



2013

City of Bellingham Stormwater Management Program

Attachment A to the NPDES Phase II Permit Annual Report



City of Bellingham
Public Works Department
Storm and Surface Water Utility
Bellingham, WA
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FORWARD

This document serves as Attachment A to City of Bellingham's annual report submittal to the Department of Ecology to meet the requirements of the Western Washington Phase II Municipal Stormwater Permit (WAR04-5550) under the National Pollutant Discharge Elimination System. This Stormwater Management Plan (SWMP) is prepared to demonstrate the City's understanding of and commitment to fully meeting the regulatory requirements of this permit. The SWMP is a dynamic document that will be updated on an annual basis and will be integral to our permit compliance.

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1.0 INTRODUCTION

Stormwater runoff from streets, parking lots, construction sites, industrial properties, and residential areas is now recognized as one of the leading sources of pollution to our streams, lakes, wetlands, and Puget Sound. Of heightened concern for the City of Bellingham is the quality of water in Lake Whatcom, the source of drinking water for over 100,000 city and county residents. To address stormwater pollution, the City of Bellingham (City) established a Storm and Surface Water Utility in 1990 and since the onset of the utility has been developing and refining its Stormwater Management Program (SWMP). While the City has been actively managing stormwater for decades, the City was officially designated in 2007 by the Environmental Protection Agency and the Washington State Department of Ecology as one of thousands of municipalities in the United States requiring a special stormwater permit: the Western Washington Phase II Municipal Stormwater Permit (Permit) under the National Pollutant Discharge Elimination System (NPDES). The City has expanded its stormwater program to meet the terms and conditions of this permit and will continue to do so as a new 5-year permit becomes effective in August of 2013 with requirements extending through 2018.

The Phase II Permit allows municipalities to discharge stormwater from municipal systems into “waters of the state” such as streams, lakes and Puget Sound, as long as there are programs in place to reduce pollutants in stormwater to the “maximum extent practicable”. Stormwater runoff from the City of Bellingham discharges to five urban streams, Lake Whatcom, Lake Padden, Bellingham Bay, and Chuckanut Bay. Improving habitat and water quality in these streams and lakes was identified as one of the top priorities in the City's Legacies and Strategic Commitments to its citizens and is a component of many other City programs such as the Lake Whatcom Management Program, Bellingham Water Quality Improvement Plans, Habitat Restoration Plans and the downtown renovation and waterfront restoration programs. Requirements under the NPDES Phase II Permit provide the City additional opportunities to accomplish cleaning up the City's streams and furthering protection of Lake Whatcom.

1.1 Document Organization

This document is organized by program components in the order found in Condition S5C of the Phase II Permit. To facilitate cross-reference with the permit language, each permit item is presented along with the associated permit section indicator in parentheses as follows:

- ✓ Section 2.0 addresses the Stormwater Management Program Development (S5.A & S5.B)
- ✓ Section 3.0 addresses the Public Education and Outreach Component (S5.C.1)
- ✓ Section 4.0 addresses the Public Involvement and Participation Component (S5.C.2)
- ✓ Section 5.0 addresses Illicit Discharge Detection and Elimination (S5.C.3)
- ✓ Section 6.0 addresses Controlling Runoff from New Development, Redevelopment and Construction Sites (S5.C.4)
- ✓ Section 7.0 addresses Pollution Prevention and Operation and Maintenance for Municipal Operations (S5.C.5)
- ✓ Section 8.0 addresses Monitoring (S8)

2.0 STORMWATER MANAGEMENT PROGRAM DEVELOPMENT (S5.A and S5.B)

2.1 Permit Requirements

Sections S5.A and S5.B of the Phase II Permit as reissued by Ecology on June, 2012 require the City to:

- Develop and implement a Stormwater Management Program and submit annual compliance reports
- Manage an ongoing program for gathering, tracking, maintaining and using information to evaluate the SWMP development, implementation and permit compliance and set priorities
- Track the cost of the development and implementation of the SWMP
- Track the number of inspections, official enforcement actions and types of public education
- Coordinate with other NPDES permittees and partners in the region on stormwater related policies, programs, and projects
- Coordinate internally among City Departments

2.2 Notable Accomplishments

The City of Bellingham has been proactively managing the quality of stormwater for over 20 years using a variety of approaches designed to control runoff, treat runoff, reduce pollutant sources, and employ adaptive management. Over the course of the first Phase II permit term (2007-2012) and the reissuance year (2012-2013), the City continued to build a strong stormwater program adding depth to existing programs and increasing staff as needed. Through education and the use of incentive programs, the City has engaged a variety of audiences in stormwater issues; from classroom children and raingarden planting volunteers, to focus groups targeting restoration options and survey respondents documenting behavioral changes. Stormwater control and treatment has been accomplished through implementing Best Management Practices (BMPs) and development standards, designing and building capital projects for new treatment facilities and retrofitting older public facilities. The City has worked with businesses on pollutant source control as well as individual homeowners to reduce runoff and pollution from their properties. All of these strategies work in unison to form a multifaceted program that addresses stormwater quality and meets the six Phase II permit elements: education and outreach, public involvement, illicit discharge detection and elimination, runoff control from new development and redevelopment, good housekeeping in all facets of municipal operations, and water quality monitoring. The City's stormwater code has been revised four times (1990, 1995, 2006, and 2009) to reflect new information on the water quality in Lake Whatcom as well as to comply with the NPDES permit requirements.

The City works very closely with other local jurisdictions to coordinate stormwater efforts citywide and in the Lake Whatcom Watershed. The City has partnered with other Phase II permittees in Whatcom and Skagit County to support Stormwater University, operated by RE Sources for Sustainable Communities, to provide workshops and educational materials targeted at businesses, industries, and municipal staff. Other examples include the recent joint purchase of a high-efficiency street sweeper that is being shared by four NPDES Phase II permit holders in Whatcom County and a study undertaken in conjunction with the Port of Bellingham to screen the stormwater quality from outfalls entering directly into Bellingham Bay.

The Lake Whatcom Management Program is a joint effort of the City of Bellingham, Whatcom County, and Lake Whatcom Water and Sewer District (formerly Water District 10) to protect Lake Whatcom as a source of drinking water. The main focus of efforts is on reducing the pollutant load and the amount of stormwater entering the lake. While there are many constituents typically associated with urban stormwater, including suspended solids, metals, and nutrients, phosphorus has become the foremost pollutant of concern to Lake Whatcom's health. For the past several years, the City has focused on evaluating the effectiveness of these efforts, documenting increased removal rates for both phosphorus and fecal coliform levels. In addition, the City is active in the land preservation program which aims to reduce water quality impacts by preserving land within the Lake Whatcom Watershed that might otherwise be made available for development.

The City's Storm and Surface Water Utility is constantly evaluating, retrofitting, and improving Bellingham's stormwater system and has completed many projects to date. The City operates 5 regional detention facilities and continues to be a leader in integrating low impact development (LID) techniques into infrastructure. Currently, the City is investing heavily in retrofitting stormwater facilities in the Lake Whatcom Watershed and in our downtown area. Noteworthy projects include the Broadway Park sand filter that receives stormwater from the Sunset Drive and I-5 junction and distributes it to planter areas for infiltration and a water quality vault installed in Maritime Heritage Park that treats 40 acres of the downtown area. In 2012, a new phase of the Central Business District program began with the completion of a field investigation locating sites for 36 raingardens to reduce runoff from the urbanized 90 acre area. This program will also feature public involvement and outreach through "DIG"- downtown improvement gardens- where local businesses will be encouraged to adopt a garden and maintain the stormwater function.

Additional highlights from 2012 include the completion of several larger stormwater capital improvement projects in the Lake Whatcom Watershed, as well as 24 infiltration, dispersion, and/or re-vegetation projects on private properties in the watershed as part of the Homeowner Incentive Program. The City secured grant and loan funding for 6 projects in 2012 with total grant funds of approximately 2.9 million dollars and loan funds of 1.4 million dollars. Projects include:

- Padden Creek Daylighting
- Lake Whatcom Right-of-Way Retrofits
- Bloedel Donovan Retrofit
- Padden Creek Water Quality (Harris Ave)
- Vactor Waste Site Expansion
- Central Business District Raingarden Retrofits

2.3 City Organizational Responsibilities for the Stormwater Management Program

The City of Bellingham's Storm and Surface Water Utility (SSWU) Section in the Natural Resources Division of the Public Works Department holds the primary responsibility for developing and implementing the stormwater program and tracking Phase II Permit requirements. Within the Public Works Department, the Engineering and Operations divisions also hold integral roles in implementing the components of the stormwater program. The program is also supported by Planning & Community

Development, Fire, Police, and Parks and Recreation (Table 1). Internal coordination between these city divisions occurs regularly as issues arise (e.g. handoff between construction inspectors and the private facility inspector, incident response and follow-up actions to stormwater violations) and more formally through stormwater committee meetings, safety meetings, and Operations and Engineering coordination meetings.

Table 1: City Organizational Responsibilities for the NPDES program

City Department	Description of NPDES Stormwater Responsibilities
Public Works/ Natural Resources Division/Storm & Surface Water Utility Section	Administers and develops the program and coordinates with other divisions within the City and other NPDES jurisdictions <ul style="list-style-type: none"> • Education and Outreach • Public Involvement • Illicit Discharge Detection and Elimination program including local source control & dry weather monitoring • Stormwater incident response • Private facility inspections • Municipal staff training • Pollution prevention practices • Integrated Pest Management Plan • Annual Reporting
Planning & Community Development	Permit Center provides first contact for new or redevelopment stormwater permits and distributes NOI
Public Works Engineering - Development Section	Site Plan Review for stormwater permits
Public Works Engineering	Capital projects -stormwater facilities and retrofits Construction stormwater inspections pre, during and post - construction
Public Works Advisory Committee	Annual review of stormwater program
Public Works - Operations - Surface and Stormwater Division	Maintenance of public stormwater facilities; stormwater incident response
Fire Department	First responder to stormwater incident if called
Police Department	First responder to stormwater incident if called; code enforcement for stormwater violations
Parks and Recreation	Integrated Pest Management Plan
Public Works - Laboratory	Water quality sample analysis for illicit discharge characterization Urban Streams Monitoring Program

2.4 Plans for Program Activities in 2013

The City plans to continue work on stormwater issues at a level commensurate with 2012 efforts building on systems and procedures developed throughout the first permit cycle.

3.0 PUBLIC EDUCATION AND OUTREACH (S5.C.1)

3.1 Permit Requirements

Section S5.C.1 of the Permit requires the City to address the following public education and outreach elements:

- Develop a program that targets specific audiences including general public, businesses, homeowners, landscapers, property managers, engineers, contractors, developers, and City employees including review staff and land use planners
- Develop a program that aims to reduce or eliminate behaviors and practices that cause or contribute to adverse stormwater impacts
- Measure improvements in the target audience's understanding of the problem and what they can do to solve it. Use this information to improve the education program
- Track and maintain records of public education and outreach activities



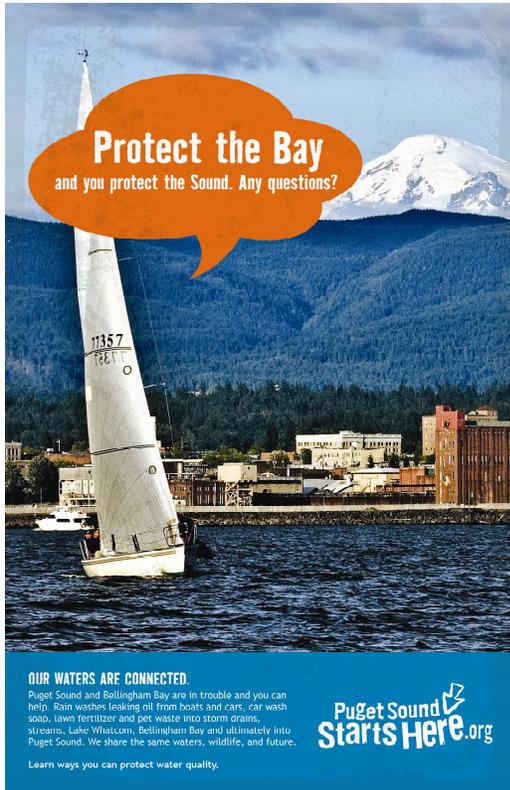
3.2 Program Overview

The City of Bellingham has developed and implemented a comprehensive stormwater education and outreach program with the goal of increasing awareness of stormwater pollution issues. The program strives to provide tools, assistance, and incentives to reduce or eliminate behaviors and practices that cause or contribute to adverse stormwater impacts. City staff emphasize the importance of environmental education and technical assistance in daily interactions with the Bellingham community.

Through both broad-based educational efforts aimed at the general public and targeted resources for specific businesses, contractors, stormwater facility owners, or municipal staff, the City has compiled a library of resources ready for scheduled presentations or available on hand as educational opportunities arise. Pollution prevention factsheets and brochures are routinely distributed to specific audiences and many of the resources are available on the City's website.

Examples of targeted handouts include pet waste fliers, car wash videos and car wash kits offered to charity groups, the "We Keep It Clean Using the 4Cs" poster for the auto industry, and good cleaning practices for the food and restaurant industry. Specific educational efforts that reach the youth in our community include an interactive stormwater grade school education program tailored for 5th graders and the "Only Rain in the Drain" storm drain marking program in partnership with the Nooksack Stream Enhancement Association.

City educators are active in STORM, the Stormwater Outreach for Regional Municipalities group, participating in meetings, roundtable discussions, and giving presentations. The Lake Whatcom Education Team meets to coordinate and collaborate on events and outreach materials and includes staff from the City of Bellingham, Sudden Valley, Whatcom County, WSU Whatcom County Extension



and the Institute for Watershed Studies. The City's education team also works with local partners to provide workshops on LID techniques, raingarden and stormwater facility /detention pond maintenance. Local stewards and restoration groups are also a priority for City educators as they support groups such as NSEA, the People for Lake Padden, the Chuckanut Bay focus groups and Lake Whatcom Stewards.

Programmatic options are employed as well to reach out to the general public such as the Residential Stormwater Retrofit Program that installed 336 rain barrels to willing homeowners citywide. Through the Homeowner Incentive Program (HIP), the City conducts low impact development outreach by assisting willing City residents of in the Lake Whatcom Watershed with design and materials cost reimbursement for completed projects that reduce runoff. The focus of the Homeowner Incentive Program is to provide support for homeowners to install projects that increase water infiltration on their properties. Project

examples include riparian plantings, impervious surface removal, lawn removal and replacement, phosphorus-limiting rain gardens, infiltration trenches and porous paving materials.

Through experiences, lessons learned, and public feedback the City continues to improve the education program. In particular, the use of customer surveys, both pre and post-education contact, have helped measure improvements in the target audience's understanding of the problem and document behavioral changes.



3.3 Accomplishments in 2012

The City of Bellingham undertook 44 educational activities that brought stormwater information to a variety of audiences. Highlights include the Homeowner Incentive Program, the Chuckanut Bay Nature Series, the pet waste pilot program in the Whatcom Creek Watershed, the Lake Whatcom Incentive Surveys, and grade school programs. In addition, the City has partnered with RE Sources, Whatcom County, and Washington State Extension to carry out joint public education and outreach activities. Table 2 summarizes education and outreach activities undertaken by the City of Bellingham and partners during 2012 and the following paragraphs highlight a few of the efforts.

The Homeowners Incentive Program (HIP) 2012 efforts resulted in 24 projects to reduce stormwater runoff in the Lake Whatcom Watershed and demonstration projects underway at two local elementary schools.

Homeowner Incentive Program

There were 24 completed HIP projects, 43 project assessments, and 20 new projects permitted and ready to move forward. A HIP demonstration project at Geneva Elementary School included two public events, one focused on students and the other was a Make-a-Difference-Day Community Event. Another demonstration project designed for Silver Beach Elementary School is permitted and ready to go to construction in 2013. Education presentations regarding the HIP were delivered to Bellingham City Council, Whatcom County Council, Whatcom County Planning Commission, Lake Whatcom Joint Policy Group, and Lake Whatcom Watershed Advisory Board, and the public (public attendance estimated at 50).



Chuckanut Bay Nature Series

As part of the Chuckanut Marsh Village water quality improvement project, the City led focus groups, held public meetings, and surveyed residents on pollution problems and use of the area. In collaboration with RE Sources for Sustainable Communities and the Marine Resources Committee of Whatcom County, the City hosted the Chuckanut Bay Nature Series, consisting of four events in June of 2012 plus a replanting party the following November. Events included guided beach walks, a community

celebration, beach discovery days and shoreline replanting. This successful series informed 1,400 residents, with 60 attending events, 40 committing to stewardship pledges, and 250 responding to surveys.

Pet Waste Management

City staff promoted messages of proper pet waste disposal with displays and activities at local pet events, including the Dog Days of



Summer and the Paws & Claws Expo, and held neighborhood meetings with pet owners. The most effective outreach seemed to be direct contact with pet owners on trails. The City continues to measure changes in behavior and documented an increase in awareness of stormwater issues and lifestyle changes for at least 25% of dog owners in the Whatcom Creek Watershed by conducting pre and post- education program surveys of 300 dog-owning residents.

School Programs

City educators offer a water education program, "Sharing our Watersheds", centered on watersheds, the Lake Whatcom Watershed, the drinking water and wastewater treatment processes, water conservation and stormwater pollution



"Sharing our Watershed" School Program educates 5th Graders on watersheds, stormwater pollution, water and wastewater treatment

prevention. The curriculum is designed for 5th grade students and was conducted at 18 local schools in 2012 reaching 920 students. The program involves tours of treatment facilities as well as in-class education sessions. Student groups watch the video "[Lost in Puget Sound](#)" and prepare small group presentations about local stormwater pollutants such as oil and gas, fertilizer, pesticides, pet waste, phosphorus, sediment, litter, and soap. At a follow-up visit, students present their stormwater pollution information to City educators. When finished, they receive a Drain Ranger certificate to remind them of their pledge to keep our waterways clean.

Lake Whatcom Incentive Survey Postcards

Postcards on four topics were mailed to all Lake Whatcom Watershed residents within the city limits. Each postcard included an educational message, a few short survey questions, and a positive behavior change incentive connected to four topics: pet waste, car washing, native planting, and trip reduction.

Please help us understand the watershed...

How much of your outdoor property is covered in lawn?
 ___none ___1-25% ___25-50% ___50-75% ___75-100%
 Considering that lawn is a pollution source for Lake Whatcom, how much of your lawn are you interested in replacing with native plants?
 ___none ___1-25% ___25-50% ___50-75% ___75-100%

get a coupon for \$24 of plants!

Beautify your property while filtering and slowing down stormwater. Thank you for protecting Lake Whatcom!

Yes! Please send me a coupon!
 (get a coupon while supplies last)

Name: _____
 Address: _____
 City, State, Zip: _____



Native plants improve lake water quality!

Where native plants once helped the Lake Whatcom Watershed filter and slow rain runoff, now impervious surfaces and lawns allow rainwater to carry natural pollutants (such as sediments, bacteria, and nutrients) and human pollutants (including soaps, pet waste, metals, and fertilizers) directly into the lake with little to no natural filtration.



You can help us restore the Lake Whatcom Watershed by planting native plants on your property. Native plants require less water and maintenance than lawns and non-native plants.



Help this watershed function like a forest: plant native trees and shrubs!

Want to do more? Search "HIP" at www.cob.org



Residential and Business Stormwater IQ Survey

A citywide survey was conducted by Hebert Research to measure the public’s knowledge and practices regarding stormwater in the City of Bellingham. Results of the survey identified and prioritized which of the residents’ perceptions, behaviors, and practices needed the most attention. Top priority items centered around car washing, use of biodegradable soap, disposal of grass clippings, and the contribution that individual homeowner practices can have on stream pollution. Bellingham residents show a very similar level of stormwater knowledge to people from 6 other Washington jurisdictions. The City is using this information to focus education efforts. In addition, the research assessed stormwater practices and behaviors from 3 business sectors: restaurants, automotive businesses, and property owners/managers. Results from this study are being used to direct local source control visits.

Business Sector Education Highlights

City staff conducted 152 site visits to local businesses providing technical assistance on pollution prevention practices. Business owners receive one-on-one education on good housekeeping practices specific to activities they are conducting such as proper storage and disposal of automotive chemicals, cleaning products, wood finish and paint, cooking grease, and other hazardous materials. In addition, owners are assisted with locating and maintaining their storm drains and the impacts of illicit discharges, how to report them, and how to prevent them by using BMPs. In 2012, the food industry and restaurants were the primary target sector. Other visits were made to metal and wood workers, fire stations, and auto repair shops.

3.4 Plans for Program Activities in 2013

The City plans to continue work on stormwater education and outreach at a level commensurate with 2012 efforts building on systems and procedures developed throughout the first permit cycle.

2012 General Educational Materials Facts and Figures

- 15 phosphorus signs and brochures distributed to fertilizer retailers
- 500 phosphorus brochures delivered to retailers
- 4,200 stewardship survey postcards sent to Lake Whatcom Watershed residents
- 150 HIP booklets distributed
- 3 new "Entering Lake Whatcom Watershed" signs added to entrances to the watershed
- 12 new signs with alternating stewardship messages were installed around the Lake Whatcom Watershed
- 367 illicit discharge information letters with Car Wash Kit information sent to schools, churches, fire stations and businesses with large parking lots citywide
- 920 School aged children learned about watersheds and took the Drain Ranger Pledge
- Informed 1,400 Chuckanut Bay neighbors and users and engaged 100 of those in watershed stewardship activities and received 250 surveys
- 1,000 pet waste fliers inserted into Whatcom Humane Society mailings

Table 2: Education and Outreach Activities Undertaken In 2012

Education/ Outreach Activity	Description	Targeted Audiences
Stormwater University	RE Sources provided workshops on pollution prevention for: <ul style="list-style-type: none"> • Mobile Cleaning Businesses • Boat Repair Businesses and Boat Owners • Equipment Rental Resources are available on the City's website for stormwater facility maintenance	Municipalities, detention pond managers, industrial businesses and interested public
Homeowners Incentive Program (HIP)	One-on-one homeowner education <ul style="list-style-type: none"> • 80 visits, calls, or emails • 60 participants received follow up visits • 43 HIP Project Assessments • 20 New HIP Projects permitted and ready for construction • 24 HIP Final Inspection visits - including maintenance education HIP presentations delivered to STORM meeting, City and County Councils, Planning Commission, Lake Whatcom groups and the public -50 attendees	Homeowners in City portion of the Lake Whatcom Watershed
BTV10 aired programs on stormwater	Lake Whatcom Challenge, Puget Sound Starts Here public service announcements	General public
Educational Events	<ul style="list-style-type: none"> • World Water Day - 102 attendees, 586 passive audience read trail signs • Chuckanut Bay Nature Series offered guided beach walks, a community celebration and beach discovery days - 58 participants • Volunteer Planting projects 20 adults and 120 elementary students rain garden planting events • Paws and Claws Expo- pet waste education - 80 contacts • Dog Days of Summer -pet waste education- 100 contacts • Institute for Watershed Studies 50th Anniversary - 30 attendees • 5th Grade School Programs - 18 elementary schools- 920 students • Neighborhood stream clean-ups (Hanna, Fever, Lincoln, and 	General public, elementary school students, pet owners

Education/ Outreach Activity	Description	Targeted Audiences
	Cemetery) - 29 volunteers <ul style="list-style-type: none"> • Neighborhood meetings with pet owners and direct discussion on trails -62 contacts • Educational car wash advertisements in paper 	
Online Outreach	City website has resources and links to stormwater resources Lake Whatcom Management E-newsletter What's the Scoop About Healthy Streams video	General public, business owners
Educational Materials	Distributed educational materials to many audiences (sidebar on page 11) Car wash kits were loaned to 12 charities	General public, pet owners, lake residents
Surveys	Whatcom Creek Pet Waste Follow-up Survey (Applied Research Northwest) Residential and Business Stormwater Behaviors Survey (Hebert Research) Chuckanut Bay Marsh Restoration Project Follow-up Community Survey (Applied Research Northwest)	Businesses, residents, pet owners
Local Source Control	152 businesses were visited and educated on good housekeeping practices for pollution prevention	Businesses, industries
Incentives Program	<ul style="list-style-type: none"> • 213 car wash coupons delivered • 134 native plant coupons delivered • 56 dog bag leash dispensers delivered • 50 bus tokens delivered 	Lake Whatcom City residents
Water Conservation public outreach measures	<ul style="list-style-type: none"> • 104 rain barrels sold, 11 participants in rain barrel construction workshop • 12 participants in rain water irrigation workshop 	General public
Watershed Pledge programs	Lake Whatcom Stewards Lake Padden Pledge Chuckanut Bay Pledge	General public

4.0 PUBLIC INVOLVEMENT AND PARTICIPATION (S5.C.2)

4.1 Permit Requirements

Section S5.C.2 of the Permit requires the City to address the following public involvement and participation elements:

- Provide ongoing opportunities for public involvement in the SWMP process through committees/commissions and updating the SWMP
- Make the SWMP and Annual Compliance Report available to the public, including posting on the City’s website

4.2 Program Overview

The Bellingham public is invited to participate in stormwater decision-making. Opportunities include the City’s Public Works Advisory Board, City Council meetings, Community meetings, public hearings, neighborhood association meetings, focus groups, community surveys, and webpage communications. The City also solicits public comment through press releases specific to projects and code updates, and leisure guide advertisements. Status reports on the Stormwater Management Program were presented at the monthly Public Works Committee meetings. In addition, the current SWMP and Annual Compliance Report were made available to the public by posting downloadable versions on the City’s website and a copy is available for public review at City Hall.

Downtown Improvement Gardens (DIG) Program encourages businesses to become stewards of raingardens

4.3 Accomplishments in 2012

Public involvement opportunities to comment on the stormwater program in 2012 are summarized in Table 3. In addition, the Department of Ecology has granted the City of Bellingham funding to help improve the water quality in

Whatcom Creek by installing 36 raingardens in strategic locations in downtown Bellingham to help treat and infiltrate stormwater from over 90 urban acres. The Downtown Improvement Garden Program (DIG) will work with downtown businesses to “adopt” raingardens, often replacing existing parallel parking spots, aiming to improve local water quality while beautifying downtown neighborhoods.

Table 3: Public Involvement Opportunities Undertaken in 2012

Public Involvement Opportunity	Description of Opportunity
City Council Meetings	City Council holds weekly meetings that are open to the public
Public Works Advisory Board	Annual review of Stormwater Management Program
Website posting of SWMP and Annual Report	Downloadable versions of the current stormwater management documents are available to the public on the City website

4.4 Plans for Program Activities in 2013

The City plans to offer public involvement opportunities similar to those offered in 2012.

5.0 ILLICIT DISCHARGE DETECTION AND ELIMINATION (S5.C.3)

5.1 Permit Requirements

Section S5.C.3 of the Permit requires the City to address and/or maintain the following illicit discharge detection and elimination (IDDE) elements:

- Develop an ongoing program to detect and remove illicit discharges, connections, and improper disposal, including any spills into the municipal separate storm sewers owned or operated by the City
- Develop a map of the municipal storm sewer system
- Implement an ordinance that prohibits illicit discharges, and create a program to detect and address illicit discharges
- Publicize a hotline or other local telephone number for public reporting of spills and other illicit discharges
- Train staff on proper IDDE response procedures
- Track all spills, illicit discharges and connections reported to the City and response actions taken, including enforcement actions

5.2 Program Overview

The City has developed and implemented an ongoing program to detect and remove illicit discharges and connections into the City's MS4. A comprehensive GIS mapping system of its Municipal Separate Storm Sewer System (MS4) has been in place for many years. The map contains all known municipal storm sewer outfalls and receiving waters, and structural stormwater BMP's owned or operated by the City. All known private stormwater facilities are mapped as well. The City tracks and locates all outfalls, retains development records, and continually updates the map as new facilities come online. Records are also refined as new information becomes available. All City staff and the public as well have access to the stormwater system attributes through the CityIQ Online Map Viewer which allows searches for Bellingham-area information. While many features are available in the GIS system, the City also has a Comprehensive Stormwater Management Plan that developed a customized application of the Western Washington Hydrology Model version 3 (WWHM3) to evaluate the hydrology and hydraulics of the City's stormwater system components.

Through Bellingham Municipal Code 15.42.020.U and 15.42.020.C, the City prohibits non-stormwater illegal discharges, and/or dumping into the City's MS4. The enforcement of all stormwater code provisions including illicit discharges is provided for in BMC 15.42 subsections 070-110. Illicit discharges were prohibited in the 1995 adopted code however the language was refined in the 2009 ordinance to fully reflect the NPDES permit language. The City is active in the enforcement of illicit discharges and continues to respond to more incidences.

Over the course of the first permit, the City implemented procedural changes to IDDE program components as new staff came on board and interdepartmental coordination was established. City staff utilize many methods to discover and trace illicit discharges and IDDE problems including visual observation and chemical analysis, internal pipe scanning, stormwater outfall monitoring/dry weather monitoring, and source control inspections. The city also uses customer information to identify and resolve stormwater issues.

A stormwater hotline number (360-778-7979) is posted on the City's website and also publicized on the newer storm drain markers throughout the City. The SSWU staff is ready to record and respond to all calls regarding illicit discharges or illegal spills that are received on the hotline. All valid inquiries are followed up as necessary to resolve the issue. Follow-up actions are tracked and feedback is given to the initiators as well as Ecology as necessary. The City has also both received and sent information through the Ecology ERTS system and responds similarly providing closure information back to Ecology. Ecology staff in Bellevue and Bellingham have been very helpful in aiding our processes.

SSWU staff respond to most stormwater incident call-outs to assess the situation and plan follow-up actions to resolve them. For incidences that reach the MS4, SSWU staff work with the Storm Operations crew and a vacator truck is used if needed. Fire and Police are often the first responder; however, if it is not a hazardous materials situation, they are trained to call SSWU responders and the Storm Operations crew. All SSWU vehicles, Storm Operations crew vehicles, and many other departmental vehicles have spill kits for containment and cleanup of small spills. The Storm Operations crew receives training on spill response and through stormwater committee meetings and safety meetings any additional questions or concerns are addressed. The COB Emergency Response Plan for Public Works Operations: Water, Wastewater, Stormwater Chapter 8 Water Quality Contamination, and Checklists 10 and 11 Hazardous Materials Spill to Streets or Storm Water System cover procedures for spill response.



In addition to responding to illicit discharge incidents, the City is proactive in tracing the source of illicit discharges. The City of Bellingham has been utilizing system scanning since 2003 to both discover illicit discharges and trace the sources as well as to detect maintenance issues. The crew has been trained to look for signs of non-stormwater discharges from private piping entering our system. Signs of staining, foam, discolored discharges are all indications that would be a part of the condition report of the piping system. This information is provided to the supervisor but is also logged into system reports for future referral. Since 2006, the City has reviewed over 80% of our total of 28 square miles of stormwater network. The initial effort captured older infrastructure in the Central Business District and known problem areas. Crews have since proceeded by ¼ sections starting in the northwest moving east and then south. This system review has resulted in locating many problems including misconnections and suspicious flows.

The City also identifies illicit connections through its dry weather outfall inspection program which was initiated in 2004. Information from the dry weather studies has been useful in identifying stormwater problems ranging from sewer/stormwater service line cross connections, leaking water valves, pet waste mismanagement, pest waste, and yard waste mismanagement. When samples from flowing outfalls indicated a problem, GIS information was used to track the pathways up the stormwater system. Even though there were some years where no illicit discharges were pinpointed, evidence of non-point source pollution or remote-source illicit discharges was typically documented. For these years, the studies were helpful in directing septic failure investigations and guiding the pet waste education efforts.



The priority of field assessment on City streams was based on the level of water quality impairment and 303d listing parameters. Outfall inspections were conducted during dry weather in accordance with the Center for Watershed Protection's Illicit Discharge Detection and Elimination Guidance Manual. To date, outfall inspections have been conducted on:

- Lake Whatcom and Silver Beach Creek in 2004
- Whatcom Creek and Tributaries in 2004
- Padden Creek and Tributaries in 2005
- Squalicum Creek and Tributaries in 2006
- Whatcom Creek and Tributaries in 2007, repeated to support TMDL efforts
- Lake Whatcom and Silver Beach Creek in 2008 repeated to support TMDL efforts
- Bellingham Bay in 2012 in conjunction with the Port of Bellingham
- Whatcom Creek wet weather sampling in 2011 and 2012 to support TMDL efforts

The City, through our Local Source Control (LSC) Partnership with Ecology, provides technical assistance and pollution prevention education to businesses and industries. The City evaluates priority businesses and industrial activities likely to have illicit discharges and provides technical assistance to these entities on ways to reduce sources of pollution. Site visits with businesses include in-depth surveys of current practices. The focus is to examine hazardous material storage and disposal, outdoor storage, catch basin maintenance, and the potential for stormwater contamination. Good housekeeping practices are commended and corrective actions are discussed. Follow-up letters, if necessary, are sent to establishments highlighting the good practices and itemizing the practices that need to be corrected along with recommendations on



how to remedy them. Certain high priority environmental issues trigger an automatic follow-up visit. During these visits the City is able to note business practice changes or continue with education to correct persistent problems. Program staff also deal directly with these businesses on illicit discharges either reported or imminent. Dye testing is used in cases where questions arise about the storm / sewer network.

Over the period of the first and second grant cycle (2008-2011), the LSC program focused technical assistance visits on high-risk sectors including boat repair, printers, photo processors, dry cleaners, landscapers, nurseries, dentists, veterinary clinics, gas stations, painters, pharmacies, auto body, and auto repair shops. During the 2011-13 biennium, the Bellingham LSC program finished the auto repair sector and focused on additional sectors, including wood workers, metal workers, jewelers, scrap recyclers, restaurants, and municipal facilities and operations. The visits have resulted in significant reductions in stormwater pollution along with reduction in hazardous waste materials sent to our sewage treatment plant.

Over the first permit term, the City has held IDDE trainings for the following crews: Surface and Storm, Streets, Water, Sewer, and Traffic and Fire. Public Works inspectors and supervisors have also been trained on illicit discharge identification and procedures. Follow-up training occurs at staff meetings and stormwater committee meetings. The City has 34 Certified Erosion and Sediment Control Lead (CESCL) trained personnel on staff.

5.3 Accomplishments for 2012

The City has taken many steps to identify and eliminate illicit discharges in 2012. Knowledge of City infrastructure improves as the City's comprehensive map of its MS4 continues to be updated. This year the City undertook a thorough review of private and public stormwater facility map information, refining the categorization of facilities and components, and ownership. Education and outreach efforts focused on IDDE through a citywide mailing of 367 illicit discharge letters with Car Wash Kit information and pollution prevention ideas to schools, churches, fire stations and businesses with large parking lots. Advertisements were run in the Bellingham Herald offering use of car wash kits and kits were loaned out to local charities on 12 occasions.

A new stormwater incident tracking system was initiated and centralized so that all responders can access incident information, status of incident response, and add follow-up actions until the issue is resolved. In 2012, the City responded to 114 hotline calls as well as many direct calls, emails, and ERTS referrals. All incidents reported were responded to in some manner. Some inquiries were discussed with the caller and did not require further action while others were forwarded on to a different department as appropriate. Most inquiries were addressed by SSWU staff and follow-up responses were tracked in the stormwater incident response database.

Stormwater system scanning continued with 45 miles of pipe viewed in 2012. The City also continued field investigations of outfalls in two study areas. A dry weather field inspection of outfalls to Bellingham Bay was conducted in conjunction with the Port of Bellingham where both City and Port-owned outfalls were surveyed. No indications of illicit discharges or connections were identified from

the Bellingham Bay outfalls. Wet weather sampling of outfalls was conducted in the Whatcom Creek basin in 2011 and 2012. The monitoring successfully identified high fecal coliform level hotspots which helped to direct the pet waste education in that basin. Through effective outreach and clean-up events, awareness of fecal coliform contamination has increased among community members and fecal coliform levels dropped significantly in one area.

In 2012, 152 business were provided technical assistance on pollution prevention techniques

Local source control staff completed 152 technical assistance visits in 2012. The food industry and restaurants were the primary target sectors. Visits were also made to metal and wood workers, fire stations, and auto repair shops. In addition to the sector-specific method of targeting businesses, the program used other approaches to reach a variety of businesses. Program staff conducted door-to-door visits in two blocks of the downtown area, examining all businesses regardless of sector. This method is helpful in areas of specific water quality concern and may be expanded upon in the future. The LSC program began working collaboratively with the City Fire Department to conduct site visits together and increase interdepartmental communication and understanding.



IDDE training of SSWU personnel occurred frequently at staff meetings. The Stormwater Committee met monthly in 2012 and served as a forum for training staff from other departments. The City purchased a new IDDE employee training kit. SSWU staff have previewed it and scheduled additional training of other municipal staff through the stormwater committee forum. SSWU Staff also participated in:

- Webinars on stormwater monitoring, stormwater BMPs, pesticides and human health, safer cleaning products, Fire Code, etc.
- Monthly conference call presentations with regional Local Source Control Specialists
- Annual Local Source Control training for LSC state-wide, on topics such as L&I safety, stormwater toxicology, low impact development, database training, and waste designation.
- Annual Regional North American Hazardous Materials Management Association conference
- Six Northwest Counties Interagency Enforcement Team meetings with presentations on regional and local LSC issues, waste designation, pesticide regulations, etc.

5.4 Plans for Program Activities in 2013

The city plans to continue responding to illicit discharges at a commensurate level of effort as in 2012.

6.0 CONTROLLING RUNOFF FROM NEW DEVELOPMENT, REDEVELOPMENT AND CONSTRUCTION SITES (S5.C.4)

6.1 Permit Requirements

Section S5.C.4 of the Permit requires the City to address the following elements regarding controlling runoff from new development, redevelopment and construction sites:

- Develop, implement, and enforce a program to reduce pollutants in stormwater runoff discharging to the municipal separate storm sewer system from new development, redevelopment, and construction site activities
- Adopt an ordinance to address runoff from new development, redevelopment, and construction activities from both public and private sites using Appendix 1 as the standard.
- Retain existing local requirements to apply stormwater controls at smaller sites or at lower thresholds than required pursuant to S5.C.4
- Develop and implement a planning process for development that includes plan review, inspection, and enforcement capability
- Provide copies of the Notice of Intent for construction or industrial activities to representatives of the proposed new development and redevelopment
- Provide training to staff on the new codes, standards, and standard operating procedures
- Develop a process to record and maintain all inspections and enforcement actions by staff

6.2 Program Overview

The City has developed, implemented, and enforced a program to control runoff from new development, redevelopment, and construction site activities. In 2006 and 2009, the City updated its stormwater code to address construction runoff control from both public and private sites using language consistent with the "Technical Thresholds" in Appendix 1 of the Phase II Permit. However, since the adoption of the City's initial stormwater ordinance in 1995, a permitting, inspection, and enforcement program has been in place that is more restrictive than the Appendix 1 thresholds. The City requires some form of erosion control on all projects that exceed 120 square feet of impervious surfaces or disturb more than 500 square feet of soil. These local requirements have been retained as the City continues to regulate stormwater from smaller sites or at lower thresholds than required pursuant to S5.C.4. Sites that trigger the Appendix 1 thresholds receive more detailed reporting, increased inspection frequencies, and additional compliance items as necessary to meet the Phase II Permit requirements.

The City previously followed the planning process and BMP selection and design criteria outlined in the 2005 Stormwater Management Manual for Western Washington. The new 2012 Manual was adopted by the City automatically at the time it was adopted by Ecology. Our permitting process includes site plan review, inspection, and enforcement capability. Copies of the Notice of Intent for construction or industrial activities are provided to project proponents. City databases are used to record permit activity and maintain a record of all inspections and enforcement actions taken by staff.

The use of Low Impact Development techniques is promoted and encouraged through the stormwater permit review process, educational outreach programs, and financial incentives. The City adopted financial incentives for the use of LID techniques in the form of reduced stormwater development fees in 2006 for any prospective project. In addition, residents in the Lake Whatcom Watershed taking part in the Ecology Grant funded Homeowner Improvement Program (HIP) receive a free stormwater permit, design assistance, and material reimbursement for completing an LID project.

All permitted development sites are inspected by qualified Public Works Department Inspectors for proper erosion and sediment controls and appropriate enforcement actions are taken as necessary to ensure compliance. The City's inspection program includes site visits prior to the onset of construction, during construction and post-construction. Verbal warnings are often given during inspections and corrections are made when the inspector is present. When necessary stormwater permit correction notices are issued listing the items that do not comply with City codes along with required corrective actions. Stop work orders are issued in cases where non-compliance persists and they remain in effect until additional inspections show compliance. All permitted developments sites are inspected upon completion and prior to final approval or occupancy to ensure proper installation of permanent stormwater controls and to verify that a maintenance plan is in place. The City uses an escalating enforcement strategy of corrective warnings, monetary ticketing, and if necessary the case is transferred to the City's legal staff.



The City's Private Stormwater Facility Inspection Program has two major components. The first priority is the scheduling and inspecting of private facilities that trigger the NPDES annual inspection requirement to ensure maintenance standards are met on post-construction private facilities. Secondly, the City inspects and provides technical assistance to owners of smaller or older private facilities within the City's jurisdiction. Private facilities built after 2007 that trigger the Appendix 1



thresholds are inspected annually unless inspection records support a different frequency. Inspection reports document conditions and itemize specific maintenance corrective actions. Notification letters are sent to the property owners along with the inspection report and a timeline for action. Typically, maintenance is required prior to the next annual inspection however there are circumstances that call for more frequent follow-up inspection and the City continues to work with owners until maintenance issues have been resolved.

Site plan reviewers, inspectors, city engineers and SSWU staff have had stormwater code training, DOE manual training, and have attended permit overview workshops. Permit Center staff are trained quarterly on the new codes, standards, and standard operating procedures. The City has 34 Certified Erosion and Sediment Control Lead (CESCL) trained personnel on staff.

6.3 Accomplishments in 2012

The Public Works Development Section reviewed 392 site plans in 2012, most of which were for small projects that were below the Appendix 1 thresholds. Of the stormwater permits reviewed, 34 were categorized as level 3 or level 4 projects which include larger projects that create from 5,000 square feet to over an acre of impervious surface and/ or more than 30,000 square feet of land disturbance or are part of a larger common development. In 2012, all level 3 and 4 projects were reviewed in detail and inspected, 12 of these triggered the NPDES requirements and subsequently were added to the required private facility inspection database. The City continued to regulate stormwater from smaller sites or at lower thresholds than required pursuant to S5.C.4 using local ordinances that were in place prior to the NPDES Phase II Permit.

City Stormwater Inspectors made 9066 stormwater inspections during 2012. Verbal warnings and corrective actions were delivered during many site visits. Stormwater permit correction notices were issued to document 120 construction activities that were not in compliance with City stormwater code. These sites were re-inspected until corrective actions were taken. Fifteen stop work orders were issued and 1 case was sent to the legal department with 3 additional cases pending legal referral.

The City continued its Private Stormwater Facility Inspection Program which provided annual inspection and documentation of 41 facilities that triggered Appendix 1 thresholds. In addition, the City provided technical assistance to 36 facilities that did not trigger NPDES requirements. In 2012, the City undertook a thorough review of the private facility mapping and database information in preparation of program expansion as the new permit becomes effective. Inspection records and subsequent maintenance activities have demonstrated that a few of the required private inspections sites can be moved to a biannual schedule (see Attachment 2).



The Public Works Department staff viewed various webcasts on design of stormwater facilities, implementing best management practices, and pollution prevention. The Development department holds quarterly trainings for permit center staff on code changes and to help with outreach questions. Many staff attended DOE municipal permit overview workshops and manual training. Additional training included:

- Washington State University LID Research Program Annual Review
- Policy Forum on water quality standards

- Center for watershed protection Webinar/Webcast series:
Retrofit This – A Guide to Retrofitting the World?
Build This – Stormwater Retrofit Construction Issues
The Art of Retrofitting

6.4 Plans for Program Activities in 2013

The city plans to continue to control runoff at a commensurate level of effort as in 2012.

7.0 POLLUTION PREVENTION AND OPERATION AND MAINTENANCE FOR MUNICIPAL OPERATIONS (S5.C.5)

7.1 Permit Requirements

Section S5.C.5 of the Permit requires the City to address the following pollution prevention and operation and maintenance elements:

- Develop and implement an operations and maintenance program, with the ultimate goal of preventing or reducing pollutant runoff from municipal operations.
- Adopt maintenance standards for the municipal separate stormwater system that are at least as protective as those specified in Ecology's 2005 Stormwater Management Manual for Western Washington
- Perform annual inspections of stormwater flow control and treatment facilities and catch basins
- Develop Standard Operating Procedures to reduce stormwater impacts associated with runoff from municipal O&M activities
- Train staff to implement new procedures
- Prepare Stormwater Pollution Prevention Plans (SWPPPs) for all heavy equipment maintenance or storage yards identified for year-round facilities or yards, and material storage facilities owned or operated by the City

7.2 Program Overview

The City of Bellingham has developed and implemented an operations and maintenance program with the goal of preventing or reducing pollutant runoff from municipal operations. One focus of the program is training municipal staff on good housekeeping pollution prevention practices that are applicable to daily City operations and activities. Other components include, maintaining public stormwater facilities, updating stormwater pollution prevention plans for city facilities, and constructing capital improvement projects that reduce pollution.

The City has a comprehensive program for maintaining city-owned or operated permanent stormwater treatment and flow control facilities. Maintenance standards from Ecology's 2005 Stormwater Management Manual for Western Washington were adopted by the City and are used to evaluate facilities for both private and public inspections. The City maintains over 250 facilities including 5 regional detention ponds, 56 swales, 70 storm filter vaults, 4 raingardens and 124 detention/water quality ponds, vaults or pipes. Inspection and maintenance of facilities is scheduled and tracked through a maintenance management system. Inspections occur at a minimum annually with most facilities inspected several times throughout the year. Filters are inspected even more frequently;

typically on a 3 month circuit. Maintenance is scheduled when a facility exceeds the applicable maintenance standards and corrective actions are executed as soon as practical. All known catch basins and inlets owned or operated by the City of Bellingham are inspected and cleaned as necessary to comply with the maintenance standards. In addition, City Storm Operations staff have identified potentially vulnerable stormwater facilities that are monitored during and after major storm events.

Stormwater Pollution Prevention Plans (SWPPPs) have been developed for the Public Works Operations Complex and the Parks & Recreation Operations Center. SSWU staff perform internal site inspections of operations facilities to ensure that proper good housekeeping practices are being followed and provide training for municipal employees.



The City's street sweeper program aims to clean all City streets on a 2 to 3 month circuit. More frequent street sweeping occurs in the downtown Central Business District where streets are serviced twice a week and in the Lake Whatcom Watershed where streets are cleaned twice a month. In addition, the City led a joint venture to purchase a street sweeper for Whatcom County NPDES partners to proactively prevent pollutants from entering

TMDL water bodies. This state of the art high efficiency street sweeper has a higher rate of fine particulate capture and is used around the city and particularly in the Lake Whatcom Watershed to improve removal of particulate phosphorus from roadways. It is also currently being used by the Port of Bellingham and is available to both Whatcom County and the City of Ferndale.

Capital improvement projects have been a major component of the City's effort to reduce stormwater impacts associated with runoff from streets and parking lots. Over the past decade, numerous stormwater quality retrofit projects have been completed citywide and many more are scheduled with funding secured. Projects have used LID techniques, conventional water quality facilities, and in-line treatment options. Currently, the City is investing heavily in retrofitting stormwater facilities in the Lake Whatcom Watershed and in our downtown area. Noteworthy projects include the Broadway Park sand filter that receives stormwater from the Sunset Drive and I-5 junction and distributes it to planter areas for infiltration and a water quality vault installed in Maritime Heritage Park that treats 40 acres of the downtown area.

For the Lake Whatcom Watershed in particular, a key component to the City's stormwater treatment strategy is implementing controls that reduce the amount of phosphorus entering the Lake. A notable accomplishment in this regard is that all public stormwater facilities in the City's portion of the Lake

Through stormwater facility retrofits and source control activities, the City has markedly decreased fecal coliform levels in our creeks

Whatcom Watershed are now utilizing phosphorus-specific filtration media, improving phosphorus removal efficiency to 50-60%. The City has 46 main treatment systems in the Lake Whatcom Watershed and other smaller ones associated with our HIP program. Of particular note is the Lake Whatcom water quality system at Bloedel Donovan Park which won the 2004 National award for Environmental Excellence from the American Public Works Association. The City secured a grant in 2012 to expand upon the area of treatment from that earlier project. Project design will employ reforestation and infiltration as Best Management Practices to mimic native forest conditions and sand media filtration to provide enhanced treatment.

The City has 34 Certified Erosion and Sediment Control Lead (CESCL) trained personnel on staff. Training of municipal staff is ongoing through interdepartmental meetings and monthly Stormwater Committee meetings and occurs as well during facility inspections from SSWU staff.

7.3 Accomplishments in 2012

The City of Bellingham inspected and maintained all publicly-owned stormwater facilities in 2012 and responded promptly to reported maintenance issues. While each facility was inspected at least once, the majority of the facilities were visited or serviced 3 to 4 times. Crews also inspected and maintained 4,249 catchbasins of the 10,875 known publicly-owned catchbasins in the City. In 2012, the City went to the extra effort of contracting Kulshan Environmental Services to conduct a pilot study that evaluated the current level of maintenance at city-owned stormwater ponds and bioswales. The study inspected 37 public facilities based on maintenance standards found in the 2012 Western Washington Stormwater Management Manual. The results of the study pointed to vegetation management as the greatest maintenance challenge facing the City. Recommendations from the study are being incorporated into the scheduled maintenance efforts and future inspections.



A Stormwater Committee was convened as a forum for interdepartmental discussions on municipal stormwater issues. Each monthly meeting contained a training component for City staff on stormwater protocol and pollution prevention practices. The City purchased two new municipal stormwater pollution prevention employee training kits. SSWU staff have previewed them and scheduled training of additional municipal staff through the stormwater committee forum. Other municipal activities undertaken in 2012 include

continuation of the street sweeping program, source control inspections on City-owned facilities and the revision of the stormwater pollution prevention plans for the Public Works Operations Complex and the Parks & Recreation Operations Center.

The City secured grant and loan funding for 6 stormwater projects in 2012 with total grant funds of approximately 2.9 million dollars and loan funds of 1.4 million dollars. Design began for several of these

projects including retrofits of Bloedel Donovan park areas, systems on Northshore Drive from Britton Road to Donald Avenue, and the Lake Whatcom right-of-way areas. Site selection analysis and design work for 36 raingardens in the Central Business District is underway. This project will retrofit existing parking areas on streets in the Bellingham Central Business District with rain gardens to improve water quality and provide flow attenuation for five existing outfalls flowing directly to Whatcom Creek, a 303(d) listed waterbody. Stormwater retrofits are also funded to treat stormwater from an outfall into Padden Creek near its mouth.

7.4 Plans for Program Activities in 2013

The city plans to continue to implement pollution prevention and maintenance for municipal operations at a commensurate level of effort as in 2012.

8.0 MONITORING (S8.C.1.b and S8.C.2)

8.1 Program Overview

The City of Bellingham has conducted water quality monitoring for over 20 years through our Urban Streams Monitoring Program. This program was initiated in 1990 with the purpose of collecting data and maintaining a record of stream conditions at up to 19 separate stream sites on the 5 major creeks within Bellingham. In addition, the City sponsors an in-depth water quality program focused on the Lake Whatcom Watershed. The program began over 50 years ago due primarily to our requirements as a purveyor of water to test the quality of incoming water to our water treatment system but has continued to grow and expand in scope as additional parameters and studies have been deemed necessary. In recent years, the City has focused not only on the Lake quality but also on the nature of the water entering the Lake through creeks and large storm drains. Western Washington University (WWU) over this time period has been commissioned by the City to provide ambient Lake monitoring and stormwater input monitoring from the various creeks.



A third facet of the City's program involves stormwater monitoring. For over 15 years, the City has tested inflows to creeks primarily in the Lake Whatcom Watershed following storm events. Monitoring started with the inclusion of the Park Place stormwater wet pond in the WWU Lake Monitoring study. Our stormwater monitoring program has expanded to test a variety of BMP's for effectiveness in removing standard pollutants and phosphorus. To date we have performed testing on raingardens, wet ponds, sand filters, and media filtration. Three different types of systems have been analyzed to date with the following results:

- Phosphorus specific filtration media - 50% phosphorus removal efficiency based on water quality sampling
- Raingardens – 81% fecal coliform removal based on quarterly sampling

- Sand filters – 50% phosphorus removal and 80 to 99.9% fecal coliform removal based on quarterly sampling

Analysis of systems in Lake Whatcom is being used to typify phosphorus removal rates for TMDL compliance. This program is of regional significance because it provides credible information on new stormwater treatment and infiltration techniques that is specific to Western Washington. The new media in the facility, including phosphorus-removing filter cartridges, has been given conditional approval from the Department of Ecology as a phosphorus-limiting best management practice (BMP).

Bellingham has also engaged in short term monitoring as a part of our illicit discharge program. In all of our system review done for illicit discharge detection the City has utilized a hydrolab or equivalent to determine water quality issues. During field investigations, the flowing outfalls have been tested for basic water quality parameters including turbidity, pH, conductivity, dissolved oxygen and temperature. In addition, testing for fecal coliform and total phosphorus was included as applicable.

8.2 Accomplishments in 2012

The City's Urban Stream Monitoring program and Lake Whatcom Monitoring programs continued. In 2012, wet weather monitoring of Whatcom Creek was completed and dry weather monitoring of Bellingham Bay was conducted. The City continued evaluating specialized filter medias for installation in vaults around Lake Whatcom. In addition to the removal of suspended solids, the new medias are formulated to remove dissolved phosphorus from stormwater. All city-operated Lake Whatcom watershed media systems have been fitted with these new phosphorus-absorbing materials. Preliminary information points to a removal rate of 50 to 60 percent using the media.

8.3 Plans for Program Activities in 2013

The city plans to continue its monitoring at a commensurate level of effort as in 2012. Chuckanut Creek and Bear Creek are potential candidates for dry weather monitoring in the coming year.