1 Introduction

Lake Whatcom

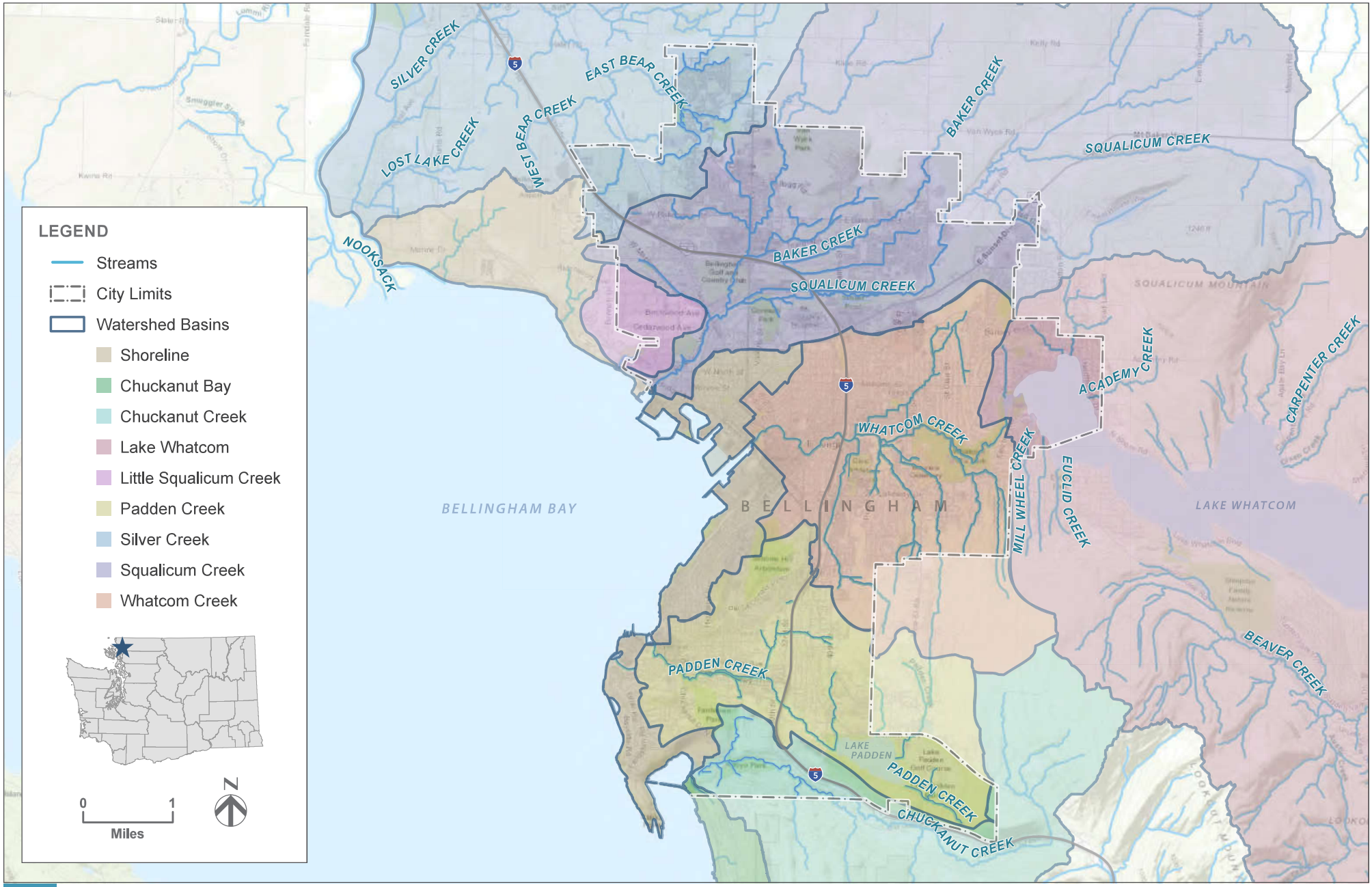
When rain falls in forested or undeveloped areas, some of the rainfall is absorbed by trees and plants, and most of it seeps or infiltrates into the ground. In developed or urban areas, the impervious surfaces (hard surfaces including roofs, driveways, sidewalks, roadways, and turf fields) do not allow the rain to infiltrate. Instead, the rain becomes stormwater runoff as it travels across hard or impervious surfaces, often picking up sediment and pollutants along the way. Stormwater flows across impervious surfaces and into catch basins or other stormwater system infrastructure through an underground network of pipes and then into natural waterways. Managing surface flows and stormwater in Bellingham is the responsibility of the City of Bellingham's Public Works Department (City) Surface and Stormwater Utility (SSWU).

The SSWU's core responsibilities are as follows:

- Protect aquatic resources
- Respond to flooding and erosion damages
- Reduce flood risk
- Reduce the discharge of pollutants
- Improve fish habitat

The City's SSWU operates to reduce water pollution being discharged into nearby wetlands, ponds, streams, creeks, lakes, and surrounding water bodies, like Bellingham Bay and Chuckanut Bay. Lake Whatcom is the drinking water source for more than 120,000 Bellingham residents, so clean stormwater runoff that discharges to it is one of the City's priorities. The City has implemented various programs to improve water quality such as the Lake Whatcom Management Program, Bellingham Water Quality Improvement Plans, Habitat Restoration Plans, and waterfront restoration programs.

The Bellingham Municipal Code (BMC) includes stormwater mitigation requirements for new development and redeveloping properties within city limits designated by the City of Bellingham's Western Washington Phase II Municipal Stormwater Permit (Phase II Permit) to help meet State of Washington (State) water quality standards in the receiving water bodies. For the City, stormwater collected by the City's storm drainage networks discharges to Chuckanut Creek, Padden Creek, Whatcom Creek, Squalicum Creek and its tributaries (Baker Creek and Spring Creek), Little Squalicum Creek, East Bear Creek, Lake Whatcom, Lake Padden, Bellingham Bay, and Chuckanut Bay, as shown in Figure 1-1.



PROJECT VICINITY

FIGURE 1-1

City of Bellingham
Surface and Stormwater Comprehensive Plan

UPDATED 8/20/2020

1.1 Purpose and Authority

The City's SSWU is responsible for operation of the City's storm drainage system under the regulatory framework of the Phase II Permit. The City carries out this responsibility in part by having a comprehensive Stormwater Management Program (SWMP) that establishes policy and service level standards, and a Capital Improvement Plan (CIP) designed to meet the goals and objectives of the SSWU. The purpose of this update to the Surface and Stormwater Comprehensive Plan (SSWCP) is to provide goals, policies, guidance, and planned program activities that will help the City meet regulatory requirements and create funding mechanisms to support a CIP, development permit reviews, and maintenance requirements for the SSWU for the years 2020 to 2026. The recommendations set forth in this SSWCP will be the basis of SSWU rates for the planning horizon.

In summary, this SSWCP:

- Describes the City's organizational approach to managing stormwater
- Evaluates the proposed CIP that supports the City's overall stormwater management goals
- Evaluates the role and management programs instituted to carry out regulatory requirements stipulated in the City's Phase II Permit
- Provides retrofit planning recommendations to address water quality concerns in areas developed prior to the use of stormwater regulations
- Recommends capital improvement projects for improving water quality, aquatic habitat, flood reduction, and infrastructure renewal
- Provides the basis for conducting an SSWU rate study
- Serves as a guide to future users to help mitigate water quality impacts

The SSWCP is organized into the following 10 chapters:

- **Chapter 1: Introduction**.
- **Chapter 2: Background,** describes the city's population growth, its history, and the sub-watersheds that are the focus of this update.
- **Chapter 3, Hydrology,** is an analysis of the City's stream flow monitoring program and a summary of past hydrologic modeling that established design flows throughout the city. The predicted design flows could be a starting point for CIP design. Chapter 3 also describes the 2020 review of past models.
- **Chapter 4, Climate Change Considerations for Stormwater Planning**, is an assessment of predicted effects on stormwater planning based on sea level rise (SLR) and changing precipitation patterns. The chapter relies on information published by the University of Washington (UW) Climate Impacts Group (CIG).
- **Chapter 5, Stormwater Condition Assessment Program**, describes the City's ongoing asset management program, culminating with program recommendations. The

recommendations are based on analysis of the City's asset inventory, a condition assessment strategy, and conditions-based maintenance and funding recommendations that are factored into the rate study.

- **Chapter 6, Stormwater Management Program Evaluation**, describes an evaluation of the City's activities to meet the 2019–2024 Phase II Permit requirements and identified SMWP gaps and opportunities. Chapter 6 presents the findings from this analysis, involving a step-by-step review of the City's SWMP as detailed in its Stormwater Annual Plan to the Washington State Department of Ecology (Ecology). The comprehensive gap analysis was based on current levels of service compared to SWMP requirements stipulated by the Phase II Permit.
- **Chapter 7, Stormwater System Analysis**, describes the analyses conducted to identify system deficiencies that the capital improvement plan would address. Chapter 7 breaks down the various system analyses that were part of the SSWCP update. The city was evaluated for stormwater retrofit opportunities, prioritizing of fish passage barriers, and a hydraulic analysis of the City's conveyance pipelines discharging directly to Bellingham Bay.
- **Chapter 8, Capital Improvement Plan**, is the proposed 2020 CIP, developed by identifying City drainage issues brought forward by City staff, projects identified by the retrofit analysis, fish passage barriers identified in the 2010 *City of Bellingham Culvert Improvement Prioritization: Phase I Final Report* (Prioritization Report) (City 2010), capacity-limiting conveyance pipes from the 2007 Stormwater Comprehensive Plan, and system modeling. Projects were identified and ranked through the City's CIP process. This process of project identification helps support appropriate funding levels for a CIP. Adjustments in project selection and scope are anticipated throughout the life of a CIP implementation; therefore, the identification of actual projects found in this SSWCP is done solely to assist in developing a CIP funding level of service.
- **Chapter 9, Recommended Stormwater Management Program and Implementation**, summarizes the findings of the SSWCP and its individual sections along with recommendations for CIP funding, staffing levels, and recommended utility rates.
- **Chapter 10, Financial Program Review**, examines the financial aspects of the stormwater program, looking specifically at the cost of service relating to the different CIP levels, evaluation of permit fees, integrating additional staffing to support the program and meeting the needs of the Phase II Permit, while also looking at affordability needs of the city and its residents. A comprehensive financial program provides a detailed account of methods to fund the CIP and demonstrate that the utility operates in a financially sustainable manner over the course of the planning period.

1.2 Organization and Staffing

The City of Bellingham's SSWU was created in 1990 to address the issues of stormwater pollution. Under the auspices of the federal National Pollutant Discharge Elimination System (NPDES) for stormwater, the SSWU is charged with working toward improvement of water

quality in stormwater runoff prior to its discharge to receiving waters. An organizational chart of the SSWU is shown in Figure 1-2.

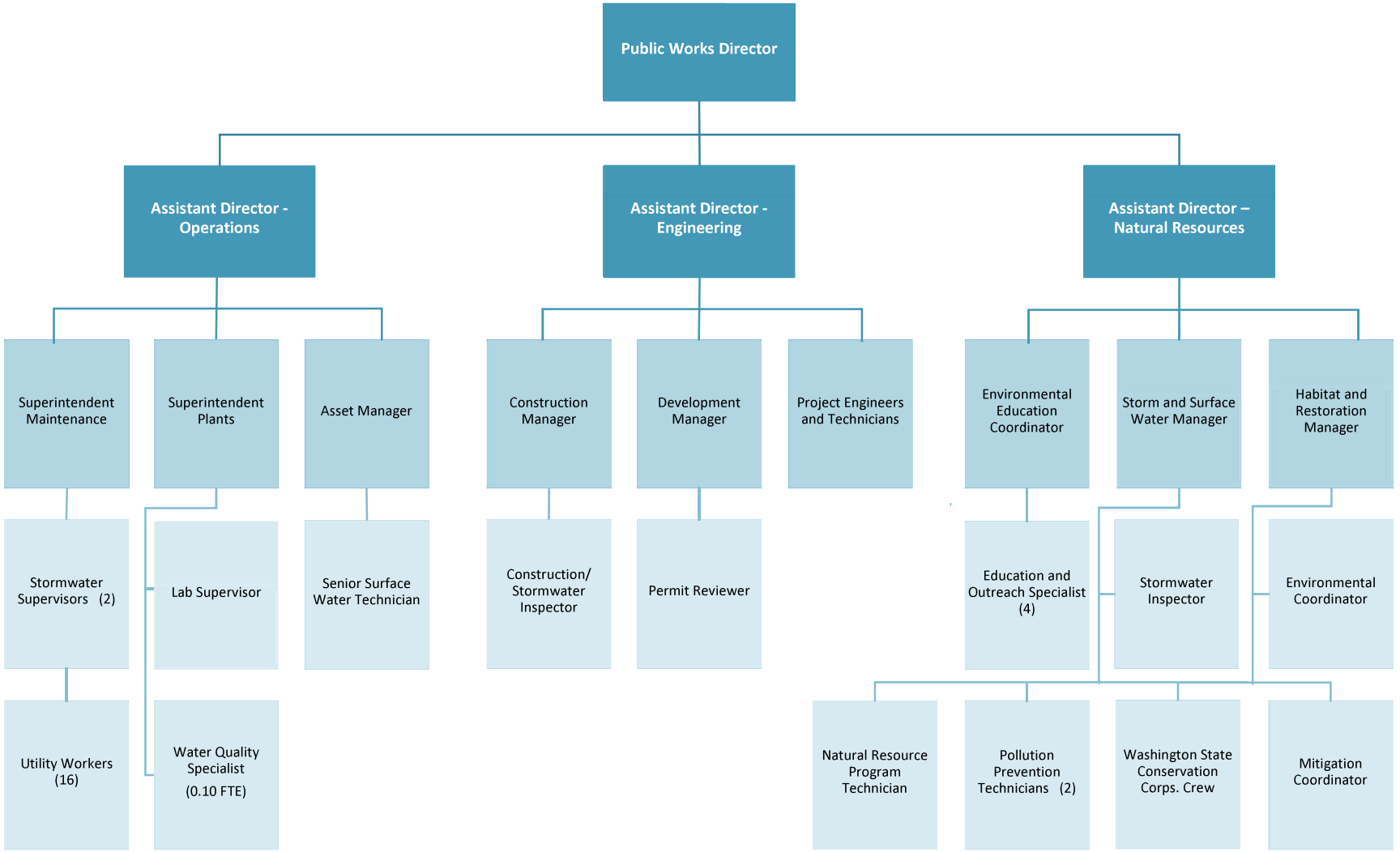


Figure 1-2. Bellingham SSWU organization chart

1.3 Regulatory Drivers

The U.S. Environmental Protection Agency (EPA) identifies stormwater runoff as a nonpoint source of pollution (Ecology 2018a) and has, since passage of the federal Clean Water Act, enacted regulations to offset the impacts of polluted stormwater runoff on the environment.

1.3.1 Western Washington Phase II Municipal Stormwater Permit

With jurisdictional authority to regulate stormwater runoff discharging from municipal stormwater systems to the waters of the United States, EPA has delegated authority to Ecology to implement the rules and regulations for managing stormwater in Washington State. To that end, Ecology regulates stormwater discharges from municipalities via the Municipal Stormwater Permit, divided into Phase I for large municipalities or Phase II for small municipalities, and between eastern Washington and western Washington. The City of Bellingham is a Phase II jurisdiction and operates its SSWU according to the standards and conditions in the Phase II Permit. The Phase II Permit requires the City to enforce the quantity and quality of stormwater runoff discharging from the City's municipal separate storm sewer system (MS4) to the "waters of the state." Integral Phase II Permit elements include the following:

- **S5.C.1, Stormwater Planning:** Efforts to assist the development of policies and strategies that protect receiving water bodies. The Phase II Permit requires future long-term planning efforts to include updates for the incorporation of low-impact development (LID) principles and best management practices (BMPs) requirements, stormwater management action planning (SMAP), and receiving-water prioritization. (Note: SMAP is used in this document as an acronym for both stormwater management action planning and Stormwater Action Plan, depending on context.)
- **S5.C.2, Public Education and Outreach:** Efforts to raise awareness of the contributions of pollutants to the environment from stormwater runoff and measure behavior changes by the public to reduce or eliminate harmful stormwater impacts. The Phase II Permit requires permittees to foster stewardship opportunities in the community to address stormwater runoff impacts.
- **S5.C.3, Public Involvement and Participation:** Efforts to foster public involvement and participation of SWMP and SMAP discussions through avenues such as advisory councils, public hearings, watershed committees, rate structure discussions, and similar activities.
- **S5.C.4, MS4 Mapping and Documentation:** Continued and new mapping and documentation of the MS4.
- **S5.C.5, Illicit Discharge Detection and Elimination:** Development of an ongoing program to prevent, detect, characterize, trace, record, and eliminate illicit connections and illicit discharges related to MS4.
- **S5.C.6, Controlling Runoff from New Development, Redevelopment and Construction Sites:** Implementation of a program to reduce stormwater runoff pollutants to regulated

levels relevant to new development, redevelopment, and construction site activities, inclusive of public and private projects.

- **S5.C.7, Operation and Maintenance:** Implementation of a program to reduce detrimental stormwater impacts through the development of maintenance standards; continued maintenance of stormwater facilities; and practices, policies, and procedures to reduce stormwater impacts. Further, activities shall include continued training of employees on best operation and maintenance (O&M) practices, and implementation of a Stormwater Pollution Prevention Plan (SWPPP) at heavy maintenance or storage yards owned and operated by the utility.
- **S5.C.8, Source Control Program for Existing Development:** Development of a program to prevent and reduce pollutants in runoff from areas that discharge to the MS4.

1.3.2 City of Bellingham Municipal Code

The BMC provides comprehensive regulatory coverage for development within the city. The following municipal codes have direct references to the SSWU. Below is a brief summary of each.

The following list summarizes sections from BMC title 15, chapter 16:

- **15.16.005: Intent.** This section establishes intent and purposes for having an SSWU by promoting a comprehensive approach to surface water and stormwater problems, controlling surface water and stormwater runoff, and enhancing environmental protection and that SSWU rates are necessary to accomplish these intentions.
- **15.16.010: Definitions.** This section provides technical definitions that are critical to owning and operating an SSWU.
- **15.16.020: Utility charges imposed.** This section includes a declaration to charge SSWU rates.
- **15.16.030: Storm and surface water service rates.** The SSWU rate schedule is listed in this section.
- **15.16.040: Exemption, credits and adjustments.** This section provides information to ratepayers on exemptions, credits, and adjustments.
- **15.16.050: Deposit and use of utility charges.** This section codifies how charges received will be used.
- **15.16.060: Impervious surface area or rate adjustments.** This section provides BMC provisions for ratepayers seeking to have the impervious area adjusted.
- **15.16.070: Billing and collection.** This section codifies how billing and fee collection will be implemented.
- **15.16.080: Severability.** This section states that, "in the event any provision of this chapter or its application to any person, entity or circumstance is held invalid, the remainder of this chapter or the application of the provision to other persons, entities or circumstances shall not be affected."

The following list summarizes sections from BMC Chapter 15.40 Drainage:

- **15.40.010: Purpose – Liability for damages.** This section declares the City's intention for operating the SSWU "to assist the city and its residents in the correction of existing storm drainage and surface water runoff."
- **15.40.020: Administration by public works department.** This section codifies that the SSWU is administered by the Public Works Department.
- **15.40.140: Dedication of drainage facilities to the city – Contract.** This section provides criteria and standards for drainage facilities to be dedicated to the public system.
- **15.40.170: Nuisances declared – Abatement.** This section codifies definitions of drainage nuisances and provides the City with authority to address the nuisances as to protect the public drainage system.

BMC Chapter 15.42 covers findings of fact, regulations, and infractions. This chapter effectively provides the regulatory framework for implementing the conditions of the Phase II Permit.

- **15.42.010: Findings of fact – Need and purpose.** This section codifies that stormwater runoff contains pollution and needs to be managed and regulated.
- **15.42.020: Definitions.** This section contains the specific definitions necessary for interpreting the SSWU code and development standards.
- **15.42.030: General provisions.** This section codifies that this chapter does not repeal, abrogate, or impair any existing regulations, easements, covenants, or deed restrictions. However, where this chapter imposes greater restrictions, the provisions of this chapter shall prevail.
- **15.42.040: Regulated activities.** This section describes the types of activities that are regulated; for example, land-clearing activities.
- **15.42.050: General requirements.** This section includes language for adoption of the Surface and Stormwater Comprehensive Plan and codifies the use of BMPs to control stormwater runoff and prevent pollution from entering receiving waters; identifies and prohibits illicit discharges; lists the restrictions on application of fertilizers, mulches, and soil amendments containing phosphorus; and lists requirements for retail stores selling such materials.
- **15.42.060: Approval standards.** This section contains the specific stormwater development regulations for new and/or redeveloping properties within city limits. It also describes the specific minimum requirements and development standards for areas within the city draining to Lake Whatcom.
- **15.42.070: Maintenance, inspection and enforcement.** This section codifies requirements for maintenance of stormwater facilities, what standards are applied, inspection, and enforcement.
- **15.42.080: Administration.** This section includes the fee schedule for approving development permits.

- **15.42.090: Variances and appeals.** This section includes criteria for requesting and granting variances from the regulations including Right of Appeal.
- **15.42.100: Infractions – Penalty.** This section codifies the authority of the City to issue penalties in the event that there are violations of this code.
- **15.42.110: Misdemeanors – Penalty.** This section codifies the authority of the City to issue penalties in the event that there are violations of this code.
- **15.42.120: Severability.** This section states: "If any provision of this chapter or its application to any person, entity, or circumstance is held invalid, the remainder of this chapter or the application of the provision to other persons, entities, or circumstances shall not be affected."

BMC Chapter 17.76, Construction in Floodplains sets forth regulations for development in floodplains meeting the standards of the National Flood Insurance Program (NFIP), a federal program that provides flood insurance to property owners in participating communities. In exchange for providing flood insurance, participating communities must manage and implement minimum standards for properties that develop in the floodplain.

1.3.3 Applicable Policies

The purpose of the City's citywide Comprehensive Plan is to provide a comprehensive statement of City goals and policies to focus, direct, and coordinate the efforts of the departments within the City government. It is a basic source of reference for officials as they consider enactment of ordinances or regulations affecting the community's physical and economic development. The Comprehensive Plan has several elements, each with a goal and several policies that are designed to help achieve the goals. The excerpts below are a partial list of goals that apply to the SWMP.

The following are land use goals of the state-mandated and citywide Comprehensive Plan (Land Use [LU] and Environmental [EV] chapters):

- **Goal LU-5:** Support the Growth Management Act's goal to encourage growth in urban areas.
- **Goal LU-7:** Protect and restore our community's natural resources (land, water, and air) through proactive environmental stewardship.
- **Goal EV-2:** Limit development in the Lake Whatcom watershed.
- **Goal EV-4:** Limit urban sprawl and promote sustainable land use planning.

The following are surface water and stormwater goals of the Comprehensive Plan:

- **Goal LU-8:** Protect and improve Lake Whatcom and its watershed to ensure a long-term, sustainable supply of water.
- **Goal EV-1:** Protect and improve drinking water sources.
- **Goal EV-5:** Protect and improve the health of lakes, stream, and the Salish Sea.
- **Goal EV-6:** Conserve and maintain natural resources, including the urban forest.

State stormwater policies from the Washington Administrative Code (WAC) that apply to water quality standards are provided below:

- **WAC 173-200:** Water Quality Standards for Groundwaters of the State of Washington
- **WAC 173-201A:** Water Quality Standards for Surface Waters of the State of Washington
- **WAC 173-204:** Sediment Management Standards

1.4 Goals and Objectives

The goals and objectives of this Plan update are as follows:

- Analyze the existing drainage system to identify capacity deficiencies as compared to the City's policies and service level standards
- Identify existing drainage problems
- Evaluate the City's SWMP to aid in maintaining compliance with the City's Phase II Permit through the development of a gap analysis of the City's efforts in complying with the Phase II Permit conditions
- Develop a CIP
- Establish an equitable stormwater utility fee structure consistent with the City's affordability policies that fully supports the City's SWMP and CIP

1.5 Plan Development Methodology

This 2020 updated SSWCP describes the built and natural systems used in the conveyance of surface water and stormwater flows. It references how urban growth and development impact the hydrology of the area. The SSWCP includes analysis of the City's asset management programs and its activities for Phase II Permit compliance, identifies stormwater retrofit opportunities, and makes recommendations for staffing and capital resources needed to meet the City's objectives. These recommendations were then used as the funding basis of a stormwater utility rate study (Chapter 10) that were approved by the Bellingham City Council in 2020, upon the conclusion of a public input and legislative process.

1.5.1 Existing Data Review

As part of the SSWCP update, a variety of information was collected, reviewed, and analyzed. Sources of information included interviews with City staff and review of the City's financial policies and current budget, organizational charts, and past SSWCPs and studies, including the City's 1995 Watershed Master Plan and 2007 Stormwater Comprehensive Plan. Critical to the retrofit planning efforts of this SSWCP was the 2015 *Bellingham Habitat Restoration Technical Assessment* (Habitat Restoration Assessment) (ESA 2015). That plan identified areas where stormwater retrofit was recommended to improve water quality in receiving waters.

Conveyance system analyses were dependent on the City's asset management database, which stores critical information on the built infrastructure. Several catch basin invert elevations were measured in the field to facilitate the analysis. Phase II Permit annual reports, O&M activity

database information, and the Lake Whatcom Management Plan provided essential information to support the evaluation and recommendations found within.

1.6 Public Involvement Conducted for This Plan

A public open house was held in conjunction with the City Council Meetings to share the findings of the draft Surface and Stormwater Comprehensive Plan and Rate Study. The open house was conducted on the City of Bellingham's website and featured a video of the draft plan presentation to City Council, an outline of five key areas within the plan, a public survey, and an invitation for public comment. The draft Stormwater Comprehensive Plan and Rate Study documents were posted on the website, along with a log of the public comments and corresponding responses.