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# Technical Memorandum

Prepared for: City of Wilsonville, Oregon

Project Title: NPDES MS4 Support

Project No.: 142588

## Technical Memorandum

Subject: Stormwater Retrofit Plan

Date: June 19, 2015

To: Kerry Rappold, City of Wilsonville

From: Angela Wieland, P.E., and Krista Reininga, P.E.

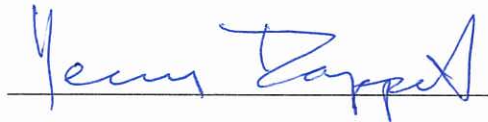
### *Limitations:*

*This document was prepared solely for City of Wilsonville, Oregon (City) in accordance with professional standards at the time the services were performed and in accordance with the contract between the City and Brown and Caldwell dated April 19, 2012. This document is governed by the specific scope of work authorized by the City; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by the City and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.*

**CITY OF WILSONVILLE**

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)  
RETROFIT PLAN  
JULY 1, 2015**

The undersigned hereby submits this Retrofit Plan in accordance with NPDES Permit Number 101348. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person, or persons, who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A handwritten signature in blue ink, reading "Kerry Rappold", written over a horizontal line.

Kerry Rappold

Natural Resources Program Manager

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## Section 1: Introduction

This technical memorandum (TM) documents the development of a stormwater quality retrofit strategy to improve water quality in areas of the City of Wilsonville (City) that are currently underserved or lacking stormwater quality controls. This TM also reflects the stormwater retrofit plan intended to guide implementation of the stormwater retrofit strategy.

This retrofit strategy and plan apply to the City's municipal separate storm sewer system (MS4), which is regulated under the National Pollutant Discharge Elimination System (NPDES) MS4 permit. This memorandum includes the following information:

- summary of current stormwater retrofit activities and policies intended to improve water quality and a summary of associated annual costs
- definition of Wilsonville's stormwater retrofit strategy and objectives
- identification of high-priority areas and/or land uses that are in need of stormwater quality retrofits
- preferred stormwater retrofit approaches, including both programmatic measures and structural controls
- an overall stormwater retrofit project list with a prioritization and estimated implementation schedule, based on the identified objectives, priority areas, and preferred approaches

### 1.1 Summary of Permit Requirements

The NPDES MS4 permit for Phase I communities requires development of a stormwater retrofit strategy. Schedule A.6 of the City's MS4 permit describes three elements of the stormwater retrofit strategy development required for this permit term, including the definition of retrofit objectives that prioritize progress toward applicable Total Maximum Daily Load (TMDL) wasteload allocations, development of a stormwater retrofit plan (this TM), and initiation of one stormwater quality improvement project during the permit term.

Specific requirements for the stormwater retrofit plan are listed in Schedule A.6.b of the City's NPDES MS4 permit, which states:

*The co-permittees must develop and submit a stormwater retrofit plan to the Department [DEQ] by July 1, 2015 that the co-permittee will use to guide the implementation of its stormwater retrofit strategy. The stormwater retrofit plan must describe or reference the following:*

- Stormwater retrofit strategy statement and summary, including objectives and rationale;*
- Summary of current stormwater retrofit control measures being implemented, and current estimate of annual program resources directed towards stormwater retrofits;*
- Identification of developed areas or land uses impacting water quality that are high priority retrofit areas;*
- Consideration of new stormwater control measures;*
- Preferred retrofit structural control measures, including rationale;*
- A retrofit control measure project or approach priority list, including rationale, identification and map of potential stormwater retrofit locations, where appropriate, and an estimated timeline and cost for implementation of each project or approach.*

## 1.2 Summary of TM Organization

The purpose of this TM is to fulfill the NPDES MS4 permit requirements for development of a stormwater retrofit strategy as listed in Schedule A.6.a and development of a stormwater retrofit plan as listed in Schedule A.6.b of the City's NPDES MS4 permit. The City also intends to use this TM to aid in the prioritization of all water quality-related capital projects (CPs) currently documented in its Stormwater Master Plan (SMP), dated March 2012.

Section 2 documents the City's current stormwater policies and retrofit activities related to water quality improvements. Costs for current retrofit activities are also provided. Section 3 defines the stormwater quality retrofit objectives comprising the overall stormwater retrofit strategy. Section 4 presents the prioritized list of projects and approaches that form the City's retrofit plan.

## Section 2: Current Stormwater Policies and Retrofit Activities

The City's current stormwater program includes programmatic activities and capital projects to improve stormwater treatment in areas of the City that currently do not have adequate treatment in place. The stormwater program works to improve water quality through implementation of the City's Stormwater Management Plan (May 2012), TMDL Implementation Plan (latest update: August 25, 2014), and SMP (March 2012).

The City's SMP itself is a comprehensive and multi-objective master planning document that references overall City policies and goals for stormwater management. It includes CPs that target water quality, natural resources, and habitat improvement. CPs identified and prioritized in the City's SMP are incorporated into the City's annual capital improvement plan (CIP) with an implementation schedule. The following sections provide a summary of the City's current and relevant stormwater policies, water quality retrofit projects, and water quality retrofit programs.

### 2.1 Stormwater Policies

The City's SMP references stormwater policies that comprise the major objectives for the City's stormwater retrofit strategy. The stormwater policies help support the selection, prioritization, and installation of CPs for improved water quality. Relevant policies and implementation measures are listed below.

- *EXP-5: The City of Wilsonville shall use a combination of regional and onsite facilities to achieve the recommended pollution reduction outlined in this Stormwater Master Plan.*
  - *Implementation Measure EXP-5a: Locate regional facilities downstream of existing development where suitable to protect existing wetland and riparian areas.*
- *LID-1: The City shall prioritize the implementation of Low Impact Development (LID) techniques and habitat-friendly development practices throughout the City for new development, redevelopment, and retrofitting of existing development.*
  - *Implementation Measure LID-1a: The City shall create a list of approved LID measures and implementation techniques to provide guidance to the development community for constructing LID features onsite.*
  - *Implementation Measure LID-1b: The City shall review and revise its Public Works Standards (PWS) to prioritize the use of LID practices prior to discharging stormwater into a conventional drainage system.*
  - *Implementation Measure LID-1c: The City shall incorporate LID techniques into all new street and public works improvement projects.*

- *Implementation Measure LID-1d: The City’s PWS shall acknowledge the use of alternative paving materials. Clear and objective standards will be developed to provide guidance on when and how to use alternative paving materials.*
- *LID-2: The City shall assist with implementation of LID techniques as a water quality retrofit for existing development.*
  - *Implementation Measure LID-2a: The City shall develop incentives or encourage retrofits of LID techniques in existing developments. Incentives may include partial funding of improvements, technical assistance, and reduced stormwater fees.*
- *WQT-1: The City shall require the provision of effective water quality treatment for all new development and redevelopment and consider ease of maintenance. The overall postdevelopment water quality shall be equivalent to or better than the predevelopment water quality conditions.*
  - *Implementation Measure WQT-1a: Catchbasins equipped with downturned elbows for control of oil and floatables are required on private property. Catchbasins, area drains, and curb inlets installed on all new public construction, reconstruction, or retrofits shall include BMP Snout® or other approved systems.*
- *WQT-3: The City will rehabilitate outfalls identified in the SMP that cause erosion.*

## 2.2 Water Quality Retrofit Projects

The City’s SMP includes CPs that address water quality in developed and redeveloping areas across the City. These water quality-related CPs are targeted at areas with known erosion issues and that are knowingly underserved for water quality treatment. The City constructs water quality CPs based on available funding and the overall project prioritization in the SMP. Recently constructed CPs with a water quality component include the following:

- BC-7 Boeckman Creek Realignment – Channel relocation and removal of berms to improve channel capacity and reduce scour potential along pilings. The water quality benefit is associated with reduced potential for instream channel erosion (City budget: \$577,000; completed in 2014).
- LID-1 Memorial Park Parking Lot Vegetated Swales – Reconfigure the existing parking lot to incorporate three water quality treatment facilities (City budget: \$203,000; completed in 2014).
- WD-3 Rivergreen Repair Project – Rehabilitation of an existing vegetated swale to prevent water pooling and enhance energy dissipation and vegetation (City budget: \$285,000; completed in 2013).

The Memorial Park Parking Lot Vegetated Swales project was identified and implemented to address the NPDES MS4 permit condition A.6.c to initiate one retrofit project during the current NPDES permit term.

## 2.3 Water Quality Programs

The City’s 2012 SMP and 2014 TMDL Implementation Plan outline water quality-related programs that are needed for compliance with the NPDES MS4 permit and the Willamette River TMDL. While all of the required programmatic activities are intended to improve water quality, several activities listed below specifically address or promote water quality retrofit in underserved areas. Please note that programmatic activities listed below are not specific for stormwater or NPDES MS4 permit compliance, but instead reflect activities to address overall instream water quality in the City.

- Continue participation in opportunistic planting efforts with local and state agencies and organizations, consistent with the 2014 TMDL Implementation Plan, to address temperature and provide additional filtration of sheet flow prior to discharge.
- Implement recently adopted stormwater design standards for new and redevelopment projects that promote infiltration of stormwater and address peak flow control, volume reduction, and flow duration.

Also implement the recently adopted stormwater facility sizing tool to aid in selection and design of stormwater treatment practices.

- Conduct industrial and commercial facility screening and inspection programs to identify businesses that have increased potential for discharge of pollutants to stormwater and require those businesses to install enhanced pollution prevention measures.
- Conduct public outreach activities to educate residents and businesses about pollution prevention and water quality protection.
- Continue coordination and partnership with Friends of Trees to support riparian planting efforts.
- Implement provisions of the Wilsonville Municipal Code, Chapter 4, that includes requirements for setbacks and buffers within the defined Significant Resource Overlay Zone (SROZ) and limitations on tree cutting and tree removal within the SROZ.
- Complete the hydromodification assessment for Boeckman Creek, Coffee Lake Creek, and applicable tributaries. The assessment will include verification of current instream erosion issues, areas with high future erosion potential, and evaluation of the feasibility of retrofit projects (including those identified in the SMP).

Over the last 5 years, the City's stormwater-related programs have been allotted an average annual budget of approximately \$800,000. This includes funding for maintenance of the stormwater infrastructure components and structural stormwater management facilities, as well as staff and consultant time to implement the stormwater programs and policies.

## Section 3: Stormwater Retrofit Objectives and Strategy

Stormwater retrofit objectives were developed based on a review of the current stormwater policies defined in the SMP (see Section 2.1), review of the prioritization criteria and overall CP scoring developed for the 2012 SMP, and requirements of the NPDES MS4 permit to incorporate progress toward applicable TMDL wasteload allocations (WLAs).

A meeting with City staff was held on March 11, 2015, to finalize the stormwater retrofit objectives for the purposes of developing a preferred water quality retrofit strategy. The newly defined stormwater retrofit objectives are intended to augment the 2012 SMP scoring criteria in order to better address current City obligations and water quality priorities, including requirements for compliance with the NPDES MS4 permit and TMDL plans.

The City's overall stormwater retrofit objectives include the following:

- Progress Toward TMDL Wasteload Allocations
- Priority Areas for Treatment
- Temperature Control
- Erosion Prevention and Control
- Additional Objectives

The stormwater retrofit objectives are described in greater detail in the following sections below and include a preferred retrofit strategy to address each objective.

### 3.1 Progress Toward TMDL Wasteload Allocations

The City's NPDES MS4 permit requires that the stormwater retrofit strategy incorporate projects that address applicable TMDL WLAs. In the City of Wilsonville, the Willamette River TMDL is the only applicable TMDL. WLAs are currently established for bacteria (*E. coli*), although future WLAs are expected to address mercury as well.



Within the City of Wilsonville, Boeckman Creek and Coffee Lake Creek are two major tributaries, which drain to the Willamette River. A small portion of area in the south part of Wilsonville drains directly to the Willamette River. In accordance with the Willamette River TMDL for the Middle Willamette subbasin, separate WLAs are established for areas that drain directly to the Willamette River versus areas that drain to a tributary prior to discharge in the Willamette River. Based on these drainage patterns and the fact that the entire City is subject to the Willamette River TMDL, this retrofit evaluation has been conducted on a citywide basis.

### Preferred Stormwater Retrofit Strategy

Sources of bacteria vary widely and jurisdictions are often limited in their ability to address bacteria loading at the source. The most effective structural water quality facilities to address bacteria include infiltration facilities that reduce stormwater runoff discharge volumes, effectively eliminating bacteria loading to surface waters. As such, the retrofit project identification efforts (see Section 4.1) and prioritization efforts (see Section 4.2) focus on water quality retrofit projects that maximize infiltration of stormwater runoff. Where infiltration is not feasible due to soil or site conditions, vegetated best management practices (BMPs)—such as rain gardens, stormwater planters, and swales—that incorporate multiple pollutant removal processes are also effective facilities in reducing bacteria.

Typically, mercury is considered to be associated with sediment in the Willamette River Basin. As such, projects that reduce sediment loading are assumed to be effective at reducing mercury. Sediment, like bacteria, is also effectively limited from discharge into surface waters if infiltration is incorporated into the treatment facility. Thus, the installation of structural water quality facilities that infiltrate or use multiple pollutant removal processes are also effective for eliminating sediment (and mercury). In addition to structural control facilities, the project identification and prioritization efforts (Sections 4.1 and 4.2) also focus on water quality CPs that aim to reduce erosion as another source of sediment load.

## 3.2 Priority Areas

Overall reduction in the discharge of pollutants to receiving waters can be achieved by either adding water quality treatment in untreated areas or by improving the effectiveness of existing treatment facilities to further reduce pollutant discharges. The identified water quality retrofit projects outlined in Section 4.1 include both approaches.

When considering compliance with TMDL WLAs, there is greater water quality benefit observed by adding structural controls to untreated areas, compared to modifying existing treatment facilities to increase effectiveness. For this reason, priority areas for water quality retrofits are those areas that do not currently have structural BMPs in place. Commercial and industrial areas are of higher retrofit priority than residential areas because the expected pollutant discharge from these areas is higher.

Figure 1 shows the current zoning in the City, overlaid with areas that are estimated to have structural water quality facilities in place to provide treatment. Priority areas for water quality retrofits include the following categories:

- **High:** Commercial and industrial areas that do not currently have structural BMPs in place
- **Medium:** Residential areas that do not currently have structural BMPs in place
- **Low:** Areas that have an existing structural BMP in place that could potentially be retrofit for enhanced treatment

These priority areas have been identified as a means to develop stormwater retrofit project evaluation criteria and develop an implementation plan for proposed retrofit projects (see Section 4.2).



### **Preferred Stormwater Retrofit Strategy**

The City's preferred strategy to address priority areas is to incorporate stormwater retrofits on a city-wide basis, targeting those areas of higher pollutant discharge and limited existing water quality treatment.

The project prioritization effort (see Section 4.2) includes the evaluation of water quality retrofit projects based on their ability to incorporate treatment in high pollutant generating areas with limited existing treatment. However, the City should not hesitate to improve water quality in currently treated areas when opportunities arise in conjunction with other projects and current stormwater policies (e.g., adding treatment rain gardens when constructing a public works project).

## **3.3 Temperature Control**

Temperature is a water quality issue addressed in the Willamette River TMDL. However, temperature is not considered a pollutant to be affiliated with stormwater runoff. The Willamette River TMDL addresses temperature loading through the establishment of load allocations (as opposed to wasteload allocations) and uses shade protection as a surrogate for temperature.

Although temperature is not a stormwater pollutant parameter subject to consideration under a stormwater retrofit strategy, Wilsonville does have management obligations for temperature under its Willamette River TMDL Plan. Planting activities, particularly on smaller, narrow tributaries, are typically used to meet the shade surrogates identified in the TMDL. As such, the City has incorporated riparian planting efforts into the SMP and CPs.

Because the City is using this stormwater retrofit plan to augment the SMP scoring and prioritization, temperature control is highlighted as a water quality (as opposed to stormwater) retrofit objective and prioritization criterion.

### **Preferred Water Quality Retrofit Strategy**

The City's preferred strategy for managing temperature is to remove nonnative plants and enhance riparian vegetation and shade potential along tributaries in the City. The project identification efforts (see Section 4.1) and the project prioritization efforts (see Section 4.2) include water quality retrofit projects that incorporate vegetation enhancement along streams.

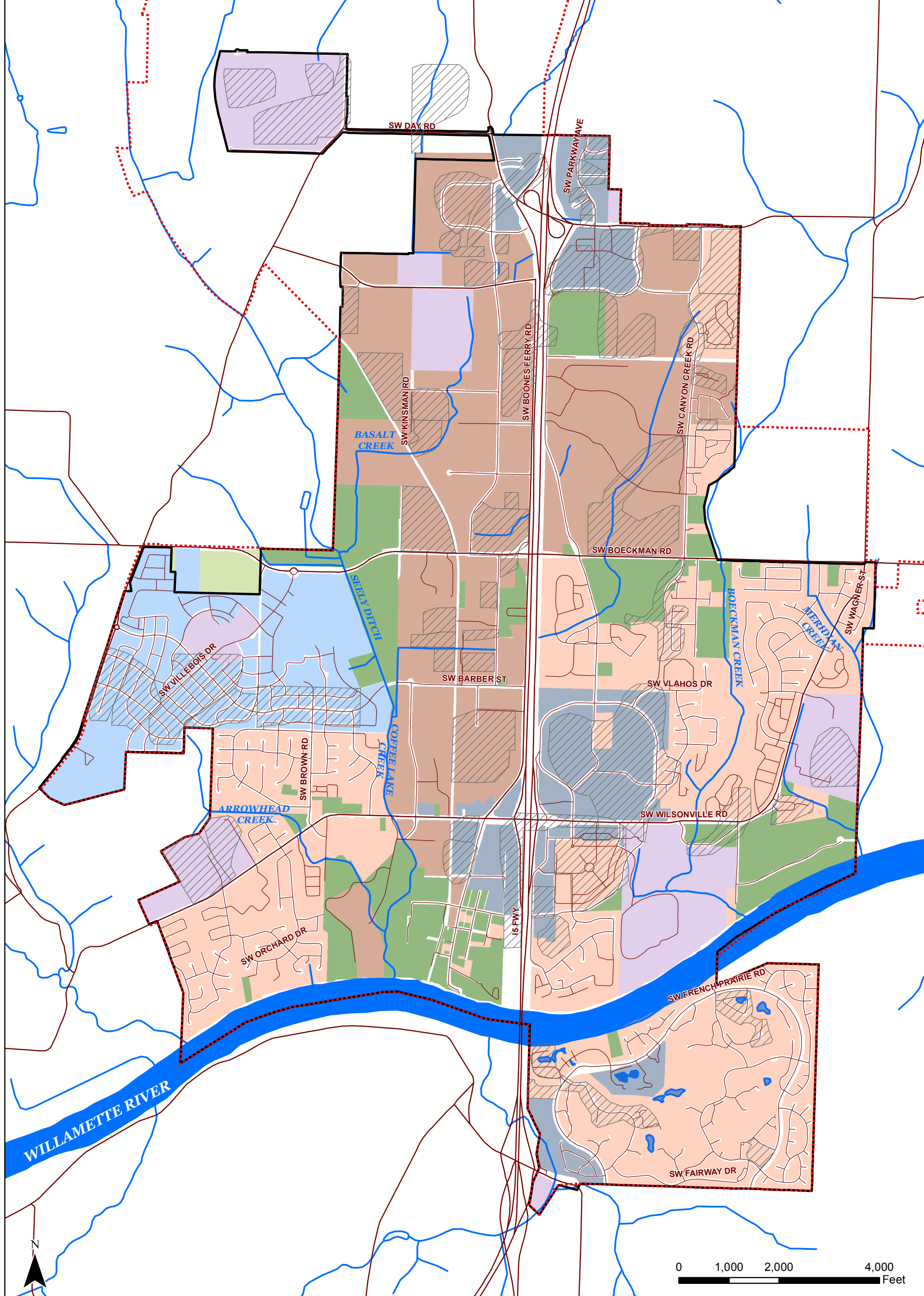
## **3.4 Erosion Prevention and Control**

The City's SMP includes a number of projects that target erosion problems at outfalls and along the stream corridors. Areas of active erosion are assumed to be, in part, due to the increase or excess stormwater runoff volumes discharging through the outfall or in the stream channel. Active erosion areas result in the transport of excess sediment loads into the stream channel, increasing turbidity and reducing instream water quality. Sediment loads can occlude stream beds and impact fish and other stream habitats. Erosion at outfalls can also lead to site and slope stability issues.

The City has incorporated these erosion control problems and erosion prevention efforts into its SMP and CPs. Water quality in terms of erosion control was a highlighted water quality and regulatory compliance prioritization criterion in the SMP and continues to be a major objective for the City.

### **Preferred Stormwater Retrofit Strategy**

The preferred strategy to prevent erosion is to retrofit outfalls with known and active erosion problems. For instream erosion issues, targeted channel excavation and restoration activities, including planting and vegetation enhancement to reduce scour potential, shall be conducted. The project identification efforts (see Section 4.1) and the project prioritization efforts (see Section 4.2) include water quality retrofit projects that incorporate erosion prevention.



**CITY OF WILSONVILLE  
RETROFIT ASSESSMENT**

MAY 2015

**FIGURE 1. ZONING & BMP COVERAGE**

- |                         |                             |
|-------------------------|-----------------------------|
| <b>LAND USE</b>         | EXISTING BMP DRAINAGE AREAS |
| COMMERCIAL              | URBAN GROWTH BOUNDARY (UGB) |
| INDUSTRIAL              | CITY BOUNDARY               |
| RESIDENTIAL             | STREETS                     |
| PUBLIC                  | STREAMS                     |
| VILLAGE                 |                             |
| RESIDENTIAL AGRICULTURE |                             |
| EXCLUSIVE FARM USE      |                             |



### 3.5 Additional Objectives

In addition to defining projects and programs to meet the retrofit objectives defined previously, the City's overall retrofit strategy must consider additional objectives for consistency with the City's overall priorities. The 2012 SMP documents these additional objectives in terms of the prioritization criteria defined in the SMP. These additional objectives include flood control, project integration, ongoing maintenance requirements, livability and sustainability, safety, and land acquisition needs.

The project prioritization criteria outlined in Section 4.2 directly include some of these additional objectives to incorporate within the larger framework for this retrofit strategy.

Additionally, the 2012 SMP used the final CP scoring to define a general implementation timeframe. Projects that scored highest were scheduled for implementation within the next 5 years, while those projects that scored low were scheduled for implementation within the next 20 years (or left unscheduled). The project prioritization criteria outlined in Section 4.2 also include a criterion called "implementation timeframe" to incorporate the comprehensive scoring results from the 2012 SMP.

## Section 4: Project Identification and Retrofit Approach

The City's overall retrofit strategy is to promote effective water quality treatment and controls in areas of the City that are lacking in such controls. Implementation of the City's retrofit strategy requires the identification of projects and programs based on the objectives outlined in Section 3.

This retrofit approach includes the definition of potential projects (Section 4.1) to address identified evaluation prioritization criteria (Section 4.2). Other water quality programs to improve surface water quality across the City are also referenced (Section 4.3).

### 4.1 Potential Projects

The City's 2012 SMP includes CPs to address flood control, water quality, temperature, habitat, erosion, and stormwater infrastructure issues. As described in Section 2, the City is actively working to construct CPs per the 2012 SMP, as funding is available.

Because this retrofit plan is intended to address stormwater and overall water quality, this plan evaluates all water quality-related projects in the 2012 SMP to determine which projects address the retrofit objectives defined in Section 3. In addition to projects defined in the 2012 SMP, ongoing updates to the City's comprehensive capital improvement plan (CIP) occasionally incorporate new CPs as project needs are identified. The current (2014) CIP was also included in the evaluation.

Table 1 provides a summary of currently unconstructed CPs (with an identified water quality element) that were considered for inclusion in this retrofit plan. For each CP, Table 1 references the general type of water quality retrofit project (i.e., planting/restoration, erosion prevention and control, or water quality treatment), the applicable retrofit objective(s) described in Section 3, and the current implementation timeframe. The implementation timeframe is identified in the 2012 SMP and 2014 CIP and reflects the overall project scoring and prioritization from the 2012 SMP. High scoring projects are slated for construction in the next 5 years and are defined as *short-term projects*; middle scoring projects are slated for construction in the next 6 to 10 years and are defined as *mid-term projects*; and lower scoring projects are slated for construction in the next 11 to 20 years and are defined as *long-term projects*.

Figure 2 shows the location and general type of water quality retrofit projects.

**Table 1. Potential Water Quality Retrofit Capital Projects**

Project ID <sup>a</sup>	Project name	Project type <sup>b</sup>	Project description	Applicable retrofit objective(s)	Project implementation timeframe <sup>c</sup>
BC-8	Canyon Creeks Estate Pipe Removal	Water quality – erosion control	Daylight piped channel to reduce scour potential and promote infiltration	Erosion prevention and control, temperature control	Short-term
BC-2	Boeckman Creek Outfall Rehabilitation	Water quality – erosion control	Evaluate and rehab up to 5 outfalls to reduce scour potential	Erosion prevention and control	Mid-term
BC-5	Boeckman Creek Outfall Realignment	Water quality – erosion control	Realign existing pipe and outfall structure to reduce scour potential and improve stability	Erosion prevention and control	Mid-term
CLC-1	Detention/Wetland Facility Near Tributary to Basalt Creek	Water quality – treatment	Construct wetland for stormwater detention and reduced downstream erosion potential	Progress toward TMDL WLAs, erosion prevention and control	Long-term
CLC-2	SW Parkway Avenue Stream Restoration	Water quality – planting/restoration	Excavate channel for flood storage capacity and enhance riparian vegetation	Erosion prevention and control, temperature control	Mid-term
CLC-3	Commerce Circle Channel Restoration	Water quality – planting/restoration	Create a more naturalistic channel through meandering, widening, and planting	Erosion prevention and control, temperature control	Mid-term
CLC-4	Ridder Road Wetland Restoration	Water quality – planting/restoration	Create new floodplain terrace and enhance vegetation	Erosion prevention and control, temperature control	Long-term
CLC-5	Coffee Lake Creek Stream and Riparian Enhancement	Water quality – planting/restoration	Excavate channel to increase meander and increase floodplain, enhance vegetation	Erosion prevention and control, temperature control	Long-term
CLC-6	Coffee Lake Creek South Tributary Wetland Enlargement	Water quality – treatment	Enhance existing wetland and create new adjacent wetland	Progress toward TMDL WLAs, priority areas, temperature control	Long-term
CLC-7	Coffee Lake Creek South Tributary Stream Restoration	Water quality – planting/restoration	Excavate channel to increase meander and increase floodplain, enhance vegetation	Erosion prevention and control, temperature control	Long-term
CLC-8	Coffee Lake Creek Restoration	Water quality – planting/restoration	Excavate channel to increase meander and increase floodplain	Erosion prevention and control, temperature control	Long-term
BC-4	Gesellschaft Water Well Channel Restoration	Water quality – erosion control	Pipe weekly water well discharge around Boeckman Creek to reduce scour, revegetate	Erosion prevention and control, temperature control	Short-term
BC-10	Memorial Park Stream and Wetland Enhancement	Water quality – planting/restoration	Enhance vegetation on existing channel	Erosion prevention and control, temperature control	Mid-term
LID2	SW Hillman Green Street Stormwater Curb Extension	Water quality – treatment	Add curb extensions and stormwater treatment, infiltrate as allowable	Progress toward TMDL WLAs, priority areas, erosion prevention and control, temperature control	Long-term

**Table 1. Potential Water Quality Retrofit Capital Projects**

Project ID <sup>a</sup>	Project name	Project type <sup>b</sup>	Project description	Applicable retrofit objective(s)	Project implementation timeframe <sup>c</sup>
LID3	SW Camelot Green Street Mid-block Curb Extension	Water quality – treatment	Add midblock curb extensions and stormwater treatment, infiltrate as allowable	Progress toward TMDL WLAs, priority areas, erosion prevention and control, temperature control	Mid-term
LID7	SW Wilsonville Road Stormwater Planters	Water quality – treatment	Install stormwater planters on an opportunistic basis	Progress toward TMDL WLAs, priority areas, erosion prevention and control, temperature control	Mid-term
WD-4A	Willamette Way West Outfall Replacement	Water quality – erosion control	Replace outfall to reduce scour potential	Erosion prevention and control	Short-term
WD-4B	Belknap Ct Outfall Protection	Water quality – erosion control	Replace outfall to reduce scour potential	Erosion prevention and control	Short-term
WD-4C	Morey Ct West Outfall Protection	Water quality – erosion control	Replace outfall to reduce scour potential	Erosion prevention and control	Short-term
CLC-10B	Coffee Creek Storm Projects	Water quality – treatment	Miscellaneous stormwater projects to provide treatment	Progress toward TMDL WLAs, priority areas, erosion prevention and control, temperature control	Mid-term

<sup>a</sup> Project ID is consistent with the naming convention in the 2012 SMP and 2014 CIP (as applicable).

<sup>b</sup> Project type reflects the primary water quality retrofit element for purposes of presentation in Figure 2.

<sup>c</sup> “Project implementation timeframe” refers to the anticipated schedule for construction. Short-term is construction in the next 5 years; mid-term is construction in the next 6–10 years; long-term is construction in the next 11–20 years or currently unscheduled projects.



Per the City’s 2014 CIP, two CPs listed in Table 1 are scheduled for construction during 2016. These CPs include BC-4 (Gesellschaft Water Well Channel Restoration) and WD-4A (Willamette Way West Outfall Replacement).

As described in Section 2.2, the City has actively been working to construct CPs with a water quality retrofit component from its 2012 SMP. Such completed projects are not listed in Table 1 but include BC-7 (Boeckman Creek Realignment), WD-3 (Rivergreen Repair Project), and LID-1 (Memorial Park Parking Lot Vegetated Swales). The Memorial Park Parking Lot Vegetated Swales project was identified and constructed to address the NPDES MS4 permit condition A.6.c to initiate one retrofit project during the current NPDES permit term.

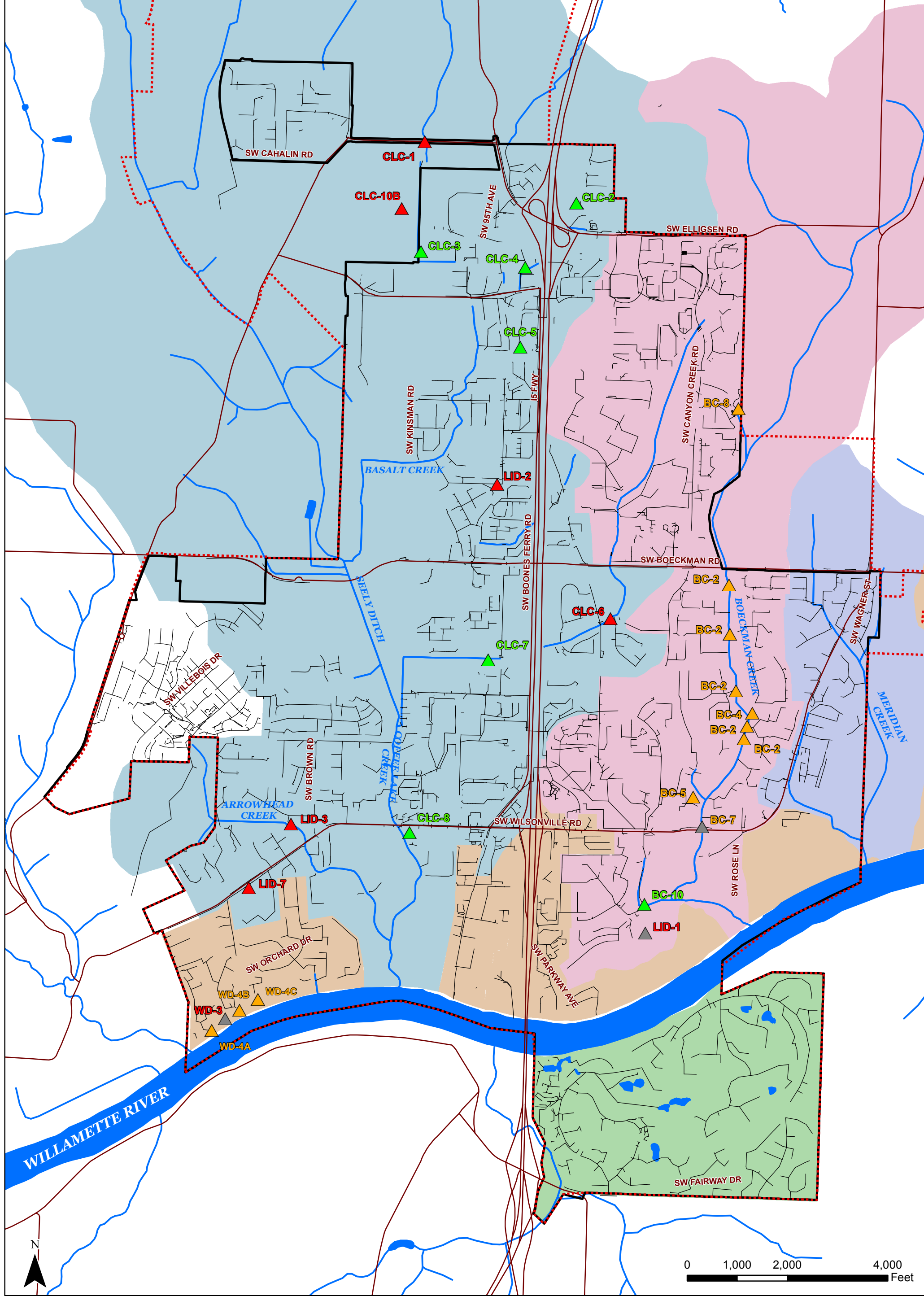
## 4.2 Prioritized Project List

The water quality retrofit projects identified in Table 1 were evaluated against the retrofit objectives described in Section 3. Consistent with the NPDES MS4 permit, the scoring rubric outlined in Table 2 emphasizes retrofit projects that will address TMDL WLAs, improve water quality in developed areas that are underserved or lacking stormwater quality controls, and make progress toward temperature reduction and erosion prevention (objectives specifically identified in the 2012 SMP). Additional scoring criteria have been included so that retrofit projects are consistent with overall City priorities, as described in Section 3.5.

**Table 2. Stormwater Retrofit Project Evaluation Criteria**

Retrofit objective (Section 3)	Criteria	Description	Points possible	Scoring description
Progress toward TMDL WLA	Address TMDL WLA	Will the project address mercury and/or bacteria?	0–4	<ul style="list-style-type: none"> <li>Two points for each TMDL parameter addressed (bacteria and mercury)</li> <li>Total suspended sediment is considered a surrogate parameter for mercury</li> </ul>
Location	Maximize pollutant reduction	For facility installations, is the project located in a priority retrofit area?	0–3	3: Commercial/industrial untreated 2: Residential untreated 1: All areas with existing BMPs 0: No facility installation associated with CP
Temperature control	Planting and riparian restoration	Does the project include measures to aid in the shading of small tributary streams?	0–3	Subjective scoring referencing the 2012 SMP scoring as applicable
Erosion prevention and control	Address active and potential erosion issues	Does the project address an area of severe erosion?	0–3	Subjective scoring referencing the 2012 SMP scoring as applicable
Additional objectives	Project integration	Is the project associated with other infrastructure projects or needs?	0–3	Subjective scoring referencing the 2012 SMP scoring as applicable
	Impact area	How large an area and/or how many people does the project benefit within the City’s MS4?	1–3	3: Regional/watershed scale 2: Subbasin scale 1: Subdivision or smaller
	Funding source	Does the project have an identified/dedicated funding source?	0/1	1: Project has an identified source of funding 0: No identified source of funding.
	Implementation timeframe	What is the overall projected implementation timeframe per the 2012 SMP scoring and current CIP?	1–3	3: Implementation in the next 5 years (SMP score = 39+) 2: Implementation in the next 6 to 10 years (SMP score = 25 to 38) 1: Implementation in the next 11 to 20 years (SMP score = below 24)





MAY 2015

# CITY OF WILSONVILLE RETROFIT ASSESSMENT

FIGURE 2. WATER QUALITY  
RETROFIT PROJECTS

## WATER QUALITY CAPITAL PROJECTS

- ▲ COMPLETED
- ▲ FUTURE: EROSION PREVENTION
- ▲ FUTURE: PLANTING/HABITAT RESTORATION
- ▲ FUTURE: TREATMENT
- ▭ URBAN GROWTH BOUNDARY (UGB)
- ▭ CITY BOUNDARY

- BOECKMAN CREEK BASIN
- CHARBONNEAU
- COFFEE LAKE CREEK BASIN
- MERIDIAN CREEK BASIN
- TO WILLAMETTE
- STREAMS
- STORM SYSTEM MAINLINES



The project evaluation criteria outlined in Table 2 were used to evaluate the potential water quality retrofit projects from Table 1. Table 3 provides the scoring results.

Table 3. Prioritized Water Quality Retrofit Capital Projects										
Project ID <sup>a</sup>	Project name	Overall score <sup>a</sup>	Scoring criteria							
			Progress toward TMDL WLA	Location	Temperature control	Erosion control	Integra-tion	Impact area	Funding source	Implementation timeframe
			0–4	0–3	0–3	0–3	0–3	1–3	0/1	1–3
LID3	SW Camelot Green Street Mid-block Curb Extension	16	4	2	2	2	3	1	0	2
LID7	SW Wilsonville Road Stormwater Planters	16	4	2	2	2	3	1	0	2
CLC-10B	Coffee Creek Storm Projects	16	4	2	2	2	2	1	1	2
BC-5	Boeckman Creek Outfall Realignment	13	2	0	0	3	3	2	1	2
CLC-6	Coffee Lake Creek South Tributary Wetland Enlargement	13	2	2	3	2	0	3	0	1
BC-4	Gesellschaft Water Well Channel Restoration	13	2	0	1	3	2	1	1	3
LID2	SW Hillman Green Street Stormwater Curb Extension	13	4	3	2	2	0	1	0	1
BC-8	Canyon Creeks Estate Pipe Removal	12	2	0	1	3	0	2	1	3
CLC-3	Commerce Circle Channel Restoration	12	0	0	3	1	3	2	1	2
WD-4A	Willamette Way West Outfall Replacement	11	2	0	0	3	0	2	1	3
WD-4B	Belknap Ct Outfall Protection	11	2	0	0	3	0	2	1	3
WD-4C	Morey Ct West Outfall Protection	11	2	0	0	3	0	2	1	3
BC-2	Boeckman Creek Outfall Rehabilitation	9	0	0	0	1	3	2	1	2
BC-10	Memorial Park Stream an Wetland Enhancement	9	0	0	3	0	2	2	0	2
CLC-1	Detention/Wetland Facility Near Tributary to Basalt Creek	8	2	1	0	2	0	1	1	1
CLC-2	SW Parkway Avenue Stream Restoration	8	0	0	3	1	0	2	0	2
CLC-7	Coffee Lake Creek South Tributary Stream Restoration	8	0	0	3	1	0	3	0	1
CLC-8	Coffee Lake Creek Restoration	8	0	0	3	1	0	3	0	1
CLC-5	Coffee Lake Creek Stream and Riparian Enhancement	7	0	0	3	1	0	2	0	1
CLC-4	Ridder Road Wetland Restoration	7	0	0	3	1	0	2	0	1

<sup>a</sup> Overall score is based on a maximum 23 points possible.

## **4.3 Additional Strategies and Approaches**

In addition to implementation of CPs, the City's water quality retrofit strategy includes a number of programmatic activities and planning efforts as described in the following sections.

### **4.3.1 Design Standards**

The City recently adopted updated stormwater design standards to directly address requirements of the City's 2012 NPDES MS4 permit. The design standards prioritize the use of LID practices for water quality treatment and reflect sizing methods to address peak flow control, volume reduction, and flow duration matching. By mitigating higher velocity and duration flows resulting from development activities, the updated design standards consider preservation of instream habitat and minimization of bank erosion, which are objectives reflected in the City's retrofit strategy. These standards have been incorporated into the City's Public Works Standards. Ongoing efforts will focus on clarifying the stormwater design standards language and development of a user's manual to aid in facility selection and design.

### **4.3.2 Master Plan Updates**

Periodic updates to the 2012 SMP will be conducted to refine project needs and clarify preliminary designs and costs. Additional projects may be added to address problem areas that have been identified since 2012.

### **4.3.3 Incorporation of Water Quality Retrofit Elements into Public Works Projects**

In conjunction with the City's stormwater policy LID-1c, the City intends to implement its new stormwater design standards on public works projects, including street and infrastructure improvements. These public works projects may include a number of other CPs from the 2012 SMP that were developed for flood control purposes (i.e., storm pipe replacement, pipe installation) but do not currently reflect a water quality retrofit element. Therefore, ongoing water quality improvement is expected through implementation of other CPs aside from those identified in Table 1. Incorporation of LID with these public works projects will ensure continued progress toward the TMDL WLAs.

### **4.3.4 Opportunistic Planting Activities**

The City continues to actively work with community groups to identify and promote restoration activities that enhance natural riparian areas and habitat. These efforts are highlighted in the City's Willamette River TMDL Implementation Plan (2014) and will result in increased shading (temperature control). Such efforts may also reduce pollutant loads to the natural system.

## **4.4 Timeline and Cost**

The City's Water Quality Retrofit Strategy and Plan include a combination of projects and programs that are funded through multiple sources (system development charges [SDCs], stormwater fund, future grants, etc.). As such, implementation will be based on funding availability.

The City's top-priority retrofit strategy action is to continue to implement CPs defined in the 2012 SMP and current (2014) CIP. The estimated cost of CPs with a proportional breakdown of funding by funding source (SDC or stormwater fund) is reflected in the current CIP.

In conjunction with the water quality retrofit project prioritization (Section 4.2), the projected implementation timeframe of some CPs, particularly those scoring high as a water quality retrofit project, may be adjusted from the current schedule in the 2014 CIP.

## References

City of Wilsonville, Oregon. *2014–2015 Capital Improvement Plan*, December 2014.

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