TUALATIN CITY COUNCIL

Monday, September 23, 2013

CITY COUNCIL CHAMBERS
18880 SW Martinazzi Avenue
Tualatin, OR 97062

WORK SESSION - CANCELED
BUSINESS MEETING begins at 7:00 p.m.

Mayor Lou Ogden

Council President Monique Beikman

Councilor Wade Brooksby **Councilor Frank Bubenik**

Councilor Joelle Davis **Councilor Nancy Grimes**

Councilor Ed Truax

Welcome! By your presence in the City Council Chambers, you are participating in the process of representative government. To encourage that participation, the City Council has specified a time for citizen comments on its agenda - *Item C*, following Announcements, at which time citizens may address the Council concerning any item not on the agenda with each speaker limited to three minutes, unless the time limit is extended by the Mayor with the consent of the Council.

Copies of staff reports or other written documentation relating to each item of business referred to on this agenda are available for review on the City website at www.tualatinoregon.gov/meetings, the Library located at 18878 SW Martinazzi Avenue, and on file in the Office of the City Manager for public inspection. Any person with a question concerning any agenda item may call Administration at 503.691.3011 to make an inquiry concerning the nature of the item described on the agenda.

In compliance with the Americans With Disabilities Act, if you need special assistance to participate in this meeting, you should contact Administration at 503.691.3011. Notification thirty-six (36) hours prior to the meeting will enable the City to make reasonable arrangements to assure accessibility to this meeting.

Council meetings are televised ***live*** the day of the meeting through Washington County Cable Access Channel 28. The replay schedule for Council meetings can be found at www.tvctv.org. Council meetings can also be viewed by live *streaming video* on the day of the meeting at www.tualatinoregon.gov/meetings.

Your City government welcomes your interest and hopes you will attend the City of Tualatin Council meetings often.

PROCESS FOR LEGISLATIVE PUBLIC HEARINGS

A ***legislative*** public hearing is typically held on matters which affect the general welfare of the entire City rather than a specific piece of property.

1. Mayor opens the public hearing and identifies the subject.
2. A staff member presents the staff report.
3. Public testimony is taken.
4. Council then asks questions of staff, the applicant, or any member of the public who testified.
5. When the Council has finished questions, the Mayor closes the public hearing.
6. When the public hearing is closed, Council will then deliberate to a decision and a motion will be made to either *approve*, *deny*, or *continue* the public hearing.

PROCESS FOR QUASI-JUDICIAL PUBLIC HEARINGS

A ***quasi-judicial*** public hearing is typically held for annexations, planning district changes, conditional use permits, comprehensive plan changes, and appeals from subdivisions, partititions and architectural review.

1. Mayor opens the public hearing and identifies the case to be considered.
2. A staff member presents the staff report.
3. Public testimony is taken:
    a) In support of the application
    b) In opposition or neutral
4. Council then asks questions of staff, the applicant, or any member of the public who testified.
5. When Council has finished its questions, the Mayor closes the public hearing.
6. When the public hearing is closed, Council will then deliberate to a decision and a motion will be made to either *approve*, *approve with conditions*, or *deny the application*, or *continue* the public hearing.

TIME LIMITS FOR PUBLIC HEARINGS

The purpose of time limits on public hearing testimony is to provide all provided all interested persons with an adequate opportunity to present and respond to testimony. All persons providing testimony **shall be limited to 3 minutes**, subject to the right of the Mayor to amend or waive the time limits.

EXECUTIVE SESSION INFORMATION

An Executive Session is a meeting of the City Council that is closed to the public to allow the City Council to discuss certain confidential matters. An Executive Session may be conducted as a separate meeting or as a portion of the regular Council meeting. No final decisions or actions may be made in Executive Session. In many, but not all, circumstances, members of the news media may attend an Executive Session.

The City Council may go into Executive Session for certain reasons specified by Oregon law. These reasons include, but are not limited to: ORS 192.660(2)(a) employment of personnel; ORS 192.660(2)(b) dismissal or discipline of personnel; ORS 192.660(2)(d) labor relations; ORS 192.660(2)(e) real property transactions; ORS 192.660(2)(f) information or records exempt by law from public inspection; ORS 192.660(2)(h) current litigation or litigation likely to be filed; and ORS 192.660(2)(i) employee performance of chief executive officer.

OFFICIAL AGENDA OF THE TUALATIN CITY COUNCIL MEETING FOR SEPTEMBER 23, 2013

A. CALL TO ORDER

Pledge of Allegiance

B. ANNOUNCEMENTS

1. Proclamation Declaring the Month of October 2013 as "National Arts & Humanities Month" in the City of Tualatin

2. New Employee Introduction: Clare Fuchs, Senior Planner

C. CITIZEN COMMENTS

This section of the agenda allows citizens to address the Council regarding any issue not on the agenda. The duration for each individual speaking is limited to 3 minutes. Matters requiring further investigation or detailed answers will be referred to City staff for follow-up and report at a future meeting.

D. CONSENT AGENDA

The Consent Agenda will be enacted with one vote. The Mayor will first ask staff, the public and Councilors if there is anyone who wishes to remove any item from the Consent Agenda for discussion and consideration. The matters removed from the Consent Agenda will be considered individually at the end of this Agenda under, I) Items Removed from the Consent Agenda. The entire Consent Agenda, with the exception of items removed from the Consent Agenda to be discussed, is then voted upon by roll call under one motion.

1. Consideration of Approval of the Minutes for the City Council Work Session and Regular Meeting on September 9, 2013

2. Consideration of **Resolution No. 5170-13** Awarding the Bid and Authorizing the Mayor and City Manager to Execute the Street Sweeping Contract

3. Consideration of **Resolution No. 5169-13** Updating School Zones in Tualatin and Rescinding Resolutions No. 2747-92, 3515-98, 5024-11, and 4284-04.

4. Consideration of **Resolution No. 5171-13** Approving and Authorizing the Provision of Workers' Compensation Insurance Coverage to Volunteers of the City of Tualatin and Repealing Resolution No. 5105-12

5. Consideration of **Resolution No. 5167-13**, Authorizing a Full Faith and Credit Borrowing for the Operations Warehouse.

E. GENERAL BUSINESS

1. **Ordinance No. 1359-13** Relating to the Tualatin Development Code (TDC) Chapter 12 - Water Service - Incorporating the January 2013 Water Master Plan and Amending TDC 12.010-12.140. Plan Text Amendment (PTA-13-01)

F. ITEMS REMOVED FROM CONSENT AGENDA

Items removed from the Consent Agenda will be discussed individually at this time. The Mayor may impose a time limit on speakers addressing these issues.

G. COMMUNICATIONS FROM COUNCILORS

H. EXECUTIVE SESSION

pursuant to ORS 192.660(2)(e) to conduct deliberations with persons designated by the governing body to negotiate real property transactions and pursuant to ORS 192.660(2)(f) to consider information or records that are exempt by law from public inspection.

I. ADJOURNMENT

City Council Meeting **B. 1.**

Meeting Date: 09/23/2013

ANNOUNCEMENTS: Proclamation Declaring the month of October 2013 as "National Arts & Humanities Month"

ANNOUNCEMENTS

Proclamation Declaring the Month of October 2013 as "National Arts & Humanities Month" in the City of Tualatin

SUMMARY

N/A

Attachments

National Arts & Humanities Proclamation

Proclamation

Proclamation Declaring the Month of October 2013 as "National Arts & Humanities Month" in the City of Tualatin

WHEREAS the month of October has been recognized as National Arts and Humanities Month by thousands of arts and cultural organizations, communities, and states across the country, as well as by the White House and Congress for more than two decades; and

WHEREAS the arts and humanities play a unique role in the lives of the citizens of Tualatin; and

WHEREAS the City of Tualatin has a vibrant and energetic arts community including an Arts Advisory Committee, Heritage Center, library, schools, non-profit organizations and local businesses that contribute significantly to the quality of life in Tualatin by presenting artistic and cultural events that celebrate community values and help connect residents to their artistic and cultural heritage; and

WHEREAS ArtWalk, a self-guided tour of Tualatin's art, cultural and natural history, furthers HEAL (Healthy Eating Active Living) and Let's Move Initiatives by promoting walking while exploring Tualatin's diverse public art; now therefore

BE IT PROCLAIMED BY THE CITY COUNCIL OF THE CITY OF TUALATIN, OREGON that:

Section 1. October 2013 be proclaimed "National Arts and Humanities Month" in the City of Tualatin.

Section 2. The citizens of Tualatin are called upon to celebrate, promote, and support the arts and culture in our city, county and nation.

INTRODUCED AND ADOPTED this 23rd day of September, 2013.

CITY OF TUALATIN, OREGON

BY _____
Mayor

ATTEST:

BY _____
City Recorder

STAFF REPORT
CITY OF TUALATIN

TO: Honorable Mayor and Members of the City Council

THROUGH: Sherilyn Lombos

FROM: Nicole Morris, Deputy City Recorder

DATE: 09/23/2013

SUBJECT: Consideration of Approval of the Minutes for the City Council Work Session and Regular Meeting on September 9, 2013

ISSUE BEFORE THE COUNCIL:

The issue before the Council is to approve minutes from the City Council Work Session and Regular Meeting on September 9, 2013.

RECOMMENDATION:

Staff respectfully recommends that the Council adopt the attached minutes.

Attachments: City Council Work Session of September 9, 2013
City Council Regular Meeting of September 9, 2013

OFFICIAL MINUTES OF TUALATIN CITY COUNCIL WORK SESSION FOR SEPTEMBER 9, 2013

Present:	Mayor Lou Ogden; Council President Monique Beikman; Councilor Wade Brooksby; Councilor Joelle Davis; Councilor Nancy Grimes; Councilor Ed Truax
Absent:	Councilor Frank Bubenik
Staff Present:	City Manager Sherilyn Lombos; City Attorney Sean Brady; Police Chief Kent Barker; Assistant City Manager Alice Rouyer; Deputy City Manager Sara Singer; Planning Manager Aquilla Hurd-Ravich; Deputy City Recorder Nicole Morris; Associate Planner Cindy Hahn; Management Analyst Ben Bryant

CALL TO ORDER

Mayor Ogden called the meeting to order at 6:03 p.m.

1. *Chickens: Policy Direction on Code Components.*

Associate Planner Cindy Hahn, Planning Manager Aquilla Hurd-Ravich, and Assistant City Manager Alice Rouyer came before Council seeking policy direction on code components for a backyard chickens ordinance.

Associate Planner Hahn recapped the timeline for the chicken ordinance with a planned public hearing date scheduled for November 12th. She presented the code components for discussion.

The Council proceeded to discuss the presented components and gave direction as follows:

Councilors expressed concerns over neighbors being able to see enclosures from their yards. Consensus was reached to set a maximum height of 8 feet for enclosures.

Council reached consensus to have setbacks be set 25 feet from all property lines.

Council reached consensus that feed be kept in metal or other vermin-proof containers or receptacles.

Council reached consensus to have a permit process. It was requested that staff complete a fee analysis before fees are determined.

Council reached consensus to not receive neighbor approval but instead send letters with information regarding the chicken ordinance after permit approval.

Council reached consensus to not allow harvesting or butchering.

Council reached consensus to implement the ordinance without a trial period.

2. ***Seneca Street Extension & Council Building.***

Deputy City Manager Sara Singer requested City Council direction on the next steps for developing a public involvement plan to gather community input on the key decisions regarding the Seneca Street extension and the Council Building. She briefly reviewed the feasibility study, identified some of the key decisions in the process, and shared the input that was received at the September 3 rd meeting on public involvement. The key questions for Council discussion are:

-What input does Council want from the community?
-Are there specific questions which should be asked?
-How should the information be collected?
-How should the information be presented?

The next steps include developing materials for public outreach, collecting public input September thru November, and a Council decision in November or December.

Councilor Truax stated that he feels he has received community input already on this project through the outreach on the Transportation System Plan. He would like to see questions regarding when it is built, should the building be moved, and what are the alternatives.

Council President Beikman would like the feasibility study presented to the CIO's and advisory groups. She would like community feedback on funding options and timing of the project.

Councilor Davis would like to make sure there is a open period of discussion at these meetings for alternative ideas regarding the project.

Councilor Grimes asked staff questions regarding the scope of the SRG feasibility study that was completed. City Manager Lombos clarified the scope of the feasibility study. She said she agreed with the ideas listed and she is interested in getting input on funding options, site locations and timing.

Councilor Davis would like to see a fact sheet developed and vetted prior to distribution.

Mayor Ogden would like the following questions asked: 1) What is the priority of this street in relation to other traffic issues? 2) Is this the best solution for the problem? 3) When should it be completed? 4) How should it be funded? 5) Should we proceed without a public vote?

Due to a lack of time, the remainder of this discussion will be held at a Special Work Session on September 16, 2013 at 7:00 p.m.

3. ***Direction on Parking Restrictions in Neighborhoods.***

Item forwarded to Special Work Session to be held September 16, 2013 at 7:00 p.m.

4. ***Council Meeting Agenda Review, Communications & Roundtable.***

None

ADJOURNMENT

The work session adjourned at 7:05 p.m.

Sherilyn Lombos, City Manager

_____ / Nicole Morris, Recording Secretary

_____ / Lou Ogden, Mayor

OFFICIAL MINUTES OF THE TUALATIN CITY COUNCIL MEETING FOR SEPTEMBER 9, 2013

Present: Mayor Lou Ogden; Council President Monique Beikman; Councilor Wade Brooksby; Councilor Joelle Davis; Councilor Nancy Grimes; Councilor Ed Truax

Absent: Councilor Frank Bubenik

Staff Present: City Manager Sherilyn Lombos; City Attorney Sean Brady; Police Chief Kent Barker; Finance Director Don Hudson; Deputy City Manager Sara Singer; Planning Manager Aquilla Hurd-Ravich; Deputy City Recorder Nicole Morris; Assistant Planner Colin Cortes; Engineering Manager Kaaren Hofmann; Teen Program Specialist Julie Ludemann; Assistant City Manager Alice Rouyer; Public Works Director Jerry Postema

A. CALL TO ORDER

Pledge of Allegiance

Mayor Ogden called the meeting to order at 7:07 p.m.

B. ANNOUNCEMENTS

1. Youth Advisory Council Update, September 2013

Members of the Youth Advisory Committee (YAC) presented a PowerPoint on their latest activities and upcoming events. Tualapalooza was held and had over 300 participants. New member recruitment is under way. Applications are due September 27, 2013. Upcoming events include the Pumpkin Regatta, the Haunted House, and the National League of Cities.

C. CITIZEN COMMENTS

This section of the agenda allows citizens to address the Council regarding any issue not on the agenda. The duration for each individual speaking is limited to 3 minutes. Matters requiring further investigation or detailed answers will be referred to City staff for follow-up and report at a future meeting.

Ginger Moshofsky, Mask and Mirror Theater Group, thanked the Tualatin Arts Advisory Committee for their generous grant of $300 to the group.

Lesley Clanton, Bryom Elementary Jog-A-Thon Committee Chair, invited everyone to the Jog-A-Thon on September 27th to help raise money to acquire 30 iPads to be used in the classrooms.

Kathy Newcomb invited all citizens to a meeting to be held regarding public transit hosted by Tri-met on September 11 from 5-7 p.m. Tri-Met Senior Planner Tom Mills will be available to answer questions.

Steve Titus noted that he felt the Martinazzi Street project was progressing well and thanked staff for a job well done.

D. CONSENT AGENDA

The Consent Agenda will be enacted with one vote. The Mayor will first ask staff, the public and Councilors if there is anyone who wishes to remove any item from the Consent Agenda for discussion and consideration. The matters removed from the Consent Agenda will be considered individually at the end of this Agenda under, I) Items Removed from the Consent Agenda. The entire Consent Agenda, with the exception of items removed from the Consent Agenda to be discussed, is then voted upon by roll call under one motion.

MOTION by Council President Monique Beikman, SECONDED by Councilor Nancy Grimes to approve the consent agenda.

Vote: 6 - 0 MOTION CARRIED

1. Consideration of Approval of the Minutes for the Special City Council Meeting on August 19, 2013, City Council Work Session and Regular Meeting on August 26, 2013.

2. Consideration of **Resolution No. 5166-13** Awarding Fiscal Year 2013/2014 Outside Agency Grant Funds to Provide Social Services to the Citizens of Tualatin

3. Consideration of Authorization for the City Manager to Sign an Intergovernmental Agreement Between Washington County and the City of Tualatin for the Coordination of Activities Related to the U.S. Department of Homeland Security's Urban Areas Security Initiative (UASI) Grant Program.

E. PUBLIC HEARINGS – *Legislative or Other*

1. Consideration of Plan Text Amendment (PTA) 13-01 Amending the Tualatin Development Code (TDC) Chapter 12-Water Service-Incorporating the July 2013 Water Master Plan. Amending TDC 12.010-12.140 and Water System Master Plan Map 12-1. (PTA-13-01)

Assistant Planner Colin Cortes, Engineering Manager Kaaren Hofmann, and Assistant City Manager Alice Rouyer presented the Plan Text Amendment (PTA) 13-01 Amending the Tualatin Development Code (TDC) Chapter 12-Water Service-Incorporating the July 2013 Water Master Plan. Assistant Planner Cortes noted that this is an update of the TDC accepted by the Council on March 11, 2013 and amended in July 2013 following public comment at the April 18, 2013 Tualatin Planning Commission (TPC) meeting. He stated that the amendment tonight will incorporate the May 2013 Water Master Plan, Water System Capital Improvement Program schedule and project summary, and allows the plan and the TDC chapter 12 to remain in compliance with state regulations.

Mike Riley, Tualatin Planning Commission Chair, presented the commission's recommendations. He asked that Grace Lucini speak as she presented concerns to the commission that they included in their recommendation. Ms. Lucini expressed concerns regarding the placement of the water main on the master plan in relation to her property. She noted that staff had made her revisions and she is happy with the master plan as presented. Mr. Riley stated that commission recommends adoption of the plan.

PUBLIC COMMENT
None

COUNCIL QUESTIONS
None

COUNCIL DELIBERATIONS
None

MOTION by Council President Monique Beikman, SECONDED by Councilor Ed Truax to direct staff to prepare an ordinance regarding a Plan Text Amendment (PTA-13-01) to the Tualatin Development Code (TDC) to amend Chapter 12, sections 12.010-12.140 by incorporating the July 2013 Water Master Plan, referencing the recommended Table 7-1 (Water System) Capital Improvement Plan (CIP) Summary and amending Map 12-1.

Vote: 6 - 0 MOTION CARRIED

F. ITEMS REMOVED FROM CONSENT AGENDA

Items removed from the Consent Agenda will be discussed individually at this time. The Mayor may impose a time limit on speakers addressing these issues.

G. COMMUNICATIONS FROM COUNCILORS

Council President Beikman asked City Attorney Sean Brady if Council could continue their discussion regarding the Seneca Street extension and the Council Building because Council ran out of time at work session.

Attorney Brady stated that Council could choose to discuss this under Councilor Communications, make a motion to add it to the agenda as an item, or re-notice and hold another work session at a later date.

Council President Beikman stated that she felt the questions asked by the Mayor for staff to take to public involvement meetings have already been answered by the Council voting and passing the Nyberg Rivers Master Plan.

Mayor Ogden re-stated his five questions.

Councilor Grimes stated that she was uncomfortable having this discussion outside of the noticed work session as she wants this process to be as transparent as possible.

Consensus was reached amongst Council to hold a Special Work Session on September 16, 2013 at 7:00 p.m.

H. ADJOURNMENT

Mayor Ogden adjourned the meeting at 7:57 p.m.

Sherilyn Lombos, City Manager

_____ / Nicole Morris, Recording Secretary

_____ / Lou Ogden, Mayor

City Council Meeting **D. 2.**

Meeting Date: 09/23/2013

CONSENT AGENDA: Resolution 5170-13 Awarding the Street Sweeping Contract to Great Western Sweeping

CONSENT AGENDA

Consideration of **Resolution No. 5170-13** Awarding the Bid and Authorizing the Mayor and City Manager to Execute the Street Sweeping Contract

SUMMARY

This Resolution (5170-13) is to award a multi-year contract for Street Sweeping Services. Staff advertised a Request for Proposals in the Daily Journal of Commerce on August 23, 2013 and August 28, 2013. Proposals were due to the City no later than 2:00 p.m. on September 6, 2013. Although there were three bidders and two document centers that were on the Plan Holder List, only one proposal was received from Great Western Sweeping, Inc. Great Western is the current service provider.

The effective date for this contract will be October 1, 2013 through October 1, 2016 including an option for two, one-year extensions. The multi-year contract allows for sweeping of approximately 151 curb miles of roads and streets that are swept on a regular monthly schedule, including sweeping of the City Parks and public parking areas. The Street Sweeping will be performed within the City limits of Tualatin. A team of staff members reviewed the Proposals and have found Great Western Sweeping, Inc. to be a qualified proposer that meets all the requirements of the Request for Proposal. The qualifications that were included in this Request for Proposal were based upon the following criteria:

- Qualifications to perform the scope of services
- Prior work experience, performing the scope of services
- Demonstrated understanding of the scope of services required
- References from other communities receiving services
- Fee schedule for providing scope of services and
- Overall best value to the City

The procurement process complied with the City of Tualatin public contracting requirements. Adoption of Resolution No 5170-13 will award the contract for Street Sweeping Services to Great Western Sweeping, Inc. and authorize the Mayor and City Manager to execute the contract between them and the City of Tualatin.

Attachments

Resolution 5170-13

Street Sweeping Contract

RESOLUTION NO. No. 5170-13

RESOLUTION AWARDING BID FOR MULTI-YEAR STREET SWEEPING CONTRACT

WHEREAS, the Street Sweeping Request for Proposal was advertised in the *Daily Journal of Commerce* on August 23 & 28; and

WHEREAS, proposals were received prior to the close of the bid period on September 6, 2013 and

WHEREAS, funding for street sweeping services is budgeted in the 2013/14 fiscal year budget line item 004-4040-515-55.03, in the amount of $190,000 annually; and

WHEREAS, the procurement complied with the City's public contracting requirements; and

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF TUALATIN, OREGON, THAT:

Section 1. The City finds Great Western Sweeping, Inc. is the successful proposer for the street sweeping contract and awards Great Western Sweeping Inc., the contract.

Section 2. The Mayor and City Manager are authorized to execute a three-year contract with Great Western Sweeping, Inc. for street sweeping services in the not the exceed amount of the following:

A. Year 1 of the contract shall not exceed $190,000.00;

B. Year 2 of the contract shall not exceed the amount budgeted by the City Council for street sweeping services; and

C. Year 3 of the contract shall not exceed the amount budgeted by the City Council for street sweeping services.

Section 3. This Resolution is effective upon adoption.

INTRODUCED AND ADOPTED this 23rd day of September, 2013.

CITY OF TUALATIN, OREGON

BY _____
Mayor

APPROVED AS TO FORM

BY _____
City Attorney

ATTEST:

BY _____
City Recorder

CITY OF TUALATIN, OREGON

Request for Proposals

Street Sweeping Operations

DATE & TIME DUE:
September 6, 2013 by 2:00 p.m.

SUBMIT PROPOSAL TO CITY OF TUALATIN:

City of Tualatin
Operations Department
10699 SW Herman Road
Tualatin, OR 97062
503-691-3096

CITY OF TUALATIN
OPERATIONS DEPARTMENT
Street Sweeping Operations
Proposals due September 6, 2013
REQUEST FOR PROPOSALS

The City of Tualatin is requesting proposals, from qualified Contractors (hereinafter referred to as Contractor, for providing street sweeping services under a multi-year contract. The City has approximately 151 curb miles of roads and streets swept on a regular monthly schedule. The street sweeping services will be performed within the City limits.

A successful Contractor will be selected based upon the following criteria: 1) Qualifications to perform the scope of services; 2) Prior work experience performing the scope of services; 3) Demonstrated understanding of the scope of services required; 4) References from other communities receiving services; 5) Fee schedule for providing scope of services; and 6) Overall best value to the City.

The City of Tualatin requires Contractors to submit one (1) unbound original and five (5) copies of the proposal outlining their experience and qualifications in performing work as described in the Scope of Services. The City will receive sealed proposals until **2:00 p.m. on September 6, 2013.** These should be delivered to the City of Tualatin, Operations Department, at 10699 SW Herman Road, Tualatin, Oregon 97062.

The City **will not accept** facsimile or emailed proposals. The City **will not accept** any proposals after the stated opening date and time. The City will return all late proposals unopened to the submitting Contractor. Proposers are required to certify non-discrimination in employment practices and identify resident status as defined in ORS 279A.120. Pre-qualification of proposers is not required. All proposers are required to comply with the provisions of Oregon Revised Statutes and the City of Tualatin Public Contracting Rules

The City of Tualatin reserves the right to reject any or all proposals not in compliance with public bidding procedures; to postpone award of the contract for a period not to exceed sixty (60) days from date of proposal opening; to waive informalities in the proposals; and to select the proposal that is in the best interest of the City.

A complete copy of the Request for Proposal, invitation to propose, terms and conditions and a detailed description of services required are available on the City's website at http://bids.tualatin.teamaha.com/. You will need to create a login in order to view the documents for this project.

WRITTEN ADDENDA: The City reserves the right to make changes to the Request for Proposals and the Contract Documents by written addenda prior to the RFP closing. Addenda shall be made available to all contractors who have obtained a copy of the Agreement Documents.

Questions pertaining to this RFP shall be directed to Bert Olheiser, Street/Sewer/Storm Manager at 503-691-3096 or bolheiser@ci.tualatin.or.us

Published 8/23/13 and 8/28 in Daily Journal of Commerce

TABLE OF CONTENTS

SECTION **PAGE**

PART 1

OVERVIEW

This project provides professional services to perform street sweeping services for the City of Tualatin's Operation's Department. The scope of services will include the following:

1. Provide all labor, equipment, materials, supervision, and quality control to perform street sweeping services.
2. Provide all labor, equipment, materials, supervision, and quality control to collect, handle, and properly dispose of street debris collected in the performance of the street sweeping services.
3. Perform all work in accordance with applicable federal, state, and local laws, statutes, and ordinances, as well as Clean Water Services regulatory requirements.

General Information

The City of Tualatin provides street sweeping services to a community of approximately 26,000 people. The City has approximately 151 curb miles of roads and streets swept on a regular monthly schedule.

The street sweeping services will be performed on all of the City of Tualatin streets, City owned parking lots and City owned parks. The funding of these services comes from the City's Operation Maintenance budget.

Tualatin Street Sweeping Program The City's street sweeping program consists of providing monthly sweeping of all paved City streets and City owned parking lots. The City Street Sweeping program consists of eight (8) areas in the City and sweeping of each area is performed on a regular monthly schedule. The City's sweeping schedule has been developed to avoid conflicts with the garbage collection schedule and the City requires the schedule be maintained.

PART 2

TIMELINE

08/23/13 08/28/13	Publication of Solicitation for Proposals
09/06/13	Deadline for Submission of Proposals
09/06/13 2:00 p.m.	Opening of Proposals at Tualatin's Operations Department, 10699 SW Herman RD Tualatin, Oregon
09/12/13	Notice of Intent to Award
09/23/13	Contract Award by City Council
10/01/13	Commencement of Services
10/01/16	Expiration of Contract

THE CITY RESERVES THE RIGHT TO MODIFY THIS SCHEDULE AT THE CITY'S DISCRETION. ALL INTERESTED PARTIES WILL RECEIVE PROPER NOTIFICATION OF CHANGES.

PART 3

SCOPE OF WORK

The street sweeping services will be provided for the City of Tualatin per the terms and conditions of the attached Personal Services Agreement. The services to be performed under this Agreement shall commence upon execution of the Agreement by both parties and terminate on October 1, 2016. Upon agreement of both parties, this Agreement maybe renewable in one (1) year increments, for a total of five (5) years.

The successful Contractor shall provide a range of professional services including, but not limited to, street sweeping service management, reporting, and documentation of services provided. The Contractor will demonstrate expertise and experience in: 1) street sweeping services; 2) quality control and performance monitoring of services provided, specific to Municipal Street sweeping; and 3) coordination with Operation's staff.

The City desires to have a street sweeping contract in place by October 1, 2013. The successful Contractor will be operational at the contract start date. The proposal for providing scope of services for street sweeping shall outline internal controls that will be used by the successful Contractor to ensure work is performed in an efficient, cost effective, reliable, and sustained manner that will satisfy the City's and Clean Water Services current and future storm and surface water management regulatory requirements.

Outline of Tasks

Task 1: Contract Management and Coordination

Contractor shall work with the City to set up street sweeping quality control measures to be utilized by the Contractor to ensure compliance with Contract requirements. The Contractor shall provide a designated contract manager that will provide response to performance, billing, or contract modification issues identified by the City.

The Contractor shall update the sweeping schedule as directed by the City throughout the duration of the Contract. Monthly progress reports and invoicing for service provided shall be prepared in an Excel spreadsheet provided by the City. Invoice and report will be due by the first of each month.

Contractor responsibilities include:

- Contract management
- Sub-Contractor management
- Coordinate and supervise contract work
- Maintain liaison and coordination with City
- Prepare records of services provided
- Monitor contract conformance

Task 2: Street Sweeping Operations

A. Street Sweeping Services

(1) Designation of Streets to be Swept. The City streets subject to scheduled, additional non-scheduled and emergency sweeps identified in the City sweeping schedule. It is estimated that 151 curb miles, all center turn lanes and cul-de-sacs in entirety are required to be swept monthly as of October 1, 2013.

a. City owned parking lots are to be swept monthly.

b. City parks are to be swept as needed and directed by the City.

(2) New Streets to be Swept. The City may add streets during the term of this agreement for street sweeping services under this agreement. When new streets are added to be swept under this agreement, the City shall first provide a map showing the location of the new streets to be swept and the total lineal feet to be swept.

(3) Scheduled Street Sweeps. Each street and publicly owned parking lot designated in the City sweeping schedule shall be swept once per month. The Contractor shall maintain a continuous weekly schedule until all streets are swept each month. The schedule may be revised by written request from the Street/Sewer/Storm Manager.

(4) Non-Scheduled Additional Sweeps. The Contractor shall provide non-scheduled sweeping services in addition if requested by the City The City shall compensate the Contractor for additional sweepings performed under this paragraph at the hourly rate specified on page 19 of the Personal Services Agreement.

(5) Emergency Additional Sweeps. If an adverse weather condition, traffic hazard or other condition requires an emergency additional sweep, the City shall immediately notify the Contractor that an emergency sweep is necessary and the Contractor shall perform the sweep within 1 hour of notification. The City shall compensate the Contractor for sweeps performed under this paragraph at the hourly rate specified on page 19 of the Personal Services Agreement. If the Contractor does not or cannot perform emergency sweeps, the City may provide or contract for such emergency sweeps. In this event, the Contractor shall be responsible to reimburse the City for the emergency sweep and shall reimburse the City for all additional costs incurred therein within five (5) business days of the posting date of an itemized invoice sent by the City to the Contractor.

(6) Performance of Street Sweeps.

a. The Contractor shall not be required to sweep those portions of streets blocked by parked vehicles.

b. All street sweeps shall be performed to comply with the provisions of City Ordinance (Sound Levels and Noise) and all subsequent amendments.

c. The Contractor shall designate a representative to be available to direct all of Contractor's operations under this agreement. The representative shall report any problems to the Street/Sewer/Storm Manager. The representative of the Contractor under this paragraph is hereby designated as Daniel F. Dodson. The Contractor shall immediately notify the City in writing of any change in the representative.

d. The Contractor shall perform all street sweeping services under this agreement in a timely and workmanship-like manner and shall follow the schedule agreed to with the City. Mechanical Sweepers shall be driven at a speed between 4 and 7 MPH during sweeping operations to assure all debris is picked up.

e. In the event the City determines that a street section has been improperly swept, the City shall request by telephone or email, that the area be re-swept. The Contractor shall perform the re-sweep within one (1) day of the request by the City, at no additional compensation. In the event the re-sweep is not performed or is improperly performed as determined by the City, the City at its option, may perform the re-sweep and charge the Contractor for the cost of this service or make a deduction from its compensation to the Contractor for the full amount.

f. The Contractor will be responsible for sweeping and removal of all debris in the roadway including sticks, rocks, leaves and all other debris left in the street behind the sweeper. The sweeper shall avoid tracking mud during operation. The disposal of this debris shall be paid by the City at the said cubic yard cost as noted on page 19 of the Personal Services Agreement.

g. A high efficiency vacuum and/ or a regenerative air sweeper shall be used on all mechanical street sweepers performing under this agreement as the Primary and Secondary sweeper units. High efficiency sweepers shall be certified, filter air particulates down to a diameter of 3 microns, and be capable of removing at least 80% of accumulated street dirt with a diameter of less than 250 microns. Sweeper must be equipped with an independent recording device that records speed while sweeping (broom activated, pickup head down, blower on), miles swept, and hours swept. Operator supplied data will not be accepted under the terms of this Agreement.

h. The Contractor must provide a truck or drop boxes with a minimum capacity of 10 cubic yards at locations designated by the City.

i. Hours of operation on residential and minor collector streets shall be between the hours of 7:00 a.m. and 5:00 p.m. Monday through Friday. Hours of operation on main arterials shall comply with the City of Tualatin Public Works Construction Code section 302.2.00. Hours of operation in City Parking Lots shall be during non-usage hours. The City reserves the right to modify as needed.

B. Street Sweeping Equipment

(1) Contractor to Provide Necessary Equipment. The Contractor shall provide all necessary equipment, fuel, spare parts, and maintenance as required for the performance of this agreement. The Contractor shall keep a sufficient supply of spare brooms and other parts on hand in order to provide timely and continuous performance of this agreement.

(2) Designation of Street Sweeping Equipment. The Contractor shall designate the street sweepers intended for use in the performance of this agreement. Such street sweepers shall be designated as either primary or secondary street sweepers and shall be identified by serial numbers or other identification. Primary street sweepers shall not be more than 3 years old and Secondary street sweepers shall not be more than 6 years old. High efficiency and/or regenerative air sweepers are required as the primary and secondary sweepers for conformance with the City and Clean Water Services Storm Water Management Program and mechanical sweepers for occasional rock spills, road sand, leaves, and heavy debris. Generative air sweepers shall have no less than 17,800 lb. gross vehicle weight.

(3) Specifications for Street Sweeping Equipment.

a. Street sweeping equipment shall be capable of dumping directly into trucks or drop boxes provided by the Contractor at locations designated by the City. The Contractors shall utilize these locations to minimize sweeper travel time.

b. Wet vacuum type street sweepers shall be equipped with an efficient water spray system capable of controlling dust and the spray system shall be maintained in good operating condition. Dust clouds will not be acceptable. The Contractor shall be required to purchase a City Water Usage Permit.

c. Street sweeping equipment operated on public streets shall be properly registered and licensed in accordance with applicable statutes and rules of the State of Oregon.

d. Street sweeping equipment shall be kept in proper working order at all times and the cost of maintenance repairs shall not be charged to the City. If a sweeper becomes inoperable, the Secondary sweeper must be immediately available.

e. Street sweepers shall have a minimum useable capacity of three (3) cubic yards.

f. Street sweepers shall be self-propelled, equipped with dual gutter brooms and be capable of sweeping a nine (9) foot path.

g. High efficiency vacuum and or a regenerative air sweeper shall be used on all street sweepers performing under this agreement as the Primary and Secondary sweeper unit. High efficiency sweepers shall be certified, filter air

particulates down to a diameter of 3 microns, and be capable of removing at least 80% of accumulated street dirt with a diameter of less than 250 microns. Sweeper must also be equipped with an independent recording device that records speed while sweeping (broom activated, pickup head down, blower on, miles swept, and hours swept). Operator supplied data will not be accepted under the terms of this Agreement.

h. The Contractor must provide a truck or drop boxes with a minimum capacity of 10 cubic yards at locations designated by the City. The truck or dump box must be emptied in a timely manner so as not to interfere with sweeper production. Debris shall not be dumped on the ground. Drop boxes shall be removed within one (1) working day from zone completion.

I. Contractor shall dispose of debris by methods approved by DEQ, Clean Water Services and the City. The Contractor shall comply with all Federal, State, County and Local laws.

(4) Contractor Responsible for Damages. All damages sustained to street sweeping equipment due to the performance of this agreement shall be the sole responsibility of the Contractor.

(5) Equipment Breakdown. At no time shall the Contractor be unable to perform scheduled sweeps due to the lack of parts. The secondary machine must be available. If equipment failure or breakdown occurs and such failure or breakdown prevents the Contractor from performing scheduled, non-emergency or emergency sweeps over a Twenty-four hour period, the City may authorize the performance of such street sweeps as necessary. The Contractor shall reimburse the City for the cost thereof within five (5) business days of the post date of an itemized invoice sent by the City to the Contractor.

PART 4

PROPOSAL CONTENT

Proposals must contain and include all information and documentation listed below:

A. Provide one (1) unbound original proposal and five (5) copies of the proposal to the City. The proposal shall not be more than twenty (20) pages single sided printing, or ten (10) pages double sided printing in length, exclusive of the following:

- A one page cover letter
- Executive Summary
- Contractor background information
- Resumes of team members and personnel references
- Timeline spread sheet
- Fee estimate spread sheet

B. List Contractor size and years in business

C. Status as a "Resident" or "Non-Resident" bidder under ORS 279A.120 (Required form included as "Attachment B.")

D. Documentation of independent contractor status, (i.e., tax ID number, evidence of incorporation, legal status of entity providing service).

E. Completed Non-Discrimination Form: The successful submitting Contractor or Contractor agrees that, in performing the work called for by this proposal, and in securing and supplying materials, Contractor will not discriminate against any person based on race, color, religious creed, political ideas, sex, age, marital status, physical or mental handicap. The submitting Contractor must certify on the appropriate form that they have not and will not discriminate against a subcontractor or the awarding of a subcontract because the subcontractor is a minority, women, or SBE certified under ORS 200.055. (Required form included as "Attachment C.")

F. The submitting Contractor must include an Executive Summary of relevant background information and a statement indicating that the Contractor has the ability to complete the described project in a successful manner.

G. Provide a proposal section that describes the submitting Contractor's or contractor's

H. Understanding of the scope of services sought.

I. Submit an estimate of billable hours to provide scheduled sweepings.

J. Demonstrate that the contractor and team have experience in providing street sweeping services.

K. List three references, preferably within the State of Oregon and preferably in the Portland Metro area, which can attest to the quality and variety of services provided by your firm. Include a contact name and telephone number with each reference.

L. Describe your Contractor's pending work schedule and impacts of availability on your Contractor's ability to work on the project following the notice of award.

M. If any sub-Contractors are proposed, provide a list of tasks, the names, responsibilities, and qualifications of those sub-Contractors.

N. Present an "Hourly Rate" fee proposal and total hours estimated to provide the street sweeping services as defined by the City's current sweeping schedule.

PART 5

EVALUATION OF PROPOSALS

The City will make a competitive based selection, with all scores based on the evaluation criteria listed below. If the City conducts interviews, then the City will use a combination of interview scores and evaluation criteria scores to make a selection. The City will establish a committee (the "Evaluation Committee") of at least three individuals to review, score, and rank proposals according to the criteria set forth below.

Evaluation Criteria

A. ***Qualifications of the Contractor:*** The Evaluation Committee will score the proposing Contractor's qualifications relating specifically to their ability to complete satisfactorily the scope of services outlined in the Scope of Work. (Maximum Score is 20 Points)

B. ***Contractor Qualifications and Demonstrated Accomplishments:*** The Evaluation Committee will score the demonstrated accomplishments of the proposing Contractor in the areas identified by the Scope of Work. (Maximum Score is 15 Points)

C. ***Demonstrated Project Understanding:*** The Evaluation Committee will score the proposing Contractor's demonstrated understanding of the scope of services sought. (Maximum Score is 15 Points)

D. ***Organization and Staffing of Proposing Contractor:*** The proposing Contractor must demonstrate the availability of adequate staff to perform the street sweeping tasks within the allotted time schedule. The Contractor must provide a clear description of supervision and quality control measures implemented in the execution of a service contract. Experience of management staff and operators will be the distinguishing criteria assessed. (Maximum Score is 15 Points)

E. ***Evaluation of Fee Schedule:*** The Evaluation Committee will score the proposing Contractor's fee schedule based on the reasonableness of the fees in relation to existing City sweeping schedule. Additionally, scoring shall also take into consideration of any fee structure or scheduling changes proposed to the current City schedule that may contribute to the "best value" for the City. (Maximum Score is 35 Points)

The Evaluation Committee will rank each Contractor based on the sum of points awarded. The evaluation committee will base points awarded solely on the Evaluation Criteria. A maximum total score of 100 points is possible. The Evaluation Committee will establish a short list of no more than three Contractors following the proposal evaluation and ranking process to enter into negotiations with the street sweeping contract.

PART 6

SELECTION PROCESS

The City shall use the following selection process:

A. Following the ranking of submitted proposal information, the Street/Sewer/Storm Manager or their designee will join at least two members of the Evaluation Committee and become the "Selection Committee."

B. The Selection Committee, at its sole discretion, may choose to interview short-listed Contractors prior to making their final recommendation.

C. The Selection Committee shall engage in negotiations whose objective shall be obtaining written agreement on:

- Contractor's performance obligations and performance schedule
- Compensation to the Contractor for services outlined in the Scope of Work
- The City will make its own determination concerning the fairness and reasonability of the fee proposed by the Contractor

D. If negotiations with the highest-ranking proposer fail to proceed to agreement on Contract terms, the Selection Committee will formally terminate negotiations with that candidate, and begin negotiations with the second highest scoring Contractor.

E. The City will give the Notice of Intent to Award.

F. The Selection Committee will submit its final recommendation to the City Council for formal approval.

G. The City Council will award the contract.

H. The City and the Contractor will enter into an agreement for the work.

PART 7

SUBMITTAL REQUIREMENTS

The City must receive proposals no later than **2:00 p.m. on September 6, 2013**. The City ***will return*** proposals received after this deadline, unopened, to the proposer. The City ***will not*** accept faxed or emailed proposals.

A. Proposal: The proposer will deliver an unbound original and five complete copies of the Proposal to the following address:

City of Tualatin – Operations
10699 SW Herman Road
Tualatin, Oregon 97062

B. Cover Letter: A Cover Letter shall accompany the proposal and it shall state that the proposer accepts all terms and conditions contained in the Request for Proposals and the sample Professional Services Contract (attached). A legal representative of the proposer, authorized to bind the Contractor in contractual matters, must sign the cover letter.

C. Direct all correspondence pertaining to this RFP to:

Stacy Zabransky
szabansky@ci.tualatin.or.us
503-691-3091
City of Tualatin - Operations Department

Any questions pertaining to Scope of Work shall be directed to:

Bert Olheiser, Street/Sewer/Storm Manager
bolheiser@ci.tualatin.or.us
503-691-3096
City of Tualatin - Operations Department

PART 8

OTHER REQUIREMENTS

A. Proposal Acceptance:

- Proposal shall be legally binding as an offer for a period of 60 days after the closing date. If the City has not accepted a submitting Contractor's proposal within sixty-(60) days from the RFP closing date, then the Contractor may withdraw its proposal. The contents of the Proposal will become a contractual obligation upon acceptance by the City.

B. *Public Records:*

- All Proposals shall become the property of the City and are public records unless otherwise specified. A bid that contains any information considered a trade secret under ORS 192.501(2) shall be segregated and clearly identified as such. This information shall not be disclosed except in accordance with the Oregon Public Records Law, ORS 192.

C. Clarification of Proposals

- The City reserves the right to obtain clarification of any point in a Contractor's proposal or to obtain additional information necessary to properly evaluate a particular proposal. Failure of a Proposer to respond to such a request for additional information or clarification could result in rejection of the Contractor's proposal.

D. Form of Agreement

- A copy of the standard Personal Service Agreement, which the City expects the successful Contractor or individual to execute, is included as "Attachment A." The agreement will incorporate the terms and conditions from this RFP document and the submitted proposal.

E. Proposal Rejection

- The City reserves the right:
    - To reject any or all proposals not in compliance with all public procedures and requirements:
    - To reject any proposal not meeting the specifications set forth herein:
    - To waive any or all irregularities in proposals submitted;
    - To reject all proposals:
    - To award any or all parts of any proposal; and
    - To request references and other data to determine responsiveness

F. Protest Process

- Protests to this RFP must be in writing and must be submitted in the form and manner prescribed by the Oregon Attorney General's Public Contracting Rules and the City of Tualatin Public Contracting Rules.

ATTACHMENT “A”
PERSONAL SERVICES AGREEMENT

CITY OF TUALATIN
PERSONAL SERVICES AGREEMENT

THIS AGREEMENT is entered by and between the City of Tualatin, a municipal corporation of the State of Oregon ("City"), and Great Western Sweeping, Inc. (“Provider").

Section 1. Agreement Documents. The Contract Documents, which together form the complete Contract between the parties, consist of the following documents in descending order of precedence. To the extent there is any conflict between the documents, the conflict is resolved by the order of precedence of the document. There are no Agreement Documents other than those listed: (i) this Agreement including price proposal; (ii) any documents specifically referenced in this Agreement; and (iii) the attached Scope of Work/Proposal; and Tualatin Public Works Standards.

Section 2. Work. Provider shall complete all Work that is generally described as set forth in Attachment A, which is incorporated into this Agreement as if fully set forth in Exhibit “A”. All Work shall be performed by qualified personnel and other professionals that are properly licensed under the laws of the State of Oregon. Provider shall be solely responsible for all Work under this Agreement, including all services, labor, materials and supplies, documents, permits and other requirements to complete the Work, whether produced by Provider or any of Provider’s subcontractors or contractors, except for those items identified as the responsibility of the City.

Section 3. Effective Date. The effective date of this Agreement is the date both Parties sign this Agreement ("Effective Date"). If the parties sign on separate dates, the latter date shall be the Effective Date.

Section 4. Standard of Care. Provider shall use that degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession. Provider will reimburse City for all costs if performance fails to meet this standard.

Section 5. Duty to Inform. If during the performance of this Agreement or in the future, Provider becomes aware of actual or potential problems, faults, or defects in the project, any nonconformance with the federal, state or local law, rule, or regulation, or has any objection to a decision or order made by City with respect to such laws, rules, or regulations, Provider shall give prompt written notice to City's Project Manager. Delay or failure by City to provide a written response to Provider shall not constitute agreement with, nor acquiescence to, Provider's statement or claim, nor constitute a waiver of City's rights.

Section 6. Independent Contractor; Responsibility for Taxes and Withholding

A. Provider shall perform all Work as an independent Contractor. The City reserves the right (i) to determine and modify the delivery schedule for the Work and (ii) to evaluate the quality of the Work Product, however, the City may not and will not control the means or manner of Provider's performance. Provider is responsible for determining the appropriate means and manner of performing the Work.

B. Provider understands and agrees that Provider is not an "officer", "employee", or "agent" of the City, as those terms are used in ORS 30.265.

C. Provider shall be responsible for all federal or state taxes applicable to compensation or payments paid to Provider under this Agreement and, unless Provider is subject to backup withholding, City will not withhold from such compensation or payments any amount(s) to cover Provider's federal or state tax obligations. Provider is not eligible for any social security, unemployment insurance or workers' compensation benefits from City under this Agreement. Provider is not entitled to, and expressly waives all claims to City benefits, including but not limited to health and disability insurance, paid leave, and retirement.

Section 7. Subcontracting.

A. Provider's services are unique and as such, shall not enter into any subcontracts for any of the Work required by this Agreement without City's prior written consent.

B. If City permits a subcontract as set forth in subsection A, Provider shall not be relieved of any of its duties or obligations under this Agreement.

C. All subcontracts for services shall be issued under written agreements that include all provisions required under Oregon Public Contracting law and substantially similar to the City’s Standard Agreement provisions.

Provider shall provide City a copy of all Agreements with subcontractors who are performing work under this Agreement, upon request by City.

Section 8. Ownership of Intellectual Property.

A. Definitions. As used in this Section 8, and elsewhere in this Agreement, the following terms have the meanings set forth below:

(i) "Provider Intellectual Property" means any intellectual property owned by Provider and developed independently from the Work.

(ii) "Third Party Intellectual Property" means any intellectual property owned by parties other than City or Provider.

(iii) "Work Product" means every invention, discovery, work of authorship, trade secret or other tangible or intangible item and all intellectual property rights therein that Provider is required to deliver to City pursuant to the Work.

B. Original Works. All Work Product created by Provider pursuant to the Work, including derivative works and compilations, and whether or not such Work Product is considered a work made for hire or an employment to invent, shall be the exclusive property of City. City and Provider agree that such original works of authorship are "work made for hire" of which City is the author within the meaning of the United States Copyright Act. If for any reason the original Work Product created pursuant to the Work is not "work made for hire," Provider hereby irrevocably assigns to City any and all of its rights, title, and interest in all original Work Product created pursuant to the Work, whether arising from copyright, patent, trademark, trade secret, or any other state or federal intellectual property law or doctrine. Upon City's reasonable request, Provider shall execute such further documents and instruments necessary to fully vest such rights in City. Provider forever waives any and all rights relating to original Work Product created pursuant to the Work, including without limitation, any and all rights arising under 17 USC §106A or any other rights of identification of authorship or rights of approval, restriction or limitation on use or subsequent modifications. In the event that Work Product created by Provider under this Agreement is a derivative work based on Provider Intellectual Property, or is a compilation that includes Provider Intellectual Property, Provider hereby grants to City an irrevocable, non exclusive, perpetual, royalty free license to use, reproduce, prepare derivative works based upon, distribute copies of, perform and display the pre existing elements of the Provider Intellectual Property employed in the Work Product, and to authorize others to do the same on City's behalf. In the event that Work Product created by Provider under this Agreement is a derivative work based on Third Party Intellectual Property, or is a compilation that includes Third Party Intellectual Property, Provider shall secure on the City's behalf and in the name of the City an irrevocable, non exclusive, perpetual, royalty free license to use, reproduce, prepare derivative works based upon, distribute copies of, perform and display the pre existing elements of the Third Party Intellectual Property employed in the Work Product, and to authorize others to do the same on City's behalf.

C. Provider Intellectual Property. In the event that Work Product is Provider Intellectual Property Provider hereby grants to City an irrevocable, nonexclusive, perpetual, royalty free license to use, reproduce, prepare derivative works based upon, distribute copies of, perform and display the Provider Intellectual Property, and to authorize others to do the same on City's behalf.

D. Third Party Works. In the event that Work Product is Third Party Intellectual Property, Provider shall secure on the City's behalf and in the name of the City, an irrevocable, non exclusive, perpetual, royalty free license to use, reproduce, prepare derivative works based upon, distribute copies of, perform and display the Third Party Intellectual Property, and to authorize others to do the same on City's behalf.

Section 9. Price; Payment Process.

A. Agreement Price. City agrees to pay Provider the hourly rate and the cubic yard rate stated within this agreement, which is inclusive of all hours necessary to complete the Work, but in no event shall City pay provider above the not to exceed amount. For the first year of the Agreement, the not to exceed amount is $190,000. The not to exceed amounts for the second and third year of the Agreement shall be as specified by the City in writing to Provider. City certifies that it has sufficient funds currently authorized for expenditure to finance the costs of the first year of this Agreement. Thereafter, all funds are subject to City Council budgetary appropriation.

B. Payment Process. Provider shall furnish City an invoice for services on a monthly basis. The invoice shall contain an itemized statement showing the work completed by Provider. City will pay Provider for services invoiced within 30 days of receiving an itemized invoice ("net thirty"), unless City's disputes the invoice, in which case City will only pay for those services not in dispute. Any invoice received more than ninety (90) days after final payment is made or contract terminated may be considered null and void by the City and Provider shall have no right to payment for the invoiced amount.

Section 10. Notice to Parties. Except as otherwise expressly provided in this Agreement, any communications between the parties hereto or notices to be given hereunder shall be given in writing by personal delivery, mail, facsimile, or email.

A. Notice by Personal Delivery. Any communication or notice given by personal delivery shall be effective when actually delivered.

B. Notice by Mail. Notice given by mail shall be by postage prepaid, to Provider or City at the address, set forth herein, or to such other addresses or numbers as either party may indicate. Any communication or notice so addressed and mailed shall be effective five (5) days after mailing.

C. Notice by Facsimile. Any communication or notice delivered by facsimile shall be effective on the day the transmitting machine generates a receipt of the successful transmission, if transmission was during normal business hours, or on the next business day, if transmission was outside normal business hours of the recipient. To be effective against City, any notice transmitted by facsimile must be confirmed by telephone notice to City's Agreement Administrator.

D. Notice by Email. Any communication or notice given by email shall be effective upon the sender's receipt of confirmation generated by the recipient's email system that the notice has been received by the recipient's email system.

E. Notice to Project Manager. Unless otherwise notified in writing as set forth above, notices shall be given to the Project Managers. If a Party's Project Manager is changed, notification of the change shall be promptly made in writing to the other party. If a party receives a communication from the other party not executed by the Project Manager, the party may request clarification by the other party's Project Manager, which shall be promptly furnished.

1. **Bert Olheiser, Street/Sewer/Storm Manager**
   18880 SW Martinazzi Avenue
   Tualatin, Oregon 97062
   503-691-3096 Office, 503-692-2024 fax
   bolheiser@ci.tualatin.or.us

2. **Daniel F. Dodson, Owner**
   Great Western Sweeping, Inc.
   PO Box 926
   14450 SW Tualatin Sherwood Road
   Sherwood, OR 97140
   503-625-0596 Office, 503-625-0672 Fax

Section 11. Assignment of Agreement. No assignment of any rights, duties, responsibilities, or interests in the Agreement will be binding on the other party without the written consent of the party sought to be bound. No assignment will release or discharge the assignor from any duty or responsibility under the Agreement Documents.

Section 12. Successors and Assigns. The provisions of this Agreement shall be binding upon and inure to the benefit of the parties, their respective successors, and permitted assigns.

Section 13. Severability. If any term or provision of this Agreements is declared by a court of competent jurisdiction to be illegal or in conflict with any law, the validity of the remaining terms and provisions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if the Agreement did not contain the particular term or provision held to be invalid.

Section 14. Merger Clause; Waiver. This Agreement and attached exhibits constitute the entire agreement between the parties on the subject matter hereof. There are no understandings, agreements, or representations, oral or written, not specified herein regarding this Agreement. No waiver, consent, modification or change of terms of this Agreement shall bind the parties unless in writing and signed by both parties and all necessary City approvals have been obtained. Any waiver, consent, modification or change, if made, shall be effective only in the specific instance and for the specific purpose given.

Section 15. Records Maintenance; Access. Provider shall maintain all financial records relating to this Agreement in accordance with generally accepted accounting principles. In addition, Provider shall maintain any other records pertinent to this Agreement in such a manner as to clearly document Provider's performance. Provider acknowledges and agrees that City, the State of Oregon, and the federal government and their duly authorized representatives shall have access to such records and other books, documents, papers, plans, records of shipments and payments and writings of Provider that are pertinent to this Agreement, whether in paper, electronic or other form, to perform examinations and audits and make excerpts and transcripts. Provider shall retain and keep accessible all such financial records, books, documents, papers, plans, records of shipments and payments and writings for a minimum of three (3) years, or such longer period as may be required by applicable law, following final payment and termination of this Agreement, or until the conclusion of any audit, controversy or litigation arising out of or related to this Agreement, whichever date is later.

Section 16. No Third-Party Beneficiaries. There are no intended third-party beneficiaries to this Agreement. Provider and the City are the only parties to this Agreement and are intended to be the only entities entitled to exercise and enforce the rights and obligations created by this Agreement.

Section 17. Nondiscrimination; Compliance with Applicable Law. Provider agrees that no person shall, on the grounds of race, color, religion, sex, marital status, familial status, domestic partnership, national origin, age, mental or physical disability, sexual orientation, gender identity, source of income, or veteran status suffer discrimination in the performance of this Agreement. Provider shall comply with all federal, state and local laws, regulations, executive orders and ordinances applicable to the Work under this Agreement.

Section 18. Registered in Oregon and City of Tualatin. If Provider is not domiciled in or registered to do business in the State of Oregon, Provider shall promptly provide to the Oregon Department of Revenue and the Secretary of State Corporation Division all information required by those agencies relative to this Agreement. Provider shall demonstrate its legal capacity to perform the Work under this Agreement in the State of Oregon prior to entering into this Agreement. Provider shall have or acquire a City business license prior to executing this Agreement.

Section 19. Use of Recycled Products. Provider shall, to the maximum extent economically feasible in the performance of this Agreement, use recycled paper (as defined in ORS 279A.010(1)(ee)), recycled PETE products (as defined in ORS 279A.010(1)(ff)), and other recycled products (as "recycled product" is defined in ORS 279A.010(1)(gg)).

Section 20. Force Majeure. Neither City nor Provider shall be held responsible for delay or default caused by fire, riot, acts of God, terrorist acts, or other acts of political sabotage, or war where such cause was beyond the reasonable control of City or Provider, respectively. Provider shall, however, make all reasonable efforts to remove or eliminate such a cause of delay or default and shall, upon the cessation of the cause, diligently pursue performance of its obligations under this Agreement.

Section 21. Survival. All rights and obligations of the parties shall cease upon termination or expiration of this Agreement, except for the rights and obligations of a party for payment of completed Work, indemnity, dispute resolution, maintenance of insurance, and those provisions, including, but not limited to, provisions concerning property rights and governing laws which, by their nature, must survive termination to accomplish the intent of the parties as expressed in this Agreement.

Section 22. Joint and Several Liability. In the event Provider includes more than one person or entity, all such persons or entities shall be jointly and severally liable for all conditions herein.

Section 23. Indemnification.

A. General indemnity. Provider shall defend, save, hold harmless, and indemnify the City, its officers, employees and agents from and against all claims, suits, actions, losses, damages, liabilities, costs and expenses of any nature whatsoever, including attorneys fees, resulting from, arising out of, or relating to the acts or omissions of Provider or its officers, employees, subcontractors, or agents.

B. Indemnity for infringement claims. Without limiting the general indemnity, Provider expressly agrees to defend, indemnify, and hold City, its officers, employees, and agents ,harmless from any and all claims, suits, actions, losses, liabilities, costs, expenses, including attorneys fees, and damages arising out of or related to any claims that the work, the work product or any other tangible or intangible items delivered to the City by Provider that may be the subject of protection under any state or federal intellectual property law or doctrine, or the City's use thereof, infringes any patent, copyright, trade secret, trademark, trade dress, mask work, utility design, or other proprietary right of any third party; provided, that city shall provide Provider with prompt written notice of any infringement claim.

C. Control of defense and settlement. Provider shall have control of the defense and settlement of any claim that is subject to indemnity; however, neither Provider nor any attorney engaged by Provider shall defend the claim in the name of the City, nor purport to act as legal representative of the City or any of its officers, employees, or agents, without first receiving from the City, in a form and manner determined appropriate by the City, authority to act as legal counsel for the City, nor shall Provider settle any claim on behalf of the City without the approval of the City. The City may, at its election and expense, assume its own defense and settlement in the event that the City determines that Provider is prohibited from defending the City, or is not adequately defending the City's interests, or that an important governmental principle is at issue and the City desires to assume its own defense.

Section 24. Insurance. Provider shall provide City a copy of each insurance policy, issued by a company currently licensed in the State of Oregon and certified as a true copy by an authorized representative of the issuing company or a certificate in a form satisfactory to City certifying to the issuance of such insurance. All policies shall provide for not less than 30 days' prior written notice to City before they may be revised, non-renewed, canceled, or coverage reduced. All policies shall provide an endorsement naming the City, its officers, employees, and agents as additional insureds.

A. Automobile. Comprehensive automobile and vehicle liability insurance covering claims for injuries to members of the public and/or damages to property of others arising from the use of motor vehicles, including on-site and off-site operations, and owned, non-owned, or hired vehicles, with $2,000,000 combined single limits.

B. General. Commercial general liability insurance covering claims for injuries to members of the public or damage to property of others arising out of any act or omission of Provider or of any of its employers, agents, or subcontractors, with $2,000,000 per occurrence and in the aggregate.

C. Primary. Coverage provided by the policy(ies) shall be primary and any other insurance carried by City is excess. Provider shall be responsible for any deductible amounts payable under all policies of insurance.

D. Workers Compensation. Provider, its subcontractors, if any, and all employers working under this Agreement are subject employers under the Oregon Worker's Compensation Law and shall comply with ORS 656.017.

Section 25. Execution of Agreement. This Agreement may be executed in one or more counterparts, all of which when taken together shall constitute one agreement binding on all parties, notwithstanding that all parties are not signatories to the same counterpart. Each copy of the Agreement so executed shall constitute an original.

Section 26. Governing Law; Venue; Consent to Jurisdiction.

A. This Agreement shall be governed by and construed in accordance with the laws of the State of Oregon without regard to principles of conflicts of law. This Agreement shall not be construed against either party regardless of which party drafted it. Other than as modified by this Agreement, the applicable rules of Agreement construction and evidence shall apply. In any litigation, the entire text of any order or permit issued by a governmental or regulatory authority, as well as any documents referenced or incorporated therein by reference, shall be admissible for the purpose of Agreement interpretation.

B. Any claim, action, suit or proceeding (collectively, "Claim") between City and Provider that arises from or relates to this Agreement shall be brought and conducted solely and exclusively within the Circuit Court of Washington County for the State of Oregon; provided, however, if a Claim must be brought in a federal forum, then it shall be brought and conducted solely and exclusively within the United States District Court for the District of Oregon. In no event shall this section be construed as a waiver of any form of defense or immunity from any Claim or from the jurisdiction of any court.

Section 27. Public Contracting Requirements. Provider shall comply with the provisions of ORS 279A.110; ORS 279B.220, 279B.225, 279B.230, 279B.235 and 279B.270 which are incorporated by reference herein. City's performance under the Agreement is conditioned upon Provider's compliance.

Section 28. Default; Remedies; Termination.

A. Default by Provider. Provider shall be in default under this Agreement if:

(i) Provider institutes or has instituted against it insolvency, receivership or bankruptcy proceedings, makes an assignment for the benefit of creditors, or ceases doing business on a regular basis; or

(ii) Provider no longer holds a license or certificate that is required for Provider to perform its obligations under the Agreement and Provider has not obtained such license or certificate within fourteen (14) calendar days after City's notice or such longer period as City may specify in such notice; or

(iii) Provider commits any material breach or default of any covenant, warranty, obligation or agreement under this Agreement, fails to perform the Work under this Agreement within the time specified herein or any extension thereof, or so fails to pursue the Work as to endanger Provider's performance under this Agreement in accordance with its terms, and such breach, default or failure is not cured within fourteen (14) calendar days after City's notice, or such longer period as City may specify in such notice.

B. City's Remedies for Provider's Default. In the event Provider is in default , City may, at its option, pursue any or all of the remedies available to it under this Agreement and at law or in equity, including, but not limited to:

(i) termination of this Agreement;

(ii) withholding all monies due for Work and Work Products that Provider has failed to deliver within any scheduled completion dates or has performed inadequately or defectively;

(iii) initiation of an action or proceeding for damages, specific performance, or declaratory or injunctive relief; and

(iv) exercise of its right of setoff.

These remedies are cumulative to the extent the remedies are not inconsistent, and City may pursue any remedy or remedies singly, collectively, successively or in any order whatsoever. If a court determines that Provider was not in default, then Provider shall be entitled to the same remedies as if this Agreement was terminated.

C. Default by City. City shall be in default under this Agreement if:

(i) City fails to pay Provider any amount pursuant to the terms of this Agreement, and City fails to cure such failure within thirty (30) calendar days after Provider's notice or such longer period as Provider may specify in such notice; or

(ii) City commits any material breach or default of any covenant, warranty, or obligation under this Agreement, and such breach or default is not cured within thirty (30) calendar days after Provider's notice or such longer period as Provider may specify in such notice.

D. Provider's Remedies for City's Default. In the event City terminates the Agreement, or in the event City is in default and whether or not Provider elects to exercise its right to terminate the Agreement, Provider's sole monetary remedy shall be:

(i) with respect to services compensable on an hourly basis, a claim for unpaid invoices, hours worked within any limits set forth in this Agreement but not yet billed, authorized expenses incurred and interest of two-thirds of one percent per month, but not more than eight percent per annum; and

(ii) with respect to deliverable based Work, a claim for the sum designated for completing the deliverable multiplied by the percentage of Work completed and accepted by City, less previous amounts paid and any claim(s) that City has against Provider. In no event shall City be liable to Provider for any expenses related to termination of this Agreement or for anticipated profits. If previous amounts paid to Provider exceed the

amount due to Provider under this subsection, Provider shall pay immediately any excess to City upon written demand provided.

E. Mutual Termination. City and Provider may terminate this Contract by mutual written consent at any time.

F. Termination By City. At its sole discretion, City may terminate this Agreement:

(i) For any reason upon thirty (30) days' prior written notice by City to Provider;

(ii) Immediately upon written notice if City fails to receive funding, appropriations, limitations, allotments or other expenditure authority at levels sufficient to pay for the Work or Work Products; or

(iii) Immediately upon written notice if federal or state laws, regulations, or guidelines are modified or interpreted in such a way that the City's purchase of the Work or Work Products under this Agreement is prohibited or City is prohibited from paying for such Work or Work Products from the planned funding source.

(iv) Immediately upon written notice by City to Provider, or at such later date as City may establish in such notice, upon the occurrence of Default by Provider.

G. Termination By Provider. Provider may terminate this Agreement with such written notice to City upon the occurrence of the following events:

(i) City is in default because City fails to pay Provider any amount pursuant to the terms of this Agreement, and City fails to cure such failure within thirty (30) calendar days after Provider's notice of the failure to pay or such longer period as Provider may specify in such notice; or

(ii) City is in default because City commits any material breach or default of any covenant, warranty, or obligation under this Agreement, fails to perform its commitments hereunder within the time specified or any extension thereof, and City fails to cure such failure within thirty (30) calendar days after Provider's notice or such longer period as Provider may specify in such notice.

H. Return of Property Upon Termination. Upon termination of this Agreement for any reason whatsoever, Provider shall immediately deliver to City all of City's property (including without limitation any Work or Work Products for which City has made payment in whole or in part) that is in the possession or under the control of Provider in whatever stage of development and form of recordation such City property is expressed or embodied at that time. Upon receiving a notice of termination of this Agreement, Provider shall immediately cease all activities under this Agreement, unless City expressly directs otherwise in such notice of termination. Upon City's request, Provider shall surrender to anyone City designates, all documents, research or objects or other tangible things needed to complete the Work and the Work Products.

Section 29. Dispute Resolution. The Parties shall exercise good faith and due diligence to resolve any disputes that may arise between them. The Parties will work amicably to resolve disputes. If a dispute cannot be resolved, the Parties shall submit the matter to mediation. The mediator shall be chosen by mutual agreement. If a mediator cannot be agreed upon, the Parties agree to present the dispute to a mediator selected by the Presiding Judge of Washington County Circuit Court. The mediation fee shall be borne equally by the Parties. If the dispute cannot be resolved through discussion, negotiation or mediation, either Party may pursue resolution by litigation, as provided the jurisdictional provision of this Agreement.

Section 30. Attorney Fees. If any suit, action, arbitration or other proceeding is instituted upon this Agreement or to enforce any rights herein or otherwise pursue, defend or litigate issues related to this Agreement, each party shall be liable for their own attorneys' fee and costs, including those on appeal. The parties each agree and hereby waive any right to attorney fees granted by statute or rule that conflicts with this provision.

Section 31. Public Records Law. Provider acknowledges that any disclosures Provider makes to City under this Contract are subject to application of the Oregon Public Records Law, including but not limited to ORS 192.410-192.505, the provisions for the Custody and Maintenance of Public Records. The non-disclosure of documents or of any portion of a document submitted by Provider to City may depend upon official or judicial determinations made pursuant to the foregoing laws. Provider will be notified prior to City's release of documents. Provider shall be exclusively responsible for defending Provider's position concerning the confidentiality of the requested documents, at its own expense.

Section 32. Confidentiality and Protection of Personal Information. Provider acknowledges that some of the material and information that may come into its possession or knowledge in connection with this Agreement or its performance may consist of information that is exempt from disclosure to the public under Oregon's Public Records Laws, the Oregon Consumer Identity Theft Protection Act, ORS 646A.600- 646A.628, or other state or Federal statutes. Provider agrees to hold such information in strictest confidence and not to make use of such information for any purpose other than the performance of this Agreement, to release it only to authorized employees or subcontractors requiring such information for the purposes of carrying out this Agreement, and not to release, divulge, publish, transfer, sell, disclose, or otherwise make the information known to any other party without City's express written consent or as provided by law.

PROVIDER, BY EXECUTION OF THIS AGREEMENT, HEREBY ACKNOWLEDGES THAT PROVIDER HAS READ THIS AGREEMENT, UNDERSTANDS IT, AND AGREES TO BE BOUND BY ITS TERMS AND CONDITIONS.

APPROVED AND ENTERED this 23rd day of September, 2013.

Great Western Sweeping, Inc.
PROVIDER

By _____

Title _____

_____
Provider's Federal ID Number or
Social Security Number

CITY OF TUALATIN

By_____
Sherilyn Lombos,
City Manager

APPROVED AS TO LEGAL FORM

_____
City Attorney

STREET SWEEPING PRICE PROPOSALS

The following price rates are effective through the terms and conditions outlined in this Agreement.

Description	Price Proposal
Scheduled, non scheduled and emergency sweeps ***Price to be inclusive of all sweeping***	$ 115.00 Hourly Rate
Hauling and disposal of all sweeper debris	$ 24.00 Cubic Yard

BIDDER/PROPOSER RESIDENCY STATEMENT

Pursuant to ORS 279A.120, Oregon's Reciprocal Preference Law, public contracting agencies shall, for the purposes of determining the lowest responsible bidder/proposer and the awarding of a contract, add a percent increase on the bid of a non-resident bidder/proposer equal to the percent, if any, of the preference given to that bidder/proposer in the state in which the bidder/proposer resides.

As defined in ORS 279A.120, "Resident Bidder/proposer" means a bidder/proposer that has paid unemployment taxes or income taxes in this state in the twelve calendar months immediately preceding submission of the bid, has a business address in this state, and has stated in the bid whether the bidder/proposer is a "Resident Bidder/proposer". A "Non-resident Bidder/proposer" is a bidder/proposer who does not meet the definition of a "Resident Bidder/proposer" as stated above.

1. Bidder/Proposer ☐ IS ☐ IS NOT a "Resident Bidder/proposer" as set forth above.

2. If a Resident Bidder/Proposer, enter your Oregon Business address below:

   _____

   _____

3. If a Non-resident Bidder/Proposer, enter state of residency:

   _____

   _____

Bidder/Proposer hereby certifies that the information provided is true and accurate.

Signature: _____ Date: _____

Printed or Typed Name: _____

Title: _____

Contractor: _____

Telephone: _____

ATTACHMENT “C”
CERTIFICATE OF NON-DISCLOSURE

CERTIFICATE OF NON-DISCRIMINATION

Pursuant to ORS 279A.110, discrimination in subcontracting is prohibited. Any contractor who contracts with a public contracting agency shall not discriminate against minority, women or emerging small business enterprises in the awarding of contracts.

By signature of the authorized representative of the bidder/proposer, the bidder/proposer hereby certifies to the City of Tualatin that this bidder/proposer has not discriminated against minority, women, or emerging small business enterprises in obtaining any subcontracts; and, further, that if awarded the contract for which this bid or proposal is submitted, shall not so discriminate.

Date: _____

Signature: _____

Printed or Typed Name: _____

Name of Contractor: _____

EXHIBIT “A”
STREET SWEEPING SCOPE OF SERVICES

Street Sweeping Operations

A. Street Sweeping Services

(1) Designation of Streets to be Swept. Those City streets subject to scheduled, non-scheduled, additional and emergency sweeps identified in the City sweeping schedule. It is estimated that 151 curb miles are required to be swept monthly as of October 1, 2013.

1a City owned parking lots scheduled for monthly sweeps

1b City Parks

Those additional city park sweeps directed to be swept as needed and directed by the City.

(2) New Streets to be Swept. The City may add streets during the term of this agreement for street sweeping services under this agreement. When new streets are added under this agreement, the City shall first provide a map showing the location of the new streets to be swept and the total lineal feet to be swept.

(3) Scheduled Street Sweeps. Each street and city owned parking lots designated in the City sweeping schedule shall be swept monthly. The Contractor shall maintain a continuous weekly schedule until all streets are swept each month. The schedule has been constructed to avoid interference with the garbage pickup schedule and may be revised by written request from the Manager or designee.

(4) Non scheduled Additional Sweeps. The Contractor shall provide sweeps in addition to those scheduled under paragraph (3), above, if requested by the City. The City shall compensate the Contractor for sweeps performed under this paragraph at the hourly rate specified in the Personal Services Agreement.

(5) Emergency Additional Sweeps. If an adverse weather condition Traffic Hazard or any other condition requires an immediate emergency additional street sweep, the City shall immediately notify the Contractor that an emergency street sweep is necessary and the Contractor shall perform the sweep within one (1) hour of notification. The City shall compensate the Contractor for sweeps performed under this paragraph at the hourly rate specified rate in the Personal Services Agreement, page 19. If the Contractor does not or cannot perform emergency sweeps, the City may provide or contract for such emergency street sweep. In this event, the Contractor shall be responsible for the cost to the City of the emergency sweep and shall reimburse the City for all additional costs incurred therein within three (3) days of the posting date of an itemized invoice sent by the City to the Contractor.

(6) Performance of Street Sweeps.

a. The Contractor will not be required to sweep those portions of street blocked by parked vehicles.

b. All street sweeps shall be performed to comply with the provisions of City Ordinance (Sound Levels and Noise) and all subsequent amendments.

c. The Contractor shall designate a representative to be available to direct all of Contactor's operations under this agreement. The representative shall report any problems to the City. The representative of the Contractor under this paragraph is hereby designated as Daniel Dodson. The Contractor shall immediately notify the City in writing of any change in the representative.

d. The Contractor shall perform all street sweeping services under this agreement in a timely and workmanship-like manner and shall follow the schedule agreed to with the City. Sweepers shall be driven at a speed between 4 and 7 MPH during sweeping operations to assure all debris is picked up.

e. In the event the City determines that a street section has been improperly swept, the City shall request by telephone, or E- Mail that the area be re-swept. The Contractor shall perform the re-sweep within one (1) day of the request by the City, at no additional compensation. In the event the re-sweep is not performed or is improperly performed as determined by the City, the City, at its option, may perform the re-sweep and charge the Contractor for the cost of this service or deduct from its compensation to the Contractor an amount based upon the hourly rate specified in Personal Services Agreement of this agreement, based upon estimated amount of time required for the sweep.

f. The Contractor will be responsible for sweeping and removal of all debris in Roadway including sticks, rocks, leaves and all other debris left in the street behind the sweeper. The sweeper shall avoid tracking mud during operation. A collection of these items shall be paid for by the City at the cubic yard costs identified in the Personal Services Agreement, page 19.

g. A high efficiency vacuum and/ or a regenerative air sweeper shall be used on all street sweepers performing under this agreement as the primary and secondary sweeper units. High efficiency sweepers shall be certified, filter air particulates down to a diameter of 3 microns, and be capable of removing at least 80% of accumulated street dirt with a diameter of less than 250 microns. Sweeper must be equipped with an independent recording device that records speed while sweeping (broom activated, pickup head down, blower on), miles swept, and hours swept. Operator supplied data is not sufficient.

h. The Contractor must provide a truck or drop boxes with a minimum capacity of 10 cubic yards. The locations of drop boxes must be approved by the City.

B. Street Sweeping Equipment

(1) Contractor to Provide Necessary Equipment. The Contractor shall provide all necessary equipment, fuel, spare parts, and maintenance as required for the performance of this agreement. A sufficient supply of spare brooms and other parts shall be kept on hand by the Contractor in order to provide timely and continuous performance of this agreement.

(2) Designation of Street Sweeping Equipment. The Contractor shall designate the street sweepers intended for use in the performance of this agreement. Such street sweepers shall be designated as either primary or secondary street sweepers and shall be identified by serial numbers or other identification. Primary street sweepers shall not be more than 3 years old and Secondary street sweepers shall not be more than 6 years old. High efficiency and/or regenerative air sweepers are required as the primary and secondary sweepers for conformance with the City and Clean Water Services Storm Water Management Program and mechanical sweepers as Secondary for occasional rock spills, road sand, leaves, and heavy debris. Generative air sweepers shall have no less than 17,800 lb. gross vehicle weight.

(3) Specifications for Street Sweeping Equipment.

a. Street sweeping equipment shall be capable of dumping directly into trucks or drop boxes provided by the Contractor at locations designated by the City. The Contractor shall utilize these locations to minimize sweeper travel time.

b. Wet vacuum type street sweepers shall be equipped with an efficient water spray system capable of controlling dust and the spray system shall be maintained in good operating condition. Dust clouds shall not be acceptable. The Contractor shall be required to purchase a City Water Usage Permit.

c. Street sweeping equipment operated on Public Street shall be properly registered and licensed in accordance with applicable statutes and rules of the State of Oregon.

d. Street sweeping equipment shall be kept in proper working order at all times and the cost of maintenance repairs shall not be charged to the City. If a sweeper becomes inoperable, the secondary sweeper must be available.

e. Street sweepers shall have a minimum useable capacity of three (3) cubic yards.

f. Street sweepers shall be self-propelled, equipped with dual gutter brooms and be capable of sweeping a nine (9) foot path.

g. High efficiency vacuum and or a regenerative air sweeper shall be used on all street sweepers performing under this agreement as the primary and secondary sweeper units. High efficiency sweepers shall be certified, filter air particulates down to a diameter of 3 microns, and be capable of removing at least 80% of accumulated street dirt with a diameter of less than 250 microns. Sweepers must also be equipped with an independent recording device that records speed while sweeping (broom activated, pickup head down, blower on), miles swept, and hours swept. Operator supplied data is not sufficient.

h. The Contractor must provide a truck or drop boxes with a minimum capacity of 10 cubic yards. The locations of the drop boxes must be approved by the City. The truck or dump box must be emptied in a timely manner so as not to interfere with sweeper production. Debris shall not be dumped on the ground. Drop boxes shall be removed within one (1) working day from zone completion.

I. Contractor shall be required to have a backup means of handling materials. Contractor shall be required to dispose of debris by methods approved by DEQ, Clean Water Services and the City. Contractor shall comply with all federal, state and local laws.

(4) Contractor Responsible for Damages. All damages sustained to street sweeping equipment due to the performance of this agreement shall be the sole responsibility of the Contractor.

(5) Equipment Breakdown. At no time shall the Contractor be unable to perform scheduled sweeps due to the lack of parts. The secondary machine must be available. If equipment failure or breakdown occurs and such failure or breakdown prevents the Contractor from performing scheduled, non-scheduled or emergency sweeps over a twenty-four hour period, the City may authorize the performance of such street sweeps as necessary. The Contractor shall reimburse the City for the cost thereof within three (3) days of the post date of an itemized invoice sent by the City to the Contractor.

EXHIBIT “B”
CITY OF TUALATIN SWEEPING SCHEDULE

All City streets and City owned parking lots are to be swept on a monthly schedule. All sweeps are scheduled beginning the first full week of each month as follows:

Schedule	Section
1st Monday	Section 1
1st Tuesday	Section 2
1st Wednesday	Section 3
1st Thursday	Section 4
1st Friday	Section 5
2nd Tuesday	Section 6
2nd Wednesday	Section 7
2nd Thursday	Section 8

EXHIBIT “C”
CITY OF TUALATIN NOISE ORDINANCE

Section 63.051 Noise

(1) Except as otherwise provided in this section, all industrial development shall comply with the Oregon State Department of Environmental Quality Standards relating to noise. From 9:00 p.m. to 7:00 a.m., a dBA reading from an industrial development, whether new or existing shall not exceed an L-max of 50 dBA when measured from a noise sensitive property.

(2) Method of measurement: sound or noise measurements procedures shall conform to the methods described in this section or to procedures approved by the Department of Environmental Quality.

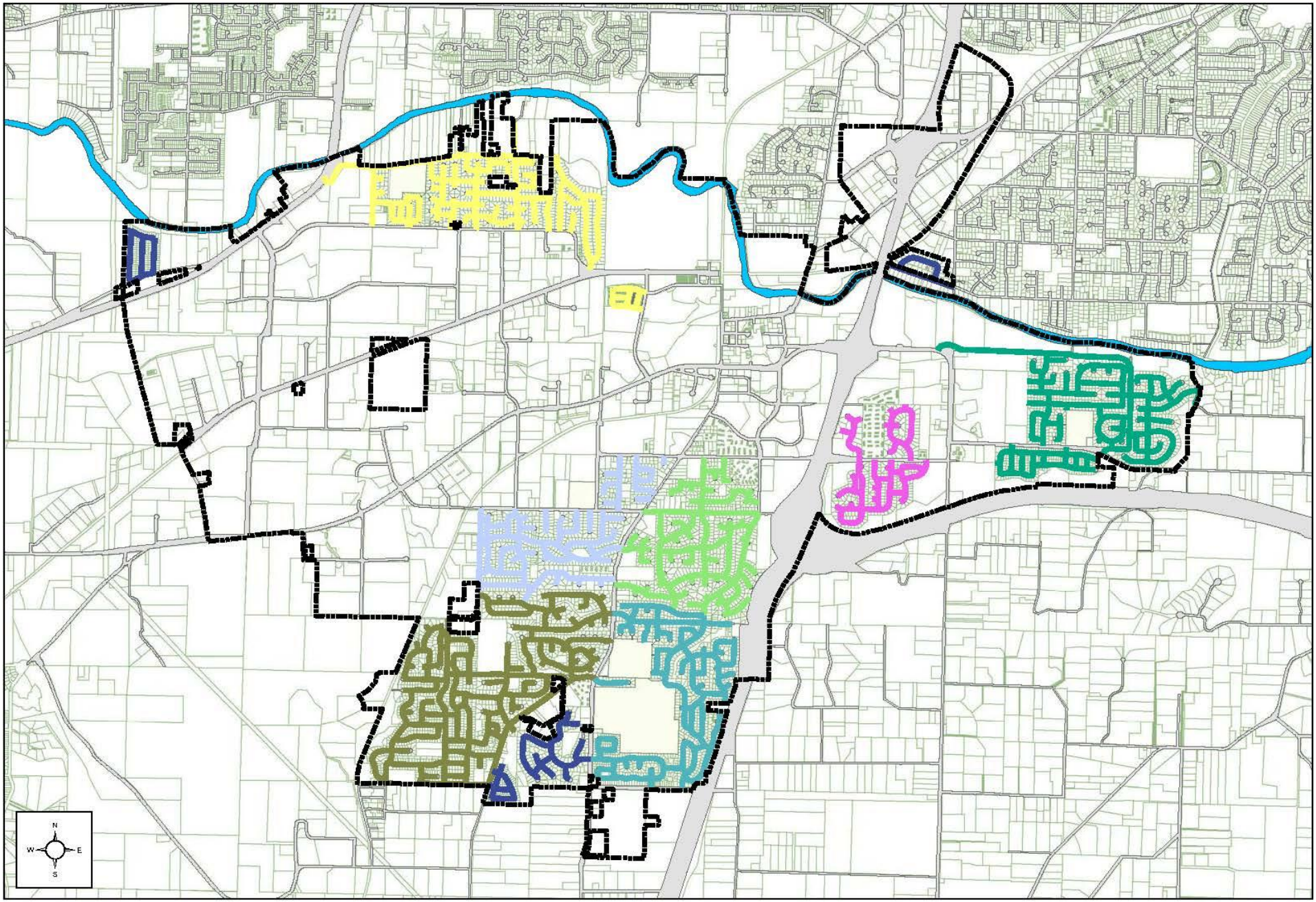
a. Measurements shall be made with a calibrated sound level meter in good operating condition, meeting the requirements of a Type I or Type II meter, as specified in ANSI Standards, Section 1.4-1971. For purposes of this section, a sound level meter shall contain at least an “A” weighting network, and both fast and slow response capability.

b. Persons conducting sound level measurements shall have received training in the techniques of sound measurement and the operation of sound measuring instruments from the Department of Environmental Quality or other competent body prior to engaging in any enforcement activity.

c. When sound measurements are made, they shall be made from a position no more than 25 feet away from the noise sensitive property (Ord. 769-89, §1,2/27/89)

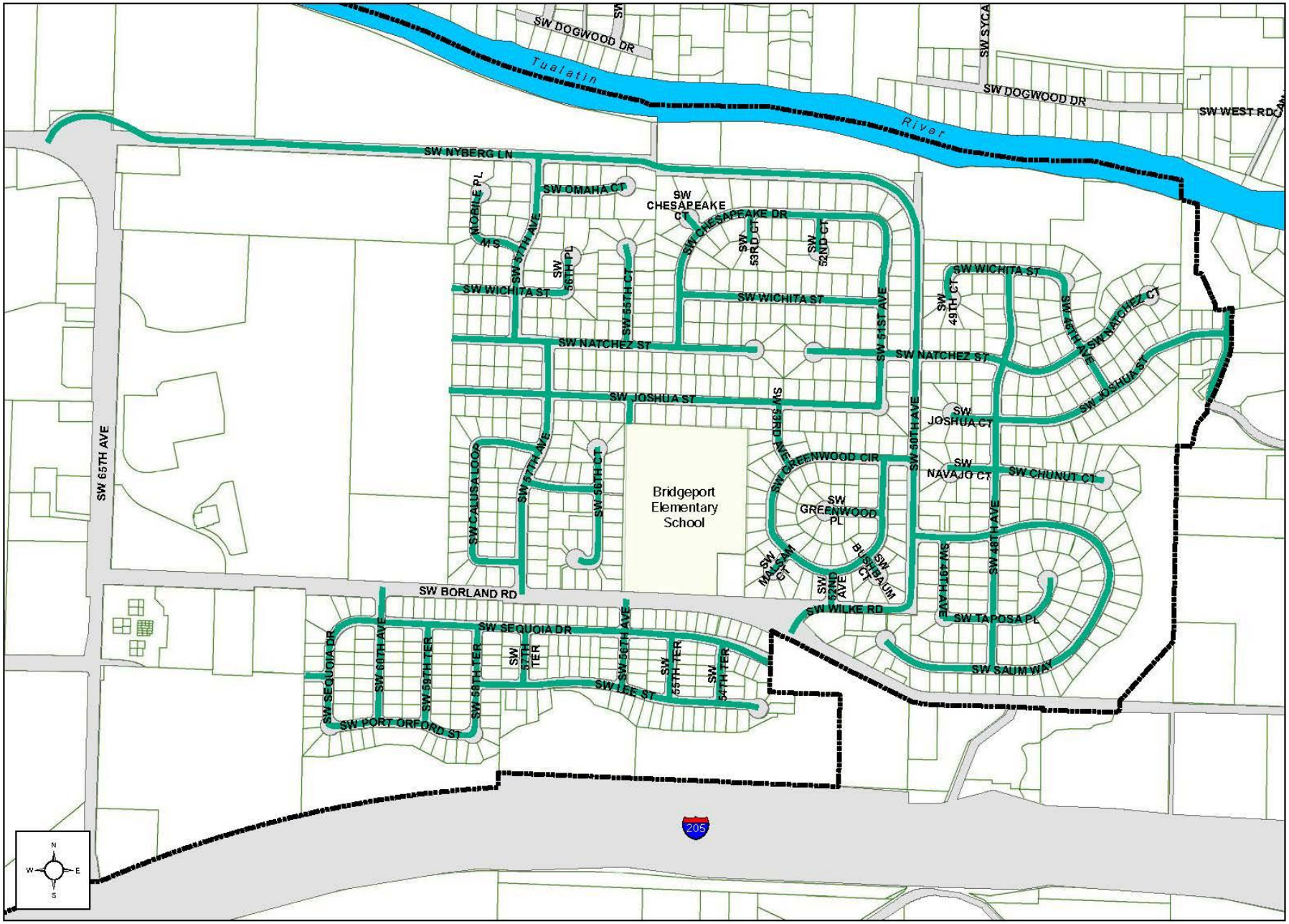
Tualatin's Street Sweeping Program

TUALGIS



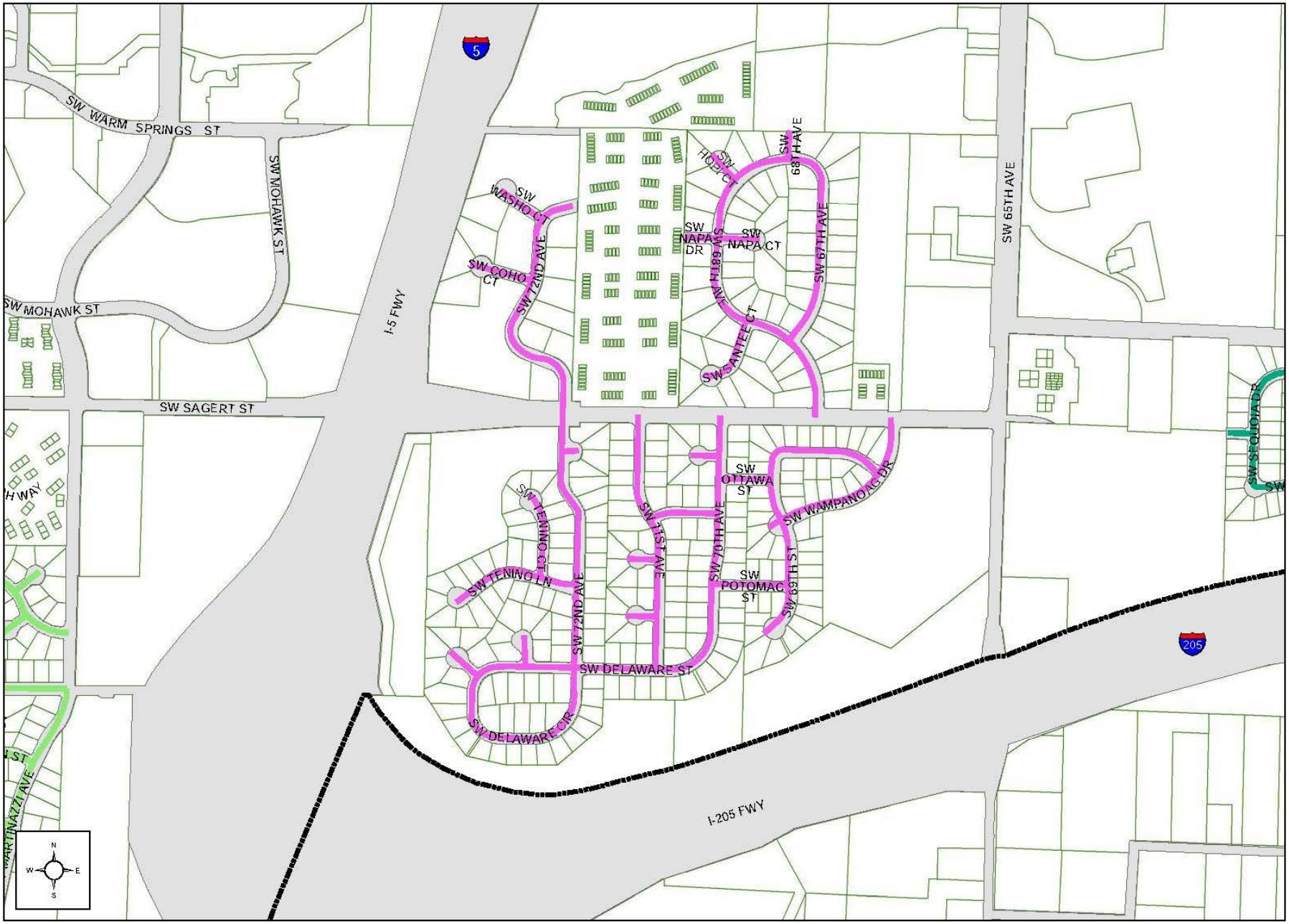
Tualatin's Street Sweeping Program - Section 1

TUALGIS



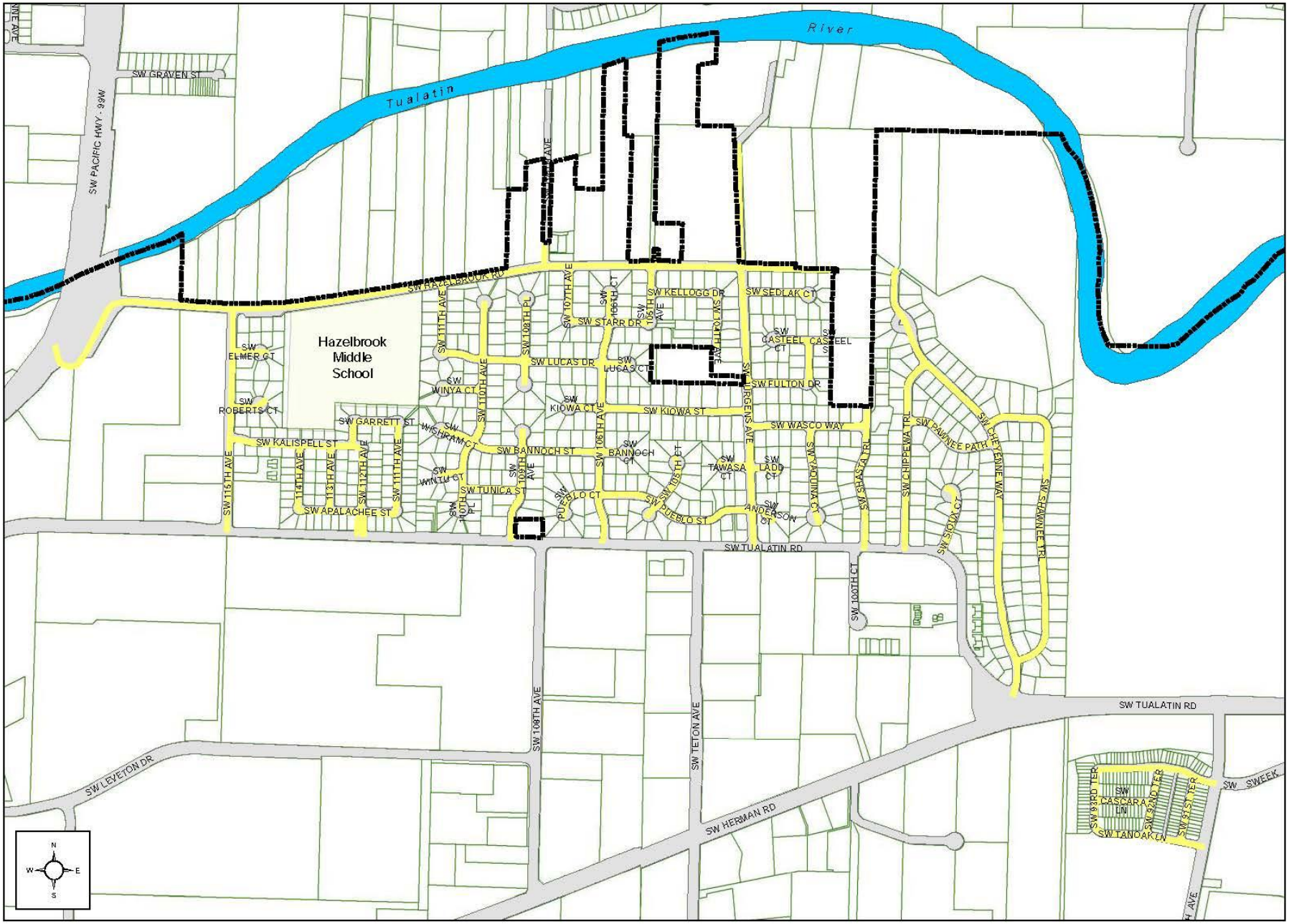
Tualatin's Street Sweeping Program - Section 2

TUALGIS



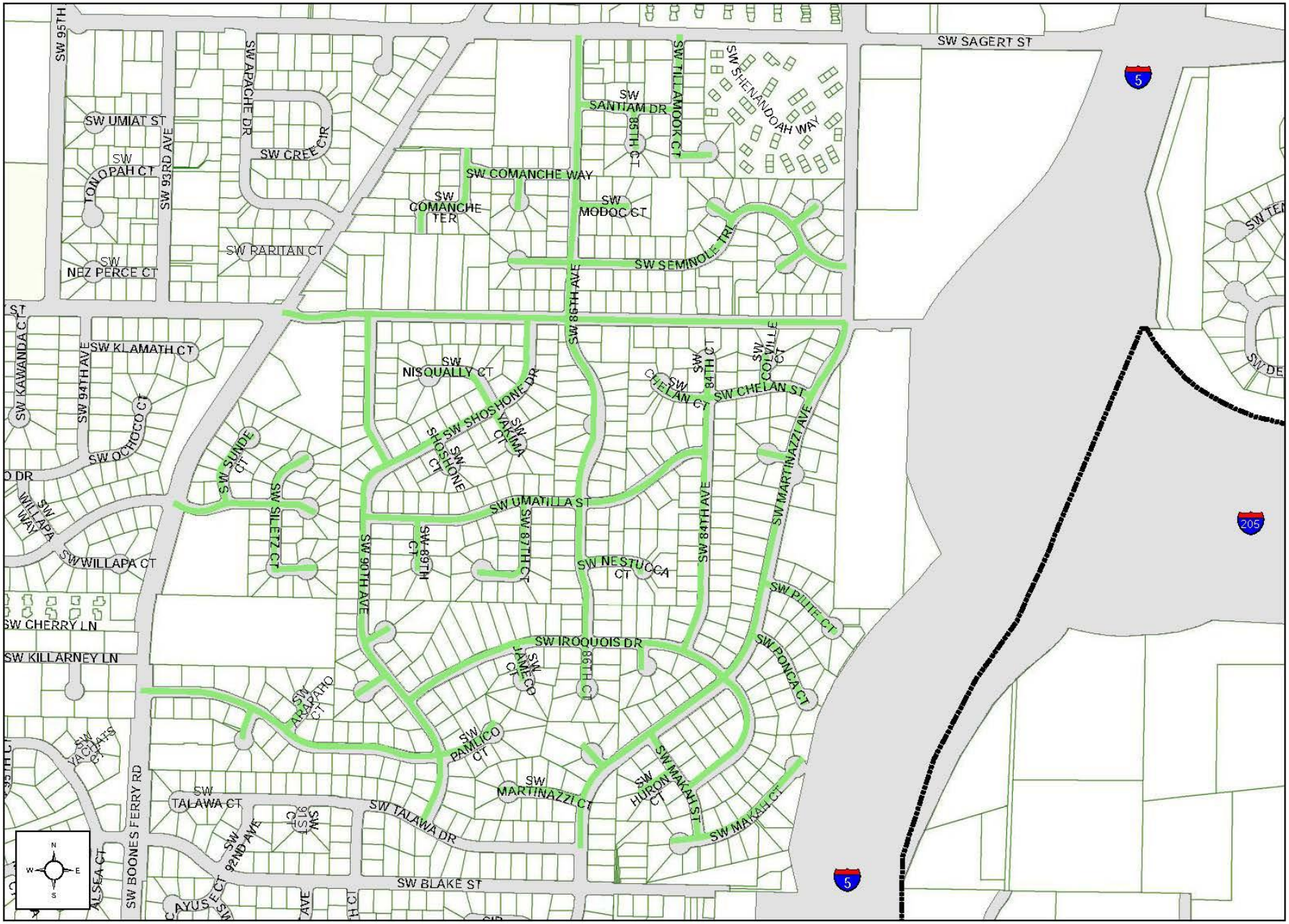
Tualatin's Street Sweeping Program - Section 3

TUALGIS



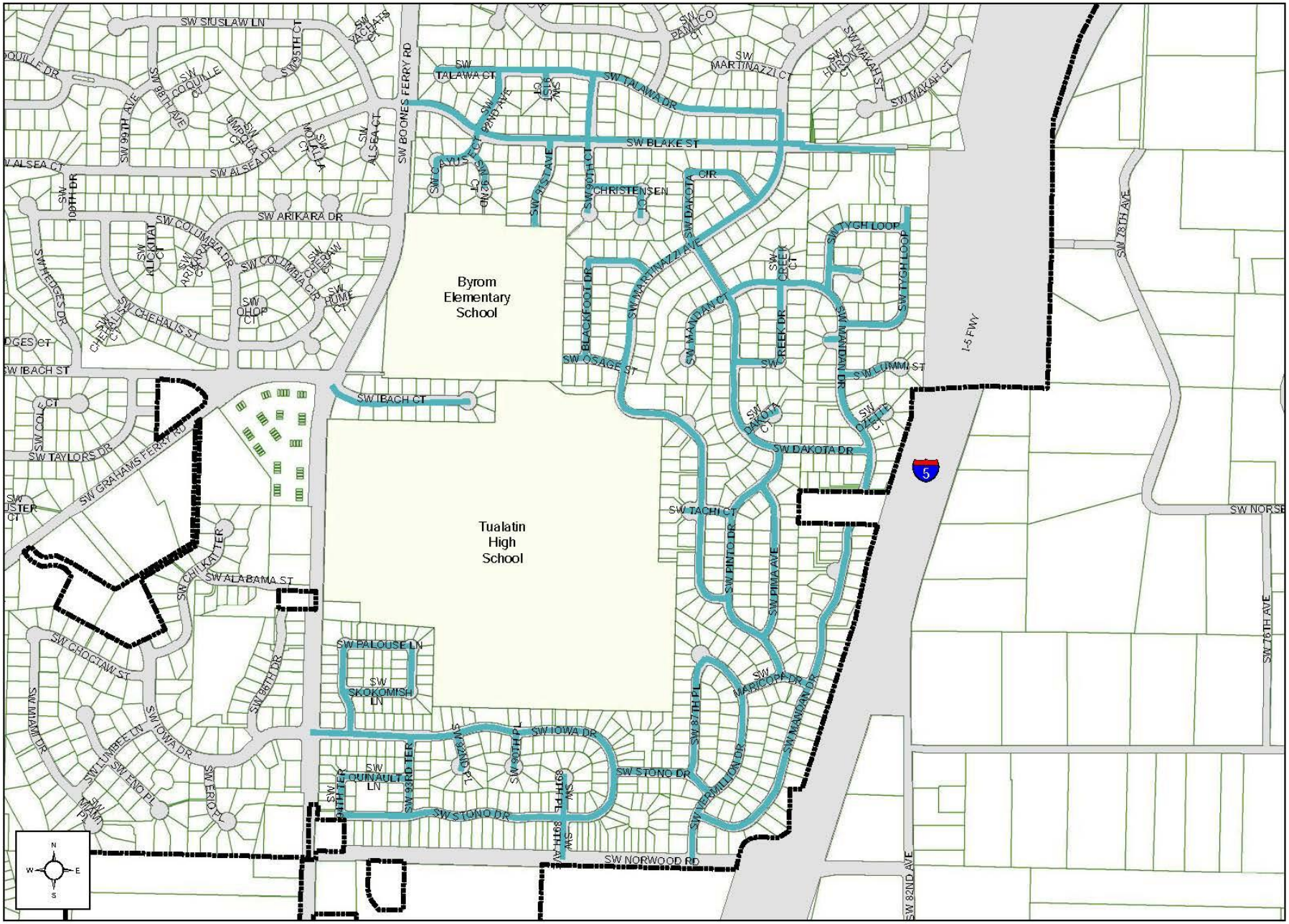
Tualatin's Street Sweeping Program - Section 4

TUALGIS



Tualatin's Street Sweeping Program - Section 5

TUALGIS

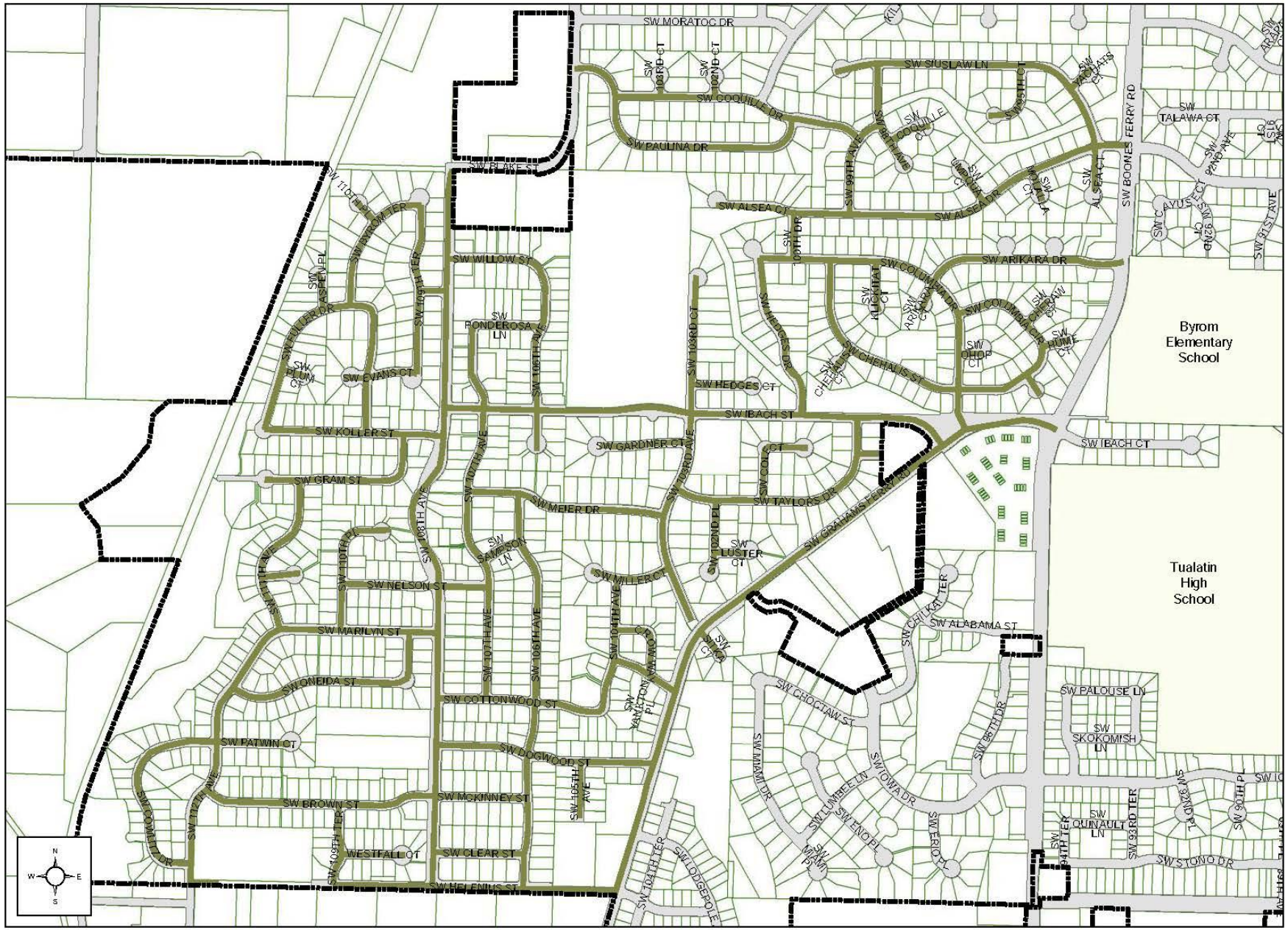


Tualatin's Street Sweeping Program - Section 6

TUALGIS

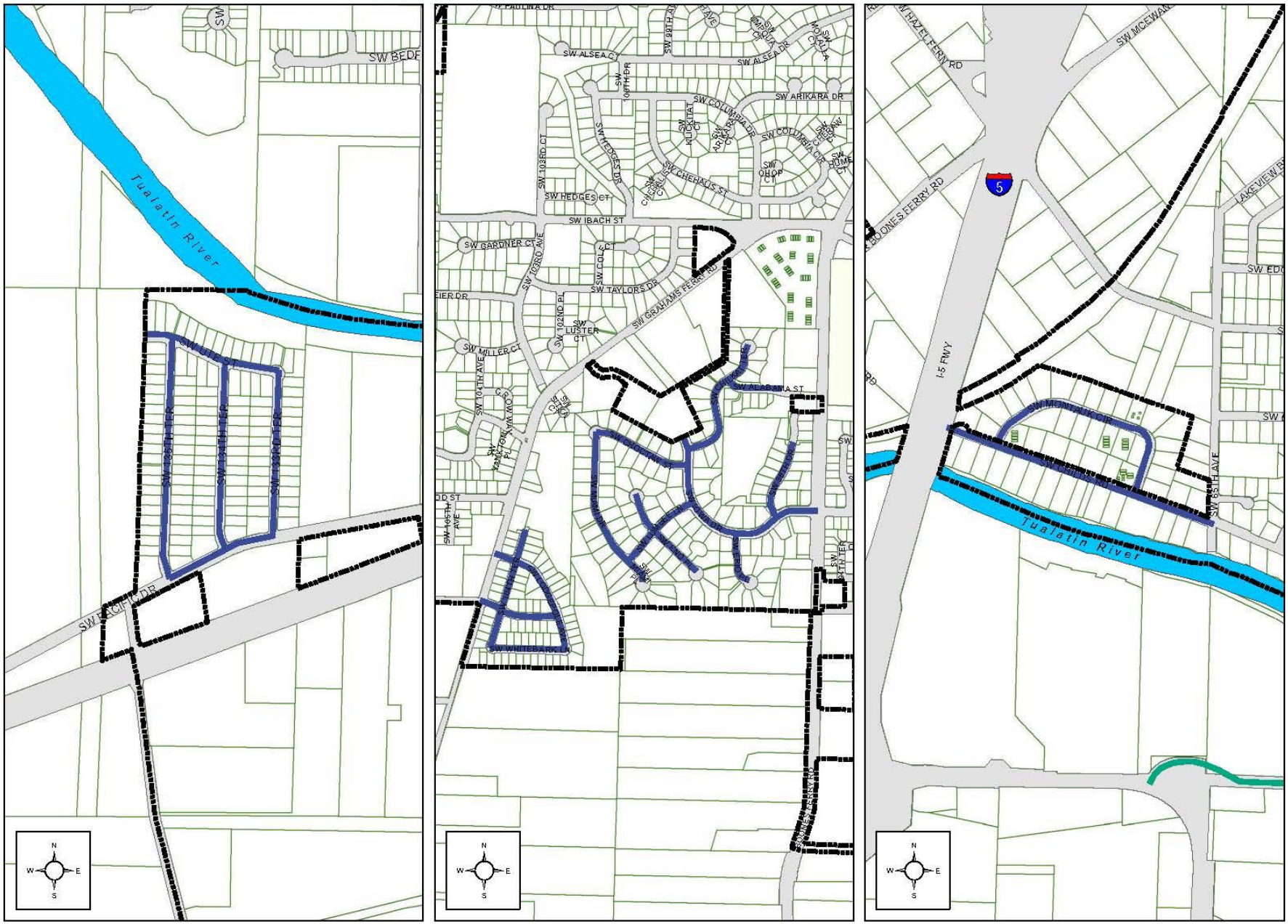
Tualatin's Street Sweeping Program - Section 7

TUALGIS



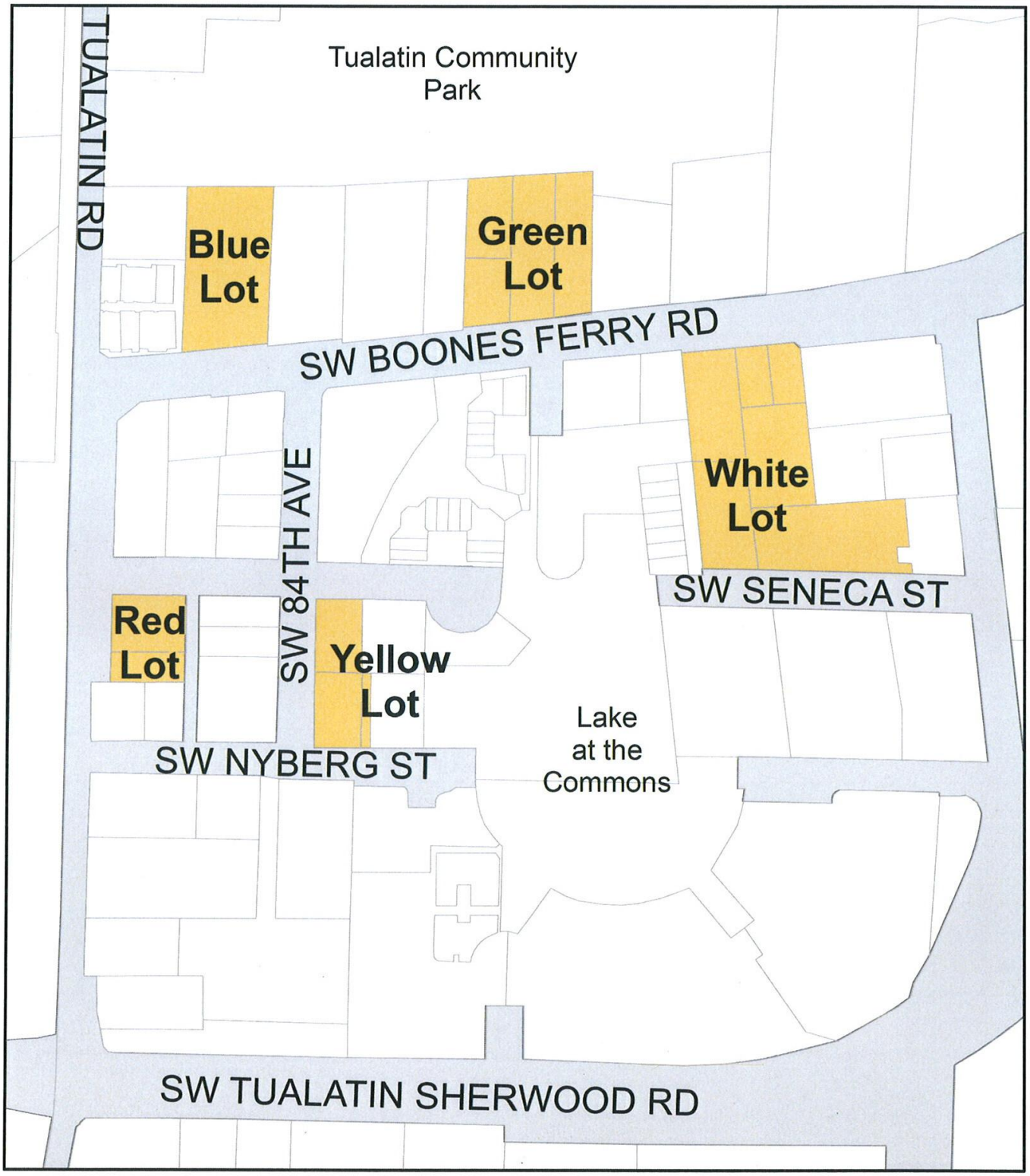
Tualatin's Street Sweeping Program - Section 8

TUALGIS



Public Parking Downtown

TUALGIS



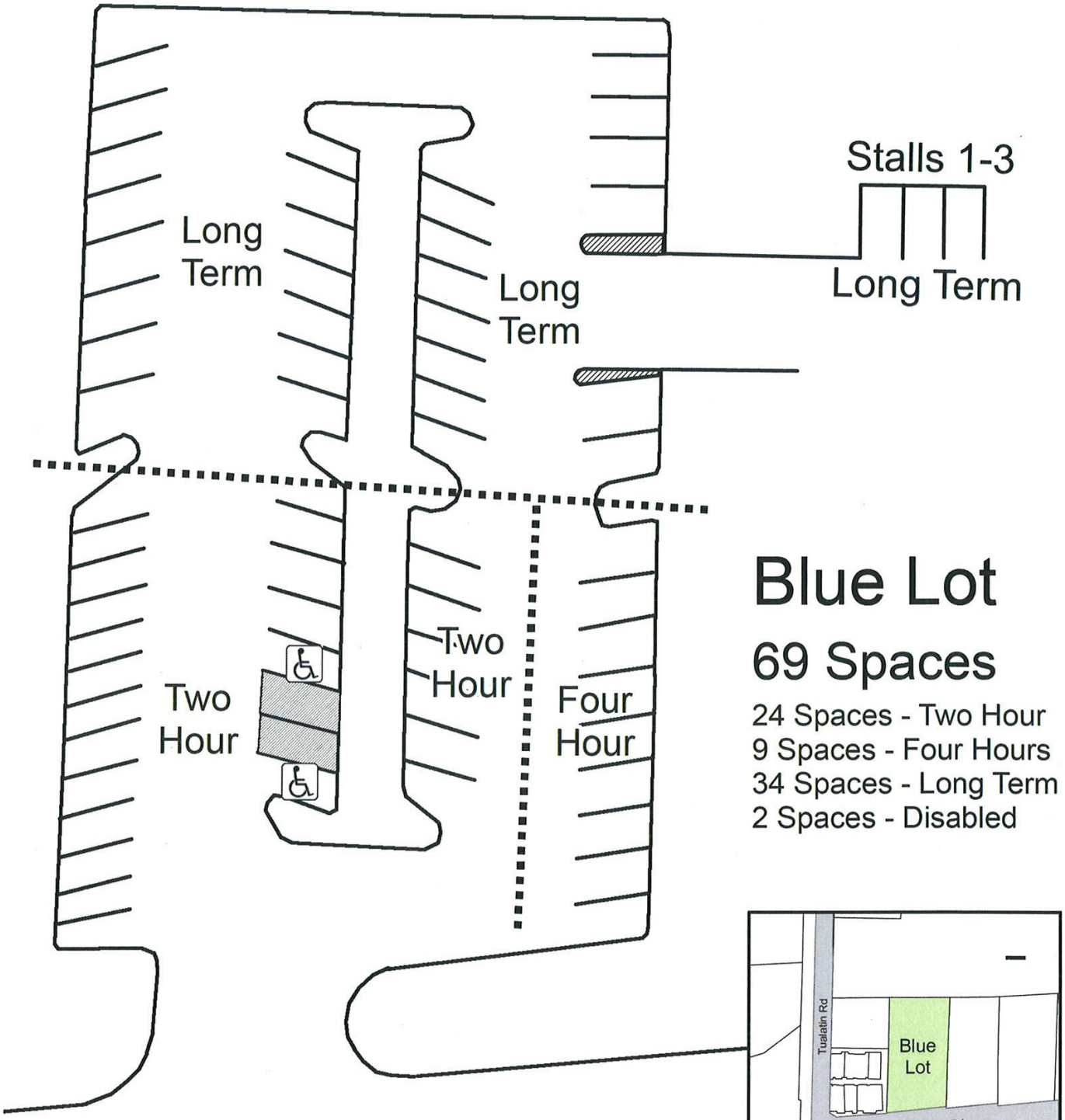
Public Parking Lots

N
W E
S

RF 1:2,400

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 ommissions in the information. This map is provided "as is". -Engineering and Building Dept.
Plotted 3/12/2008

Blue Lot



Blue Lot

69 Spaces

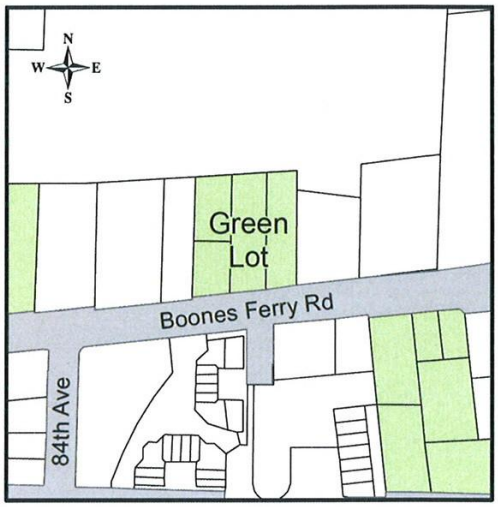
24 Spaces - Two Hour
9 Spaces - Four Hours
34 Spaces - Long Term
2 Spaces - Disabled

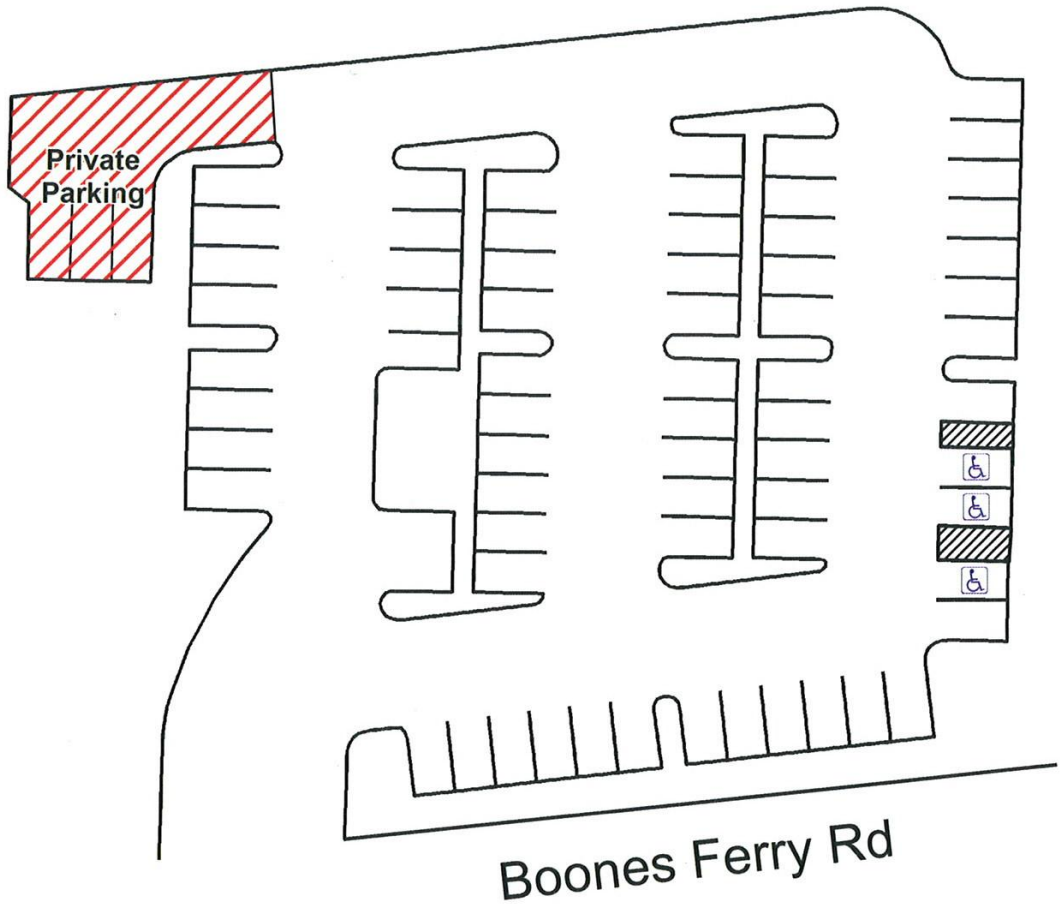
Exhibit B

Green Lot

69 Spaces

66 Spaces - Long Term
3 Space - Disabled

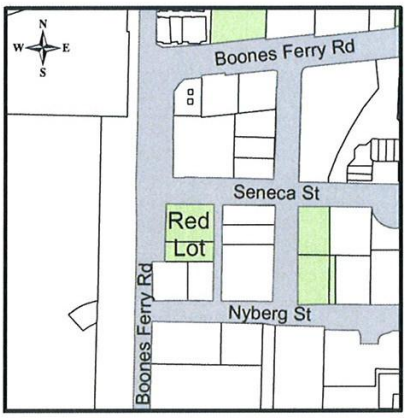




Red Lot

38 Spaces

36 Spaces - Long Term
2 Spaces - Disabled



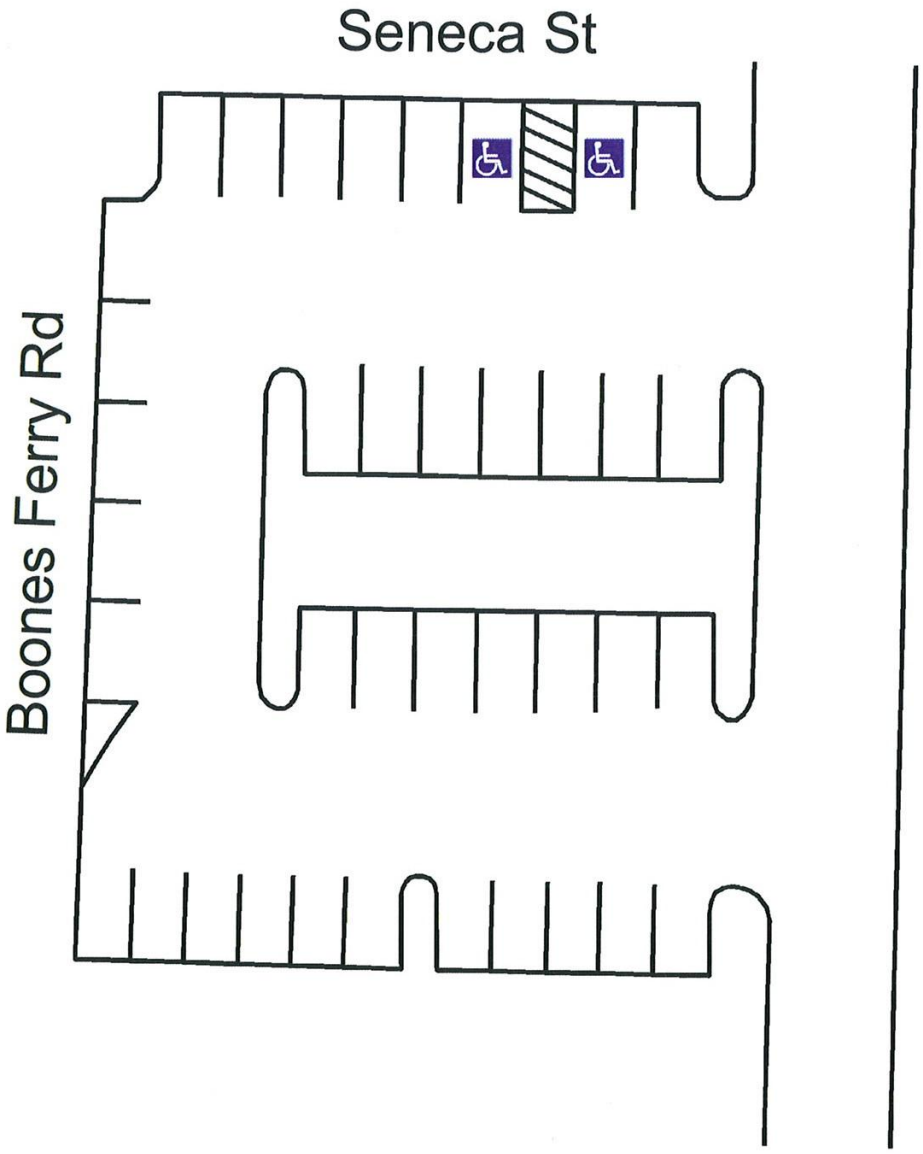


Exhibit D

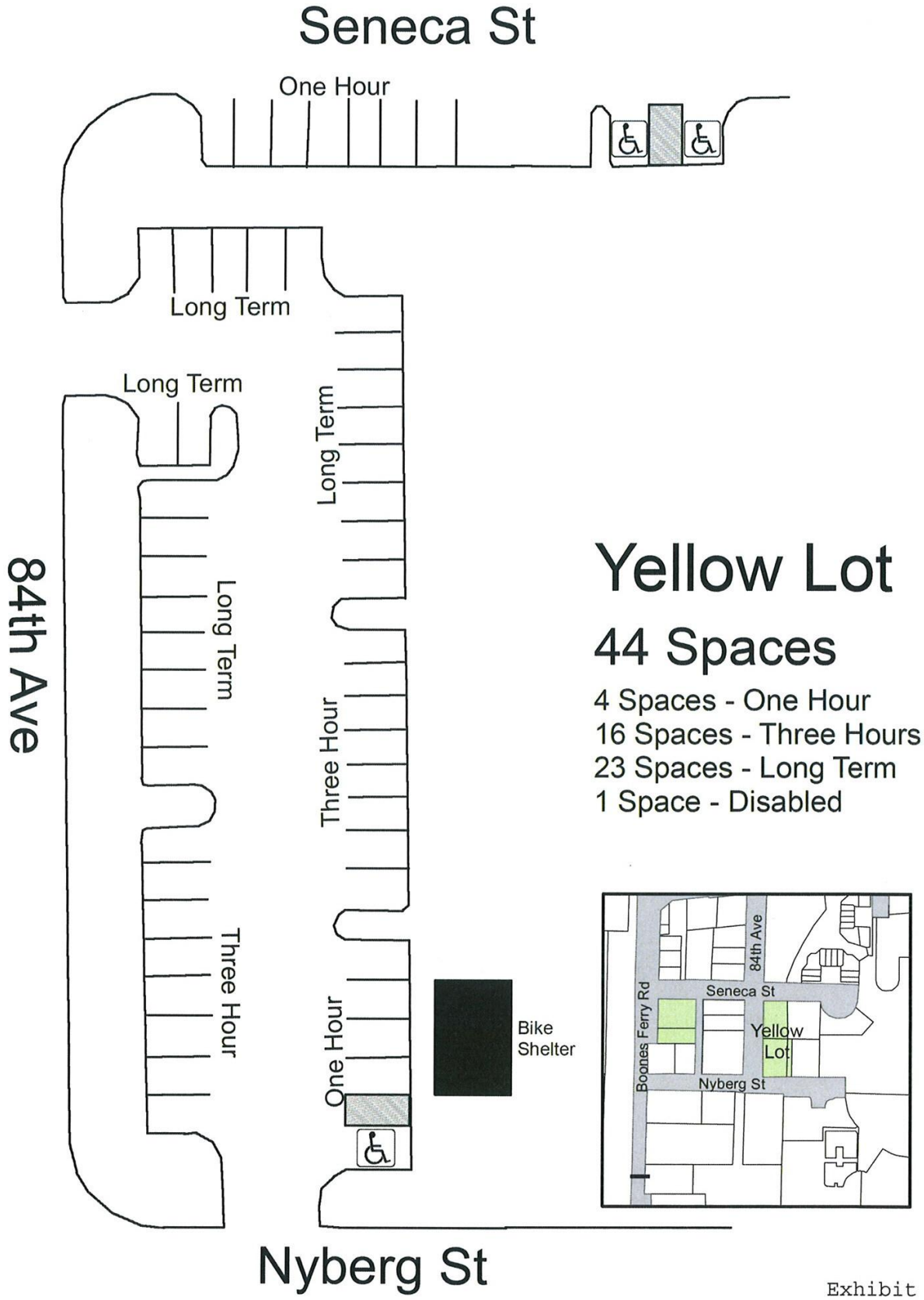
White Lot

TUALGIS

Exhibit E

Yellow Lot

TUALGIS



Yellow Lot

44 Spaces

4 Spaces - One Hour
16 Spaces - Three Hours
23 Spaces - Long Term
1 Space - Disabled

Exhibit F

STAFF REPORT
CITY OF TUALATIN

TO: Honorable Mayor and Members of the City Council

THROUGH: Alice Rouyer

FROM: Dayna Webb, Project Engineer

DATE: 09/23/2013

SUBJECT: Consideration of **Resolution No. 5169-13** Updating School Zones in Tualatin and Rescinding Resolutions No. 2747-92, 3515-98, 5024-11, and 4284-04.

ISSUE BEFORE THE COUNCIL:

Should the Council modify and update the school zones within the city?

RECOMMENDATION:

Staff recommends that the attached resolution be adopted, modifying and updating the school zones within the city.

EXECUTIVE SUMMARY:

On July 22, 2013 City Council awarded the bid for the School Zone Signage Update. The updated school zone signs have now been installed.

Some modifications to the locations of existing school zones were necessary to accommodate the new When Flashing systems, as they are taller than the standard school zone signs and have a large underground foundation. All of the school zones that were previously 7AM - 5PM, will now be When Flashing.

Tualatin Municipal Code Chapter 8-3, Schedule E, 20 MPH School Zones shall be repealed in its entirety, and replaced with the updated Schedule E as included in Attachment B and shown visually in Attachment C.

OUTCOMES OF DECISION:

Adopting the resolution will result in the following:

1. Updated school zones will be established in the city.

Not adopting the resolution will result in the following:

1. Updated school zones will not be established in the city.

FINANCIAL IMPLICATIONS:

Ongoing maintenance costs for these systems has been budgeted in the Road Operating & Gas Tax Fund.

Attachments: A. Resolution 5169-13
B. Map

RESOLUTION NO. 5169-13

RESOLUTION Updating School Zones in Tualatin and Rescinding Resolution No. 2747-92, 3515-98, 5024-11, and 4284-04.

WHEREAS, Oregon Revised Statutes 810.210; 810.245, 811.111; and 811.235 authorize the City to designate and enforce school zones; and

WHEREAS, Tualatin Municipal Code 8-3-030 grants the City Council the authority to designate school zones by resolution; and

WHEREAS, the City wishes to update and adopt the school zone sign “When Flashing” systems; and

WHEREAS, the City wishes to modify the locations of some school zones; now therefore

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF TUALATIN, OREGON, that:

Section 1. The City establishes “When Flashing” School Zones at the following locations:

(1) Hazelbrook Road from a point 200 feet east of the centerline of 115th Avenue to a point 60 feet west of the centerline of 111th Avenue.
(2) 95th Avenue from the centerline of Avery Street to a point 560 feet north of the centerline of Avery Street.
(3) Avery Street from a point 135 feet east of the centerline of Elk Horn Court to a point 150 west of the centerline of 93rd Avenue.
(4) Boones Ferry Road from a point 550 feet north of the centerline of Ibach Court to a point 150 feet north of the centerline of Iowa Drive.
(5) Boones Ferry Road from a point 300 feet north of the centerline of Alsea Drive/Blake Street to a point 275 feet south of the centerline of Alsea Drive/Blake Street.
(6) Sagert Street from a point 50 feet west of the centerline of 72nd Avenue to a point 650 feet west of the centerline of 72nd Avenue.
(7) Borland Road from a point 425 feet east of the centerline of 56th Avenue to a point 425 west of the centerline of 56th Avenue.
(8) Ibach Street from a point 425 feet east of the centerline of Boones Ferry Road to the centerline of Boones Ferry Road.

Section 2. The City establishes “When Children Are Present” School Zones at the following locations:

(1) Blake Street from a point 170 feet east of the centerline of 91st Court to a point 170 feet west of the centerline of 91st Court.

(2) 95th Avenue from a point 350 feet north of the centerline of Sagert Street to a point 255 feet south of the centerline of Sagert Street.

Section 3. The City Manager is hereby authorized to implement the provisions of this resolution by maintaining the appropriate signs and/or markings at the above listed locations.

Section 4. Resolution Nos. 747-92; 3515-98; 5024-11; and 4284-04 are hereby rescinded.

Section 5. This resolution is effective upon adoption.

INTRODUCED AND ADOPTED this 23rd day of September, 2013.

CITY OF TUALATIN, OREGON

BY_____
Mayor

APPROVED AS TO LEGAL FORM

BY_____
City Attorney

ATTEST:

BY_____
City Recorder

School Speed Zones

TUALGIS

HAZELBROOK RD
Hazelbrook Middle School
115TH AVE
JURGENS AVE
TUALATIN RD
PACIFIC HIGHWAY
PACIFIC DRIVE
124TH AVE
LEVETON DR
108TH AVE
TETON AVE
TUALATIN RD
SWEEK DR
90TH AVE
BOONES FERRY RD
SENECA ST
NYBERG ST
NYBERG ST
NYBERG LANE
HERMAN RD
118TH AVE
CIPOLE RD
MANHASSET DR
TONKA RD
WARM SPRINGS ST
INTERSTATE 5
65TH AVE
ROSEWOOD ST
65TH AVE
63RD AVE
72ND AVE
BRIDGEPORT RD
LOWER BOONES FERRY RD
MCEWAN RD
TUALATIN-SHERWOOD RD
MYSLONY ST
TETON AVE
65TH AVE
SAGERT ST
SAGERT ST
BORLAND RD
Bridgeport Elementary School
60TH AVE
WILKE RD
Tualatin Elementary School
AVERY ST
BOONES FERRY RD
Horizon Christian School
INTERSTATE 205
115TH AVE
ITEL ST
105TH AVE
COQUILLE DR
ALSEA DR
BLAKE ST
MARTINAZZI AVE
Byrom Elementary School
IBACH ST
108TH AVE
103RD AVE
GRAHAMS FERRY RD
Tualatin High School
MARILYN RD
112TH AVE
IOWA DR
STONO DR
HELENIUS RD

"When Flashing" School Speed Zone

"When Children Are Present" School Speed Zone

Planning Area Boundary

N
W E
S

RF 1:26,000

This map is derived from various digital databasesources. 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". -IS Dept.
Printed 8/28/2013

STAFF REPORT
CITY OF TUALATIN

TO: Honorable Mayor and Members of the City Council

THROUGH: Janet Newport

FROM: Janet Newport, Human Resources Manager

DATE: 09/23/2013

SUBJECT: Consideration of **Resolution No. 5171-13** Approving and Authorizing the Provision of Workers' Compensation Insurance Coverage to Volunteers of the City of Tualatin and Repealing Resolution No. 5105-12

ISSUE BEFORE THE COUNCIL:

The City of Tualatin will provide for worker's compensation insurance coverage to classes of volunteer workers for policy year 2013-2014.

RECOMMENDATION:

Staff respectfully request the City Council adopt the attached resolution approving and authorizing the provision of workers' compensation insurance coverage to volunteers of he City of Tualatin and repeal Resolution No. 5105-12.

EXECUTIVE SUMMARY:

The City Council wishes to protect its volunteers from injuries arising out of, or in the scope of, their service to the City. The City elects, pursuant to ORS 656.031, to provide workers' compensation insurance coverage to volunteers listed on the electronically submitted CIS Volunteer Election Form.

Attachments: Resolution No. 5171-13

RESOLUTION NO. 5171-13

RESOLUTION AUTHORIZING THE PROVISION OF WORKERS' COMPENSATION INSURANCE COVERAGE TO VOLUNTEERS OF THE CITY OF TUALATIN AND RESCINDING RESOLUTION NO. 5105-12.

WHEREAS, the City finds volunteers for the City provide valuable services to the citizens of the City of Tualatin;

WHEREAS, ORS 656.031 authorizes the City to provide workers' compensation coverage volunteer workers listed

WHEREAS, the City's workers' compensation insurer, Citycounty Insurance Services (CIS), allows the City to elect to cover volunteers;

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF TUALATIN, OREGON, that:

Section 1. The City of Tualatin shall provide workers' compensation insurance coverage for volunteers for Policy Year 2013 – 2014.

Section 2. The City Manager is authorized to execute any and all documents necessary to allow the City to provide workers' compensation coverage for volunteers.

Section 3. The City Manager is authorized to establish requirements for eligibility and manage the workers' compensation coverage for volunteers program.

Section 4. Resolution No. 5105-12, dated June 25, 2012 is hereby rescinded.

Section 5. This resolution is effective upon adoption.

INTRODUCED AND ADOPTED this 23rd day of September, 2013.

CITY OF TUALATIN, OREGON

BY _____
Mayor

APPROVED AS TO FORM

BY _____
City Attorney

ATTEST:

BY _____
City Recorder

City Council Meeting **D. 5.**

Meeting Date: 09/23/2013

CONSENT AGENDA: Financing for Operations Center Warehouse Project

---

CONSENT AGENDA

Consideration of **Resolution No. 5167-13**, Authorizing a Full Faith and Credit Borrowing for the Operations Warehouse.

SUMMARY

During the Fiscal Year 2013-14 budget process, the Operations Center Warehouse project was presented to the City Council and Budget Committee with the plan for about half of the project to be funded with existing funds in the Operations Fund and the remaining amount to be financed over a 10-15 year period. Council awarded the construction bid on August 12, 2013, and total project costs are estimated to be $2.16 million.

Staff requests the City Council authorize the Finance Director to enter into a Full Faith and Credit borrowing with Columbia Bank, in the amount of $1.1 million dollars, at an interest rate not to exceed 3.0%. Repayment will be through semi-annual debt service payments ($64,805 at 3% interest), beginning in July 2014, for a period of ten years, and will be repayed from the utility funds, the primary use of the items stored in the Warehouse.

Attachments

Resolution for Operations Warehouse

RESOLUTION NO. 5167-13

A RESOLUTION OF THE CITY OF TUALATIN, OREGON AUTHORIZING A FULL FAITH AND CREDIT BORROWING AND RELATED MATTERS.

The City Council of the City of Tualatin, Oregon, finds as follows:

WHEREAS, the City Council of the City of Tualatin, Washington County, Oregon (the "City") is authorized by Oregon Revised Statutes Section 271.390 to enter into financing agreements to finance real or personal property which the City Council determines is needed; and

WHEREAS, the City has identified a need for a new warehouse at the City's Operations Center (the "Project"); and

WHEREAS, the City Council hereby determines that the Project is needed, and that it is desirable to finance the Project pursuant to ORS 271.390; and

WHEREAS, the City may spend money on the Project (the "Expenditures") before the City issues a borrowing to finance the Project and the rules of the United States Internal Revenue Service require the City to declare its official intent to reimburse itself for amounts that the City will spend before the borrowing is issued in order for the City to reimbursed for such Expenditures from the proceeds of the borrowing;

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Tualatin, Oregon as follows:

Section 1. Financing Agreement Authorized.

The City is hereby authorized to enter into a financing agreement in an aggregate principal amount of not more than $1,100,000 (the "Financing Agreement") pursuant to ORS 271.390. Loan proceeds shall be used to finance the Project and to pay costs associated with the Financing Agreement. The Finance Director or the City Manager, or the person designated by the Finance Director or the City Manager (each of whom is referred to herein as a "City Official") are hereby authorized, on behalf of the City and without further action by the City Council, to:

(1) Determine the final principal amount, interest rates, payment dates, prepayment rights and all other terms of the financing;

(2) Negotiate, execute and deliver a note to evidence amounts due under the Financing Agreement;

(3) Select Columbia Bank or another commercial bank or investor with which to negotiate, execute and deliver the Financing Agreement. Subject to the limitations

of this resolution, the Financing Agreement may be in such form and contain such terms as the City Official may approve;

(4) Covenant for the benefit of the owner of the Financing Agreement to comply with all provisions of the Internal Revenue Code of 1986, as amended (the "Code") which are required for the interest paid under the Financing Agreement to be excluded from gross income for federal income tax purposes;

(5) If the United States Congress authorizes federal interest rate subsidies, such as the subsidies that were authorized for "Build America Bonds," and those subsidies reduce the cost of the Financing Agreement, issue the Financing Agreement under these provisions, apply for and receive federal interest rate subsidies and covenant to take any actions necessary to maintain those subsidies;

(6) Designate the borrowing as a "qualified tax-exempt obligation" pursuant to Section 265(b)(3) of the Code, if applicable;

(7) Appoint and enter into agreements with Hawkins Delafield & Wood LLP as bond counsel and other service providers for the Financing Agreement; and

(8) Execute and deliver any other certificates or documents and take any other actions which the City Official determines are desirable to carry out this resolution.

Section 2. Security.

Pursuant to ORS 287A.315, the City hereby pledges its full faith and credit and taxing power within the limitations of Sections 11 and 11b of Article XI of the Oregon Constitution to pay the amounts due under the Financing Agreement. The City is not authorized to levy additional taxes to pay the amounts due under the Financing Agreement.

Section 3. Declaration of Intent to Reimburse.

The City hereby declares its official intent pursuant to Section 1.150-2 of the Treasury Regulations to reimburse itself with the proceeds of the Financing Agreement for any Expenditures paid before the Financing Agreement is issued.

Section 4. Effective Date.

This resolution is effective immediately upon its passage.

INTRODUCED AND ADOPTED this 23rd day of September, 2013.

CITY OF TUALATIN, OREGON

By_____
Mayor

ATTEST:

By_____
City Recorder

APPROVED AS TO FORM:

By_____
City Attorney

STAFF REPORT
CITY OF TUALATIN

TO: Honorable Mayor and Members of the City Council

THROUGH: Sherilyn Lombos

FROM: Linda Odermott, Paralegal
Sean Brady, City Attorney

DATE: 09/23/2013

SUBJECT: **Ordinance No. 1359-13** Relating to the Tualatin Development Code (TDC) Chapter 12 - Water Service - Incorporating the January 2013 Water Master Plan and Amending TDC 12.010-12.140. Plan Text Amendment (PTA-13-01)

ISSUE BEFORE THE COUNCIL:

Shall Council adopt an ordinance amending the TDC Chapter 12 - Water Service - to incorporate the January 2013 Water Master Plan (Attachment B) and amend TDC 12.010-12.140 (PTA 13-01)?

RECOMMENDATION:

Staff recommends Council adopt an ordinance amending the TDC to include the 2013 Water Master Plan and amend TDC 12.010-12.140 (PTA 13-01).

EXECUTIVE SUMMARY:

The City of Tualatin submitted an application for a Plan Text Amendment 1(PTA-13-01). The City provided notice of PTA-13-01 to the Oregon Department of Land Conservation and Development as provided under ORS 197.610 and notice of public hearing was given as required by Tualatin Development Code 1.031. A public hearing was held before the City Council of the city of Tualatin on September 9, 2013, to consider adopting the 2013 Water Master Plan and amend related Tualatin Development Code Chapter 12. The Council considered the public testimony and evidence presented by City staff, the written comments submitted, and the oral comments of those appearing at the public hearing.

Adopting this ordinance is in the public interest and the public interest is best protected by adopting the ordinance at this time. The ordinance complies with the Tualatin Master Plan and the applicable provisions of Tualatin Development Code 1.032. The Findings and Analysis in support of this ordinance are set forth in Attachment A.

Attachments: Ordinance
Attachment A - Findings and Analysis

Attachment B - Water Master Plan

ORDINANCE NO. 1359-13

AN ORDINANCE AMENDING THE TUALATIN DEVELOPMENT CODE (TDC) CHAPTER 12-WATER SERVICE-INCORPORATING THE JANUARY 2013 WATER MASTER PLAN AND AMENDING TDC 12.010-12.140. PLAN TEXT AMENDMENT (PTA-13-01)

WHEREAS, upon the application of Community Development Department, a public hearing was held before the City Council of the City of Tualatin on September 9, 2013, related to a Plan Text Amendment of the Tualatin Development Code (TDC); and amending TDC 12.010-12.140 (PTA-13-01); and

WHEREAS, the City provided notice of PTA-13-01 to the Oregon Department of Land Conservation and Development as provided under ORS 197.610; and

WHEREAS, notice of public hearing was given as required by Tualatin Development Code 1.031; and

WHEREAS, the Council conducted a public hearing on September 9, 2013, and heard and considered the testimony and evidence presented by the City staff and those appearing at the public hearing; and

WHEREAS, after the conclusion of the public hearing, the Council voted unanimously; with Councilor Bubenik absent, to approve the application.

THE CITY OF TUALATIN ORDAINS AS FOLLOWS:

Section 1. TDC 12.010 is amended to read as follows:

(1) In 1979, the City of Tualatin adopted the Tualatin Community Plan. R. A. Wright Engineering Company prepared the water 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 water sewer service element. In 1983 the City Council amended the Plan, including the water 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”).

(2) In accordance with the Urban Planning Area Agreement between the City and Washington County and an Intergovernmental Agreement between the City and the City of Portland, the City of Tualatin is responsible for providing water service in the City of Tualatin. The City of Tualatin obtains its water from the City of Portland.

(3) In 1990 and 1999 minor amendments to TDC Chapter 12 were adopted. In 2000 and 2002 the City contracted with CH2M Hill to update the City’s water master plan. The 2000 update reflected Tualatin’s growth and refined the 1983 plan.

(4) The 2003 “Report, Tualatin Water Master Plan Update,” (the “Master Plan”) was the basis for amending the Tualatin Development Code (TDC), Chapter 12, in 2003. The purpose of the 2003 Master Plan was to provide the City with a comprehensive water master plan for future development of the water system. The 2003 Master Plan included a description of the existing water system, the planning criteria, a water system analysis and a capital improvement plan.

~~(4)~~ The 2003 Master Plan study area was the same as the Tualatin Community Plan, plus it included the Southwest Manufacturing Business Park and the Northwest Tualatin Concept Plan 2005.

(5) ~~Northwest Tualatin Concept Plan 2005 identifies water service needs for the study area. This information is new and updates the 2003 Master Plan.~~ The July 2013 Water Master Plan report was prepared as an update to the 2003 Master Plan. Its purpose is to be a comprehensive analysis of the City’s water system, to identify system deficiencies, determine future water distribution system supply requirements and recommend water system facility improvements that correct system deficiencies and provide for future system expansion.

(6) The July 2013 Water Master Plan anticipates demand as residential growth from redevelopment and infill, within the Town Center area, and industrial and employment growth in the Southwest Concept Plan Area.

~~(6)~~ (7) The purpose of Chapter 12 is to provide for:

(a) Reinforcement of the existing water system to provide adequate peak and fire-flow capabilities;

(b) Expansion of the distribution system as areas inside the Urban Growth Boundary are annexed to the City and are developed;

(c) Expansion of supply and storage facilities for present and future needs; and

(d) Financing the construction of the foregoing facilities.

Section 2. TDC 12.020 is amended to read as follows:

City of Tualatin water service policies are to:

(1) Plan and construct a City water system that protects the public health, provides cost-effective water service, meets the demands of users, addresses regulatory requirements and supports the land uses designated in the Tualatin Community Plan.

(2) Require developers to aid in improving the water system by constructing facilities to serve new development and extend lines to adjacent properties.

(3) Water lines should be looped whenever possible to prevent dead-ends, to maintain high water quality and to increase reliability in the system.

(4) Improve the water system to provide adequate service during peak demand periods and to provide adequate fire flows during all demand periods.

(5) Review and update the water system capital improvement program and funding sources as needed or during periodic review.

(6) Prohibit the extension of City water services outside the City's municipal boundaries, unless the water service is provided to an area inside an adjacent city.

(7) ~~The Report, Tualatin Water Master Plan Update, August 2003,~~ The July 2013 Water Master Plan is accepted by reference as a supporting technical document to the Tualatin Community Plan.

~~(8) The Northwest Tualatin Concept Plan 2005 is adopted by reference as a supporting technical document to the Tualatin Community Plan.~~

~~(9) The Southwest Tualatin Concept Plan 2010 is adopted by reference as a supporting technical document to the Tualatin Community Plan.~~

~~(10) Continue the work started in 2001 and select one or more additional water sources.~~

Section 3. TDC 12.040 is amended to read as follows:

~~The 2003 Master Plan used a buildout population of 29,500 in 2010 which is an annual increase of about 2.5 percent per year from 2000 to 2010.~~ The July 2013 Water Master Plan projected a "build out population" of 29396 residents including estimates of 2,288 for redevelopment and infill and 1,048 for Town Center residential growth.

Section 4. TDC 12.050 is amended to read as follows:

(1) Population projections, commercial and industrial zoning acreage, and historical water use data formed the basis for the ~~2003 Master Plan's~~ July 2013 Water Master Plan's future water demand projection.

(a) The future per capita residential average day demand was assumed to be ~~100 gallons per capita~~ 90 gallons per capita per day.

(b) The relationship between the average day demand and other flow rate demands in the system is called the peaking factor. A peaking factor of ~~3.0~~ 2.2 was used in the ~~2003 Master Plan's~~ July 2013 Water Master Plan's

calculation of combined residential, ~~maximum day demand and a factor of 2.0 was used for~~ commercial and industrial maximum day demand.

(c) Large volume users are typically large multi-family projects and specialized industrial uses. The 2003 Master Plan identified 16 large water uses and they represent about 30% of the total system demand.

(d) Unaccounted-for water is the difference between the total amount purchased wholesale from the Portland Water Bureau and the total amount billed to customers. It includes leakage losses, meter discrepancies, hydrant and main flushing, operation and maintenance uses, fire flow uses, unauthorized connections and unmetered miscellaneous uses.

(2) The ~~2003 Master Plan's~~ July 2013 Master Plan's projected average day demand at buildout ~~in 2010~~ beyond 2031 for residential uses was ~~2.95~~ 2.65 million gallons per day ~~and with a 3.0 peaking factor the maximum day demand was 8.85 million gallons per day. The 2003 Master Plan's~~ The July 2013 Master Plan's projected average day demand at buildout ~~in 2010~~ beyond 2031 for commercial and industrial uses was ~~3.41~~3.61 million gallons per day ~~and with a 2.0 peaking factor the maximum day demand was 6.82 million gallons per day~~. The total system average day demand and maximum day demand were ~~6.36 and 17.2~~ 6.47 and 14.24 million gallons per day, respectively.

Section 5. TDC 12.060 is amended to read as follows:

(1) Fire flow is the amount of water required to fight a fire for a specified period. The Insurance Services Office (ISO) Commercial Risk Services, Inc., classifies a city for insurance rating purposes on the basis of a maximum fire flow requirement of 3,500 gallons per minute (gpm). Fire flow requirements greater than 3,500 gpm are evaluated individually and are not used by the ISO to determine the public protection classification of a municipality. For fire flow analysis the total fire flow requirement is a combination of building fire flow requirements plus system maximum day demand.

(2) Fire protection for the City's service area is provided by Tualatin Valley Fire & Rescue. The fire district has adopted fire flow requirements as defined in the 2010 State of Oregon Fire Code. A summary of fire flow recommendations based on the state fire code, fire flow criteria adopted by similar communities and fire flow guidelines as developed by the American Water Works Association is presented in Table 4-2 of the 2013 Master Plan.

(3) Fire protection is not dependent on the water distribution system alone. Fire flows greater than 3,500 gpm can be reduced with individual fire suppression systems such as sprinklers, chemical and alarm systems and fire-resistant construction, onsite supply and other methods. Developments with fire flows greater than 3,500 gpm will need to supplement public water system flows through private systems such as those noted in the prior sentence. The ~~2003 Master Plan's~~ July 2013 Master Plan's recommended minimum criteria for fire suppression flows for single family residential

~~was 1,500 gpm and~~ is 1,000 gpm, for multi-family is 2,000 gpm and commercial, industrial and institutional uses ~~was~~ is 3,500 gpm for a 3-hour duration.

Section 6. TDC 12.070 is amended to read as follows:

~~The 2003 Master Plan analyzed the source, pumping, storage, pipeline and fire flow components under 2002 and 2010 demand conditions in accordance with the Oregon Public Health Services Drinking Water Program and the Oregon Water Resources Department accepted standards for master plan studies. The H2OMap network analysis software was used to simulate the system's hydraulics. The model contained about 1,000 nodes and 1,200 pipes. The modeling was verified by field data collected at 22 stations throughout the system. The overall absolute variation for the 22 stations was less than 5% which is more than adequate for master planning and capital improvement purposes.~~

The July 2013 Water Master Plan analyzed the water system based on criteria for water supply, source, distribution system piping, service pressures, storage and pumping facilities in conjunction with the water demand forecasts for 2031 and beyond in Section 3 of the Master Plan.

The analysis and recommendations in Section 4 of the Master Plan are based on performance guidelines developed in a review of State of Oregon requirements, American Water Works Association (AWWA) acceptable practice guidelines, Insurance Services Office, Inc. (ISO) guidelines and the operational practices of similar water providers. The distribution system analysis was performed using Innovyze's InfoWater hydraulic network analysis software and an updated system model that relied on geographical information system, updated reservoir and pump station data, and current control valve setting information.

Section 7. TDC 12.080 is amended to read as follows:

(1) The City of Tualatin entered into an agreement with the City of Portland in the early 1980's to obtain water from the Bull Run watershed via the Washington County Water Supply Line. In emergencies the City can obtain small quantities through interties with the cities of Tigard, Lake Oswego, Sherwood and Wilsonville. Water from the Willamette River can be used for domestic purposes if Tualatin's voters approve of its use. Water quality from the Bull Run Reservoir, the Portland Water Bureau Columbia South Shore wellfield and the Tualatin distribution system meets or exceeds all U.S. Environmental Protection Agency water quality requirements. ~~Tualatin can obtain up to about 10.8 million gallons per day (mgd), but will need about 17.2 mgd in 2010, thus additional capacity of 6.4 mgd is needed. Reservoir capacity in 2003 is deficient 5.4 million gallons for Level A and will be deficient 1.9 million gallons for Level B and 0.6 million gallons for Level C in 2010. The pipelines are adequate overall and with new reservoir capacity and pipeline improvements will provide adequate peak hour demand conditions to 2010. Fire flows are adequate in 2003 in most areas and with new pipe in~~

~~several areas to increase looping and new reservoirs future fire flows will be adequate while maintaining system pressure.~~

(2) The City's water system is composed of three service levels (Levels A, B, and C) supplied by gravity and pumps and storage reservoirs. The system is primarily within public rights-of-way, is looped and is monitored and controlled by a central telemetry system.

(3) Service Level A is the lowest in elevation and is supplied directly from the Supply Line and by gravity from the 1971 2.2 million gallon enclosed steel tank Avery Reservoir. A new reservoir site was acquired in 2003 southwest of the SW Tualatin-Sherwood Road/SW Cipole Road intersection. Service Level B is the second lowest in elevation and is supplied by gravity from the 1971 and 1989 2.2 and 2.8 million gallon enclosed steel tank reservoirs on SW Norwood Road. A new reservoir site was acquired in the 1990's southwest of the SW 108th Avenue/SW Cottonwood Street intersection Service Level C is the highest in elevation and is supplied by gravity from the 1981 0.8 million gallon enclosed steel tank reservoir southeast of the Norwood Road overpass over I-5.

(4) The City has three pump stations. Stations one and two pump a back-up supply from Level A to Level B. Station three pumps from Level B to the C reservoir.

(5) The ~~8.8~~ July 2013 Water Master Plan identifies 13.0 million gallons of water storage capacity in ~~four~~ five reservoirs~~ is inadequate~~. The ~~2003 Master Plan~~2013 Master Plan recommends ~~a new reservoir in each Service Level which will provide adequate storage to 2010~~increased storage capacity in Service Areas A and B in the future.

Section 8. TDC 12.090 is amended to read as follows:

The ~~proposed~~ water distribution and storage system with existing and proposed waterlines and reservoirs ~~for the year 2010~~ is illustrated in Map 12-1. ~~The phased construction of this system will be dictated by identified deficiencies and actual growth patterns. Growth to 2010 can be projected with reasonable accuracy because the vacant and redevelopment areas are known.~~ The proposed short-term, medium-term and long-term capital improvements for the system recommended in the July 2013 Water Master Plan are ~~in Table 12-1 and~~ in Master Plan Table 7-1 and shown mapped on Plate-1 in Appendix A of the Master Plan.

Section 9. TDC 12.100 is amended to read as follows:

~~The City's agreement with the City of Portland allows Tualatin to purchase 18% of the total capacity of the Portland Water Bureau's Washington County Supply Line which is about 10.8 million gallons per day. This source is insufficient to meet the expected 17.2 million gallons per day demand in 2010. The City began a process in~~

~~2001 to identify potential new sources, including aquifer storage and recovery. The City's process will continue and one or more new sources will be selected.~~

The City's sole water supply is purchased wholesale from the Portland Water Bureau (PWB) through a 10-year wholesale water supply contract signed in 2006. Under the terms of the agreement, the City is obligated to purchase a minimum annual volume of water equal to 4.4 million gallons per day (mgd).

The City operates a single aquifer storage and recovery (ASR) facility. ASR operations allow the City to store surplus drinking water in a groundwater aquifer during low demand periods (fall through spring) and then recover the water from a groundwater well during high demand periods (summer). The aquifer has an effective recovery capacity of approximately 90 mg and is connected to Service Area B for both injection and recovery.

As a member of the Willamette River Water Coalition (WRWC), the City has access to surface water supply capacity from the Willamette River under OWRD Permit S-49240. In May 2002 the City Charter was amended to require that before Willamette River water is used for drinking purposes, a vote must approve such use.

Section 10. TDC 12.110 is amended to read as follows:

(1) The City of Tualatin has three service levels designated as A, B, and C on Map 12-1. The Bridgeport Service Area serves commercial customers in the Bridgeport Village shopping center.

(2) Service Level A includes approximately the northern 50% of the City extending east and west covering elevations from 110 feet to about 200 feet. Service Level B includes approximately the middle 40% of the City extending east and west covering elevations from about 180 feet to 280 feet. Its southern extent is Ibach Street and Ibach Street extended west to the railroad tracks and extended east to I-5. There are isolated areas above 280 feet, but these contain a very limited number of houses. The boundaries of Service Level C are Ibach Street on the north, I-5 on the east, the UGB on the south and the railroad tracks on the west.

(3) Substantial development has occurred over the years. Future development is expected to occur in Level A on the remaining vacant manufacturing lands, in the Town Center ~~downtown~~ area (redevelopment), in the Durham Quarry area and east of I-5 (~~Nyberg property and r~~Redevelopment of the Trailer Park of Portland). Future development in Level B is expected in the area of Legacy Meridian Park Hospital and the SW Concept Plan Area. Future development in Level C is expected in the SW Grahams Ferry and SW 108th Avenue residential areas. ~~Future development will occur in the area southwest of the City that was added to the Urban Growth Boundary by Metro in 2002 (approximately 300 acres).~~

Section 11. TDC 12.111 is amended to read as follows:

(1) ~~In 2003 Service Level A was deficient in storage by 5.4 million gallons. The City acquired ownership of a new reservoir site in 2003 and a 10-million gallon reservoir is being designed with construction expected to being in 2004. The reservoir will provide adequate storage through 2010.~~

~~(2) In 2003 Service Level A included some locations that drop below 35 pounds per square inch (psi) of pressure under peak hour demand conditions. All low pressure areas will be improved by the new reservoir and by new pipelines.~~

~~(3) In 2003 there were three areas where the system had difficulty providing 3,500 gallon per minute fire flows. The difficulties will be remedied by the new Level A reservoir, by new pipelines and by increasing the pressure setting in pressure reducing valves.~~

(1) Service Level A has adequate existing storage capacity but will require additional storage in the future. Increased storage volume needs in Service Area A are associated with the Town Center redevelopment and other redevelopment and infill.

Section 12. TDC 12.112 is amended to read as follows:

~~(1) In 2003 storage was adequate in Service Level B, but will be deficient by 2010. A new 1.9 million gallon reservoir is planned at the City owned site on SW 108th Avenue which will provide adequate storage for future growth.~~

~~(2) In 2003 some areas would drop below 35 pounds per square inch (psi) of pressure under peak hour demand conditions. All low pressure areas will be improved by the new reservoir and by new pipelines.~~

~~(3) In 2003 the system had difficulty providing 3,500 gallon per minute fire flows in the eastern portion of Level B. The difficulties will be remedied by the new Level B reservoir and by new pipelines that will improve looping.~~

(1) Service Level B has adequate existing storage capacity but will require additional storage in the future. Increased storage volume needs in Service Area B are associated with expansion and development in the SW Concept Plan Area which is located largely in Service Area B.

Section 13. TDC 12.113 is amended to read as follows:

~~(1) In 2003 storage was adequate in Service Level C, but will be deficient by 2010. A new 1.0 million gallon reservoir is planned next to the existing Level C reservoir which will provide adequate storage for future growth.~~ The 2013 Water Master Plan identifies the pending construction of the 1.0 mg C-2 Reservoir to serve Service Area C.

Section 14. TDC 12.120 is amended to read as follows:

(1) ~~Additional storage is needed in Service Levels A, B and C. One new reservoir is planned for each Level. The new Level A reservoir will be constructed in 2004. The Level B and C reservoirs are planned for 2010 and 2005, respectively.~~ The City's Water System consists of five (5) storage reservoirs with a combined storage capacity of 13.0 million gallons. The reservoirs are supplied both directly from the Portland Supply Main and from pump stations.

(2) Service Areas A and B have adequate existing storage capacity but will require additional storage in the future associated with expansions and development in the Southwest Concept Plan area. Service Area C will be served by a new C-2 Reservoir and with the uncertainty of actual future development characteristics in the Service Area, the 2013 Master Plan does not recommend construction of additional storage within the planning period.

Section 15. TDC 12.130 is deleted in its entirety.

Section 16. TDC 12.140 is amended to read as follows:

~~(1) The 2003 Master Plan estimated rate and system development charge (SDC) impacts for the next 10 years. Three water supply scenarios were developed. The Base Case (Scenario 1) assumed that Aquifer Storage and Recovery (ASR) would be used to meet future supply needs. Because the City was still testing the feasibility of ASR, alternative supply sources were considered. Scenario 2 was the Wilsonville-Willamette River. Scenario 3 was the Joint Water Commission-Tualatin/Trask River option.~~

~~(2) All three scenarios would have significant rate impacts, particularly over the next five years, to fund the needed source and other improvements. All three scenarios assume the City would increase rates in FY 2003/04 by about 12 percent system wide. Additional rate increases for FY 2004/05 and FY 2005/06 range from 15 percent for Scenario 1 to 46 percent for Scenario 3. The projected annual rate increases moderate after FY 2005/06 for all scenarios, to less than 5 percent.~~

~~(3) Because the capital improvement plan was driven primarily by the need to expand capacity for anticipated growth, the revised SDC's for each scenario are significantly higher than the current SDC. The revised SDC's range from $2,758 for Scenario 1 to $6,225 for Scenario 3. The SDC's for Scenarios 1 and 2 are well within the range charged by comparable communities ($2,000 - $4,000).~~

~~(4)~~ (1) The financial plan was based on assumptions related to system revenue and cost growth and the capital improvement plan in the Master Plan. The City should review the funding possibilities for the proposed water system improvements in ~~Table 12-1.~~Table 7-1 of the July 2013 Water Master Plan.

Section 17. Table 12-1 is deleted in its entirety.

Section 18. The City adopts as its findings the Findings and Analysis attached as Attachment A and incorporated herein.

Section 19. The July 2013 Water Master Plan is as set forth in Attachment B and is incorporated herein.

Section 20. Severability. Each section of this ordinance, and any part thereof, is severable. If any part of this ordinance is held invalid by a court of competent jurisdiction, the remainder of this ordinance shall remain in full force and effect.

INTRODUCED AND ADOPTED this 23rd Day of September, 2013.

CITY OF TUALATIN, OREGON

_____
Mayor

APPROVED AS TO LEGAL FORM ATTEST:

BY_____ BY_____
City Attorney City Recorder

ANALYSIS AND FINDINGS

The proposed amendment to the Tualatin Development Code (TDC) Chapter 12-Water Service-, is an application by the Community Development Department to incorporate the evaluation, analysis and recommendations of the July 2013 Water Master Plan accepted by the Council on March 11, 2013 and updated July 2013 for inclusion into the Tualatin Community Plan.

The approval criteria of the Tualatin Development Code (TDC), Section 1.032, must be met if the proposed PTA is to be granted. The plan amendment criteria are addressed below:

1. Granting the amendment is in the public interest.

The public interest is:

1) For the Tualatin Community Plan's water system plan to be up to date for the long term viability of the system and for compliance with the Oregon Public Water System requirements in the Oregon Administrative Rules (OAR).
2) To have a plan for water system improvements that will ensure the continuing and long term viability of the City's water system.

Public Interest #1. The City of Tualatin is the public water service provider to the residences and businesses in the City. The City has built and maintains an extensive system of water supply, water storage and water distribution facilities that was planned to safely, efficiently and effectively serve the community. The water system is primarily supported by revenues from water users and from water system development charges applied to new development.

Tualatin Development Code (TDC) Chapter 12 is the water service element of the Tualatin Community Plan that in 1983 was brought as a water system plan into Chapter 12. In 2003, Chapter 12 was amended to update the water master plan based on the 2003 "Report, Tualatin Master Plan Update". The 2003 Master Plan is the basis for the City's current water system plan in Chapter 12.

OAR Chapter 333 Division 61 requires Public Water Systems to have current water master plans, meaning that the City can expect to update its 20-year water system plan every 8-10 years.

In June 2011, the City started the update to the 2003 Water Master Plan to be prepared by Murray Smith & Associates, Inc. The purpose of the Water Master Plan update was to perform a comprehensive analysis of the City's water system, to identify deficiencies, to determine future supply requirements, and to recommend facility improvements that correct existing deficiencies and provide for future

expansion. The product of the update is the "July 2013 Water Master Plan" that examines current and projected water supply and demand information, system capacity, cost and revenue projections and provides recommendations for short to long term capital projects to ensure adequate domestic water service into the 20-year plan horizon. The 2013 Water Master Plan was accepted by the Council on March 11, 2013 and staff was directed to begin the plan text amendments process to adopt the Water Master Plan into the Code.

The July 2013 Water Master Plan will be incorporated into the Tualatin Community Plan Chapter 12-Water Service- as an up-to-date water system plan that provides a 20 year plan for Tualatin's water service. The recommendation to revisit water demand projections in three years (2016) was accepted by Council. These actions will provide information to the City about the current and future needs and constraints of the system that are necessary for operating and improving the water system in an effective and timely manner.

The proposed TDC amendment incorporates a current, updated water system master plan into the Tualatin Community Plan that will be useful for the next 8-10 year plan cycle and will be consistent with the Oregon Administrative Rules for Public Water Systems. Public Interest #1 is satisfied.

Public Interest #2. The July 2013 Water Master Plan recommends water line, pumping capacity and storage reservoir improvements to correct system deficiencies and to serve the City from the present through Build-out development. The recommended improvements are presented as a Capital Improvement Program with estimated project costs and short, medium and long term schedules. The improvement program recommendations will be referenced in the proposed amendments to Chapter 12.

The Water System Capital Improvement Program schedule and project summary proposed in the Water Master Plan will provide information for the City to consider in budgeting for water system improvements as part of the City's on-going Capital Improvement Program.

The proposed amendment PTA-13-01 incorporates a plan for water system improvements that will ensure the continuing and long term viability of the City's water system. This satisfies Public Interest #2.

Granting the amendment is in the public interest. Criterion "A" is met.

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

This Water Master Plan is a 20-year planning document and projects water system needs through 2031. By State law, water master plans must be kept current. This means that the City can expect to update its 20-year plan every eight to ten years. Now is the time to update the Water Service element of the Tualatin Community Plan. The 2013 Water Master Plan is completed and was accepted by the Council on March 11, 2013 and updated July 2013. The Oregon Public Water Systems rules require the Tualatin Water Plan be kept current. Given that the last update was in 2003, it is time to update the TDC Chapter 12 to reflect the new Water Master Plan.

Granting the amendment at this time best protects the public interest.

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

The applicable objectives of the Tualatin Community Plan relating to the amendment Tualatin Development Code (TDC) Chapter 12 are discussed below:

Chapter 4. Community Growth
Section 4.050. General Growth Objectives
(1) Provide a plan that will accommodate a population range of 22,000 to 29,000 people.
The proposed amendments are consistent with this objective because they update the City's Water Master Plan so a projected population of 28,565 in 2031 can be served. The analysis and recommended water system improvements will accommodate existing and future development in this population range. The objective is met.

Criterion "C" is met.

4. The following factors were consciously considered:

The various characteristics of the areas in the City.

The characteristics of all areas of the City and inside the UGB were considered in the 2013 Master Plan's evaluation and modeling. Data for existing and planned uses were used in the modeling.

The suitability of the area for particular land uses and improvements.

Not applicable

Trends in land improvement and development.

Trends in per capita water usage, water conservation, and industrial water usage were considered in the 2013 Water Master Plan evaluations and modeling. Recommendations for system improvements were based on the needs of industry and future development.

Property Values.

Property values will be maintained and enhanced with a water master plan that calls for adequate storage and water lines that will adequately serve existing and future development.

The needs of economic enterprises and the future development of the area.

The 2013 Master Plan modeling accounted for residential, commercial and industrial water system demands for the present and the future. Recommendations for system improvements were based on the needs of industry and future development.

Needed right-of-way and access for and to particular sites in the area.

Not Applicable.

Natural resources of the City and the protection and conservation of said resources.

Not Applicable.

Prospective requirements for the development of natural resources in the City.

Not Applicable.

And the public need for healthful, safe, aesthetic surroundings and conditions.

In general, the water system will continue to provide potable water that can be used for drinking, washing, or irrigating crops, vegetable gardens, and landscaping, activities that create and maintain healthful, safe and aesthetic surroundings and conditions. As a specific example, under Distribution System notes that the minimum water system fire flow pressure would be as required by the State of Oregon Health Authority, contributing to healthful and safe conditions. The existing and improved water system will provide water that meets water quality standards in sufficient quantity to provide for healthful, safe and aesthetic surroundings and conditions.

Proof of change in a neighborhood or area.
Staff does not assert proof of change in a neighborhood or area.

Mistake in the Plan Text or Plan Map.
There is no mistake in the Plan Text or Plan Map.

5. The criteria in the Tigard-Tualatin School District Facility Plan for school facility capacity have been considered when evaluating applications for a comprehensive plan amendment or for a residential land use regulation amendment.

Because the amendment does not result in a change to plans or development regulations that would impact school facility capacity, the criterion is not applicable.

6. Granting the amendment is consistent with the applicable State of Oregon Planning Goals and applicable Oregon Administrative Rules.

Of the 19 statewide planning goals, staff determined one Goal is applicable, Goal 11 "Public Facilities and Services," which is, "To plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development." Oregon Administrative Rules (OAR) 660-015-0000(11) explains that "timely, orderly, and efficient arrangement" refers to "a system or plan that coordinates the type, locations, and delivery of public facilities and services in a manner that best supports the existing and proposed land uses."

Goal 11 and the related OARs require cities to adopt a Public Facilities Plan that includes water system facilities. The City's Water System Plan is Chapter 12 of the Tualatin Community Plan and the July 2013 Water System Master Plan and implementing amendments in PTA-13-01 fulfill water system plan requirements and are a timely update to the plan.

The amendment complies with Goal 11.

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

The Metro Urban Growth Management Functional Plan (MUGMFP) does not address water systems. The criterion does not apply.

8. 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.

Because the amendment does not relate to vehicle trip generation, the criterion is not applicable.

City of Tualatin, Oregon

Water Master Plan

January 2013

Amended July 2013

MSA
Murray, Smith & Associates, Inc.
Engineers/Planners

FCS GROUP

Prepared For:

CITY OF TUALATIN, OREGON

Water Master Plan

January 2013
Amended July 2013

RENEWS: 6-30-2013

RENEWS 12-31-14

Prepared By:

MURRAY, SMITH & ASSOCIATES, INC.
Engineers | Planners
121 SW Salmon, Suite 900
Portland, Oregon 97204
www.msa-ep.com

In Association With:

FINANCIAL CONSULTING SOLUTIONS GROUP, INC.
7525 166th Avenue NE, Suite D-215
Redmond, Washington 98052
www.fcsgroup.com

Page

EXECUTIVE SUMMARY

1. INTRODUCTION

2. EXISTING WATER SYSTEM

3. WATER REQUIREMENTS

4. PLANNING & ANALYSIS CRITERIA

5. WATER SYSTEM ANALYSIS

6. WATER QUALITY & WATER CONSERVATION

7. CAPITAL IMPROVEMENTS PROGRAM

8. FINANCIAL ANALYSIS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

PURPOSE

The purpose of this Water Master Plan (WMP) is to perform a comprehensive analysis of the City of Tualatin's (City) water system, to identify system deficiencies, to determine future water distribution system supply requirements, and to recommend water system facility improvements that correct existing deficiencies and that provide for future system expansion. This WMP complies with water system master planning requirements established under Oregon Administrative Rules (OAR) for Public Water Systems, Chapter 333, Division 61. The City's existing WMP was completed in 2003. This updated WMP meets the OAR requirement for the City to maintain a current WMP.

WATER SYSTEM CHARACTERIZATION

The City's current water service area includes all areas within the current city limits and Urban Growth Boundary (UGB). The City provides potable water to approximately 26,000 people through approximately 6,700 residential, commercial, industrial and municipal service connections.

The City purchases wholesale water from the City of Portland Water Bureau (PWB) as its sole supply. The City's water distribution system currently consists of four service zones supplied by five (5) steel storage facilities with a total combined storage capacity of approximately 13.0 million gallons (MG) and three (3) pump stations with a combined pumping capacity of approximately 5,800 gallons per minute (gpm).

The City is currently pilot testing a single Aquifer Storage and Recovery (ASR) facility. ASR operations allow the City to store surplus drinking water in a groundwater aquifer during low demand periods (fall through spring) and then recover the water from a groundwater well during high demand periods (summer). The aquifer has an effective recovery capacity of approximately 90 MG (1 mgd for 90 days) and is connected to Service Area B for both injection and recovery. A single 150 horsepower vertical turbine pump recovers the water at a capacity of approximately 400 to 500 gallons per minute (gpm), depending upon aquifer level and hydraulic conditions.

WATER SYSTEM SUPPLY & DEMAND PROJECTIONS & ASSESSMENT

This WMP is a 20-year planning document. The WMP projects water system needs through 2031. By State law, water master plans must be kept current. This means that the City can expect to update its 20-year plan every eight to ten years.

Population Projection

The projected build-out population is estimated as the current population of 26,060, plus the following growth elements identified by other planning studies for a total of 29,396 residents, projected at build-out (beyond the 20-year planning horizon).:

- ☐ 2,288 residents due to redevelopment and infill,
- ☐ 1,048 residents added to the Town Center,

Water Demand Projections

The City's current average daily water demand is approximately 4.3 million gallons per day (mgd) with a maximum day demand (MDD) of approximately 9.5 mgd. At build-out development, the anticipated average daily water demand is approximately 6.5 mgd and with a MDD of approximately 14.2 mgd within the City's current UGB.

Water Supply Capacity & Wholesale Water Purchases

Currently, the City's water supply is purchased wholesale from the PWB through a 20-year wholesale water supply contract signed in 2006. The contract extends through 2026. Under the terms of the agreement, the City is obligated to purchase a minimum annual volume of water equal to 4.4 mgd. The wholesale water rate paid by the City is based on three factors: 1) the guaranteed minimum purchase, 2) the City's peak seasonal factor, and 3) the City's peak daily factor.

The City receives water supply through the Washington County Supply Line (WCSL) which conveys water by gravity from the PWB's Powell Butte Reservoir to the City, along with other Washington County wholesale customers (Tualatin Valley Water District (TVWD) and Raleigh Water District). The WCSL is an 84-inch to 60-inch diameter transmission line that reduces to 48-inch diameter after the supply connection to the TVWD Wolf Creek Main. The WCSL continues south as a 48-inch diameter supply main ending at the Florence Lane Master Meter. A 36-inch diameter City-owned pipe conveys water from the Florence Lane Master Meter to the City, referred to as the Portland Supply Main in this plan.

The Portland Supply Main has a maximum capacity of 20 mgd; however, this supply capacity is limited by the available capacity of the WCSL system. The WCSL has a nominal capacity of 60 mgd and the City has rights to 18 percent of the capacity, or 10.8 mgd. The 60 mgd nominal capacity is based on the WCSL operating with all the owners of the line using their full capacity and maintaining adequate supply pressure. Within the 20-year planning period, the City's peak water supply needs are projected to exceed the City's 10.8 mgd capacity in the WCSL transmission system. The City's 2003 Water System Plan projected water demands to exceed this capacity by 2010, but several factors including conservation and slower population and economic growth have resulted in lower demands.

The City currently has a planning level MDD of approximately 9.5 mgd and experienced an actual peak demand of 9.3 mgd in 2007. The largest single source of increased demand within the study area is the large water users anticipated in the SW Concept Area Plan. The WMP projects that with continued conservation and slower economic growth, water supply expansion will not be required until 2023. **It is recommended that the City review the projected water demand in three years to determine if current conditions warrant action to begin acquiring additional supply capacity. This will allow the City time to evaluate changes in WCSL usage that may result in additional available capacity for acquisition by the City. The City can also evaluate the addition of any significant new customer water demands to the system. The current plan does not budget funds for any supply expansion projects.**

Water System Analysis & Improvements Summary

The City's hydraulic model was updated for recent improvements and calibrated to current water system demands. The model was used to evaluate the current and future water system for deficiencies which were evaluated for inclusion in the City's Capital Improvement Projects (CIP) list. In general, the City's water system is adequate to supply domestic water service and fire suppression capacity within the service area.

The majority of the recommended CIPs are associated with growth related development primarily in the expansion areas. Growth related infrastructure improvements include approximately 48,000 feet of transmission piping, 5.4 MG in new storage facilities, and a new 3,600 gpm pump station. There are several smaller non-growth related improvements associated with improving fire flow capacities, continuation of the asbestos cement pipe replacement program, and upgrades to the existing telemetry system.

The total estimated project cost of these improvements is approximately $24.4 million for the 20-year planning horizon and beyond to the ultimate full development of the City's existing UGB. Of the improvements required in the 20-year planning horizon, approximately $11.8 million of these improvements are required in the next 10 years. Approximately $1.2 million per year should be budgeted over the next 20 years for the completion of these projects.

FINANCIAL SUMMARY

A financial evaluation of the City's water system was performed and included recommendations for updating the System Development Charge (SDC) and recommendations for water system rate adjustments to maintain adequate funds for system operation, maintenance, capital improvements and water system bond coverage.

Water Rate Adjustment

The Plan does not include a recommended rate increase for fiscal year 2012-13. If, during that year, earned rate revenues equal or exceed budgeted rate revenues, then a rate increase can be avoided for fiscal year 2013-14. If, however, revenues for fiscal year 2012-13 are flat, a rate increase of 4.25 percent in fiscal year 2013-14 with a series of similar increases in subsequent years through fiscal year 2021-22 is recommended.

System Development Charge Update

A SDC can include three components: 1) a reimbursement fee based on existing capacity to be used by new development, 2) an improvement fee based on needed new infrastructure to serve development, and 3) compliance costs to develop and administer SDCs. Table ES-1 summarizes the components of the proposed water SDC of $4,428 per Equivalent Dwelling Unit (EDU).

Table ES-1 | SDC Components

Component	Per EDU
Reimbursement fee	$1,602
Improvement fee	2,821
Compliance costs	5
Total water SDC	$4,428

Source: FCS GROUP

The City's current total water SDC (indexed as of February, 2012) is $3,266 per EDU. The proposed SDC is 35.6 percent higher than the current SDC. The City may choose to adopt a new SDC equal to the proposed amount immediately, phase in the SDC increase over multiple years or not adopt the new proposed SDC. Both of the latter options would result in the City forgoing SDC revenue scheduled to fund required system expansion projects identified in the CIP.

CIP Funding

In general, the sources for funding growth and non-growth related Capital Improvement Projects include 1) cash resources and revenues; 2) publicly issued debt; and 3) governmental grant and loan programs.

Water Fund Cash Resources and Revenues

The City's financial resources available for capital funding include rate funding, cash reserves, and SDCs. Generally, the proposed water rate adjustment includes consideration of SDC charges for growth related projects and rate funding for the non-growth related Capital Improvement Projects, which are not SDC eligible.

Public Debt

Revenue bonds are commonly used to fund utility capital improvements. The bond debt is secured by the revenues of the issuing utility and the debt obligation does not extend to other City resources. With this limited commitment, revenue bonds typically require security conditions related to the maintenance of dedicated reserves referenced as bond reserves and financial performance measures which are added to the bond debt as service coverage. There is no bonding limit, except the practical limit of the utility's ability to generate sufficient revenue to repay the debt and meet other security conditions. Revenue bonds incur relatively higher interest rates than government programs, but due to the highly competitive nature of the low- interest government loans, revenue bonds are assumed to be a more reliable source of funding as they typically can be obtained by most communities.

Government Programs

Government programs include low rate loan programs and some grants for eligible projects and loan recipients. The major water system programs include the Oregon State Safe Drinking Water Financing Program, the Special Public Works Fund, and the Water/Wastewater Fund. The WMP financial analysis does not assume use of any lower rate government assistance programs.

AUTHORIZATION

In June 2011, the firm of Murray, Smith & Associates, Inc. was authorized by the City of Tualatin (City) to prepare this Water Master Plan (WMP).

PURPOSE

The purpose of this study is to perform a comprehensive analysis of the City's water system, to identify system deficiencies, to determine future water distribution system supply requirements, and to recommend water system facility improvements that correct existing deficiencies and that provide for future system expansion.

COMPLIANCE

This plan complies with water system master planning requirements established under Oregon Administrative Rules (OAR) for Public Water Systems, Chapter 333, Division 61.

PLAN ELEMENTS

This study includes the following elements:

- ***Water System Description.*** Prepare an inventory of existing water system facilities including supply, transmission and distribution piping, storage reservoirs, pumping stations, and control systems.
- ***Water Requirements.*** Review information related to service area, land use, population distribution, and historical water demands. Develop water demand forecasts for existing and undeveloped areas within the City's water service area.
- ***System Analysis Criteria.*** Develop system performance criteria for distribution and transmission systems and storage and pumping facilities. Develop analysis and planning criteria for pressure zone service pressure limits, for emergency fire suppression water needs, and for other system performance parameters.
- ***Water System Analysis.*** Perform a detailed analysis of the City's transmission and distribution system, storage and pumping capacity needs, and pressure zone limits.
- ***Water Quality and Regulations.*** Describe the City's compliance status with respect to current and anticipated future State and Federal drinking water regulations.
- ***Water Conservation.*** Provide the City with information on potential conservation measures that could be implemented.
- ***Prepare Capital Improvement Plan.*** Develop estimated project costs for recommended improvements, recommend project sequencing and develop a Capital Improvement Program (CIP).

- ***Financial Evaluation.*** Develop an overall financing strategy using costs associated with capital improvements, based on the planning horizons. Review options for alternative rate structures.
- Update existing Rate and System Development Charges models will be updated based on the newly generated CIP.
- ***Prepare Water Master Plan.*** Prepare a WMP that documents and describes the planning and analysis work efforts, including a color map identifying all existing and proposed water system facilities.

GENERAL

This section describes and inventories the City of Tualatin's (City) water service area and water distribution system facilities. Included in this section is a discussion of existing supply and transmission facilities, water rights, pressure zones, storage and pumping facilities and distribution system piping.

BACKGROUND AND STUDY AREA

The City's current water service area includes all areas within the current city limits and Urban Growth Boundary (UGB). The City provides potable water to approximately 26,000 people through approximately 6,700 residential, commercial, industrial and municipal service connections. The study area of this planning effort is the entire area within the UGB. Plate 1 in Appendix A illustrates the City's water system service area limits, water system facilities and distribution system piping.

The City purchases wholesale water from the Portland Water Bureau (PWB) as it sole supply. The City's water distribution system currently consists of four (4) service zones supplied by five (5) steel storage facilities and three (3) booster pumping stations. Figure 2-1, included at the end of this section, presents a hydraulic schematic of the City's water system.

SUPPLY SOURCES

Wholesale Water Purchase

Currently, the City's water supply is purchased wholesale from the PWB through a 20-year wholesale water supply contract signed in 2006. The contract extends through 2026. Under the terms of the agreement, the City is obligated to purchase a minimum annual volume of water equal to 4.4 million gallons per day (mgd). The wholesale water rate paid by the City is based on three (3) factors: 1) the guaranteed minimum purchase, 2) the City's peak seasonal factor, and 3) the City's peak daily factor. Items 2 and 3 are the ratio of use during the 90 days of the summer season and the three (3) consecutive highest water use days, respectively, to the guaranteed minimum purchase. The higher these peaking factors are, the higher the City's wholesale water rate will be.

The supply is metered through the Florence Lane master meter in the City of Portland. The PWB source is the Bull Run watershed located near Mt. Hood. Two (2) surface water impoundments, Bull Run Reservoir No 1 and No. 2, store up to approximately 9.9 billion gallons of usable storage in the protected watershed. This surface water supply is disinfected with chloramines and pH-adjusted to decrease the corrosive qualities in the water. Currently, the source is unfiltered. The PWB designed a water treatment facility to comply with the Environmental Protection Agency (EPA) requirement to address the potential for cryptosporidium contamination under the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR). Construction of the ultraviolet treatment facility has been delayed indefinitely following a State of Oregon Drinking Water Program variance for the unfiltered Bull Run source. The PWB operates a secondary groundwater supply, the Columbia South Shore

Wellfield, to supplement the Bull Run surface water storage in the summer and to provide source redundancy. The wellfield has a total capacity of approximately 90 million gallons per day (mgd).

The Washington County Supply Line (WCSL) conveys water by gravity from the PWB's Powell Butte Reservoir to the City of Tualatin, along with other Washington County wholesale customers (Tualatin Valley Water District (TVWD) and Raleigh Water District (RWD)). The WCSL is an 84-inch to 60-inch diameter transmission line that reduces to 48-inch diameter after the supply connection to the TVWD Wolf Creek Main, near the intersection of SW Beaverton-Hillsdale Highway and SW Oleson Road. The WCSL continues south as a 48-inch diameter supply main ending at the Florence Lane Master Meter. The City owns 1.5 percent of the 60-inch diameter pipe nominal capacity and approximately 58 percent of the 48-inch diameter pipe nominal capacity. The City also owns a 36-inch diameter pipe which conveys water from the Florence Lane Master Meter to the City of Tualatin. For the purposes of this plan, this pipe is referred to as the Portland Supply Main. Historically, the City of Sherwood has purchased water from the City of Tualatin through the Portland Supply Main.

Emergency Interties

The City maintains Intergovernmental Agreements (IGAs) with neighboring water providers for emergency supply. Existing emergency interties with their providers include connections with the City of Tigard, the Rivergrove Water District, the City of Lake Oswego, the City of Sherwood and the City of Wilsonville. Plate 1 shows the location of these emergency interties. Table 2-1 summarizes the interties characteristics to include the nominal hydraulic grades and estimated nominal intertie capacities to supply the City. The intertie capacities are estimated nominal capacities and assume that the neighboring water provider has excess supply available. Determination of intertie capacities is best made through field testing.

Table 2-1 | Emergency Intertie Summary

Intertie	Hydraulic Grade (Tualatin)	Hydraulic Grade (Other)	Meter size (in)	Nominal Intertie Capacity (gpm)
Lake Oswego	295	320	10	300
Tigard (SW Boones Ferry & Lower Boones Ferry)	295	410	8	700
Tigard (72nd & Bridgeport Rd)	295	410	10	1,000
Rivergrove	295	315	8	600
Sherwood – Supply Main (City Park)	295[1]	380	12	6,600
Sherwood – Distribution System (SW Cipole Road)	295	380	12	1,600
Wilsonville	506[2]	506	n/a	300

Notes:

1) The Sherwood Supply Main could be used to supply the City of Tualatin from the City of Sherwood under emergency conditions when the PWB supply is not available. The normal hydraulic grade of 530 feet would be reduced to the Service Area A grade of 295 feet.
2) Transferring water from the City of Wilsonville would require that the City of Tualatin reservoir be drawn down to induce flow.

Aquifer Storage and Recovery

The City operates a single aquifer storage and recovery (ASR) facility. ASR operations allow the City to store surplus drinking water in a groundwater aquifer during low demand periods (fall through spring) and then recover the water from a groundwater well during high demand periods (summer). The facility is located on SW 108th Avenue near the intersection with SW Dogwood Street. The aquifer has an effective recovery capacity of approximately 90 mg and is connected to Service Area B for both injection and recovery. A single 150 horsepower (hp) vertical turbine pump recovers the water to Service Area B from a pump setting of 470 feet below ground surface at a capacity of approximately 400 to 500 gallons per minute (gpm), depending upon aquifer level and hydraulic conditions. The City is currently pilot testing the ASR facility.

WATER RIGHTS

As a wholesale water customer of the PWB, the City does not hold water rights related to that supply. The City's single ASR facility operates under Oregon Water Resources Department (OWRD) ASR Limited License No. 010. This Limited License authorizes the City to operate an ASR system of up to five (5) wells storing 475 million gallons of water for recovery of up to 3,500 gpm during the summer season.

As a member of the Willamette River Water Coalition (WRWC), the City has access to surface water supply capacity from the Willamette River under OWRD Permit S-49240. A charter amendment adopted May 21, 2002, limits the City's ability to make use of the WRWC water right on the Willamette River. Specifically, the City shall not use Willamette River water as a drinking water source for its citizens unless approved through a majority vote.

SERVICE AREAS (PRESSURE ZONES)

General

The City's existing distribution system is divided into four existing service areas or pressure zones. Pressure zones are usually defined by ground topography and designated by overflow elevations of water storage facilities or outlet settings of pressure reducing facilities serving the zone. Pressure zone boundaries are further refined by street layout and specific development projects. A description of each of the City's pressure zones is presented below and includes a description of the service area, storage facilities, pumping facilities and groundwater sources serving the zone.

Service Area A

Service Area A is the largest pressure zone in the City and it serves customers between an approximate ground elevation of 88 feet and 202 feet above mean sea level (msl). The zone operates at an approximate hydraulic grade line (HGL) of 295 feet. The zone is composed of residential, commercial and manufacturing land uses. Service Area A is served directly from the Portland Supply Main through control valves. The A-1 and A-2 Reservoirs provides operational, emergency, and fire suppression storage to Service Area A.

Service Area B

Service Area B is the second largest pressure zone in the City and it serves customers between an approximate ground elevation of 192 feet and 306 feet above msl and above Service Area A. The zone operates at an approximate HGL of 399 feet. The zone is composed of residential, commercial and manufacturing land uses. Service Area B is served directly from the Portland Supply Main through a control valve. The Norwood Reservoirs provides operational, emergency, and fire suppression storage to Service Area B.

Service Area C

Service Area C is the second smallest pressure zone in the City, and it serves customers between an approximate ground elevation of 260 feet and 360 feet above msl. The zone operates at an approximate HGL of 506 feet. The zone is composed of residential and institutional land uses. Service Area C is served directly from the Norwood Pump Station and the C-1 Reservoir which provides operational, emergency, and fire-suppression storage to Service Area C.

Bridgeport Service Area

The Bridgeport Service Area is the smallest pressure zone in the City, and it serves commercial customers in the Bridgeport Village shopping complex between an approximate ground elevation of 185 feet and 200 feet above msl. The zone operates at an approximate HGL of 360 feet. The zone is composed of commercial land uses. The Bridgeport Service Area is supplied directly from the Portland Supply Main through the SW 72nd Avenue pressure reducing valve (PRV). The zone is isolated from Service Area A by normally closed valves on SW Bridgeport Road. The zone does not contain any gravity storage. A backup connection to the City of Tigard water system is located near the PRV. Fire suppression capacity is provided through both connections.

STORAGE RESERVOIRS

The City's water system contains five (5) reservoirs with a total combined storage capacity of approximately 13.0 mg. Table 2-2 presents a summary of the City's existing storage reservoirs, including capacity, overflow elevations, and pressure zones served.

Table 2-2 | Reservoir Summary

Reservoir Name	Service Area	Capacity (mg)	Overflow Elevation (ft)	Floor Elevation (ft)	Height (ft)[1]	Year Built	Type	Diameter (ft)
Avery (A-1)	A	2.2	295	248	47.0	1971	Steel	90
(A-2)	A	5.0	295	248	47.0	2006	Steel	135
Norwood 1 (B-1)	B	2.2	399	352	47.0	1971	Steel	90
Norwood 2 (B-2)	B	2.8	399	352	47.0	1989	Steel	100
Frobase (C-1)	C	0.8	506	458.5	47.5	1981	Steel	54

Note: 1) Maximum height of water column as measured from floor to overflow elevation.

The Avery Reservoir, also referred to as the A-1 Reservoir, provides gravity storage to Service Area A. The reservoir is located east of SW Teton Avenue and south of SW Avery Street. The reservoir is supplied directly from the Portland Supply Main and subsequently through five (5) PRVs to the Service Area A distribution system. The A-1 Reservoir fills when supply exceeds demand in Service Area A.

A second reservoir, referred to as the A-2 Reservoir, also provides gravity storage to Service Area A. The reservoir is located west of the City and southeast of the intersection of Tualatin-Sherwood Road and SW Oregon Street. Access is from SW Dahlke Lane. As with the Avery Reservoir, the A-2 Reservoir is supplied directly from the Portland Supply Main through the same five (5) PRVs feeding the Service Area A distribution system. The A-2 Reservoir fills when supply exceeds demand in Service Area A.

The Norwood Reservoirs, also referred to as the B-1 and B-2 Reservoirs, provide gravity storage to Service Area B. The reservoirs are located off SW Norwood Road, west of Interstate Highway 5 and are connected to the Service Area B distribution system by approximately 4,800 feet of transmission piping. The reservoirs are supplied from the Portland Supply Main through a control valve directly supplying the Service Area B distribution system. The Martinazzi and Boones Ferry Pump Stations provide backup supply from Service Area A in the event that the control valve is out of service. The Norwood Reservoirs also provide backup emergency and fire suppression storage for Service Area A. The Norwood Reservoirs fill when supply exceeds demand in Service Area B. The Norwood Reservoirs provide suction supply for the Norwood Pump Station.

The Frobase Reservoir, also referred to as the C-1 Reservoir, provides gravity storage to Service Area C. The reservoir is located outside the city limits in Washington County near the intersection of SW Frobase Road and SW 82nd Avenue. The reservoir is supplied from the Norwood Pump Station which boosts water from Service Area B through the Service Area C distribution system to the reservoir.

PUMP STATIONS

General

The City's water system contains three (3) pump stations. A description of each station is presented below and key parameters are summarized in Table 2-3, including the service zone supplied, station capacities and number, type and horsepower (hp) rating of existing pump units.

Table 2-3 | Pump Station Summary						
Pump Station	Unit	HP	Nominal Capacity (gpm)	Suction Service Area	Discharge Service Area	Function
Martinazzi	1	50	1,000	A	B	Backup
	2	50	1,000			
Boones Ferry	1	25	500	A	B	Backup
	2	25	500			
Norwood	1	75	1,400	B	C	Primary Supply
	2	75	1,400			

Martinazzi Pump Station

The Martinazzi Pump Station is located near the intersection of SW Martinazzi Avenue and SW Warm Springs Street in a below grade, cast-in-place, concrete vault. The pump station houses two (2) centrifugal pumps. The two (2) 50-hp pumps provide backup water supply from Service Area A to Service Area B when the City's Boones Ferry control valve connection to the Portland Supply Main is out of service. Each of these pumps has a nominal capacity of approximately 1,000 gpm. A portable power generator connection is provided at the pump station.

Boones Ferry Pump Station

The Boones Ferry Pump Station is located near the intersection of SW Boones Ferry Road and SW Mohawk Street in a below-grade, cast-in-place, concrete vault. The pump station houses two (2) centrifugal pumps. The two (2) 25-hp pumps provide backup water supply from Service Area A to Service Area B when the Boones Ferry control valve connection is out of service. Each of these pumps has a nominal capacity of approximately 500 gpm. A portable power generator connection is provided at the pump station.

Norwood Pump Station

The Norwood Pump Station is located near the Norwood Reservoirs and houses two (2) end-suction centrifugal pumps. Two (2) 75-hp pumps with variable frequency drives supply water from Service Area B to Area C from the transmission line that connects the Norwood Reservoirs to Service Area B. Each of these pumps has a nominal capacity of approximately 1,400 gpm. A portable power generator connection is provided at the pump station.

CONTROL VALVES

Automatic control valves are critical to the normal operation of the City's water system. The City's source water is at a higher hydraulic grade than the distribution system, although Service Area C is not able to be supplied by gravity.

Flow from the Portland Supply Main into Service Areas A and B is regulated by flow control valves (FCV) and PRVs. The Bridgeport Service area is supplied by PRVs from the Portland Supply Main and a backup supply from the City of Tigard. A summary of the City's supply

control valves is presented in Table 2-4. Service Area C is supplied from Service Area B through booster pumping at the Norwood Pump Station. Combination pressure reducing/pressure sustaining (PRPS) valves are located between service areas to help maintain adequate service pressure throughout the distribution system and are summarized in Table 2-5. All control valve locations are shown on Figure 2-1.

Table 2-4 | Supply Control Valves Summary

Valve ID	Type	Upper Zone	Lower Zone	Ground Elev. (ft)	Low Flow		High Flow	
					Size	HGL	Size	HGL
72nd Ave	FCV-PRV	PSM	A	175	6”	175	12”	288
City Park	FCV-PRV	PSM	A	113	3”	113	12”	260
108th Operations	FCV-PRV	PSM	A	124	8”	123	--	123
Leveton	FCV-PRV	PSM	A	141	4”	141	12”	256
Bridgeport (Tualatin)	PRV	PSM	BP	175	3”	117.5	8”	--
Bridgeport (Tigard)	PRV	PSM	BP	175	3”	117.5	8”	--
Boones Ferry	FCV-PRV	PSM	B	168	--	--	10”	422

Notes:
HGL = Hydraulic Grade Line, reported in feet
FCV = Flow Control Valve
PRV = Pressure Reducing Valve
PSM = Portland Supply Main
BP = Bridgeport Service Area

Table 2-5 | Distribution Control Valves Summary

Valve ID	Type	Area A Full Pressure	Area B Full Pressure	Area A ON/OFF Sustaining Minimum Pressure	Area B OFF Override Minimum Pressure
Avery Street	PRPS	56	101	35	84
65th Avenue	PRPS	70	116	50	99
Chesapeake Drive	PRPS	49	94	28	78
Mohawk Street	PRPS	62	107	41	91
57th Avenue	PRPS	55	100	34	84
Valve ID	**Type**	**Area B Full Pressure**	**Area C Full Pressure**	**Area B ON/OFF Sustaining Minimum Pressure**	**Area C OFF Override Minimum Pressure**
Dakota Drive	PRPS	54	100	33	84
Osage Street	PRPS	54	101	33	84

Notes:
Pressures are reported in pounds per square inch (psi)
PRPS = combination pressure-relief and pressure-sustaining valve

DISTRIBUTION SYSTEM

The water service area water distribution system is composed of various pipe types in sizes up to 36 inches in diameter. The total length of piping in the service area is approximately 115 miles. The distribution piping materials include asbestos cement, cast iron, and ductile iron. Transmission piping also includes 36-inch diameter Ameron concrete cylinder pipe and coal tar coated cement lined steel pipe. The majority of the piping in the system is ductile iron piping. Table 2-6 presents a summary of pipe lengths by diameter.

Table 2-6 | Transmission and Distribution System Pipe Summary

Size (in)	Pipe Length (miles) by Pipe Material					
	AC	CI	DI	CCP	STL	Total
≤ 4	0.06		3.46			3.52
6	0.47	2.84	10.14			13.45
8	0.11	2.43	33.81			36.35
10	0.57	0.35	7.78			8.70
12	0.48	9.34	25.16			34.98
16			5.28			5.28
18			2.16			2.16
24[1]			4.96			4.96
36[2]				4.76	1.26	6.02
Total	1.69	14.96	92.75	4.76	1.26	115.42

Notes:

1) Does not include the 24-inch diameter transmission pipe owned by the City of Sherwood.
2) Includes the 36-inch diameter transmission pipe from the Florence Lane Master Meter south (Portland Supply Main).
3) Pipe materials are: AC: asbestos concrete, CI: cast iron, DI: ductile iron, CCP: concrete cylinder pipe, STL: coal tar coated steel pipe

LEGEND

- RESERVOIR
- PUMP STATION
- AQUIFER STORAGE & RECOVERY FACILITY (ASR)
- DISTRIBUTION CONTROL VALVE (PRPS)
- SUPPLY CONTROL VALVE (PRV)
- SUPPLY INTERTIE
- EMERGENCY INTERTIE
- WATERLINE (DIAMETER INDICATED IN INCHES)
- PORTLAND SUPPLY MAIN
- SHERWOOD SUPPLY MAIN
- CITY LIMITS
- METRO URBAN GROWTH BOUNDARY (UGB)
- COUNTY LINE
- RAILROAD

PRESSURE ZONES:

- SERVICE AREA A
- SERVICE AREA B
- SERVICE AREA C
- BRIDGEPORT SERVICE AREA

N

1,200 0 1,200

SCALE IN FEET

TO FLORENCE LANE MASTER METER (NOT SHOWN)

BRIDGEPORT PRV'S

72ND AVE FCV-PRV

TIGARD INTERTIE

TIGARD INTERTIE

SHERWOOD INTERTIE

LAKE OSWEGO INTERTIE

RIVERGROVE WD INTERTIE

LEVETON FCV-PRV

CITY PARK FCV-PRV

108TH OPERATIONS FCV-PRV

BOONES FERRY PS

BOONES FERRY FCV-PRV

MOWHAWK PRPS

MARTINAZZI PS

65TH AVE PRPS

57TH AVE PRPS

CHESAPEAKE DR PRPS

SHERWOOD INTERTIE

AVERY ST PRPS

AVERY (A-1) RESERVOIR CAP: 2.2 MG OE: 295'

A-2 RESERVOIR CAP: 5.0 MG OE: 295'

DAKOTA PRPS

OSAGE PRPS

ASR

NORWOOD 1 (B-1) RESERVOIR CAP: 2.2 MG OE: 399'

NORWOOD 2 (B-2) RESERVOIR CAP: 2.8 MG OE: 399'

NORWOOD PS

FROBASE (C-1) RESERVOIR CAP: 0.8 MG OE: 450'

WILSONVILLE INTERTIE

CITY OF KING CITY

CITY OF TIGARD

CITY OF DURHAM

CITY OF LAKE OSWEGO

CITY OF RIVERGROVE

CITY OF SHERWOOD

WASHINGTON COUNTY
CLACKAMAS COUNTY

SW DURHAM RD

SW TUALATIN RD

SW PACIFIC HWY

SW NYBERG ST

SW SAGERT ST

SW AVERY ST

SW BORLAND RD

SW CHILDS RD

SW JEAN RD

SW LANGER DR

SW TUALATIN SHERWOOD RD

SW OREGON ST

SW SUNSET BLVD

SW DAY RD

SW BOONES FERRY RD

SW STAFFORD RD

I-5 FWY

I-205 FWY

99W

Tualatin Res.

Rock Creek

Coffee Lake Creek

Tualatin River

Oswego Lake

Willamette River

Summer Creek

Ash Creek

Fanno Creek

Cook Creek

Hedges Creek

Henry Hagg Lake

SOURCE:
Water System - City of Tualatin (2011).
Base Mapping - Metro RLIS (May 2013).

G:\PDX_Projects\11\1227\CAD\GIS\11-1227-402-OR-FIGURE 2-1.mxd 7/23/2013 2:34:34 PM DKH

Figure 2-1

TUALATIN WATER MASTER PLAN

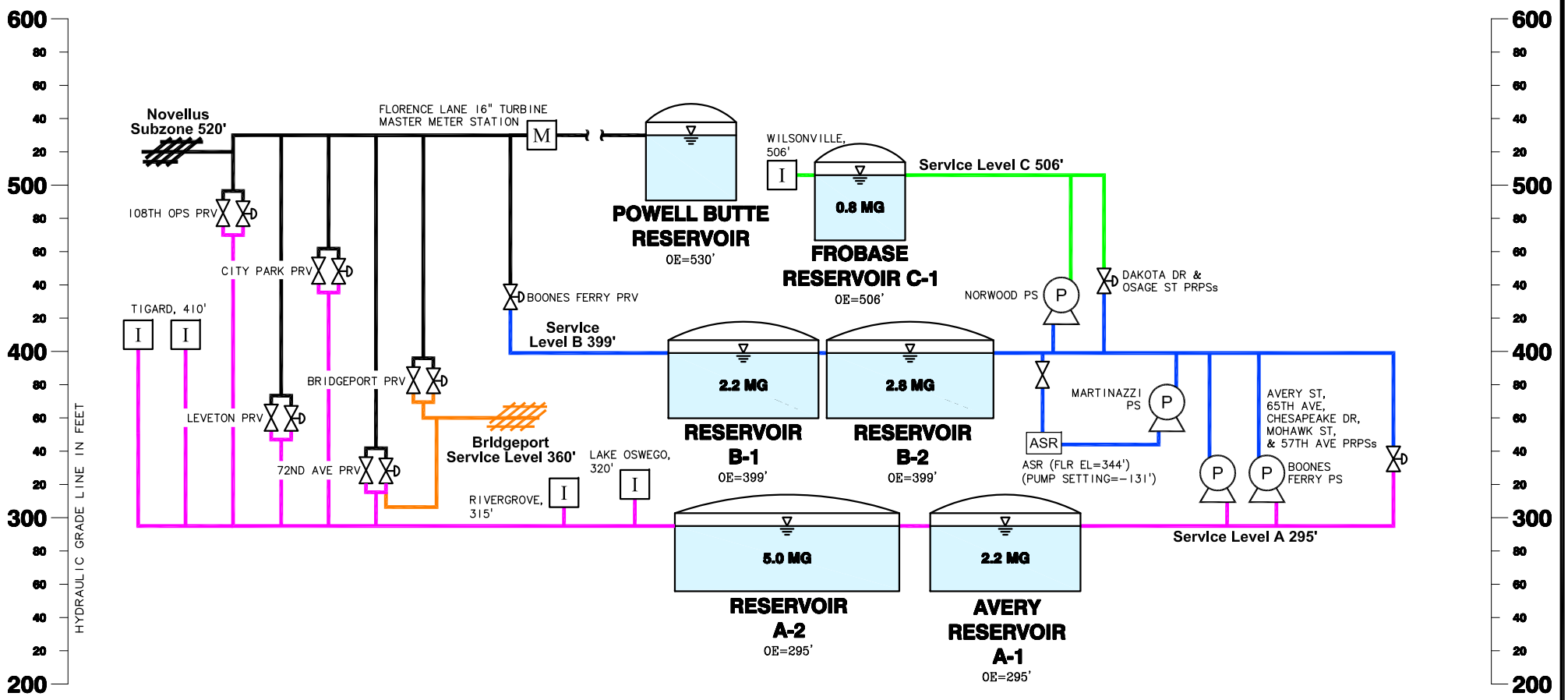
EXISTING CITY OF TUALATIN WATER SYSTEM

July 2013

Murray, Smith & Associates, Inc.
Engineers/Planners
121 S.W. Salmon, Suite 900 PHONE 503.225.9010
Portland, Oregon 97204-2959 FAX 503.225.9022

11-1227.402

G:\PDX_Projects\11\1227\CAD\11-1227-402-OR-FIGURE 2-2.dwg Figure 2-2 7/23/2013 2:51 PM DKH 18.1s (LMS Tech)



LEGEND

- SERVICE LEVEL A – 295'
- SERVICE LEVEL B – 399'
- SERVICE LEVEL C – 506'
- BRIDGEPORT SERVICE LEVEL – 360'
- FLOW CONTROL VALVE (FCV)
- PRESSURE REDUCING VALVE (PRV) OR PRESSURE RELIEF/PRESSURE SUSTAINING VALVE (PRPS)
- ASR — AQUIFER STORAGE & RECOVERY (ASR) WELL
- I — EMERGENCY INTERTIE
- M — METER STATION
- P — PUMP STATION (PS)
- STORAGE TANK (1.0 MG — CAPACITY; OE=1240' — OVERFLOW ELEVATION)

Figure 2-2

TUALATIN WATER MASTER PLAN

EXISTING CITY OF TUALATIN WATER SYSTEM HYDRAULIC SCHEMATIC

July 2013

MSA Murray, Smith & Associates, Inc. Engineers/Planners
121 S.W. Salmon, Suite 900 PHONE 503.225.9010 Portland, Oregon 97204-2919 FAX 503.225.9022

11-1227.402

GENERAL

This section presents population projections and the development of water demand forecasts for the City of Tualatin's (City) water service area. Population and water demand forecasts are developed from regional and City planning data, current land use designations, historical water demand records, and previous City water supply planning efforts. Also included in this section is a description of the water service area limits.

PLANNING AND SERVICE AREAS

The current water service area is the area within the existing city limits plus two (2) small areas that are served by the City that are outside the city limits. All of the Bridgeport Village commercial area in the northeast area of the City is served by the City including the movie theatre which is in the City of Tigard. East of the freeway, the residential lots between the Tualatin River and the City's service area along SW Childs Road in the City of Rivergrove are also served by the City of Tualatin. These areas are illustrated in Figure 3-1.

There are two (2) planning areas which have been previously developed and characterized. These include the Town Center Planning Area, the Southwest Concept Plan Area. The City's Urban Growth Boundary (UGB), which includes the 5,198 acres within the city limits, encompasses a 6,023 acre planning area. Figure 3-1 at the end of this section illustrates the City's service area.

The Basalt Creek Planning Area is located between the Cities of Tualatin and Wilsonville. Approximately half of the planning are is anticipated to ultimately be incorporated and developed by each city. Since concept planning has not been completed, the Basalt Creek Planning Area is not considered as part of this plan. After the concept plan is adopted, the City will update this Master Plan to include the Basalt Creek Planning Area.

Town Center Planning Area

Located within the city limits, the approximately 426 gross acres Town Center planning area is intended for long-range planning redevelopment to include a higher density of jobs, business floor space, and residences in the downtown Tualatin business area. Current planning anticipates a population increase from 131 to 1,048 residents over the next 20 years (Memorandum, "Urban and Rural Reserves Local Aspirations-Town Center, Commercial, Industrial and Stafford Basin, Prepared by City of Tualatin, April 13, 2009). Increased business space may result in the need for additional fire flow capacity to the Town Center, depending upon the actual specific development. Some additional demand is associated with the increase in developed commercial space. As the Town Center Planning Area is within the planning area, the projected population and water demand growth is incorporated in the respective forecasts.

Southwest Tualatin Concept Area

The Southwest Tualatin Concept Area, as considered in this study, includes the 431 gross acres with the existing UGB to include approximately nine (9) acres within the city limits west of SW Tonquin Road. The area is anticipated to be zoned a mix of industrial and commercial with significant large water users. No residential zoning is anticipated. The 2011 Southwest Tualatin Concept Plan (Prepared by CH2M-Hill, August 3, 2005) identified 352 acres of developable land for industrial and business park land uses. In 2010, Area 1 was added to the SW Concept Plan (2010 Update, Southwest Tualatin Concept Plan, prepared by the City of Tualatin, accepted by City Council October 11, 2010). Area 1 included 19 acres of industrial land.

PLANNING PERIOD

The planning period for this master plan is approximately 20 years. Certain planning and facility sizing efforts will use estimated water demands at build-out development. Build-out development occurs when all existing developable land within the planning area has been developed to its ultimate capacity according to current land use and zoning designations. Planning and analysis for transmission and distribution facilities is based on build-out development of the City's water system planning area. This assumption allows for a determination of the ultimate size of facilities. Typically, if substantial improvements are required beyond the planning period in order to accommodate water demands at build-out development, staging is often recommended for certain facilities where incremental expansion is feasible and practical. Unless otherwise noted, recommended improvements identified in this plan are sized for build-out development within the water system planning area.

HISTORICAL POPULATION

The existing population and total number of dwelling units within the City's water service area were derived from current City planning data supported by estimates from the United States 2010 Census and Portland State University Population Research Center (PRC) which provides current and historical population estimates for incorporated areas within the State of Oregon. Estimates of the City's historical population are taken from the 2010 Oregon Population Report (PRC, March 2011) and 2011 certified population estimates (PRC, December 2011) and are summarized in Table 3-1. The historical population estimates show a decrease from 2009 to 2010 when the estimate method was updated to reflect the 2010 Census value. Table 3-1 also includes a historical summary of total water service connections per City records.

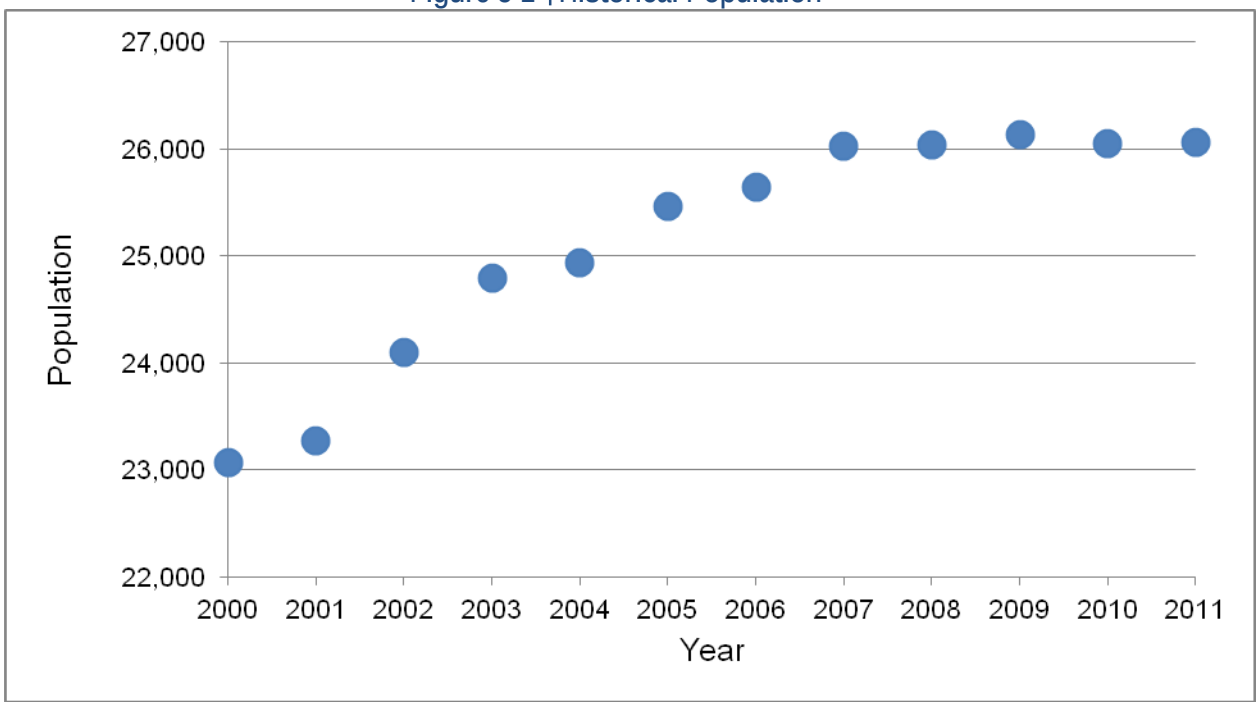
Table 3-1 | Historical Population and Water Services Summary

Year	City of Tualatin Population	Number of Water Services		
		Residential	Non-Residential	Total
2006	25,650	5,779	725	6,504
2007	26,025	5,852	736	6,588
2008	26,040	5,883	748	6,631
2009	26,130	5,877	770	6,647
2010	26,054	5,882	778	6,659
2011	26,060	5,897	773	6,660

The City supplied water to approximately 26,060 people in the water service area through approximately 773 commercial/industrial/institutional and 5,897 residential service connections, during 2011.

The historical annual population growth in the City over the 2000 through 2010 period was approximately 1.3 percent with a maximum annual rate of 3.6 percent between 2001 and 2002. The historical city population is illustrated in Figure 3-2.

Figure 3-2 | Historical Population



POPULATION FORECASTS

Build-out Population Estimate

A useful planning condition is the ultimate, or build-out, population. The build-out condition is commonly used to size the future capacity of water system infrastructure. The forecasted population at build-out development for the City's water system planning area was taken from City planning data as discussed below.

Redevelopment and Infill. For areas within the city limits, the City completed an estimate of ultimate population capacity using City and Metro planning data for vacant and developable lands and current residential densities to determine the number of potential dwelling units within the existing city limits and selected portions of the Metro UGB (Memorandum, "Tualatin Residential and Nonresidential Capacity Estimate 2011", Prepared by Colin Cortes, City of Tualatin, September 1, 2011). The analysis concluded that 2,288 additional residents can be accommodated by redevelopment and development of vacant lands in the city.

Town Center Planning Area. The planning for the city's Town Center, (Memorandum, "Urban and Rural Reserves Local Aspirations- Town Center, Commercial, Industrial and

Stafford Basin," prepared by City of Tualatin, April 13, 2009), envisions an increased residential population as well as an increase in office space through construction of more multistory buildings. By 2030, the plan anticipates an increased residential population of 131 to 1,048.

Build-out Population Estimate. No residential zoning is anticipated within the Southwest Concept Area, so it does not contribute to the build-out population. The projected build-out population is estimated as the current population of 26,060, plus the following growth elements for a total of 29,396 residents.

- 2,288 residents due to redevelopment and infill,
- 1,048 residents added to the Town Center.

Future Population Estimates

An estimate of the annual population growth rate for the short-term planning horizon needs to be consistent with other planning data, be consistent with historical trends and known population drivers, and be somewhat conservative when the population forecast will be used to determine the needed water supply capacity. The City's historical annual growth rate over the last 5-year period is 0.46 percent per year. Given that the City has seen the development of most of its large, residentially-zoned areas, this rate was assumed for projecting further population growth. The 5-year, 10-year and 20-year projected population forecasts are presented in Table 3-2.

Table 3-2 | Population Forecast Summary

Year	Population
Current (2011)	26,060
2016	26,665
2021	27,284
2031	28,565
Build-out (~2039)	29,396

HISTORICAL WATER USAGE

Terminology used in this section to describe uses of drinking water supplied by the municipal water system is defined below:

- ***Water demand*** refers to all of the water requirements of the system including domestic, commercial, municipal, institutional, industrial and unaccounted-for water.
- ***Water production*** is the amount of water produced and delivered to the distribution system. The City of Tualatin does not produce water, but purchases wholesale water from the Portland Water Bureau (PWB). For the purposes of this study, water production is equivalent to water purchases.
- ***Water consumption*** is the amount of metered water usage billed to customers by the City. Consumption is also commonly referred to as customer usage.

- ***Unaccounted-for water*** includes system leakage, or water loss, and unmetered uses. Unaccounted-for water is the difference between water demand and water consumption.
- ***Peaking factor*** is the ratio of maximum day demand (MDD) to average daily demand (ADD). It is a useful tool for characterizing the total water system demands.

Water usage is discussed in terms of volume (gallons) per unit of time such as gallons per day (gpd), million gallons per day (mgd) or gallons per minute (gpm). Demands are also related to per capita use as gallons per capita per day (gpcd). The City maintains daily water purchase records which are used to estimate water demands. Table 3-3 summarizes this data for the years 2006 through 2011.

Table 3-3 also shows the historical purchase of water by the City of Sherwood from the PWB and wheeled through the City of Tualatin infrastructure. The City of Sherwood is currently completing improvements to begin supply of water from the Willamette River Water Treatment Plant in Wilsonville. For water system infrastructure planning purposes, it is assumed that the City of Sherwood will not continue to purchase water from the PWB through City of Tualatin facilities for non-emergency water supply.

Table 3-3 | Historical Water Consumption

Year	Total Purchases (mgd)	Consumption (mgd)			
		City of Tualatin	City of Sherwood	Combined	Unaccounted-for Water
2006	5.03	4.25	0.58	4.83	4.0%
2007	5.48	4.26	0.97	5.23	4.6%
2008	5.81	4.16	1.44	5.60	3.6%
2009	5.29	3.81	1.46	5.27	0.4%
2010	4.62	3.63	0.99	4.62	0.0%
2011	4.85	3.60	1.16	4.76	1.8%
Average	*5.18*	*3.95*	*1.10*	*5.05*	*2.4%*

Table 3-4 presents water consumption by customer class. The City has significant commercial and industrial water consumption. Approximately 40 percent of the total annual water consumption is by commercial and industrial customers.

Historically, ADD within the City has been approximately 3.6 to 4.5 mgd and per capita consumption has ranged from approximately 139 to 174 gpcd. Recent MDD has been as high as approximately 9.0 mgd, with a MDD per capita demand range of approximately 275 to 360 gpcd. MDD to ADD peaking factors varied from 1.9 to 2.2. Table 3-5 summarizes this data for the years 2006 through 2011 to include residential and commercial/industrial usage rates. As illustrated in Figure 3-3 at the end this section, it should be noted that the trend in water use appears to be decreasing for all customer classes. Possible contributing influences include weather temperatures, conservation efforts and increased water efficiency appliances, and economic considerations.

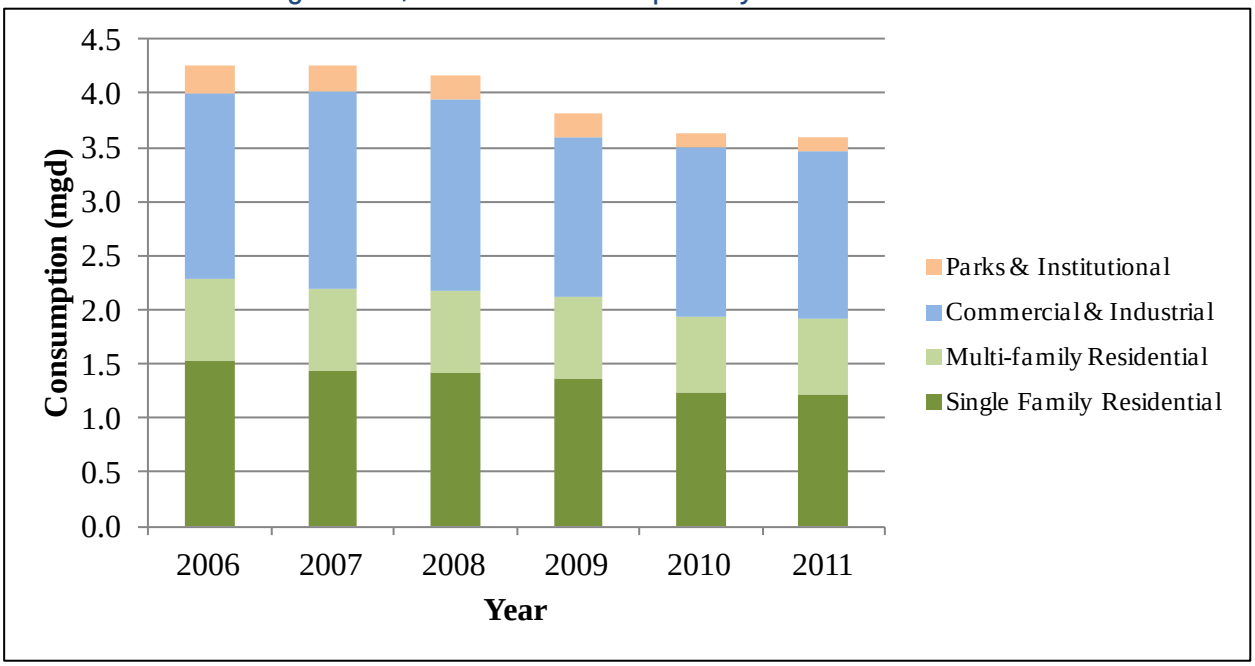
Table 3-4 | Historical Water Consumption by Customer Class							
Year	Water Consumption (mgd)					Residential Use (gpcd)	Commercial/ Industrial Use (gpad)
	SFR	MFR	Commercial/ Industrial	Other[1]	Total		
2006	1.53	0.76	1.71	0.25	4.25	89	648
2007	1.44	0.76	1.81	0.24	4.26	85	686
2008	1.42	0.75	1.78	0.21	4.16	83	672
2009	1.37	0.75	1.49	0.21	3.81	81	561
2010	1.23	0.71	1.55	0.14	3.63	75	586
2011	1.22	0.70	1.55	0.13	3.60	74	585
Average	*1.37*	*0.74*	*1.65*	*0.20*	*3.95*	*81*	*623*

Notes:
1) "Other" class includes institutional and city government uses.
2) Abbreviations: single family residential (SFR); multifamily residential (MFR); gallons per capita per day (gpcd); gallons per acre per day (gpad)

Table 3-5 | Historical Water Demand Trends										
Year	Population	Average Day		Peak Season[1]		Max. Month[2]		Max. Day		Peaking Factor[3]
		(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	
2006	25,650	4.45	174	6.89	268	7.92	309	9.03	352	2.03
2007	26,025	4.51	173	6.46	248	7.05	271	9.34	359	2.07
2008	26,040	4.38	168	6.72	258	7.88	303	8.98	345	2.05
2009	26,130	3.83	146	6.04	231	7.09	271	8.49	325	2.22
2010	26,054	3.63	139	5.68	218	6.79	261	7.79	299	2.14
2011	26,060	3.69	142	5.38	206	6.38	245	7.12	273	1.93

Notes:
1) Peak Season Demand is the average daily demand for the 92 days of the peak water use season; defined as July 1st to September 30th.
2) Peak Month Demand is the average daily demand for the 31 days of the peak water use month based on available data.
3) The peaking factor is the ratio of the maximum day demand to the average day demand.

Figure 3-3 | Historical Consumption by Customer Class



WATER DEMAND PROJECTIONS

Estimates of future water demands were developed separately for three customer classes - residential, commercial/industrial, and institutional/other – based on City water demand and planning data to estimate the total future water demand forecast. Institutional water use was a small component and assumed to be constant. The historical average residential water consumption rate was approximately 81 gallons per capita per day (gpcd) with a peak of approximately 89 gpcd in 2006. A per capita residential ADD of 90 gpcd is estimated for planning purposes.

The historical commercial and industrial 6-year average water use is approximately 825 gallons per acre per day (gpad) with a peak use of 907 gpad in 2007. Commercial and industrial billing records were used to determine annual consumption and the City's vacant land information was applied to the zoning information to determine the total acreage of active commercial and industrial land. A per acre commercial and industrial demand of 870 gpad for existing areas is estimated for planning purposes. The historical peaking factors are shown in Table 3-5 and ranged from 1.9 to 2.2. A MDD peaking factor value of 2.2 is assumed for water system planning purposes.

The water demands associated with the major planning areas are discussed below.

Town Center Planning Area

The approximately 426 gross acres Town Center planning area, as shown in Figure 3-1, is intended for long-range planning redevelopment to include a higher density of jobs, business floor space, and residences. Current planning anticipates a population increase from 131 to 1,048 residents over the next 20 years (Memorandum, "Urban and Rural Reserves Local

Aspirations - Town Center, Commercial, Industrial and Stafford Basin, Prepared by City of Tualatin, April 13, 2009). Increased business space may result in the need for additional fire flow capacity to the Town Center, depending upon the actual specific development. Some additional demand is associated with the increase in developed commercial space. As the Town Center Planning Area is within the planning area, the projected population increase is used to forecast the water demand growth.

Southwest Tualatin Concept Area

The Southwest Tualatin Concept Area includes 352 acres identified as developable land for industrial and business park land uses outside the existing service area and further identified an additional 88 acres of "wet" industry, or large water users, with an ADD of approximately 1 mgd. The existing ADD rate of 720 gpad is allocated to these areas resulting in a total increased ADD of 1.25 mgd.

Water Demands

Using the per capita residential water demand rate of 90 gpcd and the commercial/industrial per acre demand rate of 870 gpad, as well as planning area specific forecasts reported by others, water demand forecasts were made. Institutional water demand was assumed to remain constant. Table 3-6 presents the average daily water demand projections by customer class and the forecasted of 5.9 mgd in 2031. Table 3-7 summarizes the projected total system water demands to include a current MDD of 9.5 mgd and a 2031 MDD of 13 mgd. Peak season, peak month, and maximum day and peak hour demands are estimated from the average day demand using constant multipliers of 1.6, 1.9, .2.2 and 3.74, respectively. These factors were determined from historical records, except for the peak hour demand. Information is not available to estimate peak hour demand, so a typical value of 1.7 times MDD was assumed.

Table 3-6 | Average Daily Water Demand Projection by Customer Class Summary

Year	Population	Forecasted ADD (mgd)			
		Total	Combined Residential	Commercial/ Industrial	Institutional/ Other
Current	26,060	4.31	2.35	1.75	0.21
2016	26,665	4.70	2.40	2.09	0.21
2021	27,284	5.10	2.46	2.44	0.21
2031	28,565	5.93	2.57	3.15	0.21
Build-out	29,396	6.47	2.65	3.61	0.21

Table 3-7 | Water Demand Projection Summary						
Year	Population	Water Demand (mgd)				
		Average Day Demand	Peak Season Demand[1]	Peak Month Demand[2]	Maximum Day Demand	Peak Hour Demand
Current	26,060	4.31	6.90	8.19	9.48	16.12
2016	26,665	4.70	7.52	8.93	10.34	17.58
2021	27,284	5.10	8.16	9.69	11.22	19.08
2031	28,565	5.93	9.49	11.27	13.05	22.19
Build-out	29,396	6.47	10.35	12.29	14.24	24.20

Notes:

1) Peak Season Demand is the average daily demand for the 92 days of the peak water use season; defined as July 1st to September 30th.
2) Peak Month Demand is the average daily demand for the 31 days of the peak water use month based on available data. The peak month in the Pacific Northwest is usually either July or August.

SUMMARY

The City's water system planning area, which includes all developable land within the current UGB, encompasses approximately 6,668 acres. Land use analysis and growth rates developed by the City anticipate an ultimate population within the planning area of approximately 31,972 residents.

The City's current average daily demand is approximately 4.3 mgd with a maximum day water demand of approximately 9.5 mgd. At build-out development, the anticipated ADD demand is approximately 6.5 mgd and the MDD is approximately 14 mgd within the City's planning area.

LEGEND

- CITY OF TUALATIN PLANNING AREA BOUNDARY (UGB)
- SERVICE AREAS OUTSIDE CITY LIMITS
- SW TUALATIN CONCEPT PLAN AREA
- TOWN CENTER PLAN AREA
- TUALATIN CITY LIMITS
- METRO URBAN GROWTH BOUNDARY (UGB)
- COUNTY LINE
- RAILROAD

N

1,200 0 1,200

SCALE IN FEET

MOVIE THEATER (TIGARD)

RESIDENTIAL LOTS (RIVERGROVE)

TOWN CENTER PLAN AREA

SW CONCEPT PLAN AREA

CURRENT SERVICE AREA INCLUDES THE CITY LIMITS PLUS THE TWO SMALL AREAS OUTSIDE THE CITY LIMITS.

CITY OF TIGARD
CITY OF KING CITY
CITY OF DURHAM
CITY OF LAKE OSWEGO
CITY OF RIVERGROVE
CITY OF SHERWOOD
WASHINGTON COUNTY
CLACKAMAS COUNTY

SW BEEF BEND RD
SW DURHAM RD
SW HALL BLVD
99W
SW 72ND AVE
UPPER DR
SOUTH SHORE BLVD
GREENTREE RD
BONES FERRY RD
LAKEVIEW BLVD
BRYANT RD
PILKINGTON RD
JEAN WAY
JEAN RD
SW JEAN RD
HELLAM RD
OVERLOOK DR
TREETOP LN
SW TUALATIN RD
SW UPPER BOONES FERRY RD
SW CHILDS RD
CHILDS RD
SW PACIFIC HWY
SW NYBERG ST
SW TUALATIN SHERWOOD RD
SW SAGERT ST
SW BORLAND RD
SW AVERY ST
SW BONES FERRY RD
I5 FWY
I205 FWY
SW LANGER DR
SW OREGON ST
SW 1ST ST
SW RAILROAD ST
SW MAIN ST
SW SUNSET BLVD
SW BAKER RD
SW DAY RD
SW 65TH AVE
SW STAFFORD RD

Oswego Lake
Tualatin Res.
Fanno Creek
Ash Creek
Rock Creek
Tualatin River
Nyberg Creek
Saum Creek
Coffee Lake Creek

SOURCE:
Planning Areas - City of Tualatin (2011).
Base Mapping - Metro RLIS (May 2013).

Figure 3-1

TUALATIN WATER MASTER PLAN

PLANNING AREA AND SERVICE AREA

July 2013

Murray, Smith & Associates, Inc.
Engineers/Planners
121 S.W. Salmon, Suite 900 PHONE 503.225.9010
Portland, Oregon 97204-2989 FAX 503.225.9022

11-1227.402

G:\PDX_Projects\11\1227\CAD\GIS\11-1227-402-QR-FIGURE 3-1.mxd 7/23/2013 2:42:10 PM DKH

GENERAL

This section presents the planning and analysis criteria used for the City of Tualatin's (City) water system analysis. Criteria are presented for water supply source, distribution system piping, service pressures, storage and pumping facilities. Recommended water needs for emergency fire suppression are also presented. These criteria are used in conjunction with the water demand forecasts presented in Section 3 to complete the analysis of the City's water distribution system presented in Section 5.

WATER SUPPLY SOURCE

As described in Section 2, the City's sole water supply is wholesale water purchased from the Portland Water Bureau (PWB). The transmission system delivering water from the Florence Lane Master Meter to the City must be adequate to supply the city-wide maximum day demand (MDD). As the City water demand increases with growth, the City intends to operate one aquifer storage and recovery (ASR) facility to manage peak season water purchases and alleviate transmission capacity improvements.

DISTRIBUTION SYSTEM

The water distribution system should be capable of operating within certain system performance limits, or guidelines, under several varying demand and operational conditions. The recommendations of this plan are based on the following performance guidelines, which have been developed through a review of State of Oregon requirements, American Water Works Association (AWWA) acceptable practice guidelines, Insurance Services Office, Inc. (ISO) guidelines and operational practices of similar water providers. The recommendations are as follows:

- The distribution system should be capable of supplying the peak hourly demand while maintaining minimum service pressures of not less than approximately 75 percent of normal system pressures. The system should meet this criterion with the reservoirs approximately one-half full.
- The distribution system should be capable of providing the recommended fire flow to a given location while, at the same time, supplying the MDD and maintaining a minimum residual service pressure at any meter in the system of 20 pounds per square inch (psi). This is the minimum water system pressure required by the State of Oregon Health Authority, Drinking Water Program. The system should meet this criterion with the reservoirs approximately one-half full.

Typically, proposed or new water mains should be at least 8 inches in diameter in order to supply minimum fire flows. In special cases, 6-inch diameter mains are acceptable if no fire hydrant connection is required, there are limited services on the main, the main is dead-ended, and looping or future extension of the main is not anticipated.

SERVICE AREA PRESSURE

As discussed in Section 2, water distribution systems are typically separated into pressure zones or service areas to provide service pressures within an acceptable range to all customers. The existing water service area distribution system is divided into four (4) service areas or pressure zones. Pressure zones are usually defined by ground topography and designated by overflow elevations of water storage facilities or outlet settings (discharge pressure) of pressure reducing facilities or pump stations serving the zone. Typically, water from a reservoir will serve customers by gravity within a specified range of ground elevations so as to maintain acceptable minimum and maximum water pressures at individual service connections. When it is not feasible or practical to have a separate reservoir serving each pressure zone, pumping facilities or pressure reducing facilities are used to serve customers in different pressure zones from a single reservoir.

Generally, 80 psi is considered the desirable upper pressure limit and 35 psi the lower limit. Whenever feasible, it is desirable to achieve the 35 psi lower limit at the point of the highest fixture within a given building being served. Conformance to this pressure range may not always be possible or practical due to topographical relief, existing system configurations and economic considerations. In the case of the upper pressure limit, while pressures in excess of 100 psi may be acceptable in water mains, services must be equipped with individual pressure reducing valves (PRVs) to maintain their static pressures at no more than 80 psi. Table 4-1 summarizes the service pressure criteria used in the analysis of the water system.

Table 4-1 | Recommended Service Pressure Criteria

Condition	Pressure(psi)
Minimum Service Pressure Under Fire Flow Conditions	20
Minimum Normal Service Pressure	35
Maximum Service Pressure	80

STORAGE VOLUME

General

Water storage facilities are typically provided for three purposes: equalization storage, fire storage, and emergency storage. A brief discussion of each storage element is provided below. This three-component criterion for storage volume is commonly used by other water providers and by the AWWA.

Equalization Storage

Equalization storage is required to meet water system demands in excess of delivery capacity from the supply source to system reservoirs. Equalization storage volume should be sufficient to supply demand fluctuations throughout the day resulting from typical customer water use patterns and is generally considered as the difference between peak hour demand and MDD on a

24-hour duration basis. In other words, equalization storage is the volume of water available to meet system demands when demands exceed the capacity of the supply source. Standard industry practice indicates that equalization storage equal to approximately 25 percent of a system's MDD is typically sufficient for analysis and planning purposes.

Fire Storage

Fire storage should be provided to meet the single most severe fire flow demand within each pressure zone. The fire storage volume is determined by multiplying the recommended fire flow rate by the expected duration of that flow. Specific fire flow and duration recommendations are discussed later in this section.

Emergency Storage

Emergency storage is often provided to supply water from storage during emergencies such as pipeline failures, equipment failures, power outages or natural disasters. The amount of emergency storage provided can be highly variable depending upon an assessment of risk and the desired degree of system reliability. Provisions for emergency storage in other systems vary from none to a volume that would supply a maximum day's flow or higher. A reasonable volume for emergency storage for the water service area is approximately two (2) days of average demand. This amount of storage volume for emergency purposes is consistent with accepted water industry practices and guidelines for systems with interties with other providers for emergency supply.

Summary

The recommended system-wide storage volume is the sum of the equalization, fire and emergency storage volume components.

PUMPING STATION CAPACITY

Pumping capacity requirements vary depending on available storage and the number of pumping facilities serving a particular pressure zone. Firm pumping capacity is defined as a station's pumping capacity with the largest pump out of service. Back-up power is recommended for all stations in the event of power failure. When pumping to storage facilities, a firm pumping capacity equal to the pressure zone's MDD is recommended.

FIRE FLOW RECOMMENDATIONS

While the water distribution system provides water for domestic, commercial, industrial and other uses, it is also expected to provide water for fire suppression. The rate of flow of water recommended for fire suppression purposes is typically associated with the local building type or land use of a specific location within the distribution system. Fire flow recommendations are typically much greater in magnitude than the normal MDD present in any local area. Adequate hydraulic capacity must be provided for these potential large fire flow demands.

Fire protection for the City's service area is provided by Tualatin Valley Fire & Rescue. The fire district has adopted fire flow requirements as defined in the 2010 State of Oregon Fire Code. A

summary of fire flow recommendations based on the state fire code, fire flow criteria adopted by similar communities and fire flow guidelines as developed by the AWWA is presented in Table 4-2. Water stored for fire suppression is typically provided to meet the single most severe fire flow demand within each zone. The recommended fire storage volume is determined by multiplying the fire flow rate by the duration of that flow. Table 4-3 summarizes fire flow durations recommended by the AWWA.

Table 4-2 | Summary of Recommended Fire Flows		
Land Use Type	Applicable Zoning	Recommended Fire Flow (gpm)
Single-family Residential	RL, RML	1,000
Multi-family Residential	RMH, RH, RH-HR	2,000
Commercial/ Institutional/ Industrial	CO, CN, CR, CC, CG, ML MG, IN	3,500

Table 4-3 | Fire Flow Duration Summary	
Recommended Fire Flow (gpm)	Duration (hours)
Up to 3,000	2
3,000 to 3,500	3
Greater than 3,500	4

SUMMARY

The criteria developed in this section are used in Section 5 to assess the system's ability to provide adequate water service under existing conditions and to guide improvements needed to provide service for future water needs. Recommended planning criteria for the City's source, pumping stations, distribution system, pressure zones, and storage facilities are summarized as follows:

- ***Source Capacity:*** Transmission capacity should deliver MDD.
- ***Pumping Station Capacity:*** When pumping to storage facilities, pumping stations should have a firm pumping capacity equal to the pressure zone's MDD.
- ***Distribution System Criteria:*** The distribution system should be capable of supplying the peak hourly demand while maintaining minimum service pressures of not less than approximately 75 percent of normal system pressures.
- ***Service Pressure Criteria:*** Minimum static system service pressures within each pressure zone should be at least 35 psi at the highest fixture in any building being served. Maximum static service pressure should not exceed approximately 80 psi.
- ***Storage Volume Criteria:*** Total storage volume should be the sum of the operational, fire and emergency storage volume components.

- ***Fire Flow Criteria:*** The distribution system should be capable of supplying the recommended fire flows while maintaining minimum residual pressures everywhere in the system of not less than 20 psi.

GENERAL

This section describes the analysis of the City of Tualatin's (City) water distribution system and water supply needs. The analysis is based on water demands presented in Section 3 and the planning and analysis criteria outlined in Section 4. This section includes a detailed evaluation of the City's distribution system and presents findings of a computerized hydraulic network analysis of the system. Included in the analysis is an evaluation of the system's existing pressure zones, pump stations and storage facilities. The findings and recommendations of this water system analysis are developed into a capital improvement program (CIP) which is summarized in Section 7.

DISTRIBUTION SYSTEM ANALYSIS

General

A hydraulic network analysis computer program was used to evaluate the performance of the existing distribution system and to aid in the development of proposed system improvements. The computerized model of the City's water system uses a digital base map of the distribution system and the InfoWater hydraulic network analysis software. The purpose of the model is to determine pressure and flow relationships throughout the distribution system for a variety of critical water demand and hydraulic conditions. System performance and adequacy is then evaluated on the basis of planning criteria presented in Section 4.

Computerized Hydraulic Network Analysis Model

The City's previous hydraulic model was developed using the H20-Map software. This model was converted to Innovyze's InfoWater software and the model was updated. Updates included comparison of the model to geographical information systems (GIS) data provided by the City, updated reservoir and pump station data, and current control valve setting information. Portions of the distribution system that had developed since the previous model development were added to the model network. The updated model files and supporting database were then used to perform the system analysis and to illustrate recommended improvements. A map of the water system and the recommended capital improvements is presented as "Water System Improvements", Plate 1 in Appendix A.

All pipes are shown as links between nodes which represent pipeline junctions or pipe size changes. Pipes and nodes are numbered to allow for easy system updating and revision. These numbers have not been shown on Plate 1 for drawing clarity but are available within the computer model for future use. Diameter and length are specified for each pipe although only pipe diameters are illustrated for drawing clarity. Pipe lengths are drawn to approximate scale. An approximate ground elevation is specified for each node. Ground elevations with 10-foot contours for the City's Urban Growth Boundary (UGB) and surrounding area were assigned to nodes using available United States Geological Survey (USGS) topographic data. Hydraulic elements, such as pressure reducing valves, pump stations and reservoirs, are also illustrated and operating parameters are incorporated into the model database.

Modeling Conditions

The analysis of the existing and proposed system was performed to assess the distribution system's ability to provide recommended fire flows throughout the system during maximum day demand (MDD) conditions. The system's adequacy under existing demand conditions was evaluated first. Existing current water demands as presented in Section 3 were applied to the existing system. The analysis was then extended to evaluate system performance under water demands at build-out development.

All hydraulic analyses assume that the City's storage reservoirs are approximately one-half full and that the pump stations are not operating. Fire flow scenarios test system performance in providing the recommended fire flow to a given location while at the same time supplying the MDD and maintaining a minimum residual service pressure of 20 pounds per square inch (psi) at all service meters in the system.

Demand Allocation

The water system demands were allocated to each service area as shown in Table 5-1. Within each service area, the total residential and total commercial/industrial/institutional demands were allocated uniformly amongst the model nodes. Service Area A includes the Bridgeport Service Area water demand. Service Area B includes the future demand associated with the SW Concept Plan Area at build-out development.

Table 5-1 | Demand Allocation Summary

Service Area	Maximum Day Demand (mgd)		
	2010	2030	Build-out
Area A[1]	5.3	6.2	6.7
Area B[2]	3.2	5.8	6.4
Area C	1.0	1.0	1.1
Total	9.5	13.0	14.2

Notes: 1) Includes the Bridgeport Service Area water demand.
2) Includes the SW Concept Plan Area

Model Calibration

For a hydraulic network model to provide accurate results under test conditions, the model is calibrated with field-measured data to ensure that modeled conditions reflect actual system operation. Data from fire hydrant flow tests are compared to pressure and flow results obtained from modeled demands placed at the same location. Calibration is generally considered successful when pressures measured during hydrant flow tests are within five (5) to 10 percent of the hydraulic model.

The previous H2O-Map model had been calibrated using fire hydrant flow test data. As the system updates were minor, the calibration was not repeated; however, the updated hydraulic model was verified using September 2011 fire hydrant flow test data to confirm the model is accurately predicting system performance at a number of locations.

Hydraulic Analysis Findings

Peak Hour Demand. The results of the peak hour demand analysis showed that the water distribution system is generally able to provide for peak hour demands meeting the pressure criterion presented in Section 4 under existing and build-out conditions. No specific deficiencies are observed under these conditions.

Maximum Day Demand. The results of the MDD analysis showed that the water distribution system is generally able to provide for MDD meeting the pressure criterion presented in Section 4 under existing and build-out conditions. It was observed that the flow from the Portland Supply Main was generally equal to the MDD under existing conditions, but was much less than the build-out MDD which includes significant increases in demand associated with the SW Concept Area. Adjustments to the City Park 12-inch PRV and 10-inch Boones Ferry PRV settings allowed the Portland Supply Main to supply demands in excess of the nominal capacity of 10.8 mgd. The City will need to evaluate the long-term capacity of the Portland Supply Main as discussed later in this section.

Fire Flow Analysis. The results of the fire flow analysis indicate that the City's water distribution system is currently generally able to supply the required fire flows presented in Section 4 while providing for existing MDD and maintaining minimum service pressures throughout the system. There are some areas where the required flow was not available while meeting the minimum service pressure requirements. Figures 5-1 and 5-2 illustrate system fire hydrant locations where the minimum service pressure requirements were not met under existing conditions and future build-out conditions with the existing infrastructure, respectively. Improvements for all deficiencies are not recommended, as discussed below. Recommended distribution system piping improvements are shown on Plate 1. Further descriptions of recommended distribution system improvements and cost estimates for these improvements may be found in Section 7.

Several areas were found to have deficient fire flow capacities for the land use zoning and existing conditions, but improvements were not recommended. The most common case is a fire hydrant located in a developed area that is able to provide 70 to 90 percent of the required fire flow that is also located within 500 feet of another hydrant that is able to provide the adequate capacity. The fire hydrants not meeting this condition are identified and illustrated in Figure 5-1 and discussed below:

NA-1: Several industrially-zoned and developed properties north of SW Herman Road are provided fire suppression water through several fire hydrants along 8-inch diameter dead end mains. These mains are inadequate to provide the full recommended industrial fire flow per the land use zoning. However, it is assumed that the buildings are equipped with fire suppression sprinklers and other fire suppression improvements which reduce the required water system fire flow capacity. As the land is already developed, no improvements are recommended. Should these areas redevelop, the City and Fire Marshall will review the fire flow capacity requirements of the new structures.

NA-2: An industrially-zoned and developed area at the end of SW 90th Court, south from SW Tualatin-Sherwood Road, is provided fire suppression water through several fire hydrants along a 10-inch diameter dead end main. The main is inadequate to provide the full recommended

industrial fire flow per the land use zoning; however, it is assumed that the buildings are equipped with fire suppression sprinklers and other fire suppression improvements which reduce the required water system fire flow capacity. As the land is already developed, no improvements are recommended. Should these areas redevelop, the City and Fire Marshall will review the fire flow capacity requirements of the new structures.

NA-3: The commercially-zoned property north of SW Nyberg Road occupied by the Kmart building and the buildings to the east are provided fire suppression water through several fire hydrants along an 8-inch diameter looped main. The main is inadequate to provide the full recommended industrial fire flow for the land use zoning; however, it is assumed that the buildings are equipped with fire suppression which reduces the required water system fire flow capacity. As the land is already developed, no improvements are recommended. Should these areas redevelop, the City and Fire Marshall will review the fire flow capacity requirements of the new structures.

NA-4: The residentially-zoned property along SW Mandan Drive is provided fire suppression water from 8-inch diameter mains. Where Service Areas B and C meet, the 8-inch diameter dead end mains are inadequate to provide the full recommended residential fire flow for the land use zoning; however, because the deficient hydrants are within 500 feet of one another and supplied from separate service areas, adequate fire suppression flow can be achieved from multiple hydrants and no improvements are recommended to address this deficiency.

NA-5: The residentially-zoned and developed area at the end of SW 103rd Court, north of SW Ibach Street, is provided fire suppression water through a fire hydrant along a 6-inch diameter dead end main. The main is inadequate to provide the full recommended residential fire flow per the land use zoning. The closest fire hydrant is 650 feet away near the intersection with SW Ibach Street. The developed residential lots, occupied by relatively new homes smaller than 3,600 square foot, are located between a city park to the west and a stormwater green space to the east. As such, a reduced fire flow availability of 1,000 gpm is acceptable for this development.

NA-6: The residentially-zoned and developed area at the end of SW Elk Horn Court, south of SW Avery Street, is provided fire suppression water through a fire hydrant along a 6-inch diameter dead end main. The main is inadequate to provide the full recommended residential fire flow for the land use zoning. The closest fire hydrant is approximately 700 feet away near the intersection with SW Avery Street. The developed residential lots are occupied by homes smaller than 2,300 square foot. As such, a reduced fire flow availability of 1,000 gpm is acceptable for this development.

Pressure Zone Analysis

As discussed in Section 2, the City is currently divided into three pressure zones. Typically, municipal water systems are designed to operate at static pressures ranging from 35 to 100 psi. The City's existing pressure zone configuration supplies water effectively within these pressure ranges. A summary of existing service areas and their static pressure ranges is shown in Table 5-2.

Table 5-2 | Pressure Zone Summary			
Service Area	Static Hydraulic Grade (ft)	Approximate Ground Elevation (ft)	Approximate Existing Static Pressure (psi)
A	295	88 - 202	40 - 90
B	399	192 - 306	40 - 90
C	506	260 - 360	63 - 106[1]
Bridgeport	360	185 - 200	69 - 76

Note: 1) Services in Service Area C with a pressure greater than 80 psi have individual service PRVs installed.

The Bridgeport Service Area is a commercial pressure zone with less than 20 feet of variation in ground elevation. During development of the commercial area, higher minimum service pressures, than were available from Service Area A, were desired which resulted in the Bridgeport Service Area being created and supplied independently from the Portland Supply Main.

Ground elevations in the SW Concept Area vary between 170 and 300 feet with most of the elevations between 190 and 260 feet; consequently, the SW Concept Area will largely be an extension of Service Area B. Some low elevation individual tax lots along SW Tualatin-Sherwood Road may be serviced from Service Area A. Some customers in the low elevations in the southeast portion of the expansion area may be served by pressure reducing valves either on individual services or as a pressure subzone from a common pressure reducing valve station.

PUMP STATION CAPACITY ANALYSIS

The City's existing water system contains three (3) pumps stations. The Norwood Pump Station supplies Service Area C from the Norwood Reservoirs. The Martinazzi and Boones Ferry Pump Stations serve as backup supply to Service Area B, boosting water from Service Area A, in the event that the Boones Ferry PRV is out of service.

As outlined in Section 4, firm pumping capacity is defined as a pump station's capacity with the largest pump out of service, or in the case of multiple pump stations serving the same service area, the largest single supply serving the zone is out of service. A firm pumping capacity equal to the MDD of Service Area C is recommended for the Norwood Pump Station. As the Martinazzi and Boones Ferry Pump Stations provide back-up supply to Service Area B., it is recommended that the total combined capacity of these pump stations be adequate to deliver MDD in the event of failure of the Service Area B primary supply from the Boones Ferry PRV.

Recommended pump station capacities are summarized in Table 5-3. The City's pump stations are adequate to meet existing recommended pumping capacities and future pumping capacities for Service Area C. In the future, improvements to the back-up capacity for Service Area B associated with growth in the SW Concept Area should be accomplished as the existing Service Area B pump station lacks the recommended future pumping capacity. Further discussion of pumping capacity improvement recommendations are presented in Section 7.

Table 5-3 | Pumping Capacity Recommendation Summary						
Pump Station	Estimated Total Station Capacity (mgd)		Service Area Supplied	Existing MDD (mgd)	2030 MDD (mgd)	Build-out MDD (mgd)
Boones Ferry Station	1.44	4.32 Total	B+C[1]	4.2	6.3	7.5
Martinazzi Station	2.88					
Norwood Station	2.02		C	1.0	1.0	1.1

Note: 1) Service Area C is supplied through Service Area B, therefore pumping capacity to Service Area B must be adequate to meet the MDD of both Service Area B and C.

STORAGE VOLUME ANALYSIS

Table 5-4 illustrates the individual storage components and combined storage needs recommended for operational, fire and emergency purposes for each service area under existing demand conditions and projected demands in the year 2031 and at build-out conditions. Further discussion of storage improvement needs and recommendations are presented in Section 7. The storage volume criteria developed in Section 4 are summarized below:

- Equalization Storage: 25 percent of MDD
- Fire Flow Storage: 2010 State of Oregon Fire Code:
  - Residential: 1500 gpm for 2 hours
  - Commercial/Industrial: 3500 gpm for 3 hours.
- Emergency Storage: Two times ADD

Service Area C has an existing storage volume deficit of approximately 0.5 mg. The City had already identified the Frobase Reservoir site for a second Service Area C reservoir (C-2) and has completed designs for a 1.0 mg reservoir. Project funding is being secured for construction. While Service Area C has a forecasted deficit of 0.1 mg after construction of the proposed C-2 reservoir, it is not recommended that additional storage be constructed within the planning period to address this deficiency given the uncertainty of actual development characteristics within this water service area

Service Areas A and B have adequate existing storage capacity but will require additional storage in the future. Most of this increased storage need is associated with expansion and development in the SW Concept Area which is located largely in Service Area B. Increased storage volume needs in Service Area A are associated with the Town Center redevelopment and other infill and redevelopment.

Table 5-4 | Storage Volume Recommendation Summary						
Existing (2011) Development Conditions Storage (mg)						
Service Area	Equalization	Emergency	Fire Flow	Total	Available Storage	Deficit
A	1.30	4.80	0.63	6.70	7.2	
B	0.80	2.90	0.63	4.30	5.0	
C	0.30	0.90	0.18	1.40	0.8	0.6
Total	2.40	8.60	1.44	12.40	13.0	
20-year (2031) Development Conditions Storage (mg)						
Service Area	Equalization	Emergency	Fire Flow	Total	Available Storage	Deficit
A	1.60	6.10	0.63	8.30	7.2	1.1
B	1.50	5.90	0.63	8.00	5.0	3.0
C	0.30	1.40	0.18	1.90	0.8	1.1
Total	3.40	13.40	1.44	18.20	13.0	5.2
Build-out Development Conditions Storage (mg)						
Service Area	Equalization	Emergency	Fire Flow	Total	Available Storage	Deficit
A	1.70	6.10	0.63	8.40	7.2	1.2
B	1.60	5.90	0.63	8.10	5.0	3.1
C	0.30	1.00	0.18	1.40	0.8	0.7
Total	3.60	13.00	1.44	18.00	13.0	5.0

Notes: 1) Service Area A includes the Bridgeport Service Area.
2) Service Area B includes the SW Concept Plan Area.

WATER SUPPLY CAPACITY

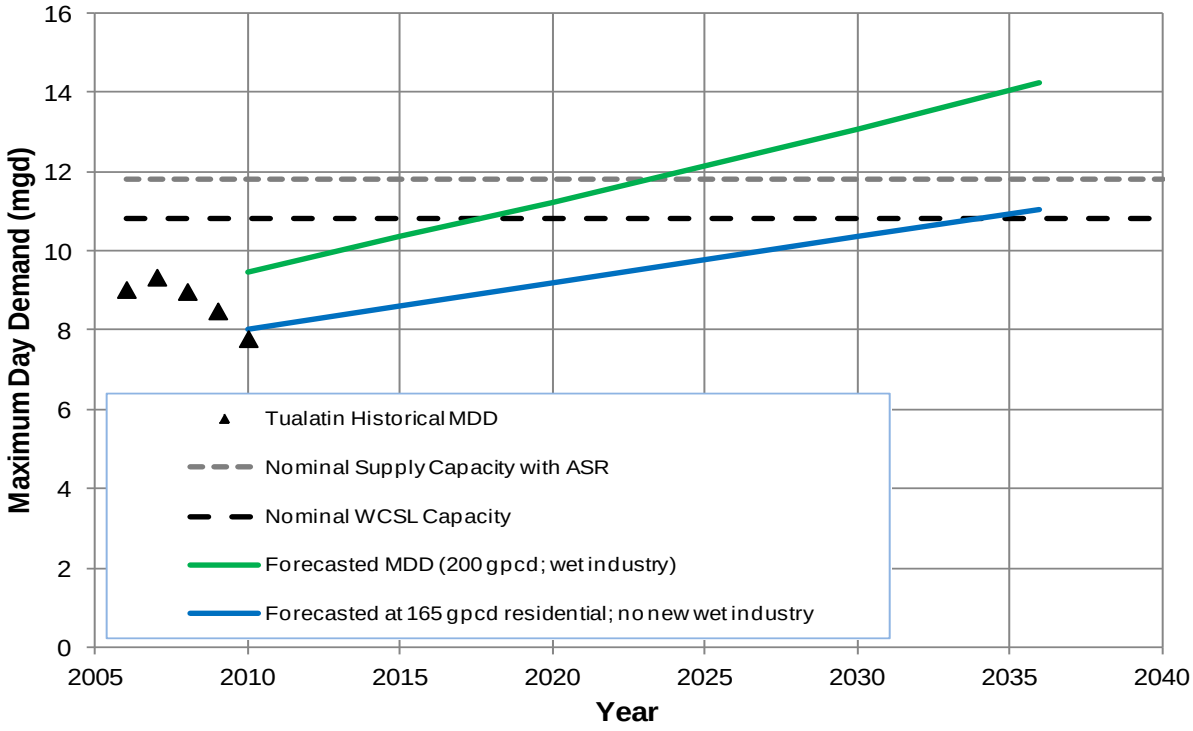
As noted in Section 3, the City currently has a planning level MDD of approximately 9.5 mgd and experienced an actual peak demand of 9.3 mgd in 2007. The 36-inch diameter Portland Supply Main owned by the City has a minimum capacity of 20 mgd; however, supply capacity is limited by the available capacity of the overall Washington County Supply Line (WCSL) system. The WCSL has a nominal capacity of 60 mgd and the City has rights to 18 percent of the capacity, or 10.8 mgd. The 60 mgd nominal capacity is based on the WCSL operating with all the owners of the line using their full capacity and maintaining adequate supply pressure. Within the 20-year planning period, the City's peak water supply needs will exceed the City's 10.8 mgd capacity in the transmission system. The largest single source of increased demand within the study area is the large water users anticipated in the SW Concept Area Plan.

Figure 5-4 illustrates the forecasted supply capacity needs compared to the existing nominal WCSL transmission capacity with and without consideration of supply from the City's ASR facilities. The plot includes a forecasted MDD growth at both a conservative planning rate and a smaller rate reflecting the low residential water use over the last five years (75 gpcd ADD; 165 gpcd MDD versus 90 gpcd ADD; 198 gpcd MDD) and a smaller industrial water use growth that does not included the anticipated 1 mgd ADD identified as "wet industry" in the SW Concept Plan (8.4 versus 6.2 mgd of commercial MDD). It should be noted that the MDD growth rates

illustrated reflect a likely growth rate, but future MDD for specific years could be higher or lower. Also, the growth rates do not include the future addition of UGB areas not currently identified for incorporation by Metro.

It is recommended that the City review the projected water demand in three years to determine if current conditions require that study and action are needed to begin acquiring additional supply capacity. This will allow the City time to evaluate changes in WCSL usage that may result in additional available capacity for acquisition by the City. The City can also evaluate the addition of significant new customer water demands to the system.

Figure 5-4 | Source Capacity Needs Summary



SUMMARY

This section presents the analysis of the City's water distribution system. Recommended system improvements are discussed in Section 7 and are illustrated on Plate 1. Plate 1 illustrates recommended piping, pumping, and reservoir improvements needed to correct existing system deficiencies and to serve the City at build-out development. Section 7 presents recommended capital improvements and estimates of project costs for the proposed improvements.

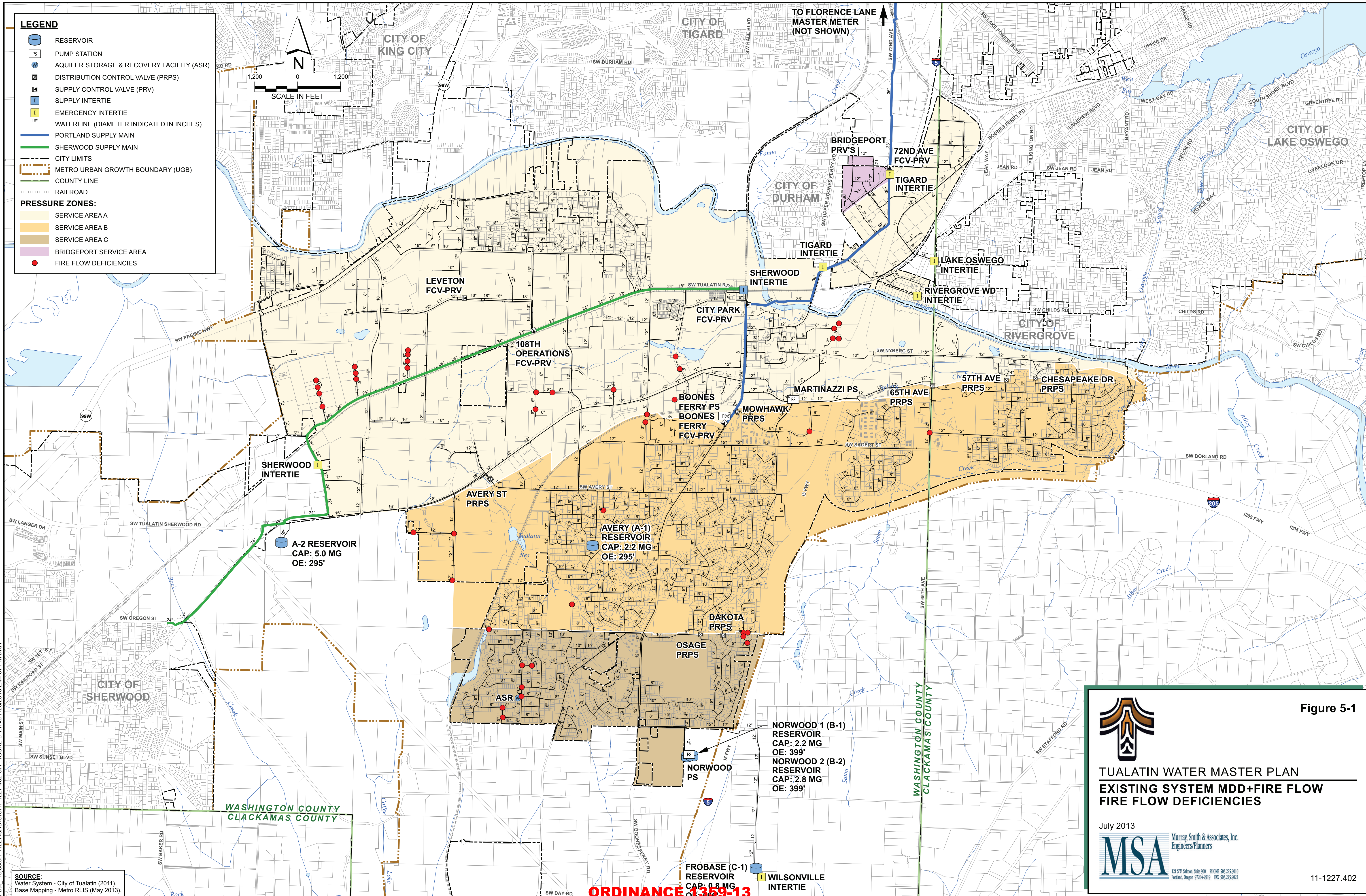

LEGEND
RESERVOIR
PUMP STATION
AQUIFER STORAGE & RECOVERY FACILITY (ASR)
DISTRIBUTION CONTROL VALVE (PRPS)
SUPPLY CONTROL VALVE (PRV)
SUPPLY INTERTIE
EMERGENCY INTERTIE
WATERLINE (DIAMETER INDICATED IN INCHES)
PORTLAND SUPPLY MAIN
SHERWOOD SUPPLY MAIN
CITY LIMITS
METRO URBAN GROWTH BOUNDARY (UGB)
COUNTY LINE
RAILROAD
PRESSURE ZONES:
SERVICE AREA A
SERVICE AREA B
SERVICE AREA C
BRIDGEPORT SERVICE AREA
FIRE FLOW DEFICIENCIES
N
1,200 0 1,200
SCALE IN FEET
CITY OF KING CITY
CITY OF TIGARD
TO FLORENCE LANE MASTER METER (NOT SHOWN)
CITY OF DURHAM
BRIDGEPORT PRV'S
72ND AVE FCV-PRV
TIGARD INTERTIE
CITY OF LAKE OSWEGO
LAKE OSWEGO INTERTIE
RIVERGROVE WD INTERTIE
CITY OF RIVERGROVE
SHERWOOD INTERTIE
LEVETON FCV-PRV
CITY PARK FCV-PRV
108TH OPERATIONS FCV-PRV
MARTINAZZI PS
65TH AVE PRPS
57TH AVE PRPS
CHESAPEAKE DR PRPS
BOONES FERRY PS
BOONES FERRY FCV-PRV
MOWHAWK PRPS
AVERY ST PRPS
A-2 RESERVOIR
CAP: 5.0 MG
OE: 295'
AVERY (A-1) RESERVOIR
CAP: 2.2 MG
OE: 295'
DAKOTA PRPS
OSAGE PRPS
ASR
NORWOOD PS
NORWOOD 1 (B-1) RESERVOIR
CAP: 2.2 MG
OE: 399'
NORWOOD 2 (B-2) RESERVOIR
CAP: 2.8 MG
OE: 399'
FROBASE (C-1) RESERVOIR
CAP: 0.8 MG
WILSONVILLE INTERTIE
CITY OF SHERWOOD
WASHINGTON COUNTY
CLACKAMAS COUNTY
SW TUALATIN RD
SW NYBERG ST
SW SAGERT ST
SW AVERY ST
SW TUALATIN SHERWOOD RD
SW PACIFIC HWY
SW DURHAM RD
SW BORLAND RD
I205 FWY
I5 FWY
SW 65TH AVE
SW 72ND AVE
SW BOONES FERRY RD
SW STAFFORD RD
SW DAY RD
SW OREGON ST
SW LANGER DR
SW BAKER RD
SW SUNSET BLVD
SW MAIN ST
SOURCE:
Water System - City of Tualatin (2011).
Base Mapping - Metro RLIS (May 2013).

Figure 5-1

TUALATIN WATER MASTER PLAN

EXISTING SYSTEM MDD+FIRE FLOW
FIRE FLOW DEFICIENCIES

July 2013

MSA Murray, Smith & Associates, Inc. Engineers/Planners
121 S.W. Salmon, Suite 900 PHONE 503.225.9010
Portland, Oregon 97204-2919 FAX 503.225.9022

11-1227.402

G:\PDX_Projects\11\1227\CAD\GIS\11-1227-402-OR-FIGURE 5-1.mxd 7/23/2013 2:44:07 PM DKH

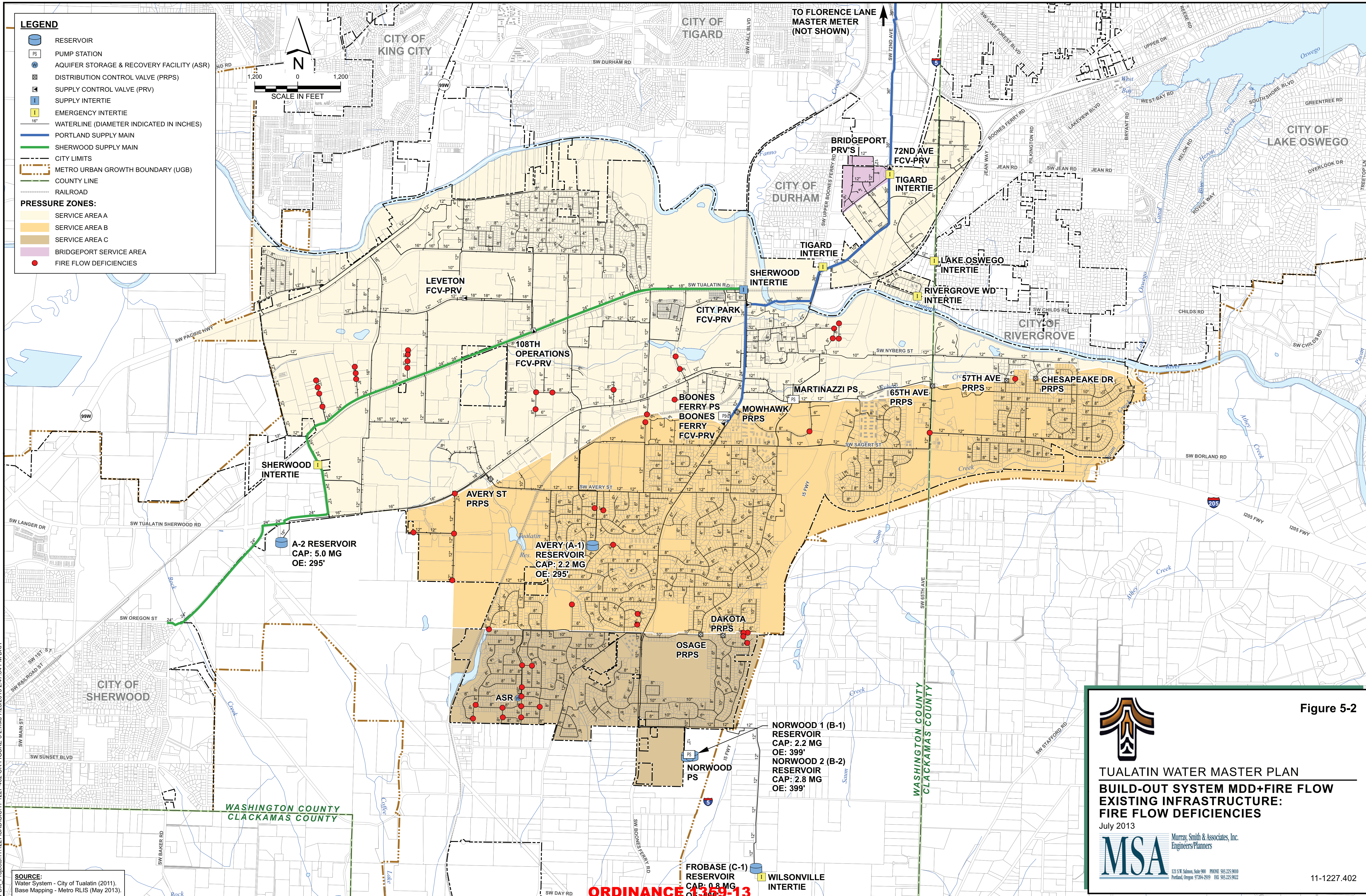


Figure 5-2

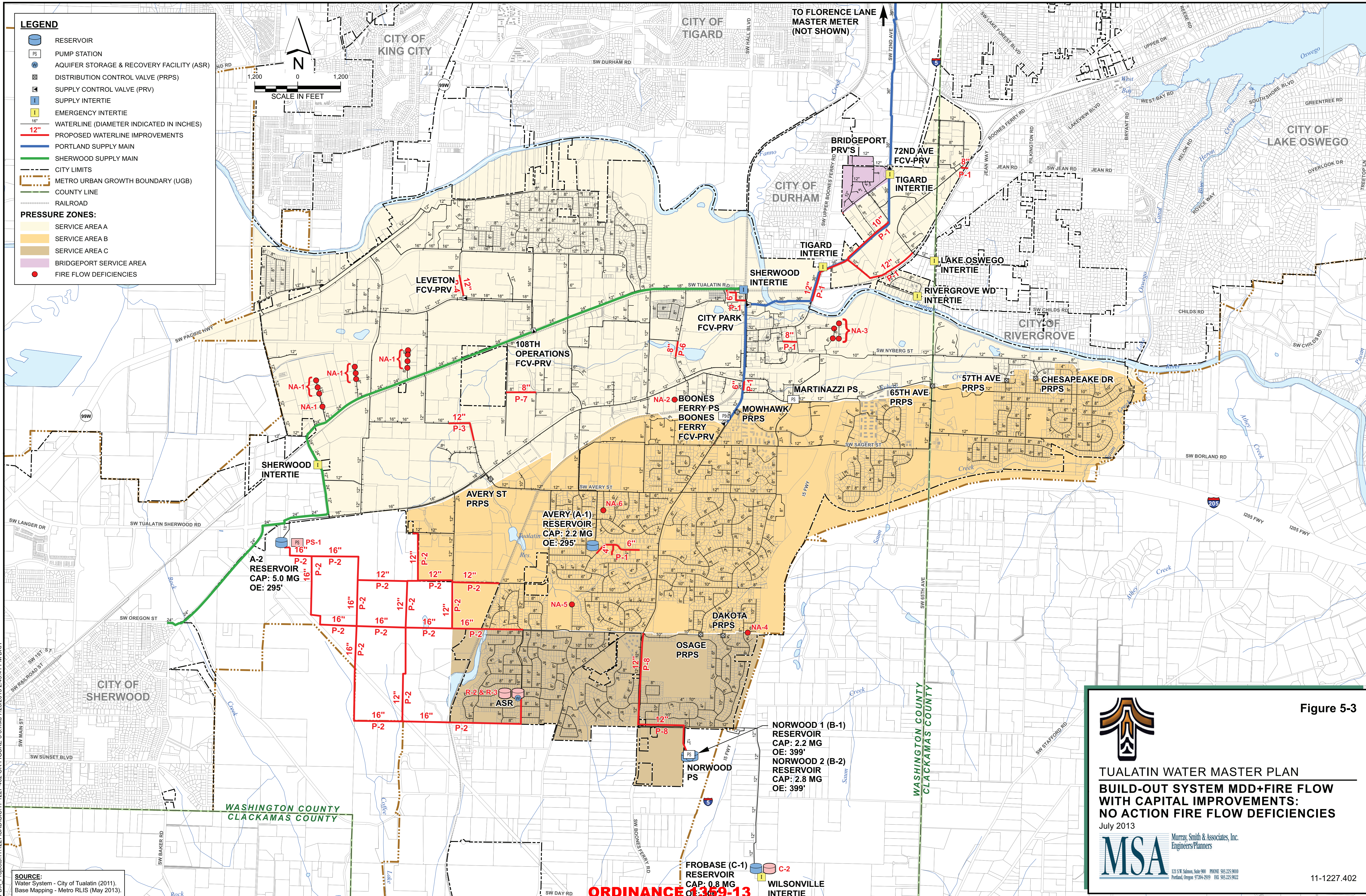
TUALATIN WATER MASTER PLAN

BUILD-OUT SYSTEM MDD+FIRE FLOW EXISTING INFRASTRUCTURE: FIRE FLOW DEFICIENCIES

July 2013

Murray, Smith & Associates, Inc. Engineers/Planners
121 S.W. Salmon, Suite 900 PHONE 503.225.9010
Portland, Oregon 97204-2919 FAX 503.225.9022

11-1227.402



ORDINANCE 1359-13
ATTACHMENT B, PAGE 55

GENERAL

This section describes water quality regulations affecting the City of Tualatin's (City) water system. This section also presents an overview of potential water conservation measures the City could consider implementing and provides guidance for future conservation efforts.

WATER QUALITY REGULATIONS

Introduction

Both state and federal agencies regulate public drinking water systems. For the federal government, the U.S. Environmental Protection Agency (EPA) establishes standards for water quality, monitoring requirements, and procedures for enforcement. Oregon, as a primacy state, has been given the primary authority for implementing EPA's rules within the state. The State of Oregon agency that administers most of EPA's drinking water rules is the Oregon Health Authority, Drinking Water Program (DWP). DWP rules for water quality standards and monitoring are adopted directly from EPA. The DWP is required to adopt rules at least as stringent as federal rules. To date, the DWP has elected not to implement more stringent water quality or monitoring requirements to date.

In some areas not directly related to water quality, DWP rules cover a broader scope than EPA rules. These areas include general construction standards, cross connection control, backflow installation standards, and other water system operation and maintenance standards. The City's activities are also governed by the Oregon Department of Environmental Quality (DEQ). The complete rules governing the DWP in the State of Oregon are contained in Oregon Administrative Rules Chapter 333, Division 61, Public Water Systems.

Status of Drinking Water Regulations

General. The Safe Drinking Water Act (SDWA) was originally enacted in 1974 by Congress to ensure the quality of America's drinking water. In 1986, the SDWA was reauthorized and changed significantly. In 1996, Congress reauthorized the SDWA and made further changes. The SDWA contains the following assignment and programs for the EPA and the states to administer including:

- State revolving loan fund for water system construction
- Public notification reports
- Source water assessment and protection
- Monitoring reductions based on source water protection
- Mandatory certification of operators

All of these assignments have been implemented by the EPA and the individual states. Progress on evaluation of potential contaminants continues with the unregulated contaminant sampling

requirements and health effects research. Implementation of the Unregulated Contaminants Monitoring Rule 3 (UCMR3) will result in additional water quality sampling in 2013.

Disinfectants/Disinfection By-Products Rule

General. The Disinfectants/Disinfection By-Products (D/DBPs) rule and the Stage 1 D/DBP rule apply to all Community Water Systems and Non-Transient Non-Community Water Systems that treat water with a chemical disinfectant for primary or residual treatment. This rule is currently in effect and regulates Total Trihalomethanes (TTHMs) and Haloacetic Acids (HAA5s), which include:

TTHMs

- Trichloromethane (chloroform)
- Tribromomethane (bromoform)
- Bromodichloromethane
- Dibromochloromethane

HAA5s

- Monochloroacetic acid
- Dichloroacetic acid
- Trichloroacetic acid
- Monobromoacetic acid
- Dibromoacetic acid

The Maximum Contaminant Levels (MCL) for TTHMs and HAA5s in the Stage 1 D/DBP rule are calculated as the running annual average of quarterly samples at four distribution system sites per plant or entry point. The MCLs for several constituents are listed in Table 6-1.

Table 6-1 | Constituents Listed by the Disinfectants/ Disinfection By-Products Rule

Constituent	MCL/Requirement
Chlorine	4 mg/L
Total Organic Carbon (TOC)	Treatment Technique
TTHMs	0.080 mg/L
HAA5s	0.060 mg/L

The Stage 2 D/DBPs rule is currently being implemented. This rule maintains the MCL levels established in Stage 1 D/DBP rule and added Maximum Contaminant Level Goals (MCLGs) for four TTHMs and three HAA5s. The most significant change in the Stage 2 D/DBP is the requirement that the MCL be calculated on the locational running annual average of quarterly samples taken at locations to be determined by an Initial Distribution System Evaluation (IDSE). The compliance sites consist of locations where high TTHMs are found, locations where high HAA5s are found and average detention time sites within the distribution system. The number

of sites is based on the type of source water and population served. The rule provides for reduced monitoring for systems with very low disinfection by-products based on two (2) years of existing data.

City Compliance. The City prepared an IDSE in September, 2006 using the System Specific Study (SSS) method. The City is currently monitoring DBPs and is meeting all D/DBPs Rule requirements. The City is currently sampling quarterly at four (4) sites for the Stage 2 requirements.

Statistics for the sampling results from 2003 through 2010 for the Stage 1 D/DBP Rule are shown in Table 6-2, which show that the City is meeting the MCL for trihalomethanes and haloacetic acids.

Table 6-2 | Quarterly Disinfection Byproduct Monitoring Results

Quarterly Average Value, 2003 - 2010	Trihalomethanes (TTHM) (mg/l)	Haloacetic Acids (HAA5) (mg/l)
Minimum	0.017	0.004
Average	0.029	0.023
Maximum	0.063	0.039
MCL	0.080	0.060

Total Coliform Rule

General. The Total Coliform Rule applies to all surface water and groundwater systems. Total coliforms include both fecal coliforms and *E. coli*. The MCLG for total coliforms is zero. Compliance with the MCL is based on the presence or absence of total coliforms in a sample. The MCL for systems analyzing at least 40 samples per month is that no more than five (5) percent of the monthly samples may have total coliforms present.

Monthly monitoring requirements are based on the population served. A system must collect a set of repeat samples for each positive total coliform result and have it analyzed for total coliforms. The total coliform sampling requirements vary according to population served.

City Compliance. The City is currently meeting all applicable requirements for the Total Coliform Rule. It is important to maintain active circulation of water throughout the distribution system, in both pipes and reservoirs so as to retain a chlorine residual. The absence of chlorine residual and accumulation of sediments contribute to bacterial growth, which in turn can result in failure to comply with the Rule.

These factors should be considered as new pipelines and reservoirs are being added. Large dead-end pipes should be avoided. Where they are installed, it is important for the City to continue the existing program of regular flushing of these lines. Flushing programs must be regular and not just in response to loss of chlorine residuals, because by that time the system may test positive for coliforms.

Reservoirs should be designed and operated to ensure adequate mixing and reservoir turnover to promote good water quality. The City's reservoirs include inlet mixing systems on most reservoirs, and reservoirs are operated at reduced capacity to ensure adequate turnover during low water use periods.

EPA standards for the residual disinfectant concentration in the water entering the distribution system cannot be less than 0.2 mg/L for more than 4 hours (40 CFR 141.72(a)(3) and (b)(2)). The residual disinfectant concentration in the distribution system cannot be undetectable in more than five (5) percent of the samples each month for any two (2) consecutive months that the system serves water to the public (40 CFR 141.72(a)(4) and (b)(3)). The City samples monthly for chlorine residual at approximately 25 to 30 points in the distribution system. Most monthly samples have a residual in the range of 1.0 to 1.5 parts per million (ppm). Annual average system-wide chlorine residual levels range from 1.2 to 1.5 ppm. The sites with the lowest annual average vary in location and have a residual annual average from 0.3 to 1.0 ppm. The City has not reported any compliance problems.

Lead and Copper Rule

General. On June 7, 1991, the EPA published maximum contaminant level goals and regulations for lead and copper. In April 2000, the EPA Lead and Copper Rule Minor Revisions (LCRMR) took effect. The Lead and Copper Rule (LCR) regulation requires lead and copper to be monitored at consumers' taps every 6 months. One (1) monitoring period is equivalent to six (6) months, and two (2) monitoring periods are required per calendar year (that is, January to June and July to December). The LCRMR did not change the Action Levels (AL) and they did not change the basic requirements to optimize corrosion control and, if needed, treat source water, deliver public education, and replace lead service lines. In October 2007, the EPA published the Short-term Revisions which added criteria for reduced sampling frequency for systems in compliance.

Water samples at the customer's tap are required to be taken at high-risk locations, which are defined as homes with the following conditions:

- Lead solder installed after 1982
- Lead service lines
- Lead interior piping

For a water system to comply with the Lead and Copper Rule (LCR), the samples at the customer's tap must not exceed the following action levels:

- Lead - 0.015 mg/L detected in the 90th percentile of all samples
- Copper -1.3 mg/L detected in the 90th percentile of all samples

If the action levels are exceeded for either lead or copper, the water system is required to collect source water samples and submit the data with a treatment recommendation to the State. Additionally, if the action level is exceeded, the water system is required to present a public education program to its customers within 60 days of learning the results. The public education program must be continued as long as the water system exceeds the action levels.

All systems that exceed the lead or copper action level and all systems serving more than 50,000 persons are required to conduct corrosion control studies and optimize corrosion control at the customer tap. Corrosion control studies must compare the effectiveness of pH and alkalinity adjustment, calcium adjustment, and addition of a phosphate or silica-based corrosion inhibitor. In addition to lead and copper, systems that exceed the lead or copper action levels are required to monitor other water quality parameters.

After performing a corrosion control study, water systems are required to develop a corrosion control treatment plan based on study results and monitoring data and submit this plan to the DWP for approval. Once the treatment plan is approved by the State, the purveyor will have 24 months to install the optimal corrosion control treatment and 12 months to collect follow-up samples. Once monitoring has shown that corrosion control is effective, the regulatory agency will assign values for water quality parameters that will be used to ensure that corrosion treatment is effective.

City Compliance. The City is currently monitoring for lead and copper at customer taps and is meeting all applicable requirements of the Lead and Copper Rule. To control leaching of lead and copper, the Portland Water Bureau (PWB), the City's water supplier, adds sodium hydroxide during water treatment to condition the water to a target pH of 8.

Per the agreement with the DWP, of April 2003, the City, along with 15 other water providers, is sampled as part of the PWB Bull Run system for Lead and Copper Rule monitoring. A minimum of three (3) samples are required in the City, and four (4) samples are typically collected to ensure the minimum is met. A summary of the lead and copper monitoring is presented in Table 6-3. The PWB continues the monitoring program established in 2003 and has elected not to reduce the monitoring frequency established in the 2007 Rule revisions based on an agreement with the DWP.

Table 6-3 | Lead and Copper Rule Monitoring Results

	Lead	Copper
Action Level (mg/l)	0.150	1.30
PWB system 90th Percentile, 2006	0.009	0.31
City of Tualatin, maximum value		
2007	0.011	0.31
2008	0.012	0.35
2009	0.013	0.51
2010	0.020	0.47

Unregulated Contaminant Monitoring Rule

General. The 1996 SDWA amendments require that once every five (5) years, EPA issue a new list of no more than 30 unregulated contaminants to be monitored by public water systems. The EPA uses the Unregulated Contaminant Monitoring program to collect data for contaminants suspected to be present in drinking water, but that do not heave health-based standards set under the SDWA. The Unregulated Contaminant Monitoring Rule 3 (UCMR 3) was enacted by the EPA in May 2012, requiring monitoring for 30 contaminants between 2013 and 2015.

City Compliance. The City will be required to perform Assessment Monitoring for 21 chemicals (List 1) during a 12-month period. The 21 chemicals, listed below, will be sampled at distribution system entry points for all chemicals and distribution system maximum residence time for seven of the chemicals.

UCMR 3 List 1 Contaminants

- 1,2,3-trichloropropane
- 1,3-butadiene
- Chloromethane
- 1,1-dichloroethane
- Bromomethane
- Chlorodifluoromethane
- Bromochloromethane
- 1,4-dioxane
- Vanadium
- Molybdenum
- Cobalt
- Strontium
- Chromium
- Chromium-6
- Chlorate
- Perfluorooctanesulfonic acid
- Perfluorooctanoic acid
- Perfluorononanoic acid
- Perfluorohexanesulfonic acid
- Perfluoroheptanoic acid
- Perfluorobutanesulfonic acid

Aquifer Storage and Recovery Sampling

The City operates a single aquifer storage and recovery (ASR) facility under Limited License #010. Licensing requirements include additional water quality sampling and reporting to the DWP. Since the ASR facility began operation in 2010, only the initial rounds of sampling have been conducted. Ongoing sampling and reporting will be required for the ASR well, including compliance with a number of source water sampling requirements described below. Based on a DWP classification as groundwater, the ASR monitoring requirements for recovered water are presented in Table 6-4. No additional sampling is required to meet Stage 2 D/DBP compliance.

Table 6-4 | ASR Monitoring Requirements per Drinking Water Program Groundwater Classification

Constituent	Initial Sampling/Reporting	Anticipated Monitoring Reduction
Nitrate (NO3)	Annual	--
Nitrite (NO2)	1 per 3 years	If non-detect in 2014, reduce to 1 per 9 years
Inorganic Compounds (IOCs)	1 per 3 years	If non-detect in 2014, reduce to 1 per 9 years
Arsenic (As)	1 per 3 years	If non-detect in 2014, reduce to 1 per 9 years
Sodium (Na)	1 per 3 years	--
Soluble Organic Compounds (SOCs)	Annual	If non-detect through 2012, sample 2 consecutive quarters every 3 years
Volatile Organic Compounds (VOCs)	Annual	If non-detect through 2012, 1 sample every 3 years
Radionuclides (Gross Alpha)	Quarterly	Reduction possible based on initial testing results
Coliform	Annual (at wellhead)	--
Disinfection By-Products (DBPs)	No additional sampling beyond Stage 2 compliance monitoring sites	--

Additional Wholesale Provider Regulatory Issues

General. The PWB, as the source water provider, is responsible for sampling, monitoring and compliance with numerous water quality regulations that do not need to be addressed directly by the City. These include:

- Synthetic Organic Chemicals and Inorganic Chemicals
- Volatile Organic Compounds
- Arsenic
- Sulfate
- Fluoride
- Radon/Radionuclides
- Groundwater Rule
- Surface Water Treatment Rule and Supplementary Rules:
  - Interim Enhanced Surface Water Treatment Rule
  - Long Term 1 Enhanced Surface Water Treatment Rule
  - Long Term 2 Enhanced Surface Water Treatment Rule

City Compliance. While the City is not directly responsible for meeting these regulatory requirements, as a wholesale water purchaser from the PWB, the City is directly impacted by these regulatory requirements through wholesale water rates. The Bull Run Watershed drinking water supply is generally considered a high quality protected source with very low vulnerability to the regulated contaminants listed above. The PWB designed a water treatment facility to comply with the EPA requirement to address the potential for cryptosporidium contamination under the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR). Construction of the ultraviolet treatment facility has been delayed indefinitely following a State of Oregon Drinking Water Program variance for the unfiltered Bull Run source.

With the addition of an ASR well to the City's system, the City will need to initiate compliance monitoring and reporting for a number of the constituents listed above. The City is already performing the sampling for all of these potential contaminants as part of the ASR pilot testing program and has not observed levels of concern for any of the regulated contaminants.

Water Conservation

Introduction

The City is required to meet certain water conservation goals under the wholesale water supply agreement with the Portland Water Bureau. As the City is not an active municipal water rights holder, it is not required to develop a formal Water Management and Conservation Plan, but may consider establishing a formal program to implement the following conservation measures to reduce water usage, particularly peak water usage. The following are examples of water conservation efforts that water utilities are required to consider under the Oregon Administration Rules Chapter 690, Division 86, Water Management and Conservation Plans.

Public Education and Outreach

Water conservation can be promoted through a variety of programs and activities in the public school system, higher education system, community events and regional partnerships. Conservation information can be provided with billing statements and at the City's front lobby. In addition, specific conservation messages are often included with the billing statements to provide tips to use water wisely. These tips, in conjunction with the other elements of the City's public education program, provide a clear link between water conservation and financial savings for the individual customer.

As a member of the Regional Water Providers Consortium (RWPC), the City actively participates in regional water conservation program development and implementation. Comprised of 23 water providers and the Metro Regional Government, the RWPC provides a forum for collaboration on water supply, resource management and conservation issues affecting the region. The RWPC was formed in 1996 by an Intergovernmental Agreement to coordinate the implementation of the Regional Water Supply Plan for the Portland Metropolitan Area. The Regional Water Supply Plan is the region's water supply strategy and recognizes that water conservation plays a key role in meeting future water needs. In December 2004, the RWPC completed the Regional Water Supply Plan Update. The updated plan evaluated regional source options while reflecting the actions and plans of the individual members. The plan also updated water demand forecasts and continued to emphasize opportunities for regional conservation programs where economies of scale and regionally-consistent conservation messages and benefits can be achieved. The RWPC's conservation objectives are to:

- Plan and implement regional programs and events focused on reducing peak summer water use.
- Effectively encourage customers to visit and utilize the web site at www.conserveh2o.org
- Integrate consistent conservation messages into the daily lives of customers.
- Develop and implement effective monitoring and reporting techniques to verify program effectiveness.
- Invite stakeholder participation in conservation program development.
- Seek economies of scale by working together.
- Foster public awareness of the RWPC's collaborative efforts.

The RWPC's conservation plan contains a variety of programs and outreach opportunities which include:

- Summer marketing campaign
- Education programs
- Regional events
- Landscape industry partnerships
- A web site (www.conserveh2o.org)
- Informational materials (brochures, kits and water-saving devices)

Given the City's participation in RWPC, further City-specific public education and outreach programs are not likely to offer cost-effective water conservation results. The commitment of up to a 1/4 full time employee (FTE) would be required to implement a City-specific program.

Technical and Financial Assistance Programs

There are existing State of Oregon and federal water conservation programs that the City can promote through awareness. Examples include the Oregon Energy Trust and federal rebate programs. The City can also take an active role in promoting conservation through technical and financial assistance programs. For example, the Tualatin Valley Water District (TVWD) distributes three residential "kits" to homeowners upon request to help them detect leaks and reduce water usage.

Due to the cost of hiring staff, potentially up to 1/4 FTE , and implementing such programs, including the purchase and distribution of household water use reduction "kits" implementation of such programs should be re-evaluated as part of future WMP updates.

Retrofit/Replacement of Inefficient Fixtures

The City can offer commercial and residential rebates for replacement of high-water use appliances and fixtures and, as described above, provides kits to help identify leaks and other potential reasons for high water bills, such as inefficient fixtures. These programs can be effective where a water system service area contains a high number of older homes that likely still contain aging, inefficient fixtures.

The cost of hiring staff, estimated at 1/2 FTE, to implement and manage rebate and exchange programs is not recommended at this time given the high cost of rebates to the City and a fairly low return on investment that would be expected.

Leak Detection Program

Water loss prevention and leak detection programs are typically economical when annual water losses regularly exceed 10 percent. Given that the estimated percentage of unaccounted-for water is below this level, the City does not currently have and is not planning for implementation of a comprehensive on-going leak detection program within the distribution system.

The City is actively implementing a water main replacement program that is systematically replacing aging mains with a focus on existing asbestos cement pipe and associated service lines to reduce water loss and excessive main breaks. The continuation of this program as a key element of the City's water system capital budget is recommended to maintain current low levels of water loss.

Water Conservation Recommendations

As a member of the RWPC, the City contributes funds to the promotion of water conservation throughout the Portland Metropolitan area and realizes significant benefit from the conservation program of this organization. It is recommended that the City continue to invest its water conservation funds in the larger RWPC conservation program. No further investment in City-specific water conservation measures is recommended at this time; however, as the City continues to grow and develop, future efforts to encourage and support water conservation efforts may help to delay the need to make substantial capital improvements to meet increased water demands. The City should continue to evaluate potential conservation-encouraging programs with future Water Master Plan updates.

GENERAL

This section presents recommended water system improvements based on the analysis and findings presented in Section 5. These improvements include proposed storage reservoir, pumping capacity and water line improvements. Also presented is a capital improvement program (CIP) schedule for all recommended improvements. All proposed system improvements are illustrated on Plate 1 in Appendix A.

COST ESTIMATING DATA

An estimated project cost has been developed for each improvement project recommendation presented in this section. Cost estimates represent opinions of cost only, acknowledging that final costs of individual projects will vary depending on actual labor and material costs, market conditions for construction, regulatory factors, final project scope, project schedule and other factors. The Association for the Advancement of Cost Engineering (AACE) classifies cost estimates depending on project definition, end usage and other factors. The cost estimates presented here are considered Class 4 with an end usage being a study or feasibility evaluation and an expected accuracy range of -30 percent to +50 percent. As the project is better defined the accuracy level of the estimates can be narrowed. Itemized project cost estimate summaries are presented in Appendix C. This appendix also includes a cost data summary for recommended water main improvements developed on a unit cost basis. Estimated project costs include approximate construction costs and an allowance for administrative, engineering and other project-related costs.

The estimated costs included in this plan are planning-level budget estimates presented in 2012 dollars. Since construction costs change periodically, an indexing method to adjust present estimates in the future is useful. The Engineering News Record (ENR) Construction Cost Index (CCI) is a commonly used index for this purpose. For future cost estimate updating, the recent Seattle, Washington, ENR CCI is 9075 (May 2012).

WATER SYSTEM CAPITAL IMPROVEMENT PROGRAM

A summary of all the recommended improvements is presented in Table 7-1 which provides for project sequencing by showing prioritized short-, medium- and long-term recommendations. Short-range recommendations are those suggested to be completed in the next one (1) to five (5) years, medium-term in the next six (6) to 10 years, and long-term in the next 11 to 20 years. Estimated project costs are also summarized in Table 7-1 and discussed in this section.

Table 7-1 | Capital Improvement Program Summary							
Category	Project ID	Project Description	CIP Schedule and Project Cost Summary				Percent SDC Eligible
			Short	Medium	Long	Estimated Project Cost	
			2013-2016	2017-2021	2022-2031		
Distribution Piping	P-1	Continuation of AC pipe replacement.	$575,000	$500,000	$425,000	$1,500,000	36%
	P-2	Development of SW Concept Area. 20,000 ft of 16-inch diameter piping and 11,000 ft of 12-inch diameter piping.			$8,200,000	$8,200,000	100%
	P-3	1,100 ft of 12-inch diameter piping to complete system looping along SW Myslony St. and SW 112th Ave. to improve fire flow capacity.		$240,000		$240,000	36%
	P-4	700 ft of 12-inch diameter piping to complete system looping near the Leveton PRV site to improve fire flow capacity.		$150,000		$150,000	36%
	P-5	Installation of 3 fire hydrants on SW Boones Ferry Road to improve fire flow capacity at the Tualatin High School site.	$100,000			$100,000	36%
	P-6	450 ft of 8-inch diameter piping to complete system looping near SW 90th Ave. to improve fire flow capacity.			$70,000	$70,000	36%
	P-7	850 ft of 8-inch diameter piping to complete system looping near SW Manhasset Dr. to improve fire flow capacity.			$130,000	$130,000	36%
	P-8	4,700 ft of 12-inch diameter piping to improve Norwood Reservoirs outlet transmission capacity to provide for fire flow capacity and improve reservoir water quality when proposed B-Level reservoir near ASR site is constructed.		$1,010,000		$1,010,000	36%
		Subtotal	**$675,000**	**$1,900,000**	**$8,825,000**	**$11,400,00**	

Table 7-1 | Capital Improvement Program Summary (continued)							
Category	Project ID	Project Description	CIP Schedule and Project Cost Summary				Percent SDC Eligible
			Short 2013-2016	Medium 2017-2021	Long 2022-2031	Estimated Project Cost	
Storage Facilities	R-1	New 1.0 MG storage reservoir in Service Area C adjacent to Reservoir C-1.	$1,500,000			$1,500,000	50%
	R-2	New 2.2 MG storage reservoir in Service Area B at ASR site to accommodate SW Concept Area growth.		$3,700,000		$3,700,000	100%
	R-3	New 2.2 MG storage reservoir in Service Area B at ASR site to accommodate SW Concept Area growth and Service Area B infill.			$2,600,000	$2,600,000	100%
		Subtotal	**$1,500,000**	**$3,700,000**	**$2,600,000**	**$7,800,000**	
Pumping	PS-1	New 3,600 gpm pump station near the A-2 Reservoir to provide primary and back-up supply to Service Area B.			$950,000	$950,000	100%
		Subtotal	**$0**	**$0**	**$950,000**	**$950,000**	
Other	M-1	SCADA Improvements.	$100,000	$25,000	$50,000	$175,000	36%
	M-2	Water Rate and SDC Study Update.			$25,000	$25,000	36%
	M-3	Water System Master Plan Update.			$150,000	$150,000	36%
		Subtotal	**$100,000**	**$25,000**	**$225,000**	**$350,000**	
			$2,275,000	**$5,625,000**	**$12,600,000**	**$20,500,000**	
			$455,000	**$790,000**	**$1,025,000**		
			5-year annual average	**10-year annual average**	**20-year annual average**		

Note: The improvement R-1 is not included in the financial analysis and SDC calculation.

As discussed in Section 8, the City of Tualatin (City) collects System Development Charges (SDCs) to fund capital improvements that are associated with future development, or growth, as allowed under Oregon Revised Statute 223.297 through 223.314. For improvements that benefit both current and new customers, a fraction of the project cost is allocated to SDCs proportional to the benefits. Table 7-1 includes the percent of the project cost eligible to be allocated to SDCs for each CIP project.

RECOMMENDED DISTRIBUTION SYSTEM IMPROVEMENTS

General

Presented below are recommended water distribution system improvements for pump stations, storage reservoirs, pressure reducing facilities and distribution system piping. Project cost estimates are presented for all recommended improvements in Appendix C and summarized herein. The recommendations are presented by project type and discussed in order of need.

Piping Improvements

The system analysis found that some distribution water main improvements are needed to provide sufficient fire flow capacities under both existing and future demand conditions. Transmission piping improvements are necessary to extend the water system to serve future growth areas. Improvements that involve construction of new waterlines to expand the distribution system capacity are considered 100 percent eligible for SDCs.

Improvement P-1 is an allocation for continued replacement of asbestos concrete (AC) pipe. AC pipe is commonly associated with increased water line breaks and costly emergency repairs. Approximately 9,000 feet of AC pipe remains in the City's distribution system ranging from 4-inch to 12-inch diameter pipe. It is anticipated that the City will complete AC pipe replacement within the next five (5) years.

Improvement P-2 includes transmission piping improvements associated with growth in the SW Concept Area. The recommended 12-inch and 16-inch diameter piping size and alignments are presented at the conceptual level. Further review and analysis will be required during infrastructure planning as development plans are prepared.

Improvements P-3 and P-4 are completion of 12-inch diameter distribution system looping to improve capacity to address existing fire flow deficiencies. Improvement P-3 is located near SW Myslony Street. Improvement P-4 is located near the Leveton pressure reducing valve (PRV) vault.

Improvement P-5 improves fire flow capacity at the Tualatin High School through the installation of three additional fire hydrants along SW Boones Ferry Road off the 12-inch diameter main of Service Area B. The existing fire hydrants are supplied from the Service Area C main that runs parallel to the Service Area B main.

Improvement P-6 includes completion of 8-inch diameter distribution system looping along SW 90th Avenue to improve capacity to address existing and future fire flow deficiencies.

Improvement P-7 includes completion of 8-inch diameter distribution system looping along SW Manhasset Drive to improve capacity to address existing and future fire flow deficiencies.

Improvement P-8 includes approximately 4,700 ft of parallel 12-inch diameter outlet piping from the Norwood Reservoirs to the Service Area B distribution system at SW Ibach Road. Reservoir outlet capacity improvements are necessary when the future Service Area B reservoirs are constructed to promote turnover in the Norwood Reservoirs.

The proposed piping improvements described above are listed and summarized in Table 7-1 and illustrated in Plate 1 in the Appendix.

Storage Reservoirs Improvements

The storage volume analysis in Section 5 identified a current storage volume deficit in Service Area C and a future storage volume deficit in all service areas. The recommended improvements associated with these deficits include construction of two new reservoirs as previously identified and anticipated.

The primary cause of future anticipated storage deficiencies in Service Area B is growth in the SW Concept Area. The existing ASR site has adequate space to accommodate new storage and is one of the few locations within the City with appropriate elevation to serve Service Area B by gravity. This site should be used to provide future storage capacity for Service Area B, especially to serve the anticipated growth in the SW Concept Area.

Service Area A has adequate current storage volume capacity, but is anticipated to have a small deficiency in the future as increased density from redevelopment occurs. It is recommended that the future storage volume needs for Service Area A, which are small (~1.1 million gallon (MG)), be supplied from the new storage in Service Area B. As the bulk of the future storage needs are for emergency storage, the new storage at a higher elevation is still available to serve Service Area A by gravity in the event of an emergency. Use of the planned reservoir site in Service Area B will avoid costly property acquisition and provide economy of scale in storage construction costs. It is recommended that two (2) 2.2 MG reservoirs be planned. The first of these reservoirs is a medium-term improvement to coincide with infill development in Service Area B. The second reservoir is a long-term improvement for build-out of the service area to include the SW Concept Area. Project cost estimating data for the storage capacity improvements are included in Appendix C.

The Frobase Reservoir site, supplying Service Area C, has adequate existing space to accommodate a second small reservoir. This second reservoir, with a volume of 1 million gallons, will be constructed as an at-grade welded steel reservoir consistent with the City's other reservoirs. Transmission piping is largely in place and no further property acquisition is required. This project has been designed and is awaiting construction funding. This project has been identified as a high priority improvement to meet an existing deficiency and is

recommended as an immediate priority improvement. Approximately half of the storage volume of the second reservoir is associated with an existing storage deficit. The other half is allocated for future growth and emergency storage at the highest level in the water system. This project is currently not included in the financial analysis in Section 8.

Pump Station Capacity Improvements

With development of the SW Concept Area, it is recommended that the City construct a new back-up pump station located near the A-2 reservoir. This new station will provide for future pumping capacity needs to Service Area B in the event of PRV failure. The pump station will also provide for improved service pressures under high demand conditions and improve turnover for water quality in the A-2 reservoir.

The City anticipates future transportation improvements will include the widening of SW Boones Ferry Road. Widening of the road would require the relocation of the existing Boones Ferry Pump Station. It is recommended that the new pump station near the A-2 reservoir site be sized such that the new station (5.22 million gallons per day (mgd)) and the existing Martinazzi Pump Station (2.88 mgd) have a combined capacity equal to the future Service Area B and C maximum day demand of 8.1 mgd. This will allow for the abandonment of the Boones Ferry Pump Station. Cost data for the pumping capacity and site improvements is included in Appendix C.

Pressure Reducing Facilities Improvements

The existing pressure reducing facility capacities are adequate to meet existing and future conditions. Hydraulic analysis found that the existing PRV settings at the City Park facilities will need to be operationally adjusted to meet large increases in maximum day demand associated with the Service Area A demands from the SW Concept Area. No recommendations are made for pressure reducing facility capital improvements.

SCADA System Improvements

The existing System Control and Data Acquisition (SCADA) system is reaching the end of its useful service life and will require significant investment to continue to maintain outdated equipment. An assessment of needed system upgrades to the software and hardware should be made and compared to the costs and benefits of a full system replacement. It is recommended that the City budget approximately $100,000 in the immediate term for completion of system assessments and implementation of replacement or improvements. An ongoing system renewal budget of $25,000 every five (5) years is further recommended.

Capital Improvement Program Funding

It is recommended that the City's water system capital improvement program be funded at approximately $1 million annually. While the funding for certain water system improvements may exceed this amount, the proposed improvements listed in Table 7-1 are phased and sequenced so that the average annual capital requirement for water system improvements is

approximately $1 million over the 20-year planning horizon. Further financial analysis is presented in Section 8.

SHERWOOD SUPPLY MAIN EVALUATION

The City of Sherwood is currently in the process of changing supply sources and it is anticipated that the existing 24-inch diameter main will not be required to serve the City of Sherwood in the future. A scenario where the City of Tualatin acquires rights and/or ownership to this main is examined under a separate memorandum ("Evaluation of Sherwood Main Use Options", prepared by MSA for Kaaren Hofmann, April 30, 2012). This scenario would affect the pumping capacity improvements recommended in the CIP. Use of the Sherwood Supply Main to transmit water to the western portion of the City's Service Area B would allow for a reduction in the required new station capacity and also reduce pumping costs associated with serving the higher elevation service areas.

SUMMARY

This section presents recommendations for improvements to the City's storage reservoirs, pumping stations, control valves, supply transmission capacities and distribution system. The total estimated project cost of these improvements is approximately $20.5 million for the 20-year planning horizon and beyond to the ultimate full development of the City's existing UGB. Of the improvements required in the 20-year planning horizon, approximately $5.6 million of these improvements are required in the next 10 years. Approximately $1.02 million per year should be budgeted over the next 20 years for the completion of these projects.

GENERAL

This section provides a financial plan that will allow the City of Tualatin (City) to implement its capital improvement plan while meeting its other financial obligations, including policy objectives. The two (2) components of this plan are 1) the computation of a system development charge and 2) a revenue requirement analysis that includes a set of fiscal policy recommendations.

SYSTEM DEVELOPMENT CHARGES

System development charges (SDCs) are one-time fees imposed on new and increased development to recover the cost of system facilities needed to serve that growth. This section provides the rationale and calculations for proposed water SDCs.

Methodology

An SDC can include three (3) components: 1) a reimbursement fee, 2) an improvement fee, and 3) compliance costs.

Reimbursement Fee. The reimbursement fee is the cost of available capacity per unit of growth that such available capacity will serve. In order for a reimbursement fee to be calculated, unused capacity must be available to serve future growth. For facility types that do not have excess capacity, no reimbursement fee may be charged.

Improvement Fee. The improvement fee is the cost of capacity-increasing capital projects per unit of growth that those projects will serve. In reality, the capacity added by many projects serves a dual purpose of both meeting existing demand and serving future growth. To compute a compliant SDC rate, growth-related costs must be isolated, and costs related to current demand must be excluded.

We have used the "capacity approach" to allocate costs to the improvement fee basis. Under this approach, the cost of a given project is allocated to growth in proportion to the growth-related capacity that projects of a similar type will create.

Growth should be measured in units that most directly reflect the source of demand. In the case of water, growth is measured in the number and size of water meters. The smallest meters are those typically used by households are therefore designated one "equivalent dwelling unit" (EDU). A larger meter with, for example, five (5) times the flow capacity is considered five (5) EDUs.

Compliance Costs. ORS 223.307(5) authorizes the expenditure of SDCs on "the costs of complying with the provisions of ORS 223.297 to 223.314, including the costs of developing system development charge methodologies and providing an annual accounting of system development charge expenditures." To avoid spending monies for compliance that might

otherwise have been spent on growth-related projects, this report includes an estimate of compliance costs in its SDC rates.

Growth

Based on information provided by City staff, the City currently has approximately 6,660 water connections, representing 11,244 EDUs. For this analysis, one EDU is defined as the flow equivalent of a 5/8-inch by 3/4-inch water meter. Maximum day demand is expected to grow from the current 9.48 million gallons per day to 14.26 million gallons per day at buildout, and the facilities planned for construction in the next twenty years are sized to meet that buildout demand. We therefore assume that the customer base will grow similarly, resulting in our estimate of 16,913 EDUs at buildout. The difference between buildout and current EDUs is the projected growth associated with the capital projects listed in this plan, 5,669 EDUs. This increase in EDUs is used in the SDC calculation.

Eligible Costs

The City has SDC-eligible costs in both its existing water facilities and its planned capital projects.

Existing Facilities. Because the City's water infrastructure has excess capacity that is available to serve growth, the City can charge a reimbursement fee as part of its water SDC. Table 8-1 summarizes the cost of excess capacity that can be included in a reimbursement fee. Note that water-related debt principal outstanding is deducted from these costs to avoid double collection.

Table 8-1 | Reimbursement Fee Cost Basis

Asset Class	Estimated Historical Cost	Available Portion	SDC-Eligible Cost
Storage	$12,636,627	5.38%	$680,434
Pumping	388,819	6.53%	25,403
Transmission	6,304,849	12.04%	758,917
Distribution	21,876,918	36.24%	7,928,548
Construction work in process	4,315,292	22.80%	983,683
Utility debt principal outstanding	(5,685,000)	22.80%	(1,295,912)
Total	39,837,506		9,081,072

Source: City staff (total historical cost) and MSA (asset functionalization and capacity analysis)

When the total eligible cost of $9,081,072 is divided by the expected growth of 5,669 EDUs, the resulting reimbursement fee is $1,602 per EDU.

Planned Capital Projects. Based on the capital improvement plan developed by Murray, Smith & Associates, Inc., the City will construct water facilities with an estimated cost of $18,415,000 over the planning period. However, most of these projects will not serve growth exclusively. Only the growth-related portion of each project can be collected as the improvement fee component of an SDC. Table 8-2 shows the growth-related portion of the planned water projects.

Table 8-2 | Planned Water Projects					
ID	Description	Timing	Total Cost	Portion Serving Growth	SDC Eligible Cost
P-1	Continuation of AC pipe replacement (reduced for already budgeted funds)	2013-32	$915,000	36%	$331,620
P-2	Development of SW Concept Area. 20,000 ft of 16-inch diameter piping and 11,000 ft of 12-inch diameter piping.	2023-32	8,200,000	100%	8,200,000
P-3	1,100 ft of 12-inch diameter piping to complete system looping along SW Myslony St and SW 112th Ave to improve fire flow capacity.	2018-22	240,000	36%	86,982
P-4	700 ft of 12-inch diameter piping to complete system looping near the Leveton PRV site to improve fire flow capacity.	2018-22	150,000	36%	54,364
P-5	Installation of 3 fire hydrants on Boones Ferry Road to improve fire flow capacity at the High School site.	2013-17	100,000	36%	36,243
P-6	450 ft of 8-inch diameter piping to complete system looping near W 90th Ave to improve fire flow capacity.	2023-32	70,000	36%	25,370
P-7	850 ft of 8-inch diameter piping to complete system looping near SW Manhasset Dr to improve fire flow capacity.	2023-32	130,000	36%	47,115
P-8	4,700 ft of 12-inch diameter piping to improve Norwood Reservoirs outlet transmission capacity to provide for fire flow capacity and improve reservoir water quality when proposed B-Level reservoir near ASR site is constructed.	2018-22	1,010,000	36%	366,050
R-2	New 2.2 MG storage reservoir in Service Area B at ASR site to accommodate SW Concept Area growth.	2018-22	3,700,000	100%	3,700,000
R-3	New 2.2 MG storage reservoir in Service Area B at ASR site to accommodate SW Concept Area growth and Service Area B infill.	2023-32	2,600,000	100%	2,600,000
PS-1	New 3,300 gpm pump station near the A-2 Reservoir to provide primary and back-up supply to Service Area B.	2023-32	950,000	100%	950,000
M-1	SCADA Improvements.	2013-32	175,000	36%	63,425
M-2	Water Rate and SDC Study Update.	2023-32	25,000	36%	9,061
M-3	Water System Master Plan Update.	2023-32	150,000	36%	54,364
			$18,415,000		16,524,593
	Less current SDC fund balance				(533,831)
	Cost basis for improvement fee				$15,990,763

Source: MSA

When the SDC-eligible cost of $15,990,763 is divided by the expected growth of 5,669 EDUs, the resulting improvement fee is $2,821 per EDU.

Compliance Costs. Based on data provided by the City, we estimate that the annual cost of compliance with Oregon's SDC law (in excess of projects M-2 and M-3 in the capital improvement plan) will be 0.09 percent of the reimbursement and improvement fees collected.

Summary of Costs. Table 8-3 summarizes the components of the water SDC of $4,428 per EDU.

Table 8-3 | SDC Components	
Component	Per EDU
Reimbursement fee	$1,602
Improvement fee	2,821
Compliance costs	5
Total water SDC	$4,428

Source: FCS GROUP

Fee Basis. For the purpose of imposing a water SDC on an individual property, the number of EDUs will be determined by the size of the property's water meter, as shown in Table 8-4.

Table 8-4 | SDC by Meter Size		
Meter Size	Flow Factor	SDC
5/8" x 3/4"	1.0	$ 4,428
3/4"	1.5	6,641
1"	2.5	11,069
1 ½"	5.0	22,138
2"	8.0	35,421
3"	16.0	70,841
4"	25.0	110,690
6"	50.0	221,379
8"	80.0	354,207
10"	115.0	509,173

Source: FCS GROUP

Comparison

Resolution No. 4819-08 contains the City's most recently published schedule of water SDCs and is further indexed each year for inflation. The indexed SDC as of February, 2012, for one EDU (i.e., the smallest meter) is $3,266. The proposed SDC of $4,428 per EDU is 35.6 percent higher than then current SDC. One way to mitigate the immediate impact of the recommended increase is to phase it in. For example, the City could choose to adopt an SDC of $3,500 for year 1, $4,000 for year 2, and the full $4,428 for year 3 and beyond. If growth were to occur as forecasted (assuming 20 years to build-out), the City would forego SDC revenue of $215,185 in year 1 and $101,292 in year 2, if the rates are phased in.

An area-specific SDC was also calculated for consideration by identifying and allocating the associated costs of projects intended to serve specific sub-areas within the City service area. For the purposes of comparison, that calculation resulted in a citywide charge of $2,661 and a SW Concept Area sub-area surcharge of $2,952, for a total SDC of $5,613 in the sub-area.

REVENUE REQUIREMENT ANALYSIS

The revenue requirement analysis is the determination of annual rate revenue needed to meet all of the utility's financial obligations. Prudent fiscal management requires that utility rates should be set as low as possible, yet sufficient to provide for the long-term sustainability of the water utility. The following framework of reliable, reasonable policies is provided to guide future financial decisions.

Self-Sufficient Enterprise Fund

Rates and charges were developed for this study based on the understanding that the water utility operates as a self-supporting enterprise fund. The utility receives revenues for payment of services on a user fee basis as opposed to property taxes or other non-utility revenue sources. By utilizing an enterprise fund concept of accounting, reporting, and management, subsidies among various City-provided services are avoided. The City's budgeting process includes a balanced and controlled annual budget for the utility. For this study, utility rates are established such that the utility recovers the full cost of operating & maintenance expenses, applicable debt service and related coverage requirements, planned capital, and agreed-upon levels of system reinvestment and reserves.

System Reinvestment Funding

The purpose of system reinvestment funding is to provide for the replacement of aging system facilities to ensure sustainability of the system for ongoing operations. Providing such funding through rates helps to ensure that existing ratepayers pay for the use of the assets serving them (rate equity), with the proceeds funding at least a portion of the eventual replacement of those assets.

The City has not historically set water rates at a level sufficient to provide funding for system replacement. To mitigate near-term rate increases, this study does not include annual system reinvestment funding over and above the cost of replacement projects identified in the capital improvement plan.

Reserve Levels

Cash reserves are a necessary and appropriate part of prudent utility management practices. We recommend that the City maintain its existing reserve levels, as described below.

- Operating Contingency – Operating contingencies, or reserves, are designed to provide a liquidity cushion to ensure that adequate cash working capital will be maintained to deal with significant cash balance fluctuations, such as seasonal billings and receipts, unanticipated cash operating expenses, or lower than expected revenue collections. Target funding levels are generally expressed in the number of days' cash operating expenses with the minimum requirement varying with the expected risk of unanticipated needs or revenue volatility. This study incorporates a target of 60 days of operating expenses (16.4 percent) for the water utility.

In any year where cash reserves exceed the target, we recommend using the excess to help pay for capital projects. This can be accomplished by calculating a target maximum balance at year end (e.g., 120/365 x actual operating expenses for the year) and comparing it against the actual ending cash balance. If the actual balance is greater than the target, the City may transfer the difference to the capital reserve fund.

- Capital Reserve – The capital (construction) fund typically holds any transfers of cash reserves and additional rate revenues from the operating fund. A minimum capital reserve is intended to provide a cushion against unanticipated capital project needs and capital cost overruns, as well as to meet any minimum capital reserve requirements. We recommend that the City establish such an account separate from the operating contingency, and maintain a minimum balance target of one (1) percent of total plant-in-service (utility physical assets), or $459,225 in fiscal year 2011-12.
- Enterprise Bond Fund – When issuing revenue bonds, bond underwriters require that a utility establish a restricted cash reserve, typically equal to one (1) year's debt service payment (principal and interest) for each bond issue. The reserve can be used to fund the final year's debt service payment for each issue. This study incorporates reserve funding of $438,616 for existing revenue bond debt throughout the study period.
- Rate Stabilization Account – The City's existing water revenue bond resolution further provides for a "Rate Stabilization Account within the Water Operating Fund as long as the Bonds are Outstanding." Revenue may be transferred to the Rate Stabilization Account as allowed, and money may be withdrawn "at any time and used for any purpose for which the Gross Revenues may be used," including meeting debt service and associated requirements (such as coverage). The City forecasts an account balance of almost $3 million at the end of fiscal year 2011-12. Due to uncertainty about budgeted revenues, this study does not draw upon Rate Stabilization Account funds to mitigate forecasted rate increases. It instead assumes that the utility will be self-sufficient from year to year.

Summary of Revenue Requirements Analysis

The following financial analysis reveals how much rate revenue will be required to meet operational and capital needs within contractual and policy constraints over the next 10 years.

Criteria

At least two (2) separate conditions must be satisfied in order for rates to be sufficient. First, the water utility must generate revenues adequate to meet cash needs. Second, revenues must satisfy bond coverage requirements. Revenues should be sufficient to satisfy both tests. If revenues are found to be deficient by one or more of the tests, then the greater deficiency drives the rate increase.

Cash Flow. The cash flow test identifies all cash requirements as projected in each given year. Cash requirements include operations and maintenance expenses, debt service payments, policy-driven additions to working capital, and capital improvement costs. If the water service collected replacement funding, it would also be included in the test as an expense. These expenses are compared to the total projected revenues, including interest on

fund balances. Shortfalls are then used to estimate the necessary rate increases.

Bond Coverage. The bond coverage test measures the ability of rate revenues to meet contractual obligations. The master declaration for the City's outstanding Water System Revenue Bonds, Series 2005, specifies three separate requirements.

First, net revenues (as defined in Section 2) excluding SDC revenue must equal or exceed 115 percent of annual bond debt service (as defined in Section 2). Second, net revenues including SDC revenue must equal or exceed 125 percent of annual bond debt service. Both of these requirements are found in Section 6 of the master declaration and apply over the life of the bonds. However, since SDCs are not a reliable source of income, we recommend that the City continue its practice of ignoring SDC revenues in bond coverage tests.

The third requirement is found in Section 7 of the master resolution and is commonly known as an "additional bonds test." It applies only if the City intends to issue additional revenue bonds with the same seniority as its outstanding revenue bonds. This test is identical to the second test (125 percent of annual bond debt service) with the inclusion of the new bonds in the debt service calculation. Although the City does not anticipate issuing new bonds at this time, it currently has some capacity to do so. However, that capacity can be maintained in future years only by adequate rate increases.

For modeling purposes, we have combined these three requirements into a single test for 125 percent of annual bond debt service. Since our modeled net revenues do not include SDC revenue, our test is slightly more stringent than the requirements of the master declaration.

Assumptions

The financial analysis measures the interaction of multiple assumptions over time, and is therefore only as good as those assumptions. Table 8-5 shows the key assumptions used in the revenue requirement analysis.

Note that estimates of water demand used here for financial purposes are lower than those used elsewhere in this report for engineering purposes. Also note that, for fiscal year 2012-13, revenue and expenditure projections have been updated to incorporate fiscal year 2011-12 actual performance. As a result, these projections do not necessarily agree with budgeted revenues and expenditures.

Table 8-5 | Modeling Assumptions		
Variable	Value in FY 2011-12	Average Annual Change
Demand:		
Customers in EDUs	11,244	0.46%
Water demand per customer		-0.46%
Total water demand		0.00%
Operating revenues:		
Rate revenue	$4,622,735	Determined by model
Sherwood contract	520,000	Discontinued
Other non-rate revenue	189,670	0.00%
Operating expenditures:		
Personal services	$1,777,132	3.52%
M&S and operating transfers	2,138,718	3.69%
Capital outlay (operating)	-	2.94%
Capital project expenditures	Per CIP plus annual escalation of 2.94%	
Debt service	$ 539,531	Per debt service schedule

Sources: City staff (FY 2011-12 budget and customer statistics, MSA (CIP), and FCS GROUP (other escalation rates)

We further assume that there will be neither any draws upon nor additions to the rate stabilization reserve, which was $2.7 million at the end of fiscal year 2010-11. We recommend drawing upon this reserve only at the end of fiscal years when (and to the extent that) actual revenues fall short enough of forecasted revenues to threaten compliance with bond coverage. Over time, actual revenues will naturally vary from projected revenues. The variations will be both positive and negative. They will usually be small, but they will sometimes be large. When actual revenues reflect a large, negative variation from projected revenues, some type of additional revenue may be needed to ensure compliance with bond coverage. Under the terms of the master declaration, the rate stabilization reserve is the only type of reserve that can be counted as revenue in the year that it is used (as opposed to the year that it is reserved). Therefore, its use should be limited to cases in which bond coverage is threatened.

Projections

The following two (2) tables summarize the results of the analysis for a 10-year forecast period. Table 8-6 shows the minimum rate increases that are needed each year. Table 8-7 shows a program of constant annual rate increases (4.25 percent per year starting in fiscal year 2013-14) that achieves the same results.

Table 8-6 shows that annual rate increases starting in fiscal year 2013-14 are required to ensure bond coverage. Starting in fiscal year 2017-18, rate increases are driven by capital improvement needs as the capital improvement program moves into a second, more intensive phase of spending.

Some of these planned project costs are growth-related and will be recovered in the system development charge. Unfortunately, the projects are needed before the SDCs will generate enough cash flow to cover the costs. As SDCs are collected and spent over time, they will ultimately offset the ratepayer burden by being spent on other needed projects. In fact, reimbursement fee proceeds can be spent on any capital projects – not just those that are growth-related. We therefore recommend that the City maintain separate accounts for the receipt and expenditure of both improvement fees and reimbursement fees. In addition, the City's accounting for SDCs must comply with ORS 223.311.

If growth does not occur as projected, SDC receipts also fall short of projections. The City may choose to delay associated capital project construction as a result.

It is important to note that the City's proposed fiscal year 2012-13 budget includes budgeted water rate revenues of $5,490,445 (which do not include miscellaneous fees and are therefore less than total revenues). This is an increase of almost 19 percent over the estimated fiscal year 2011-12 rate revenues of $4,622,735 used in this financial analysis. Recent revenue performance does not appear to support the budgeted water rate revenues for fiscal year 2012-13. If the City generates and sustains rate revenues at budgeted levels, then future increases will not be necessary for at least five (5) years.

Recommendations

We recommend no rate increase for fiscal year 2012-13. If, during that year, earned rate revenues equal or exceed budgeted rate revenues, then a rate increase can be avoided for fiscal year 2013-14. If, however, revenues for fiscal year 2012-13 are flat as we project, we recommend a rate increase of 4.25 percent in fiscal year 2013-14 with a series of similar increases in subsequent years.

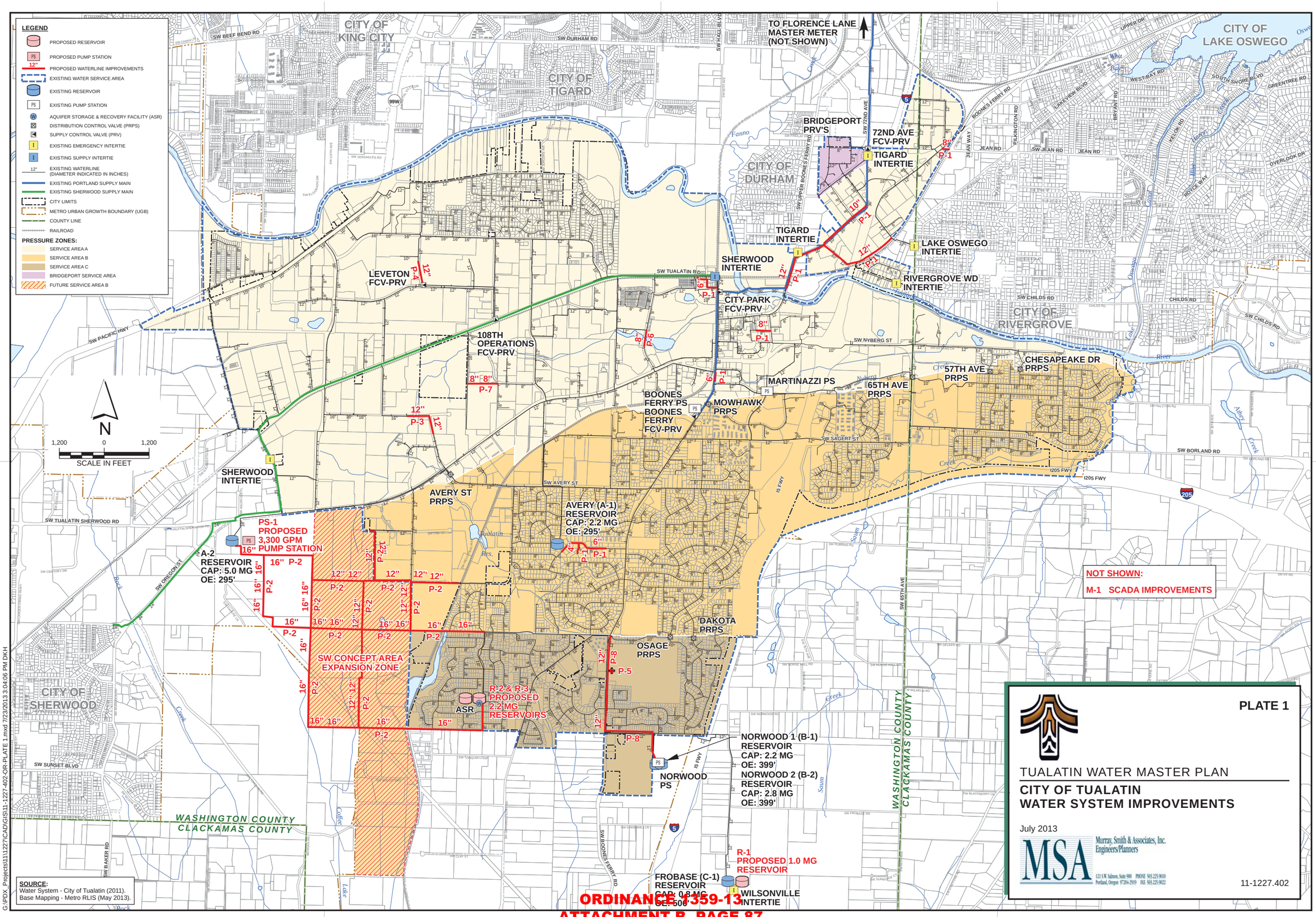
Table 8-6 | Projection Summary – Minimum Annual Rate Increase										
Revenue Requirements	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Revenues										
Rate Revenues Under Existing Rates	$4,622,735	$4,622,735	$4,622,735	$4,622,735	$4,622,735	$4,622,735	$4,622,735	$4,622,735	$4,622,735	$4,622,735
Non-Rate Revenues	716,530	261,920	198,669	198,914	199,169	199,432	199,705	199,705	199,705	199,705
Total Revenues	$5,339,265	$4,884,655	$4,821,404	$4,821,649	$4,821,904	$4,822,167	$4,822,440	$4,822,440	$4,822,440	$4,822,440
Expenses										
Cash O&M Expenses	$3,915,850	$4,065,510	$4,212,660	$4,365,139	$4,523,140	$4,686,863	$4,856,515	$5,032,312	$5,214,476	$5,403,234
Existing Debt Service	539,531	538,281	536,263	538,363	539,863	540,763	541,063	540,519	538,869	541,125
Rate Funded CIP[1]	-	-	-	-	-	-	266,693	1,077,809	1,117,855	1,155,069
Total Expenses	$4,455,381	$4,603,791	$4,748,923	$4,903,502	$5,063,003	$5,227,626	$5,664,271	$6,650,640	$6,871,201	$7,099,428
Annual Rate Adjustment	0.00%	0.00%	1.23%	3.30%	3.28%	3.26%	5.88%	17.97%	3.28%	3.28%
Rate Revenues After Rate Increase	$4,622,735	$4,622,735	$4,679,643	$4,834,405	$4,993,967	$5,158,532	$5,464,567	$6,450,936	$6,671,496	$6,899,723
Net Cash Flow After Rate Increase	883,884	280,864	129,389	129,817	130,133	130,338	-	-	-	-
Coverage After Rate Increases	2.64	1.53	1.25	1.25	1.25	1.25	1.50	3.00	3.08	3.14

Note: 1) "Rate Funded CIP" represents same-year revenue that must be used for capital projects when previous operating surpluses (not shown in this table) have been exhausted.

Table 8-7 | Projection Summary – Constant Annual Rate Increase										
Revenue Requirements	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Revenues										
Rate Revenues Under Existing Rates	$4,622,735	$4,622,735	$4,622,735	$4,622,735	$4,622,735	$4,622,735	$4,622,735	$4,622,735	$4,622,735	$4,622,735
Non-Rate Revenues	716,530	261,920	198,669	198,914	199,169	199,432	199,705	199,987	200,280	200,565
Total Revenues	$5,339,265	$4,884,655	$4,821,404	$4,821,649	$4,821,904	$4,822,167	$4,822,440	$4,822,722	$4,823,015	$4,823,300
Expenses										
Cash O&M Expenses	$3,915,850	$4,065,510	$4,212,660	$4,365,139	$4,523,140	$4,686,863	$4,856,515	$5,032,312	$5,214,476	$5,403,234
Existing Debt Service	539,531	538,281	536,263	538,363	539,863	540,763	541,063	540,519	538,869	541,125
Rate Funded CIP[1]	-	-	-	-	-	-	-	4,323	598,536	1,152,436
Total Expenses	$4,455,381	$4,603,791	$4,748,923	$4,903,502	$5,063,003	$5,227,626	$5,397,578	$5,577,155	$6,351,882	$7,096,795
Annual Rate Adjustment	0.00%	0.00%	4.25%	4.25%	4.25%	4.25%	4.25%	4.25%	4.25%	4.25%
Rate Revenues After Rate Increase	$4,622,735	$4,622,735	$4,819,044	$5,024,630	$5,239,933	$5,465,411	$5,701,546	$5,948,841	$6,207,823	$6,479,043
Net Cash Flow After Rate Increase	883,884	280,864	268,790	320,042	376,099	437,217	503,672	571,674	56,222	(417,187)
Coverage After Rate Increases	2.64	1.53	1.51	1.60	1.71	1.82	1.95	2.08	2.22	2.36

Note: 1) "Rate Funded CIP" represents same-year revenue that must be used for capital projects when previous operating surpluses (not shown in this table) have been exhausted.

APPENDIX


LEGEND
PROPOSED RESERVOIR
PROPOSED PUMP STATION
PROPOSED WATERLINE IMPROVEMENTS
EXISTING WATER SERVICE AREA
EXISTING RESERVOIR
EXISTING PUMP STATION
AQUIFER STORAGE & RECOVERY FACILITY (ASR)
DISTRIBUTION CONTROL VALVE (PRPS)
SUPPLY CONTROL VALVE (PRV)
EXISTING EMERGENCY INTERTIE
EXISTING SUPPLY INTERTIE
EXISTING WATERLINE (DIAMETER INDICATED IN INCHES)
EXISTING PORTLAND SUPPLY MAIN
EXISTING SHERWOOD SUPPLY MAIN
CITY LIMITS
METRO URBAN GROWTH BOUNDARY (UGB)
COUNTY LINE
RAILROAD
PRESSURE ZONES:
SERVICE AREA A
SERVICE AREA B
SERVICE AREA C
BRIDGEPORT SERVICE AREA
FUTURE SERVICE AREA B
N
1,200 0 1,200
SCALE IN FEET
CITY OF KING CITY
CITY OF TIGARD
CITY OF DURHAM
CITY OF LAKE OSWEGO
CITY OF RIVERGROVE
CITY OF SHERWOOD
TO FLORENCE LANE MASTER METER (NOT SHOWN)
BRIDGEPORT PRV'S
72ND AVE FCV-PRV
TIGARD INTERTIE
TIGARD INTERTIE
LAKE OSWEGO INTERTIE
RIVERGROVE WD INTERTIE
SHERWOOD INTERTIE
CITY PARK FCV-PRV
LEVETON FCV-PRV
108TH OPERATIONS FCV-PRV
BOONES FERRY PS
BOONES FERRY FCV-PRV
MOWHAWK PRPS
MARTINAZZI PS
65TH AVE PRPS
57TH AVE PRPS
CHESAPEAKE DR PRPS
SHERWOOD INTERTIE
AVERY ST PRPS
AVERY (A-1) RESERVOIR CAP: 2.2 MG OE: 295'
PS-1 PROPOSED 3,300 GPM PUMP STATION
A-2 RESERVOIR CAP: 5.0 MG OE: 295'
SW CONCEPT AREA EXPANSION ZONE
R-2 & R-3 PROPOSED 2.2 MG RESERVOIRS
ASR
DAKOTA PRPS
OSAGE PRPS
NORWOOD 1 (B-1) RESERVOIR CAP: 2.2 MG OE: 399'
NORWOOD 2 (B-2) RESERVOIR CAP: 2.8 MG OE: 399'
NORWOOD PS
R-1 PROPOSED 1.0 MG RESERVOIR
FROBASE (C-1) RESERVOIR CAP: 0.8 MG OE: 500'
WILSONVILLE INTERTIE
NOT SHOWN:
M-1 SCADA IMPROVEMENTS
SOURCE:
Water System - City of Tualatin (2011).
Base Mapping - Metro RLIS (May 2013).
WASHINGTON COUNTY
CLACKAMAS COUNTY
PLATE 1
TUALATIN WATER MASTER PLAN
CITY OF TUALATIN
WATER SYSTEM IMPROVEMENTS
July 2013
Murray, Smith & Associates, Inc.
Engineers/Planners
11-1227.402
ORDINANCE 1359-13
ATTACHMENT B, PAGE 87
G:\PDX_Projects\11\1227\CADIGIS\11-1227-402-QR-PLATE 1.mxd 7/23/2013 3:04:06 PM DKH

APPENDIX B

APPENDIX B
REFERENCES

1. Memorandum, "Evaluation of Sherwood Main Use Options," prepared by Murray, Smith & Associates, Inc., for the City of Tualatin, April 30, 2012.

2. Memorandum, "Tualatin Residential and Non-Residential Capacity Estimate 2011", prepared by Colin Cortes, City of Tualatin, September 1, 2011.

3. "2010 Update, Southwest Tualatin Concept Plan," prepared by the City of Tualatin, accepted by City Council October 11, 2010.

4. Memorandum, "SW Tualatin Concept Plan Update – Estimate Revisions," prepared by CH2M-Hill, July 27, 2010 for the City of Tualatin.

5. Memorandum, "Urban and Rural Reserves Local Aspirations - Town Center, Commercial, Industrial and Stafford Basin," prepared by City of Tualatin, April 13, 2009.

6. "2005 Southwest Tualatin Concept Plan," prepared by CH2M-Hill, August 3, 2005.

APPENDIX C

APPENDIX C
COST ALLOCATION FOR FACILITIES AND PIPING IMPROVEMENTS

Appendix C contains cost data for recommended improvements to reservoirs, pressure reducing valves, pump stations, and system piping. Improvement project cost estimates presented in this appendix are based upon recent experience with construction costs for similar work in the area and assume improvements will be accomplished by private contractors. Estimates include provisions for approximate construction costs plus an aggregate 45 percent allowance for contingencies, engineering, administration and other project-related costs. Since construction costs change periodically, an indexing method to adjust present estimates in the future is useful. The Engineering News-Record (ENR) Construction Cost Index (CCI) is a commonly used index for this purpose. For purposes of future cost estimate updating; the current ENR CCI for Seattle, Washington is 9075 (May 2012).

Table C-1
Reservoir Project Cost Estimate Summary
Frobase (C-2) Storage Reservoir (1.0 MG)

This project has been designed and is awaiting construction project funding. The design engineer's construction cost estimate is $1,148,950 as of January 2012.

Item No.	Description	Estimated Project Cost[1]
	Design Engineer's Construction Cost Estimate	$1,148,950.
	35% Contingency, Administration & Construction Engineering	$402,000
	Total Estimated Project Cost	$1,550,950
	SAY	$1,560,000

[1] The cost estimates presented are opinions of cost based on the assumptions stated and developed from information available at the time of the estimate. Final costs for all projects will depend on actual field conditions, on actual material and labor costs, final project scope, project implementation and other variables.

Table C-2
Reservoir Project Cost Estimate Summary
New Service Level B (B-3) Storage Reservoir (2.2 MG)

The reservoir project cost estimate is based on the following assumptions:

- No rock excavation included.
- No property acquisition costs included (current planned site is City-owned)
- Construction by private contractors.
- An Engineering News-Record (ENR) Construction Cost Index (CCI) of 9075 for Seattle, Washington (May 2012).

Reservoir B-3 will be constructed first and will include most of the site improvements. Consequently, Reservoir B-4 will be a smaller project.

Item No.	Description	Estimated Project Cost[1]
1.	Reservoir Structure (Welded Steel)	$1,650,000
2.	Site Work	$500,000
3.	Access/Parking	$100,000
4.	Yard Piping	$200,000
5.	Electrical & Instrumentation	$50,000
8.	Landscaping/Fencing	$50,000
	Total Estimated Construction Cost	$2,550,000
	45% Contingency, Administration & Engineering	$1,147,000
	Total Estimated Project Cost	$3,697,000
	SAY	$3,700,000

[1] The cost estimates presented are opinions of cost based on the assumptions stated and developed from information available at the time of the estimate. Final costs for all projects will depend on actual field conditions, on actual material and labor costs, final project scope, project implementation and other variables.

Table C-3
Reservoir Project Cost Estimate Summary
New Service Level B (B-4) Storage Reservoir (2.2 MG)

The reservoir project cost estimates is based on the following assumptions:

- No rock excavation included.
- No property acquisition costs included (current planned site is City-owned)
- Construction by private contractors.
- An Engineering News-Record (ENR) Construction Cost Index (CCI) of 9075 for Seattle, Washington (May 2012).

Reservoir B-3 will be constructed first and will include most of the site improvements. Consequently, Reservoir B-4 will be a smaller project.

Item No.	Description	Estimated Project Cost[1]
1.	Reservoir Structure (Welded Steel)	$1,650,000
2.	Site Work	$100,000
3.	Yard Piping	$25,000
4.	Electrical & Instrumentation	$10,000
	Total Estimated Construction Cost	$1,785,000
	45% Contingency, Administration & Engineering	$803,000
	Total Estimated Project Cost	$2,588,000
	SAY	$2,600,000

[1] The cost estimates presented are opinions of cost based on the assumptions stated and developed from information available at the time of the estimate. Final costs for all projects will depend on actual field conditions, on actual material and labor costs, final project scope, project implementation and other variables.

Table C-4
Pump Station Project Cost Estimate Summary
New Pump Station (PS-1)

The pump station project cost estimates is based on the following assumptions:

- No rock excavation included.
- No property acquisition costs included.
- Construction by private contractors.
- 3,600 gpm nominal pumping capacity (~100 HP)
- An Engineering News-Record (ENR) Construction Cost Index (CCI) of 9075 for Seattle, Washington (May 2012).

Item No.	Description	Estimated Project Cost[1]
1.	Structure	$100,000
2.	Site Work	$75,000
3.	Yard Piping	$50,000
4.	Pumps and Mechanical	$200,000
5.	Electrical & Instrumentation	$100,000
6.	Landscaping	$25,000
7.	Standby Power Generator	$100,000
	Total Estimated Construction Cost	$650,000
	45% Contingency, Administration & Engineering	$292,500
	Total Estimated Project Cost	$942,500
	SAY	$950,000

[1] The cost estimates presented are opinions of cost based on the assumptions stated and developed from information available at the time of the estimate. Final costs for all projects will depend on actual field conditions, on actual material and labor costs, final project scope, project implementation and other variables.

Table C-5
Piping Unit Project Cost Summary

Pipeline cost estimates are based on the following assumptions:

- No rock excavation included.
- No excessive dewatering included.
- No property or easement acquisitions costs included.
- No specialty construction included.
- A 45% contingency, administration and engineering allowance included.
- Construction by private contractors.
  An Engineering News-Record (ENR) Construction Cost Index (CCI) of 9075 for Seattle, Washington (May 2012).
- An additional 60 percent allowance is included for construction with rock excavation the entire depth of trench.

The following table summarizes the estimated project cost per linear foot by pipe size for water pipelines.

Pipe Diameter	Estimated Project Cost per Linear Foot
8-inch	$145
12-inch	$215
16-inch	$290

[1] The cost estimates presented are opinions of cost based on the assumptions stated and developed from information available at the time of the estimate. Final costs for all projects will depend on actual field conditions, on actual material and labor costs, final project scope, project implementation and other variables.