high priority actions will begin in 2020, based on City Council direction.

Summary of Actions

The table below summarizes the Strategies, Actions, and Recommendations made by the CAC.

Note: The priority will be added based on discussions with the CAC.

Strategy, Action, and Recommendations	Priority
Strategy 1: Ensure an adequate supply of land that is available and serviceable.	
Action 1.1. Evaluate opportunities to increase mixed-use development. ▪ **Recommendation 1.1a:** Identify opportunities to re-zone industrial or commercial land for mixed-use that includes commercial and residential uses. ▪ **Recommendation 1.1b:** Evaluate opportunities to develop an employment zone that allows for greater mixture of industrial and commercial uses, limiting retail commercial uses.	
Action 1.2. Identify opportunities to make more efficient use of industrial land. ▪ **Recommendation 1.2a:** Disallow new development that require substantial amounts of land but result in little employment. ▪ **Recommendation 1.2b:** Evaluate reducing or eliminating the minimum lot size from 20,000 square feet.	
Action 1.3. Identify opportunities to make more efficient use of commercial land. ▪ **Recommendation 1.3a:** Evaluate reducing or eliminating the minimum lot size from 10,000 square feet in most commercial zones and allow other development standards to determine minimum lot size. ▪ **Recommendation 1.3b:** Evaluate increasing the building height limit in commercial development centers, including for retail development.	
Action 1.4. Plan for infrastructure development to support commercial and industrial development. ▪ **Recommendation 1.4a:** Prioritize infrastructure projects, especially transportation projects, that are necessary to support employment growth. ▪ **Recommendation 1.4b:** Seek support from regional partners for development and improvement of transportation infrastructure that serves employment centers in Tualatin. ▪ **Recommendation 1.4c:** Identify opportunities to increase transit service between Tualatin and other cities within the Portland region. ▪ **Recommendation 1.4d:** Identify options to extend transit service within Tualatin to employment centers.	
Action 1.5. Work with landowners ensure land is development-ready and certified as shovel ready by Business Oregon. ▪ **Recommendation 1.5a:** Encourage and assist landowners to get their sites certified through the Business Oregon Certified Shovel Ready program. ▪ **Recommendation 1.5b:** Continue to work with landowners to ensure that development sites are listed on Business Oregon's prospector site.	
Action 1.6. Plan for long-term development in Tualatin through 2040 and beyond. ▪ **Recommendation 1.6a:** Actively work with Metro staff to ensure that Tualatin's population and employment forecasts are planned for similar growth rates and to coordinate Tualatin's planning with regional plans. ▪ **Recommendation 1.6b:** Develop and implement a system to monitor the supply of commercial and industrial land every two years. ▪ **Recommendation 1.6c:** Reevaluate Tualatin's economic opportunities and land sufficiency on a regular basis tied to the Metro Growth Management cycle.	

Strategy, Action, and Recommendations	Priority
Strategy 2: Identify redevelopment opportunities.	
Action 2.1. Identify districts within Tualatin with opportunities for redevelopment for housing and employment uses. ▪ **Recommendation 2.1a:** Initiate a process to identify opportunities for redevelopment of mixed-use districts and initiate an area planning process to guide redevelopment.	
Action 2.2. Revise the Tualatin Town Center Plan to focus on opportunities to support redevelopment. ▪ **Recommendation 2.2a:** Develop a community vision and planning for Town Center, with a focus on redevelopment. ▪ **Recommendation 2.2b:** Evaluate opportunities to redevelop City-owned properties to create catalytic projects that include a mix of housing and retail and office uses.	
Action 2.3. Identify opportunities to redevelop and intensify uses in industrial areas. ▪ **Recommendation 2.3a:** Identify opportunities for industrial redevelopment and work with property owners to support redevelopment.	
Action 2.4. Develop policies to support redevelopment and mixed-use development. ▪ **Recommendation 2.4a:** Evaluate the redevelopment potential of publicly owned properties, such as parking lots. ▪ **Recommendation 2.4b:** Continue to evaluate establishing a new urban renewal district to support development of commercial, industrial, and residential businesses, especially mixed-use districts.	
Strategy 3: Support business retention, growth, and attraction.	
Action 3.1. Revise the economic development strategy and create an economic development action plan. ▪ **Recommendation 3.1a:** Establish an Economic Development Committee to guide development of the economic development strategy. ▪ **Recommendation 3.1b:** Develop an action-oriented 5-year economic development action plan that includes a community vision.	
Action 3.2 Support growth of existing businesses in Tualatin. ▪ **Recommendation 3.2a:** Continue to identify opportunities to support existing businesses in Tualatin, through working with partners such as the Tualatin Chamber of Commerce to identify and resolve issues that are barriers to the businesses growing and staying in Tualatin.	
Action 3.3. Support growth of and retain entrepreneurial businesses in Tualatin. ▪ **Recommendation 3.3a:** Continue to identify opportunities to support growth and retention of entrepreneurial businesses in Tualatin.	
Action 3.4. Identify opportunities to attract or grow businesses with pay at or above Tualatin's average wage. ▪ **Recommendation 3.4a:** Identify partnerships and incentive programs to grow, retain, and attract businesses with wages at or above the City's average wage of $57,300.	
Action 3.5. Evaluate use of incentives to retain, grow, and attract businesses. ▪ **Recommendation 3.5a:** Evaluate the outcomes the City wants to achieve through offering economic development incentives and the incentives the City could offer.	
Action 3.6. Ensure that Tualatin has sufficient staff capacity to implement the economic development priorities set by the City Council. ▪ **Recommendation 3.6a:** Council should work with the City Manager and Community Development Director to determine whether the City will need to add staff to implement the policies in the Economic Development Strategy.	

Strategy, Action, and Recommendations	Priority
Strategy 4: Ensure there are connections between planning for economic development and other community planning.	
Action 4.1. Ensure that updates to the Transportation System Plan coordinate with planning for employment and business growth. ▪ **Recommendation 4.1a:** Evaluate opportunities to decrease dependence on automotive transportation in areas planned for mixed-use and commercial development. ▪ **Recommendation 4.1b:** Evaluate opportunities to expand transit and improve transportation connectivity for freight and automobiles between Tualatin and other cities within the Portland Region. ▪ **Recommendation 4.1c:** Evaluate opportunities to expand transit and improve transportation connectivity within Tualatin. ▪ **Recommendation 4.1d:** Evaluate opportunities for planning transit-oriented development. ▪ **Recommendation 4.1e:** Develop a bicycle and pedestrian plan for Tualatin.	
Action 4.2. Coordinate planning for economic development planning with housing planning. ▪ **Recommendation 4.2a:** Ensure the City plans for housing that is affordable to people who work at businesses in Tualatin.	
Action 4.3. Develop a design and planning framework for "ten-minute neighborhoods" that include a mixture of uses. ▪ **Recommendation 4.3a:** Develop a framework for mixed-use neighborhoods that include the elements that residents need for day-to-day life.	
Action 4.4. Identify opportunities to support workforce development. ▪ **Recommendation 4.4a:** Work with businesses and partners in education to ensure there are workforce training opportunities in Tualatin.	
Action 4.5. Evaluate development of a civic center with a range of uses. ▪ **Recommendation 4.5a:** Evaluate development of a civic center with a range of uses in Tualatin.	

Strategy 1: Ensure an adequate supply of land that is available and serviceable

This strategy is about ensuring an adequate land supply, which includes a twenty-year supply, but also a pipeline of serviced land that is available for immediate development (referred to as a "short-term" supply of employment land). Employment land supply should include sites with a variety of characteristics (e.g., site sizes, locations, visibility, and other characteristics). Efficient use of Tualatin's employment land is key to ensuring that Tualatin has adequate opportunities to grow from 2020 to 2040, and beyond.

Issue Statement

Tualatin's forecast for commercial and industrial employment growth and land demand shows that Tualatin has a deficit of land (74 gross acres) in Industrial plan designations and a deficit (175 acres) in Commercial plan designations (including retail, office, and other commercial services).

Tualatin is part of the Metro UGB and cannot expand its planning area on its own. Tualatin can, however, increase land use efficiency within its planning area, through changing zoning standards (e.g., limiting uses with lower employment density), allowing and encouraging more mixed-use development, and planning for redevelopment (see Strategy 2). This is a common issue and opportunity in Tualatin for both housing and economic development, which provides an opportunity for the City to develop solutions for both.

Tualatin not only needs land that is vacant but also has urban services that support commercial and industrial development, such as municipal water services, sewer and wastewater services, storm water management systems, and transportation connections with adequate capacity to accommodate growth. Tualatin can monitor growth to ensure that the City has enough land in the short-term land supply (available for development within one year of application for a building permit) and "shovel-ready" land (available for development within 180 days of application for a building permit). Tualatin can work with Metro and other regional partners on future expansions of the Metro UGB to accommodate additional employment land development in Tualatin.

Goal

Ensure that sufficient land is designated so that the supply is adequate for commercial and industrial development. Maintain an adequate short-term supply of suitable commercial and industrial land to respond to economic development opportunities as they arise.

> "Short-term supply" means suitable land that is ready for construction usually within one year of an application for a building permit or request for service extension.

Recommended Actions

Action 1.1: Evaluate opportunities to increase mixed-use development

Tualatin has a deficit of land for industrial land (74 acres) and commercial land (175 gross acres). In addition, Tualatin has a deficit of residential land in the Medium High Density Residential designation (about 7 gross acres of land) and in the High Density / High-Rise Residential designation (about 4 gross acres of land). One way to address these land deficits is to allow and encourage mixed-use development.

Tualatin can identify additional opportunities for development of commercial and residential mixed-use development (consistent with recommendation Action 1.2 in the Housing Strategy). In identifying opportunities for mixed-use, the City should coordinate planning for new mixed-use areas with Action 5.1 in the Housing Strategy, to identify three to four areas within Tualatin for redevelopment as mixed-use areas (Action 2.1 addresses need for redevelopment). The mixed-use areas could serve multiple purposes in Tualatin: as places to live, to work, to live and work, or as destinations for residents in other parts of Tualatin or visitors to Tualatin for restaurants or other recreational experiences.

In addition, Tualatin could develop an employment zone that allows for a greater mixture of industrial and commercial uses, limiting retail commercial uses. Areas for this type of employment zone might include Basalt Creek or the Leveton Area. These mixed-use zones should allow for greater density in the form of taller buildings, smaller lot sizes, and other opportunities for increased development capacity.

> Recommendation 1.1a: Identify opportunities to re-zone industrial or commercial land for mixed-use that includes commercial and residential uses. The City should exclude industrial sanctuary land (i.e., land in the Southwest Tualatin Concept Plan area) from this evaluation, as this land has been identified as regionally significant industrial areas.
>
> Recommendation 1.1b: Evaluate opportunities to develop an employment zone that allows for greater mixture of industrial and commercial uses, limiting retail commercial uses.

Action 1.2: Identify opportunities to make more efficient use of industrial land

Tualatin has a deficit of 74 acres of industrial land. One way to make the most efficient use of industrial land in Tualatin is changing the zoning ordinance to focus uses on key target industries and allow denser development.

The City should consider no longer allowing development of new businesses that require substantial amounts of land but result in little employment and have low employment densities. Such uses include warehouse and distribution, vehicle storage, or self-storage units. Existing businesses of these types should be allowed to continue to operate.

The City should consider reducing or eliminating the minimum lot size from 20,000 square feet, especially in areas that have existing small lots already. These standards may be necessary in regionally significant industrial areas (RSIA).

> Recommendation 1.2a: Disallow new development that require substantial amounts of land but result in little employment and have low employment densities, such as warehouse and distribution.

> Recommendation 1.2b: Evaluate reducing or eliminating the minimum lot size from 20,000 square feet, especially in areas that have existing small lots already.

Action 1.3: Identify opportunities to make more efficient use of commercial land

Tualatin has a deficit of 175 acres of commercial land. One way to make the most efficient use of industrial land in Tualatin is changing the zoning ordinance code to make more efficient use of commercial areas, such as reducing or eliminating the minimum lot size from 10,000 square feet (the 3 acres minimum lot size the Mid-Rise Office Commercial zone) or increasing building height limits (currently at 35 to 45 feet in most commercial zones, with Mid-Rise Office Commercial zone allowing buildings as tall as 75 feet) to allow taller buildings in key commercial development centers.

In addition, promoting mixtures of uses (consistent with Action 1.1) that integrate employment and housing can help promote efficient use of land. The large deficit of commercial land, however, will require re-zoning land for new commercial uses or redeveloping existing land to allow new commercial uses (consistent with Action 2.1).

> Recommendation 1.3a: Evaluate reducing or eliminating the minimum lot size from 10,000 square feet in most commercial zones. Allow other development standards, such as requirements for parking and circulation or setbacks, to determine minimum lot size.

> Recommendation 1.3b: Evaluate increasing the building height limit in commercial development centers, including for retail development.

Action 1.4. Plan for infrastructure development to support commercial and industrial development.

The City already coordinates land use planning with the Capital Improvement Plan to ensure that infrastructure is available to support commercial and industrial development, especially in newly urbanizing areas and areas identified as high priority for development. Some types of infrastructure development, especially transportation and transit infrastructure, have lagged behind growth in Tualatin and in the broader region, resulting in automotive congestion and insufficient transit service, as discussed in Strategy 4 and in Strategy 6 of the Housing Strategy.

> Recommendation 1.4a: Prioritize infrastructure projects, especially transportation projects, that are necessary to support employment growth, with the goal of managing and reducing congestion resulting from new growth.

Recommendation 1.4b: Seek regional support for development and improvement of transportation infrastructure by working with Washington County, Metro, adjacent communities, and ODOT, to advocate for and support improvements to key regional transportation facilities that serve employment areas in Tualatin.

Recommendation 1.4c: Identify opportunities to increase transit service between Tualatin and other cities within the Portland region (such as the on-going planning for the Southwest Corridor) and transit within Tualatin.

Recommendation 1.4d: Identify options to extend transit service to employment centers to expand transportation options for workers in Tualatin, such as a local bus service like Wilsonville's SMART.

Action 1.5: Work with landowners ensure land is development-ready and certified as shovel ready by Business Oregon.

The *Regional Industrial Site Readiness Inventory (2017 update)* identifies large sites (those over 25 buildable acres) and their development-ready status across the Portland Metro Region. The report categorizes sites within the Region based on size of site (focusing on sites with 25 or more net buildable acres), development-ready status (based on the status of urban infrastructure provision and brownfield remediation status), and the willingness of the owner to sell or develop the site.

Tier 1 sites are those with at least 25 net buildable acres, that are development-ready within 180 days (6 months), and have an owner who is willing to sell or develop the site. Tualatin has no Tier 1 sites. There are four sites in Tualatin that qualify for Tier 2 or Tier 3 status, identified as being ready for development between 7-30 months for Tier 2 sites and more than 30 months for Tier 3 sites.

In addition, the *Regional Industrial Site Readiness Inventory* also identifies four sites in Tualatin that are smaller than 25 buildable acres. While these smaller sites aren't part of the inventory of Tier 1 through 3 sites, they play an important role in providing opportunities for business development in Tualatin. Many of the inquiries to Greater Portland Inc. for development sites for new businesses are for sites smaller than 25 acres.

For areas with existing or planned infrastructure (consistent with Action 1.4), the City can encourage and assist landowners in getting their sites certified as shovel-ready through the Business Oregon Certified Shovel Ready program. A site is shovel-ready if it is specifically zoned for industrial or traded-sector uses, has the infrastructure necessary to support development (or can have it within 180 days), and is available for development within 180 days or less.

Shovel-ready sites and other development sites can be listed on Business Oregon's Oregon Prospector web site to market sites to potential developers and businesses. The Oregon Prospector website reports information about site location, size, access to infrastructure, and

other characteristics that developers need to know prior to making locational decisions. There is one site in Tualatin currently listed on Oregon Prospector.

> Recommendation 1.5a: Encourage and assist landowners in getting their sites certified through the Business Oregon Certified Shovel Ready program.
>
> Recommendation 1.5b: Continue to work with landowners to ensure that development sites are listed on Business Oregon's Oregon Prospector web site.

Action 1.6. Plan for long-term development in Tualatin through 2040 and beyond.

The Economic Opportunity Analysis plans for the 2020 to 2040 period. It shows that employment will continue to grow in Tualatin at a substantially faster pace over the next 20-years than households. One of the key issues discussed through the Economic Opportunity Analysis and Housing Needs Analysis is the existing and likely future imbalance of employment and housing, where people who work at businesses in Tualatin have limited opportunities to live in Tualatin.

A key part of long-range planning is working with Metro on regional planning for housing and employment in and around Tualatin. The City would be well-served by having information to share with Metro about new development, the City's planning efforts to provide opportunities for people to work and live in Tualatin, and economic development plans.

> Recommendation 1.6a: Actively work with Metro staff on upcoming Regional Growth Management reports to ensure that Tualatin's population and employment forecasts are planned for similar growth rates and to coordinate Tualatin's planning with regional plans.
>
> Recommendation 1.6b: Develop and implement a system to monitor the supply of commercial and industrial land every two years. This includes monitoring employment development (through permits) as well as land consumption (e.g., development on vacant, or redevelopable lands). The reports resulting from growth monitoring can be used in working with Metro to better understand Tualatin's opportunities for growth and characterize needs for expansion to accommodate employment growth.
>
> Recommendation 1.6c: Reevaluate Tualatin's economic opportunities and land sufficiency on a regular basis tied to the Metro Growth Management cycle (i.e., every six years), as part of the City's coordination with Metro.

Strategy 2: Identify redevelopment opportunities

This strategy focuses on actions that are intended to identify redevelopment opportunities in areas where employment growth would be appropriate.

Issue Statement

Tualatin has a deficit of land for industrial and commercial land of 74 and 175 gross acres, respectively. Some of this deficit could be accommodated through redevelopment of existing areas within Tualatin, where there are opportunities to increase the intensity of land uses. Redevelopment opportunities may also provide opportunities for development of mixed-use areas that are more walkable, have amenities that households frequently access (e.g., schools, medical facilities, parks, retail, restaurants, and other services), have access to transit, and accommodate new housing, consistent with the actions in Strategy 4.

Redevelopment may require actions from other strategies, such as: increasing allowable densities, re-zoning, land assembly, tax abatement programs to support employment growth development, and funding support such as Urban Renewal or Local Improvement District.

Goal

Redevelop selected areas of Tualatin to create vibrant mixed-use districts that include new employment and housing opportunities.

Recommended Actions

Action 2.1. Identify districts within Tualatin with opportunities for redevelopment for housing and employment uses.

This action is consistent with the Housing Strategy Action 5.1. Tualatin has deficits of land for development of commercial uses, as well as for development of multifamily housing to accommodate new housing in the Medium High Density and High Density / High-Rise plan designations.

The City should identify three to four areas within Tualatin for redevelopment into mixed-use areas, with a mixture of higher-density housing and employment uses such as retail, office, and commercial services. For example, some areas that may be appropriate for redevelopment include: the Commons, areas near key transit stops, and the area West of 6th Street/East of 90th Street/North of Sagert Street. In selecting areas ripe for redevelopment, the City should consider whether economic conditions support redevelopment, landowner attitudes to redevelopment, and set criteria for selecting redevelopment areas based on considerations such as transportation and transit connections and proximity to existing employment centers.

The City should engage the community in developing a vision for redeveloping the selected areas. The planning to implement this vision could be developed through a redevelopment plan that shows how the property will be redeveloped into a vibrant area with a mixture of uses, connections with Tualatin's automotive and pedestrian/bicycle transportation networks, and a variety of housing types. The redevelopment plans should include working with landowners to

ensure they are supportive of redevelopment plans, as well as stakeholder and citizen involvement and input into the vision for the district and development of the redevelopment plans.

The City should consider opportunities to support redevelopment, such as use or Urban Renewal (Action 2.4) to address infrastructure deficiencies, and approaches to overcome barriers to redevelopment.

> Recommendation 2.1a: Initiate a process to identify opportunities for redevelopment of mixed-use districts and initiate an area planning process to guide redevelopment.

Action 2.2: Revise the Tualatin Town Center Plan to focus on opportunities to support redevelopment.

The Tualatin Town Center Plan was intended to guide development in Tualatin's downtown area, which centers around the Lake of the Commons and includes about 364 acres of land. The existing Town Center Plan was developed in the mid-2000's and was not adopted.

An update of the Town Center Plan could focus on opportunities for redevelopment, including identifying changes to zoning necessary to allow and encourage development of both housing and employment uses. The update should include development of a community vision for the future of Town Center to guide changes to zoning and other policy, as well as City investments in Town Center.

In conjunction with the update to the Tualatin Town Center Plan, the Tualatin Development Commission could act as developer for redevelopment of City-owned properties (such as surface parking lots) to create catalytic projects that include a mix of housing (both market-rate and affordable housing) and retail and office uses.

> Recommendation 2.2a: Develop a community vision and planning for Town Center, with a focus on redevelopment to support development of housing and employment uses.

> Recommendation 2.2b: Evaluate opportunities to redevelop City-owned properties to create catalytic projects that include a mix of housing (both market-rate and affordable housing) and retail and office uses.

Action 2.3: Identify opportunities to redevelop and intensify uses in industrial areas.

Redevelopment often focuses on commercial and residential redevelopment. Industrial redevelopment (where industrial land is redeveloped for new industrial uses) is less common in smaller cities like Tualatin because the costs of redevelopment often exceed the value of land for new industrial uses or rents are not high enough to support industrial redevelopment. In the Portland Region, however, redevelopment is occurring in industrial areas, possibly as a result of the higher achievable rents and desirability of locations in Portland and other industrial centers.

There may be opportunities for industrial redevelopment for new industrial uses in Tualatin over the 20-year planning period. These opportunities may include sites with excellent access to I-5 or other regional roads, where redevelopment costs are lower (i.e., brownfield remediation is not required), or at Tigard Sand and Gravel's gravel mine, once the company is done with mining operations.

> Recommendation 2.3a: Identify opportunities for industrial redevelopment and work with property owners to support redevelopment, which may require changes to zoning to allow different types of industrial buildings (i.e., vertical buildings) or infrastructure investments to provide additional urban services. This action is consistent with Action 1.2.

Action 2.4: Develop policies to support redevelopment and mixed use development.

The costs of redevelopment and of mixed-use development can make these types of development financially infeasible or at least very difficult. Given the deficit of land for commercial and industrial development, Tualatin will need to support redevelopment. Supporting mixed-use development is key to accommodating need for higher-density multifamily housing and providing opportunities for people to live and work in Tualatin. The City should evaluate opportunities to support redevelopment and mixed use development within Tualatin. Some examples include:

- Use publicly owned-properties, such as parking lots, to assemble land for development of catalytic projects that support additional development and further other community objectives, such as housing affordable to workers with income of about $50,000 (about 60% of Median Family Income, based on the Housing Needs Analysis) or a business incubator or shared workspace to support growth of small businesses.
- Assist with assembly of land to support redevelopment that includes multiple properties.
- Continue to evaluate establishing a new urban renewal district, consistent with Action 4.2 in the Housing Strategy. For economic development purposes, urban renewal is often used for projects to improve districts (i.e., street beautification or façade programs), providing low-interest loans to businesses (i.e., loans to support expansion of businesses that provide jobs at or above the City average), or infrastructure improvements needed to support commercial or industrial development.
- Recommendation 2.4a: Evaluate the redevelopment potential of publicly owned properties, such as parking lots.
- Recommendation 2.4b: Continue to evaluate establishing a new urban renewal district to support development of commercial, industrial, and residential businesses, especially mixed-use districts.

Strategy 3: Support business retention, growth, and attraction

Economic development generally occurs through three broad approaches: retention of existing businesses, growth of existing and small businesses (such as entrepreneurs), and attracting of new businesses from outside of the city. This strategy describes economic development efforts to support growth of economic activity and employment.

Issue Statement

The main focus of economic development is retaining and growing businesses. These businesses both provide employment for people living in Tualatin and the surrounding region and pay property taxes that help balance the City's tax base. Generally speaking, the costs to serve residential lands is often greater than the cost to serve employment lands, because residents use more services (such as schools, police, fire, governance and leadership, infrastructure maintenance, etc.) at a higher rate than employment. As the City works to balance development of housing and employment, the City should consider the long-term fiscal health and sustainability of the City by encouraging continued employment growth, while also encouraging additional residential growth to provide opportunities for people to live and work in Tualatin.

This strategy is about actions that support retention and expansion of existing businesses, growth and creation of entrepreneurial businesses, and attraction of new businesses that align with Tualatin's values as a community. The types of businesses the City wants to attract most are non-polluting businesses with wages at or above the Washington County average, focusing on growth of businesses that have sufficient wages for their workers to afford to live and work in Tualatin.

Goal

Support business growth in Tualatin to diversify and expand commercial and industrial development in order to provide employment opportunities with levels of pay that allows workers to live in Tualatin, as well as supporting the City's tax base.

Recommended Actions

Action 3.1: Revise the economic development strategy and create an economic development action plan.

Tualatin has an existing economic development strategy, last updated in 2014. The City plans to update the economic development strategy, based on the City's new Economic Opportunities Analysis. Discussions with stakeholders suggest it is important that updating the economic development strategy include development of a clear vision for economic development, as the starting place for the economic development strategy. The vision should identify community aspirations for economic development and the City's role in economic development.

The revised document should be an action-oriented 5-year economic development action plan that includes a community vision for economic growth in Tualatin. The factual basis for the Action Plan is the information gathered about on local and regional economic trends gathered

through the Economic Opportunity Analysis, from policies and objectives established for the Comprehensive Plan (this document) and with feedback and input from stakeholders. The Action Plan would present detailed actions for executing the economic development policies based on the priorities established by the Tualatin City Council.

Development of this strategy could be guided by an Economic Development Committee composed of elected and appointed officials, business owners and managers in Tualatin, people involved in economic development in Tualatin (i.e., the Tualatin Chamber of Commerce) and the Portland Region, and residents of Tualatin.

> Recommendation 3.1a: Establish an Economic Development Committee to guide development of the economic development strategy.
>
> Recommendation 3.1b: Develop an action-oriented 5-year economic development action plan that includes a community vision for economic growth in Tualatin.

Action 3.2: Support growth of existing businesses in Tualatin.

Business retention is a key part of successful economic development. Working with partners such as the Tualatin Chamber of Commerce and the Tualatin Commercial Citizen Involvement Organization, the City should continue to reach out to businesses in Tualatin to identify and resolve issues to growing their business and remaining in Tualatin. Issues that businesses in Tualatin have already identified include: difficulties retaining workforce (given potentially long commutes and difficulty in finding qualified workers), increasing concerns about transportation and freight access and congestion, and a lack of incentives to support development. Issues related to transportation (commuting and freight access) are discussed in Action 4.1 and incentives to support development are discussed in Action 3.5. This document does not propose actions related to workforce quality but this is likely an issue that would be addressed in the economic development action plan in Action 3.1b.

City staff can also support existing businesses by sharing technical resources, maintaining open communications with local businesspeople, and providing available staff support for economic development projects initiated by the business community.

> Recommendation 3.2a: Continue to identify opportunities to support existing businesses in Tualatin, through working with partners such as the Tualatin Chamber of Commerce to identify and resolve issues that are barriers to the businesses growing and staying in Tualatin.

Action 3.3: Support growth of and retain entrepreneurial businesses in Tualatin.

Small businesses, many of which are entrepreneurial, account for the majority of businesses in Tualatin. Businesses with five or fewer employees in Tualatin account for 64% of private employment and businesses with fewer than 20 employees account for 89% of private employment. The City should identify opportunities to support small and entrepreneurial businesses to grow and retain them in Tualatin. Some approaches to this include:

- Form partnerships with organizations that assist entrepreneurial businesses, such as Tualatin Chamber of Commerce, Tualatin Commercial Citizen Involvement Organization, Westside Economic Alliance, Greater Portland Inc., Business Oregon, and Federal agencies such as the Economic Development Administration. These partnerships can help Tualatin identify solutions to issues or resources to assist businesses.

- Identify opportunities to support growth of small businesses and entrepreneurs, such as business incubators or buildings with co-working space for small businesses.

- Support and encourage home-based businesses and identify barriers in the City's policies to growth of home-based businesses.

- Support or organize community events that involve local businesses, such as revitalization of the farmer's market or organizing events like Portland's Sunday Parkway.

  Recommendation 3.3a: Continue to identify opportunities to support growth and retention of entrepreneurial businesses in Tualatin.

Action 3.4: Identify opportunities to attract or grow businesses with pay at or above Tualatin's average wage.

Tualatin's average wage was $57,300 in 2017, compared with the Washington County average of $70,300 in 2018. One of the areas of significant concern in development of the Economic Opportunities Analysis and Housing Needs Analysis was ensuring that workers in Tualatin can afford to both live and work in Tualatin. A worker earning the average wage in Tualatin can afford rents of about $1,400 per month, which is above the average multifamily rent of $1,200 in 2018. Affording the median housing sale price in Tualatin (about $480,000 as of February 2019) requires a household income of $120,000 to $160,000, which will most frequently require a household with two full-time workers.

Attracting businesses that pay wages at or above the City's average wage will require deliberate effort on the City's part, such as developing incentive programs that attract or retain businesses such as: low-interest loans, fee waivers, and other incentives. The City will need to work with organizations that support business growth, retention, and attraction, such as: Tualatin Chamber of Commerce, Tualatin Commercial Citizen Involvement Organization, Westside Economic Alliance, Greater Portland Inc., Business Oregon, and Federal agencies such as the Economic Development Administration. These partnership may include marketing Tualatin to attract new businesses.

Examples of these businesses that often pay above average wages include those identified as Target Industries in Tualatin's Economic Opportunities Analysis, such as advanced manufacturing, food processing, furniture manufacturing, plastics manufacturing, information technology and analytical systems, and business services.

Recommendation 3.4a: Identify partnerships and incentive programs to grow, retain, and attract businesses with wages at or above the City's average wage of $57,300.

Action 3.5: Evaluate use of incentives to retain, grow, and attract businesses.

Cities often offer incentives to retain, grow, and attract businesses. In addition to having businesses stay in the community, cities use incentives to achieve goals such as: attracting higher paying jobs, increasing the diversity of jobs or businesses, attracting businesses that have pay high property taxes (such as manufacturers or data centers), or other desirable attributes. In Action 3.4, this memorandum identifies a goal of attracting businesses with higher paying jobs. Through development of the economic development action plan (Action 3.1), the City may identify other business attributes or economic development goals it wants to achieve through offering incentives.

The City should evaluate use of incentives to achieve these goals, such as:

- Financial assistance for business expansion or attraction, such as low interest loans or grants.
- Public/private partnerships to support redevelopment of mixed-use development.
- Assist with assembly of land to support redevelopment that includes multiple properties.
- Property tax exemption, such as the Strategic Investment Program, which grants a 15-year property tax exemption for large capital-intensive facilities.
- Systems development charge (SDC) financing opportunities (consistent with Action 3.5 in the Housing Strategy).
- Development of or participation in a business incubator, shared workspace, start-up accelerators, or other forms of business mentoring.
- Work with partners (such as Tualatin Chamber of Commerce, Westside Economic Alliance, Greater Portland Inc., and Business Oregon) to market Tualatin's business and their products, across the state, nationally, and internationally.
- Street improvements and beautification.

Recommendation 3.5a: Evaluate the outcomes the City wants to achieve through offering economic development incentives and the incentives the City could offer. This evaluation should be part of development of the economic development action plan in Action 3.1.

Action 3.6. Ensure that Tualatin has sufficient staff capacity to implement the economic development priorities set by the City Council.

The Economic Development Strategy presented in this memorandum and especially the actions presented in Strategy 2 and Strategy 3 will take substantial staff time to evaluate and implement. The City may need additional staffing to implement the Economic Development Strategy.

> Recommendation 3.6a: As the City Council sets priorities for implementation of the Economic Development Strategy, the Council should work with the City Manager and Community Development Director to determine whether the City will need to add staff to implement the policies in the Economic Development Strategy.

Strategy 4: Ensure there are connections between planning for economic development and other community planning

This strategy focuses on actions that are intended to ensure coordination between planning for economic development and other community planning, such as housing, transportation planning or other urban infrastructure planning (such as water or wastewater systems), and natural resources and parks planning.

Issue Statement

Discussions of economic development leads to discussions of transportation issues in Tualatin and a desire to ensure a jobs-housing balance in Tualatin. Transportation issues include heavy congestion on Tualatin's roadways, including access to I-5, arterial roads connecting Tualatin within the region, and local roadways. In addition, Tualatin is not well-served with transit. Tualatin is served with the West Side Express Service (WES) train and two TriMet bus lines. The Max line is expected to extend to Bridgeport Village.

In addition, Tualatin has more employees than residents. Between 2007 and 2017, the population grew by about 0.35% per year, compared with employment growth of 2.9% per year. The forecast for population growth over the next 20 years is substantially lower than employment growth, with a household growth forecast of about 0.4% per year and an employment forecast growth about 1.4% per year. The Housing Needs Analysis shows that Tualatin has opportunities for residential growth beyond the forecast for growth. Success in housing development as a part of redevelopment and mixed use development (Strategy 2) will further increase the amount of housing that could be developed in Tualatin beyond the forecast for new growth.

Jobs with at least average wages pay enough to live in rental housing in Tualatin. The average wage for employment in Tualatin in 2017 was about $57,000, which is sufficient to afford a monthly rent of about $1,425. The average multifamily rent in Tualatin was nearly $1,200 in 2017. As a result, a person earning around the average wage can afford rent of about $1,425 and the average multifamily rent in Tualatin.

However, the average sales price for a unit in Tualatin in early 2019 was $480,000, which would require a wage of $120,000 to $160,000 to afford homeownership. None of the industries in Tualatin has average pay this high and only one-quarter of households in Tualatin and Washington County have household income high enough to afford the average sales price. As a result, people who work in Tualatin can own a newly purchased home in Tualatin if they have substantially higher-than-average wages or if there is more than one worker per household, which is common, with an average of 1.4 jobs per household in Tualatin.

Reasons for working in Tualatin and not living in Tualatin likely include more causes than problems affording households. People choose to commute for a variety of reasons: preference for another community, family and friends living in another community, choosing a location that allows the other worker(s) in the household an easier commute, long-term homeownership in another community, and other reasons.

The result of so much commuting is congestion on Tualatin's roads and the region's highways. Planning for new employment growth will require coordination with transportation planning. It will also require coordination with water, wastewater, and stormwater planning. Through this project and the Housing Needs Analysis, it requires coordination with planning for housing and neighborhood growth.

Goal

Ensure that Tualatin develops as a walkable and complete community with a range of amenities that are easily accessible to people who live in Tualatin.

Recommended Actions

Action 4.1. Ensure that updates to the Transportation System Plan coordinate with planning for employment and business growth.

The next update to the Transportation System Plan (TSP) should coordinate planning for employment and business growth with transportation planning, providing opportunities for more intensive employment development (or redevelopment) where there is sufficient capacity for automotive and transit capacity. The redevelopment areas (Action 2.1) should be planned for in areas where there is higher capacity for freight access, automotive and transit access, and with connections to pedestrian and bicycle trails.

The update to the TSP should ensure there are additional opportunities to decrease dependence on automotive transportation, such as increased focus on development in walkable and bikeable areas and increases in transit service (amount and frequency of transit, as well as increased destinations for transit). The TSP update should also identify opportunities to address capacity issues on Tualatin's roads to ease congestion and make traveling by car within Tualatin and to areas outside of Tualatin easier. This action and the recommendations below are consistent with those in the Housing Strategy Action 6.1.

> Recommendation 4.1a: Evaluate opportunities to decrease dependence on automotive transportation in areas planned for mixed-use and commercial development, such as

increased focus on development in walkable and bikeable areas and increases in transit service (amount and frequency of transit, as well as increased destinations for transit).

Recommendation 4.1b: Evaluate opportunities to expand transit and improve transportation connectivity (both capacity and access on I-5 and regional connector roads) for freight and automobiles between Tualatin and other cities within the Portland Region.

Recommendation 4.1c: Evaluate opportunities to expand transit and improve transportation connectivity within Tualatin particularly from the future Southwest Corridor station in Bridgeport to the Tualatin's Town Center and vital services and out to the neighborhoods.

Recommendation 4.1d: Evaluate opportunities for planning transit-oriented development, as transit becomes more available in Tualatin, consistent for redevelopment planning.

Recommendation 4.1e: Develop a bicycle and pedestrian plan for Tualatin to increase these types of connectivity within Tualatin.

Action 4.2. Coordinate planning for economic development planning with housing planning.

Tualatin has a jobs and housing imbalance, with more jobs than residents in Tualatin. The other strategies in this memorandum are intended to support development of housing that is affordable to people who work at businesses in Tualatin (the average wage was $57,300 in 2017), such as Action 3.4. This action and the recommendation below are consistent with those in the Housing Strategy Action 6.2.

Recommendation 4.2a: Ensure the City plans for housing that is affordable to people who work at businesses in Tualatin.

Action 4.3. Develop a design and planning framework for "ten minute neighborhoods" that include a mixture of uses.

The City should develop a framework for development of mixed-use neighborhoods that results in neighborhoods where residents have easy, convenient access to many of the places and services they use daily without relying heavily on a car. The framework would include the following elements: walkable neighborhoods, with access to transit, with nearby parks (i.e., within one-quarter mile), with neighborhood retail and restaurants, and near schools. The neighborhood would have higher concentrations of people and are complete with the sidewalks, bike lanes, and bus routes that support a variety of transportation options. The design of the neighborhood should integrate design standards that promote public safety. In larger cities, these are referred to as "20 minute neighborhoods" but given Tualatin's smaller size, the scale might be more like "10 minute neighborhoods." This action and the recommendation below are consistent with those in the Housing Strategy Action 6.2.

> Recommendation 4.3a: Develop a framework for mixed-use neighborhoods that include the elements that residents need for day-to-day life.

Action 4.4. Identify opportunities to support workforce development.

Ability to attract and retain qualified and trained workers is one of the key barriers to development identified by existing businesses in Tualatin. These partners could include Tualatin High School, Portland Community College, Portland State University, and Worksource Oregon. The City could play a convening role to work with businesses to understand their workforce training needs, then work with these partners to offer classes in Tualatin to provide this training. This training could be offered in existing facilities (such as at the High School) or in newly built facilities that are part of one or more mixed-use areas.

> Recommendation 4.4a: Work with businesses and partners in education to ensure there are workforce training opportunities in Tualatin, identifying opportunities to integrate workforce training in mixed-use areas.

Action 4.5. Evaluate development of a civic center with a range of uses.

Evaluate development of a civic center with a range of uses, include a performing arts center, convention center, historic museum, welcome center for visitors, and other uses to enhance life and business in Tualatin.

> Recommendation 4.5a: Evaluate development of a civic center with a range of uses in Tualatin.

Appendix A: Tualatin's Existing Comprehensive Plan Policies

Section 4.050 General Growth Objectives.

> Note to CAC: The following section includes objectives related to commercial and industrial development and that are not directly related to commercial and industrial development.

The following are general objectives used as a guide to formulate the Plan. The objectives are positive statements to de-scribe the Plan's intent to:

(1) Provide a plan that will accommodate a population range of 22,000 to 29,000 people.

(2) Cooperate with the Metropolitan Service District to reach regional consensus on population growth projections within the Tualatin area.

(3) Conform to Metropolitan Service District (Metro) procedures for initiating amendments to the Metro Urban Growth Boundary.

(4) Provide a plan that will create an environment for the orderly and efficient transition from rural to urban land uses.

(5) Convert agricultural land only if needed for urban uses.

(6) Arrange the various land uses so as to minimize land use conflicts and maximize the use of public facilities as growth occurs.

(7) Prepare a balanced plan meeting, as closely as possible, the specific objectives and assumptions of each individual plan element.

(8) Define the urban growth boundary.

(9) Prepare a plan providing a variety of living and working environments.

(10) Encourage the highest quality physical design for future development.

(11) Coordinate development plans with regional, state, and federal agencies to as-sure consistency with statutes, rules, and standards concerning air, noise, water quality, and solid waste. Cooperate with the U.S. Fish and Wildlife Service to minimize adverse impacts to the Tualatin River National Wildlife Refuge from development in adjacent areas of Tualatin.

(12) Adopt measures protecting life and property from natural hazards such as flooding, high groundwater, weak foundation soils and steep slopes.

(13) Develop regulations to control sedimentation of creeks and streams caused by erosion during development of property.

(14) Develop a separate growth program that controls the rate of community growth and is acceptable to the Land Conservation and Development Commission.

(15) Arrange the various land uses in a manner that is energy efficient.

(16) Encourage energy conservation by arranging land uses in a manner compatible with public transportation objectives.

(17) Maintain for as long a period as possible a physical separation of non-urban land around the City so as to maintain its physical and emotional identity within urban areas of the region.

(18) Fully develop the industrial area located in Washington County west of the City only when adequate transportation facilities are available and the area has been annexed to the City and served with water and sewer services.

(19) Cooperate with Washington County to study the methods available for providing transportation, water and sewer service to the industrial area west of the City, designating this area as a special study area.

(20) Initiate annexation of property within the Urban Growth Boundary planned for residential development only when petitioned to do so by owners of the affected property, including cases involving unincorporated "islands" of property surrounded by land annexed previously.

(21) Territories to be annexed shall be in the Metro Urban Growth Boundary.

(22) Address Metro's Urban Growth Management Functional Plan, Title 13, Nature in Neighborhoods, through the conservation, protection and restoration of fish and wildlife habitat, including Metro's Regionally Significant Fish and Wildlife Habitat, through the Tualatin Basin Natural Resource Coordinating Committee and the Tualatin Basin Program.

(a) Support and implement the elements of the Tualatin Basin Program to:

(i) Develop and adopt local policies and regulations to implement the provisions of the Tualatin Basin Program.

(ii) Adopt low impact development (LID) provisions to reduce environmental impacts of new development and remove barriers to their utilization.

(iii) Coordinate with Clean Water Services (CWS) to implement their Healthy Streams Action Plan and other programs such as their Stormwater Management Plan and Design and Construction Standards.

(iv) Coordinate with CWS, Metro and others to develop and support the funding, voluntary and educational components of the Tualatin Basin Program.

(v) Coordinate with CWS, Metro and others to develop and support the monitoring and adaptive management components of the Tualatin Basin Program.

(b) Continue active participation in the Tualatin Basin Natural Resources Coordinating Committee and the Steering Committee to support and implement the Tualatin Basin Program.

(c) Coordinate with CWS and Metro to update Metro's Regionally Significant Fish and Wildlife Habitat Inventory Map. Changes to the Inventory Map will be on-going as on-site inventories are conducted as part of private and public construction projects.

(d) Support and implement provisions allowing public access to planned public facilities.

Section 6.030 Objectives.

The following are general objectives used to guide the development of this Plan:

(1) Encourage commercial development.

(2) Provide increased employment opportunities.

(3) Provide shopping opportunities for surrounding communities.

(4) Locate and design commercial areas to minimize traffic congestion and maximize access.

(5) Continue to utilize specific and enforceable architectural and landscape design standards for commercial development.

(6) Encourage developers to consider solar access when designing commercial development projects.

(7) Provide for limited and carefully designed neighborhood commercial centers.

(8) Provide for the continued development of major medical services facilities in the City of Tualatin, especially at the Meridian Park Hospital site. The Medical Center Planning District shall be applied only to a property, or a group of contiguous properties, of no less than 25 acres and shall have frontage on an arterial as designated in TDC Chapter 11, Tualatin Community Plan.

(9) To work with the applicable jurisdictions and agencies to develop the Durham Quarry Site and Durham Quarry Area with high quality development. It is appropriate to apply an overlay district on the Durham Quarry Site and Durham Quarry Area to allow mixed commercial/residential uses. It is appropriate to enter into an intergovernmental agreement with the City of Tigard and Washington County to allow the City of Tualatin to review and decide land use applications and building permit applications for the portion of the Durham Quarry Site in the City of Tigard.

Section 7.030 Objectives.

The following are general objectives used to guide development of the Plan and that should guide implementation of the Plan's recommendations:

(1) Encourage new industrial development.

(2) Provide increased local employment opportunity, moving from 12 percent local employment to 25 percent, while at the same time making the City, and in particular the Western Industrial District, a major regional employment center.

(3) Improve the financial capability of the City, through an increase in the tax base and the use of creative financing tools.

(4) Preserve and protect, with limited exceptions, the City's existing industrial land.

(5) Cooperate with Washington County, METRO, and the State of Oregon to study the methods available for providing transportation, water, and sewer services to the Western Industrial District.

(6) Fully develop the Western Industrial District and the Southwest Tualatin Concept Plan Area (SWCP), providing full transportation, sewer, and water services prior to or as development occurs.

(7) Improve traffic access to the Western Industrial District and SWCP area from the Interstate 5 freeway and State Highway 99W through regional improvements identified in the 2035 Regional Transportation Plan.

(8) Cooperate with the Department of Environmental Quality and METRO to meet applicable air quality standards by 1987.

(9) Construct a north/south major arterial street between Tualatin Road and Tualatin-Sherwood Road and SW Tonquin Road in the 124th Avenue alignment to serve the industrial area.

(10) Rebuild the Tualatin Road/Pacific Highway intersection to allow for substantially greater traffic flows.

(11) Provide truck routes for industrial traffic that provide for efficient movement of goods while protecting the quality of residential areas.

(12) Protect residential, commercial, and sensitive industrial uses from the adverse environmental impacts of industrial use.

(13) Protect adjacent land uses from noise impacts by adopting industrial noise standards.

(14) Continue to protect the Hedges Creek Wetland and Tonquin Scablands from adverse impacts of adjacent development.

(15) Continue to administer specific and enforceable architectural and landscape design standards for industrial development.

(16) Encourage industrial firms to use co-generation as a means to utilize waste heat from industrial processes and consider solar access when designing industrial facilities.

(17) Protect wooded areas identified on the Natural Features Map found in the Technical Memorandum by requiring their preservation in a natural state or by integrating the major trees into the design of the parking lots, buildings, or more formal landscaping areas of an industrial development. If it is necessary to remove a portion or all of the trees, the replacement landscape features shall be subject to approval through the Architectural Review process.

Appendix B: Potential Economic Development Actions

This appendix presents potential economic development actions that cities take to increase economic activities. The purpose of this appendix is to provide information and ideas to Tualatin staff and stakeholders, as they develop economic development policies and actions to implement those policies. This appendix is not intended to be adopted into the Tualatin Comprehensive Plan.

A wide range of economic development policies and actions are available to cities for influencing the level and type of economic development. It is useful to make a distinction between economic development policies, which are typically adopted by ordinance into local comprehensive land use plans, and a local economic development strategy. While policies and economic development strategies should be aiming to achieve the same outcomes, they are not the same thing. The key differences are: (1) economic development strategies are typically presented in the form of a strategic plan that covers a five-year time horizon while policies use the longer 20-year horizon in most comprehensive plans; (2) strategies are more broad reaching and may identify actions that extend outside the capacity of local government while policies focus on land use and infrastructure; and (3) strategies are more agile in the sense that they provide a framework rather than legal guidance.

While many of the actions identified in this appendix could be included either as policies or strategies, the focus is primarily on policies and actions that implement those policies.

Local economic development policy usually has a fundamental goal of supporting businesses that align with a jurisdiction's long-term vision for the community.[1] Economic development broadly focuses on three strategies: (1) business recruitment; (2) business retention and expansion (BRE); and (3) innovation and entrepreneurship. Historically, many cities focused on recruitment as their foundational strategy; however, many cities and economic development are rethinking this approach and local governments are increasingly implementing policies that focus on support for entrepreneurs, especially those starting new businesses.[2]

Recent research on the effectiveness of local economic development efforts support this focus on innovation and entrepreneurship to attract new, young businesses. Providing support for institutions and firms where innovation happens allows for businesses to grow and new businesses to form as industries evolve. Local jurisdictions can specifically provide support for accelerators and incubators, especially those that provide connections between research

[1] Based on Leigh and Blakley's definition for sustainable economic development as follows, "Local economic development is achieved when a community's standard of living can be preserves and increased through a process of human and physical development that is based on principles of equity and sustainability. There are three essential elements in this definition, detailed below: First economic development establishes a minimum standard of living for all and increases the standard over time. Second, economic development reduces inequality. Third, economic development promotes and encourages sustainable resource use and production." Leigh, N. and Blakeley, E. *Planning Local Economic Development: Theory and Practice.* 2013.

[2] Kauffman Foundation. "Entrepreneurship's Role in Economic Development." Entrepreneurship Policy Digest. June 2014.

institutions, established firms, and entrepreneurs. Entrepreneurs are also increasingly mobile with improved access to high-speed internet. Local jurisdictions can promote quality of life and access to amenities as a way to attract these new businesses.[3] Moreover, every start up is also a BRE opportunity.

Economic development is also about collaboration and identifying partnerships that can make the most of the resources available for economic development activities. Local jurisdictions should focus on their role in economic development, as there are factors that the jurisdiction can and cannot control. As identified in a 2017 University of Oregon report on the "Perceptions and Needs of Economic Development Programs in Oregon," organizations and jurisdictions involved in economic development activity supported the importance of coordination between entities, but that implementation of coordinating efforts is difficult due to lack of capacity, unbalanced effort, or trust issues.[4] To help overcome these barriers to coordinating economic development efforts, a key component to developing local economic development policies is identifying which policies and actions that the City is well-suited to be a lead partner, and those better suited for a partner organization to lead. It is important to develop policies and actions that identify other organizations as the lead partner. Successful implementation of these policies and actions will depend on an understanding of an organization's capacity and access to resources.

The focus of the actions listed in this Appendix is primarily on the City's role: what resources can the City commit to economic development and what roles are most appropriate for the City. Following are foundational assumptions about the City's role:

- The City plays a support role in economic and business development.
- The City is one of several organizations that provide and maintain infrastructure.
- The City has limited staff and financial resources that can be invested in appropriate economic development activities.
- The City has an obligation to adopt an economic development strategy, policies to manage employment lands, and maintain a 20-year supply of commercial and industrial sites under Goal 9 and OAR 660-009.
- The City is not the ideal organization to coordinate BRE and entrepreneurship activities or to house staff that are coordinating BRE and entrepreneurship activities.

The policy and action examples provided in this appendix are organized by broad policy categories, with cross-references to the factors of production that influence business location and expansion. The factors of production are discussed in detail the EOA document. While it is important to understand how the factors of production influence economic development

[3] Leigh, N. and Blakeley, E. *Planning Local Economic Development: Theory and Practice*. 2013.

[4] University of Oregon, Department of Planning, Public Policy & Management, Community Services Center. "Perceptions and Needs of Economic Development Programs in Oregon." Final Report. December 2017.

activity, it is more useful to group policies and actions in broad categories such as, Land Use, Public Facilities, Business Assistance, etc.

The effectiveness of any individual actions or combination of actions depends on local circumstances and desired outcomes. Local strategies should be customized not only to meet locally defined objectives, but also to recognize economic opportunities and limitations (as defined in the Economic Opportunity Analysis). Positive outcomes are not guaranteed: even good programs can result in limited or modest results. It is important to remember that effective economic development requires a long-term view—immediate results are not guaranteed. Thus, maintaining a focus on implementation is essential.

Economic development is a team activity—no single entity can implement all the activities that are necessary for a robust economic development program. Many municipal economic development strategies include actions that rely on other entities to implement. For example, many municipal strategies we have reviewed include strategies and actions around workforce development. Workforce development is not a municipal service, so cities must coordinate with external entities for this function. The main points here are (1) be deliberate about policies / strategies /actions that rely on external partners, and (2) if these are included in the plan, be sure that resources are committed to execute them—understanding that coordination is time-consuming and challenging.

Table B-1 identifies a range of potential economic development strategies that the Tualatin could consider implementing. These strategies range from those closely associated with the basic functions of government (provision of buildable land and public services) to those sometimes viewed as outside the primary functions of government (such as financial incentives and business assistance). The primary action categories in Table B-1 are Land Use, Public Facilities, Business Assistance, Workforce, and Other. As stated above, it is important for Tualatin to identify the policies and actions they are well-suited to lead, and where collaboration with, and leadership from, partner organizations is necessary. Table B-1 also includes suggestions for potential partners and whether Tualatin should take on a lead or support role.

Table B-1. Potential economic development actions

Category/Policy Examples	Description and Examples	Potential Partners	City Lead or Support Role	Relevant Factors of Production
Land Use	**Policies regarding the amount and location of available land and allowed uses.**			
Provide adequate supply of land	Provide an adequate supply of development sites to accommodate anticipated employment growth with the public and private services, sizes, zoning, and other characteristics needed by firms likely to locate in Tualatin.	County, adjacent cities, State, landowners, and key stakeholders	Lead	Land, infrastructure
Zoning Code	Conduct an audit of the city's zoning code and a review of other development regulations to ensure that the regulations support the goals of economic development	County, if they manage land within the city's planning area but outside of the city limits	Lead	Land, Regulation
Increase the efficiency of the permitting process and simplify city land-use policies	Take actions to reduce costs and time for development permits. Adopt development codes and land use plans that are clear and concise.	County, if they assist with the permitting or building inspection process	Lead	Regulation, taxes, financial incentives
Public Facilities	**Policies regarding the level and quality of public and private infrastructure and services.**			
Provide adequate infrastructure to support employment growth	Provide adequate public services (i.e. roads, transportation, water, and sewer) and take action to assure adequate private utilities (i.e. electricity and communications) are provided to existing businesses and development sites. One way to pay for adequate infrastructure is through use of urban renewal, shown in the table below.	Public works department, special service districts, utilities, State and Federal partners who may provide grants, developers and landowners	Lead	Local infrastructure, Access to markets, suitable land to serve
Focused public investment	Provide public and private infrastructure to identified development or redevelopment sites.	Public works department, special service districts, utilities, State and Federal partners who may provide grants, developers and landowners	Lead	Regulation, taxes
Communications infrastructure	Actions to provide high-speed communication infrastructure, such as developing a local fiber optic network.	Communication utilities and public works department	Lead/Support	Local infrastructure, Access to markets

Category/Policy Examples	Description and Examples	Potential Partners	City Lead or Support Role	Relevant Factors of Production
Business Assistance	**Policies to assist existing businesses and attract new businesses.**			
Business retention and growth	Targeted assistance to businesses facing financial difficulty or thinking of moving out of the community. Assistance would vary depending on a given business' problems and could range from business loans to upgrades in infrastructure to assistance in finding a new location within the community.	Chamber of Commerce, Business Oregon, Regional ED Corporation	Support	Local infrastructure, Access to markets, Materials, Regulation, Taxes, Financial incentives, Industry clusters
Recruitment and marketing	Establish a program to market the community as a location for business in general, and target relocating firms to diversify and strengthen the local economy. Take steps to provide readily available development sites, an efficient permitting process, well-trained workforce, and perception of high quality of life.	Chamber of Commerce, Business Oregon, Regional ED Corporation	Support	Labor, Land, Local infrastructure, Regulation, Taxes, Industry clusters, Quality of life
Development districts (enterprise zones, renewal districts, etc.)	Establish districts with tax abatements, loans, assist with infrastructure, reduced regulation, or other incentives available to businesses in the district that meet specified criteria and help achieve community goals.	Business Oregon, taxing districts, special districts, county	Lead	Local infrastructure, Regulation, Taxes, Financial incentives, Quality of life
Business clusters	Help develop business clusters through business recruitment and business retention policies. Encourage siting of businesses to provide shared services to the business clusters, businesses that support the prison and hospital and agricultural industry, including retail and commercial services.	Business Oregon, Educational/research institutions	Support	Industry clusters, Innovative capacity

Category/Policy Examples	Description and Examples	Potential Partners	City Lead or Support Role	Relevant Factors of Production
Public/private partnerships	Make public land or facilities available, public lease commitment in proposed development, provide parking, and other support services.	Developers, businesses, and landowners	Lead and/or Support	Land, Financial incentives
Financial assistance	Tax abatement, waivers, loans, grants, and financing for firms meeting specified criteria. Can be targeted as desired to support goal such as recruitment, retention, expansion, family-wage jobs, or sustainable industry.	County, special service districts, other taxing districts	Lead	Regulation, Taxes, Financial incentives
Business incubators	Help develop low-cost space for use by new and expanding firms with shared office services, access to equipment, networking opportunities, and business development information. Designate land for live-work opportunities.	Education/research institutions, Chamber of Commerce, Small Business Administration (Federal)	Support	Entrepreneurship, Innovative capacity, Access to markets
Business/start-up accelerators	Provide similar services and opportunities as a business incubator but using a specific timeframe for businesses to meet certain benchmarks. Help connect businesses with funding at the end of the time period of the program to continue product development.	Education/research institutions, Chamber of Commerce, Small Business Administration (Federal), venture capitalists	Support	Entrepreneurship, Innovative capacity, Access to markets
Mentoring and advice	Provide low-cost mentors and advice for local small businesses in the area of management, marketing, accounting, financing, and other business skills.	Chamber of Commerce, local businesses, and other potential mentors	Support	Entrepreneurship, Innovative capacity
Export promotion	Assist businesses in identifying and expanding into new products and export markets; represent local firms at trade shows and missions.	State, Chamber of Commerce, regional economic development partners	Support	Entrepreneurship, Innovative capacity, Access to markets

Category/Policy Examples	Description and Examples	Potential Partners	City Lead or Support Role	Relevant Factors of Production
Workforce	**Policies to improve the quality of the workforce available to local firms.**			
Job training	Create opportunities for training in general or implement training programs for specific jobs or specific population groups (i.e. dislocated workers).	School districts, education/research institutions, businesses	Support	Labor
Job access	Provide transit/shuttle service to bring workers to job sites.	Businesses, transit agency	Support	Labor, Local infrastructure
Jobs/housing balance	Make land available for a variety of low-cost housing types for lower income households, ranging from single-family housing types to multifamily housing.	Developers, landowners, businesses, affordable housing developers, other housing agencies or developers	Support	Land, Labor, Quality of life
Other				
Regional collaboration	Coordinate economic development efforts with the County, the State, and local jurisdictions, utilities, and agencies so that clear and consistent policies and objectives are developed.	Regional economic development partners, county, nearby cities, Business Oregon	Lead initiation of the coordination, participatory in the coordination process	Innovative capacity
Quality of life	Maintain and enhance quality of life through good schools, cultural programs, recreational opportunities, adequate health care facilities, affordable housing, neighborhood protection, and environmental amenities.	School district, recreational districts, hospitals and medical providers, affordable housing providers, and other stakeholders	Lead on city programs, support on other programs	Local infrastructure, Labor, Land, Quality of life

Source: ECONorthwest.

Tualatin 2040 Update

Tualatin Planning Commission

October 17, 2019

Tonight's Update

- **Where We've Been**
  - Housing Needs Analysis
  - Economic Opportunities Analysis
- **What We've Heard from the Community**
  - Housing Strategies
  - Economic Development Strategies
  - Broad Planning Policy Input
- **Next Steps**

Where We've Been:

Housing Needs Analysis
&
Economic Opportunities Analysis

Housing Needs Takeaways

- Total Buildable Land: 322 acres
  - Over 50 % designated Low/Medium Low Density Residential
- 2040 Forecast: 1,014 dwelling units
  - 1,915 at full build out
- Future Housing Mix (recommended):
  - Single Family Detached – 40%
  - Single Family Attached – 15%
  - Multifamily – 45%

Housing Needs Takeaways (Cont'd)

- Land Availability
  - Surplus 101 acres- Low/Medium Low Density Residential
  - Deficit 11 acres- Medium High and High/High Rise Residential
- Affordability
  - 22% homeowners and 56% renter households pay more than 30% income in housing costs
  - Combination of land cost and fees = cost rising on all levels

Economic Opportunities Takeaways

- Buildable Land Inventory: 385 buildable acres
  - Over 95 % designated Industrial
- 2040 Forecast: 53,332 employees
  - Increase of 12,850 employees from today
  - Estimated 1.39% annual growth rate
- Allocation of New Employees
  - Industrial-45%
  - Retail- 8%
  - Office-45%
  - Government- 2%

Economic Opp. Takeaways (Cont'd)

- Land Availability
  - Deficit of Industrial – 74 acres
  - Deficit of Retail/Office- 175 acres
  - No "Tier 1" Industrial sites are "shovel ready"
- Employment
  - 2% of businesses have more than 100 employees
  - Over 93% Tualatin's workforce lives outside of Tualatin

What We Heard

Housing Strategy
Economic Development Strategy

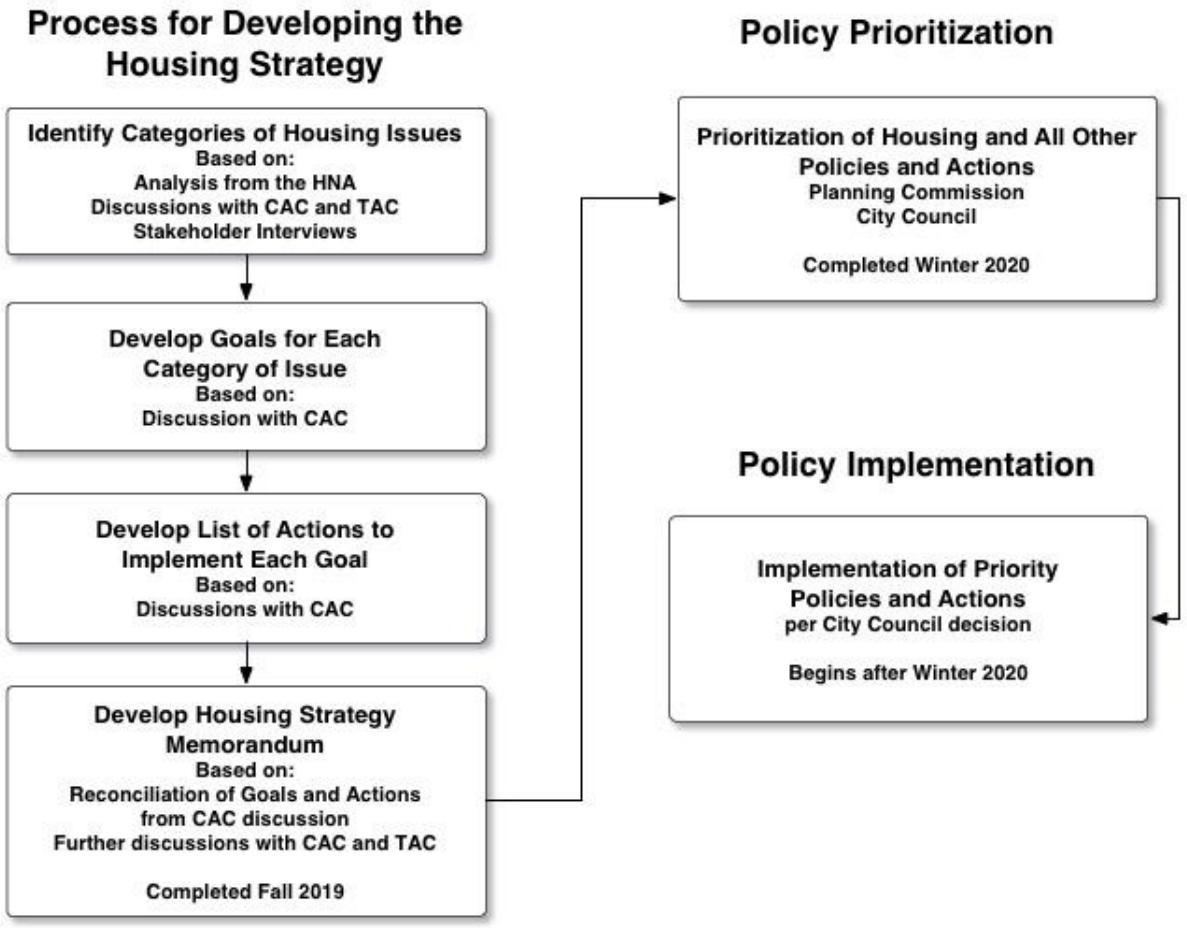
Housing Strategy

Step 1:
June 27, 2019

Step 2:
Aug. 8, 2019

Step 3:
Aug. 8, 2019

Step 4:
Sept. 26, 2019



Housing Strategy Discussion

Question:

- *Given the existing, limited amount of buildable land available, what are the most effective ways to meet Tualatin's existing and future housing needs, while improving quality of life in Tualatin?*

Advisory Committee Feedback

Housing Policy Strategies:

1. Adequate land supply
2. Housing type variety
3. Affordability and affordable housing
4. Funding tools
5. Redevelopment opportunities
6. Housing-transportation-other connections

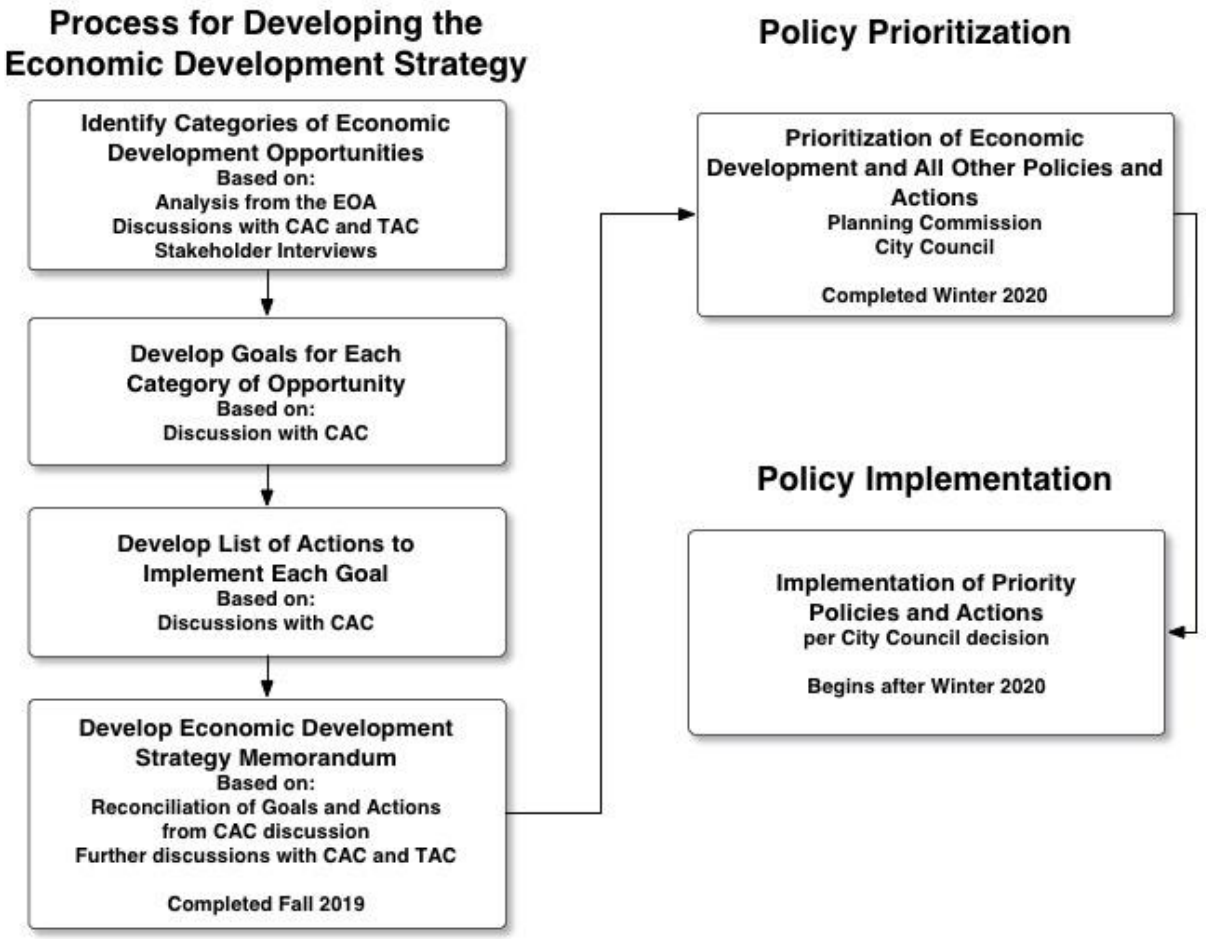
Economic Development Strategy

Step 1:
June 27, 2019

Step 2:
Aug. 22, 2019

Step 3:
Aug. 22, 2019

Step 4:
Sept. 26, 2019



Economic Strategy Discussion

Questions:

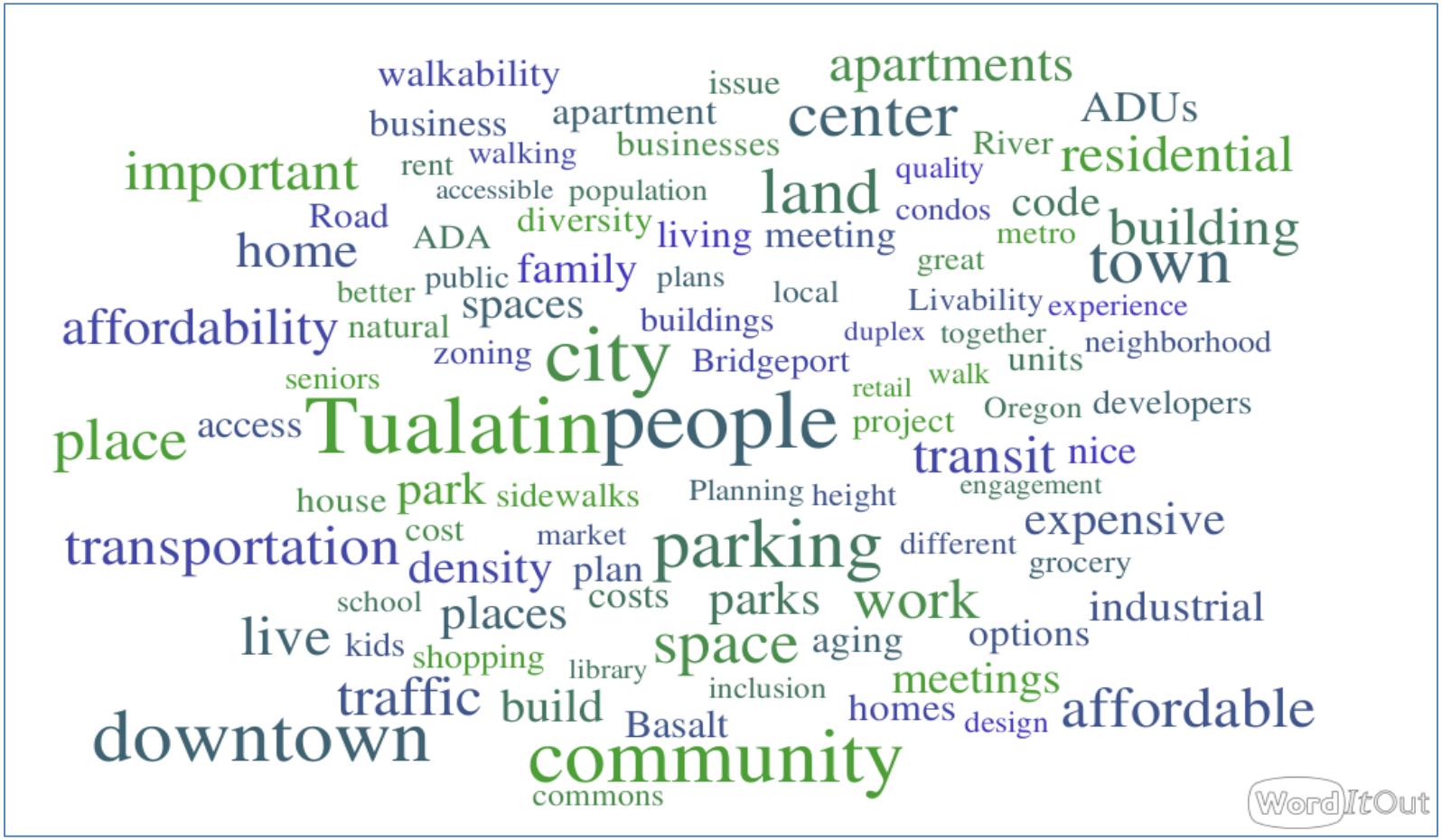
- *Given the existing, limited amount of buildable land available, what are the most effective ways to build on the city's economic assets, while improving quality of life in Tualatin?*
- *What do you think the City's role should be in Economic Development and what resources are required?*

Advisory Committee Feedback

Economic Development Strategies:

1. Efficient use of buildable Land
2. Redevelopment opportunities
3. Business retention, growth and attraction
4. Planning and economic development connections

Stakeholder Feedback



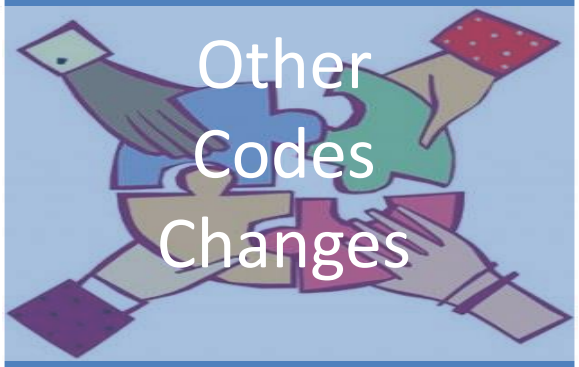
Next Steps

Upcoming Schedule: Fall 2019

- **October / November**
  - Public Comment on Draft Prioritization Plan
  - City Council Meeting on Draft Prioritization Plan
  - Planning Commission Meeting on Draft Prioritization Plan
- **December / January 2020**
  - City Council Meeting on Final Prioritization Plan

Three Parallel Paths Forward

Policy Prioritization Plan

Update Tualatin's Economic Development Strategic Plan	Update Tualatin's Development Code and Create a Housing Strategy	Other Codes Changes
		

Tualatin 2040

2019

Questions/Discussion